



Global Change and Sustainable Development

**A Synthesis of Regional Experiences
from Research Partnerships**

Edited by
Hans Hurni and Urs Wiesmann
with an international group of co-editors

perspectives
Volume 5

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NCCR North-South
Swiss National Centre of Competence
in Research North-South
University of Bern
Switzerland

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Addressing major challenges of global and local change: self-made bridge crossing a highly polluted river and connecting two disadvantaged neighbourhoods in Abidjan, Côte d'Ivoire. In the absence of a satisfactory solution for linking the two communities, an inventive inhabitant set up a bridge and toll system that feeds his family and provides a needed service. The problem of pollution goes beyond technical solutions and requires involvement from a much broader range of stakeholders and concerned scientists. (Photo by Anne Zimmermann, February 2009)

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Introduction



Introduction: Research for Development – A Synthesis of Regional Experiences

Hans Hurni¹

Humankind today is confronted with numerous threats brought about by the speed, scope and unpredictable interconnectedness of global change dynamics. A concerted and informed approach to solutions is required to address the magnitude and severity of the numerous crises we are facing, related to the global economy, climate change and natural resource degradation, food security, poverty and social exclusion, water and sanitation, and conflict and governance, to name but a few. Generating shared knowledge and developing the ability to cross multiple borders between understandings of realities and issues are a key to addressing such global challenges. This is underlined in most of the peer-reviewed syntheses of regional research presented in this volume. The authors who cooperated to produce these articles are all members or former members of the Swiss National Centre of Competence in Research (NCCR) North-South, a development-oriented research programme guided by principles of sustainability. They review achievements of disciplinary, interdisciplinary and transdisciplinary work conducted in the past eight years and draw conclusions about future research agendas in nine regions worldwide (Figure 1).

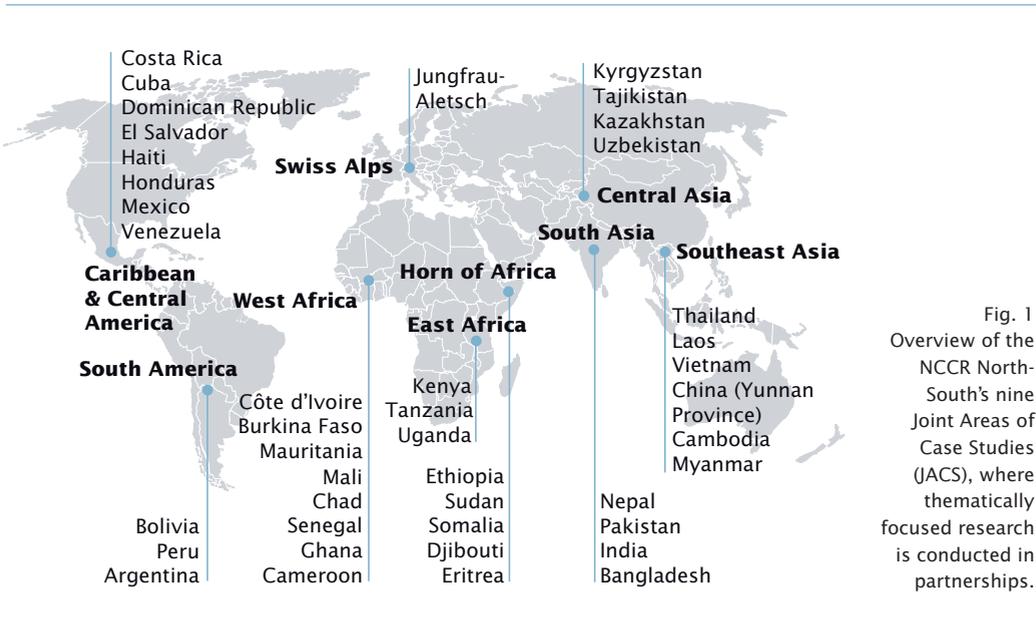


Fig. 1
Overview of the NCCR North-South's nine Joint Areas of Case Studies (JACS), where thematically focused research is conducted in partnerships.

The NCCR North-South is an international research network for which the University of Bern is the lead institution. It is based on research partnerships between people and institutions in nine regions of the global North, South and East. These partnership regions are called Joint Areas of Case Studies (JACS). The programme initially brought together seven Swiss institutions and their partners in developing and transition countries, in order to formulate and carry out research partnership projects. By early 2009 it had developed into an international network of over 190 institutions in 40 countries worldwide. The programme was made possible by the Swiss National Science Foundation (SNSF), which currently implements 19 such NCCRs in very different fields of scientific endeavour, ranging from nanotechnology to cancer research and affective sciences. The NCCR North-South is unique among these NCCRs: it is an international cooperative network seeking ways of increasing the effectiveness of development activities through research with solid societal support. Moreover, as it focuses on the impact of global change particularly in developing countries, the NCCR North-South is co-funded by the Swiss Agency for Development and Cooperation (SDC), with a view to enabling partners in the global South to contribute to, and benefit from, development-relevant research.

The programme is currently in its third phase, lasting from mid-2009 to mid-2013. Eight years of research partnerships on problems and potentials of global change have resulted so far in more than 1600 scientific publications. Over 250 researchers and 150 PhD students have been engaged in socially relevant research to date, and about 215 Master's students have conducted their fieldwork within this international framework. Currently, a new series of 15 research projects is being launched, involving 30 post-docs, as well as approximately 30 doctoral and 50 Master's students. After eight years of research the time was ripe for a synthesis of insights gained during the first two phases of the NCCR North-South, between 2001 and 2009. Apart from the thematically and regionally focused research results presented in this volume, programme members are also preparing a peer-reviewed synthesis of a more global nature, concerned with transversal topics, soon to be published in a companion volume in this series. The present book has 123 contributors: 45 women and 78 men, 72 coming from partner countries in the South and 51 from the global North.

The table of contents reveals a broad diversity of synthesis topics: from environmental sanitation and health to governance and conflict transformation, land degradation and sustainable management, poverty, institutional

transformation and livelihood assets, rural accessibility and migration, and social learning and sustainable regional development. This great variety of themes reflects what were considered to be the most pressing challenges of sustainable development by stakeholders consulted in the nine regions in 2001, when the partner institutions of the NCCR North-South initiated workshops in each JACS, with the aim of determining common problems and potentials (Hurni et al 2004). This negotiated compendium of research questions was defined as a “pre-synthesis of syndromes of global change”, meant to guide research activities in the years to follow (Hurni and Wiesmann 2004a). The topics identified in 2001 were defined in a transdisciplinary process (Hurni and Wiesmann 2004b), in which scientists from different cultural and scientific backgrounds and stakeholders in policy-making and from society participated in three-day meetings (Wiesmann and Hurni 2004) with the aim of elaborating a common understanding of core problems of non-sustainable development and assessing potentials for finding solutions (Messerli and Wiesmann 2004). This identification was followed by a considerable number of thematically focused research projects involving most of the staff of the NCCR North-South. The present book reflects both the diversity of the research themes within the programme and their clearly focused nature from a regional perspective, resulting from the initial negotiated definition of issues of particular concern to each region.

The synthesis of research carried out in the Joint Areas of Case Studies is presented in nine sections with four chapters each: the first chapter offers a general reflection on the overall focus in the region, followed by three thematic synthesis chapters (Table 1). The authors of each chapter review and discuss insights from a number of publications produced by NCCR North-South members, placing them within the context of broader international scientific debates on these themes. In the lists of references, asterisks indicate which publications resulted from research carried out within the programme.

All chapters reflect work carried out in research partnerships with the aim of contributing to the mitigation of, or adaptation to, the negative impacts of global change. Global change, as it is understood in the NCCR North-South, is much more than climate change; it embraces all aspects of global dynamics in the social, political, ecological, institutional and economic spheres. Another common characteristic of the synthesis chapters is that they result from multidisciplinary studies on the topics chosen. Very often, interdisciplinary cooperation between researchers also took place, and, at

Table 1

General topic	JACS	WAF	EAF	HOA	CAS	SAS	SEA	CCA	SAM	ALP
Development challenges and research		X	X	X	X	X	X	X	X	X
Health risks, social exclusion		X						X		
Wastewater management, environmental sanitation		X					X X			
Risk perception and management									X	
Natural resource conflicts and governance		X		X		X		X		
Soil and water resource management			X	X X	X					
Adaptation to climate change			X X							
Sustainable regional development							X			X
Land use and institutions in transition					X X	X				
Migration, state and social organisation						X		X	X	
Negotiating protected areas									X	X X

General synthesis topics addressed and their distribution in the different JACS. Each chapter is identified by a cross in this matrix. (Abbreviations are spelt out in the text.)

specific times during the research process, transdisciplinary phases were included, during which representatives of stakeholder groups were invited to join the research process, e.g. to identify problems and potentials, help formulate research questions, assist in orienting the research towards finding pathways for mitigation of, or adaptation to, the negative impacts of global change, or even help validate the results of research in concrete development projects.

Three JACS regions are in Africa. In West Africa (WAF), the focus is on health risks, wastewater management and natural resource conflicts and governance. Approaches developed are vulnerability and resilience in health, equity effectiveness in environmental sanitation, and autochthony and conflicting rights in natural resource management. In East Africa (EAF), the chapters address water management using a multi-level and multi-stakeholder perspective, strengthening of institutions to enhance adaptation to climate change, and increasing the resilience of the most vulnerable and empowering them to mitigate syndromes of global change. In the Horn of Africa (HOA), the overall theme is improved governance of natural resources. This includes dealing with pastoral conflicts and state-building activities, water management and conflict transformation, and land degradation and sustainable land management issues.

Three additional JACS regions are in Asia. In Central Asia (CAS), understanding transformation processes remains an important issue despite the fact that 20 years have elapsed since the collapse of the Soviet Union. The three syntheses relate to new ways of managing water resources, to land use in transition, and to natural resource institutions facing privatisation and decentralisation. In South Asia (SAS), the general focus is on livelihoods, institutions and migration. The topics are access to livelihood assets, state building, resource governance and conflict issues, as well as patterns and politics of migration. In Southeast Asia (SEA), environmental management is addressed using integrated approaches: decentralised waste-water management, tools for environmental planning and river basin management, and assessing accessibility in rural areas as a determinant of social and economic disparities.

Two JACS regions are in Latin America. In the Caribbean and Central America (CCA), the development challenges discussed are social exclusion, migration, and environmental governance. Poverty and insecurity are barriers to development and lead to exclusion and migration, considered to be responses exhibiting both problematical and promising features. Local responses to environmental problems are also analysed in terms of their positive and negative aspects. In South America (SAM), relationships and conflicts between states and citizens are addressed with a view to reconstructing them, sharpening perceptions of natural hazards and enhancing risk management, as well as improving the governance of protected areas inhabited by indigenous peoples.

Perhaps surprisingly for a research programme focusing essentially on developing countries, one JACS region is in the European Alps, more specifically in the Swiss Alps (ALP). There, research focuses on sustainable regional development using the example of a protected area, on reconciling global and local dynamics and stakes, on the construction of meaningful spaces in negotiations about conservation, and on the potentials and limitations of transdisciplinary approaches to managing a World Natural Heritage Site. JACS ALP has hosted programme activities of two kinds: research focusing on regional issues analysed from the perspective of both Northern and Southern researchers, leading to interesting insights into power structures and mutual learning, and international conferences as well as annual planning meetings involving all project coordinators, to coordinate interdisciplinary activities and conceptual frameworks.

The 36 chapters of this book reflect the broad spectrum of research questions, approaches, disciplines and institutional contexts that characterise the NCCR North-South programme. Readers can either dip into individual regions or themes, or explore the book as a whole and discover what holds it together: a common effort to make research more relevant to society, a commitment to conducting research in complex partnerships where issues of difference and power need to be addressed on a daily basis, a willingness to cross disciplinary and other epistemological boundaries whenever necessary for developing a common understanding of issues and possible solutions, and a commitment to mutual learning for sustainable development.

Endnotes

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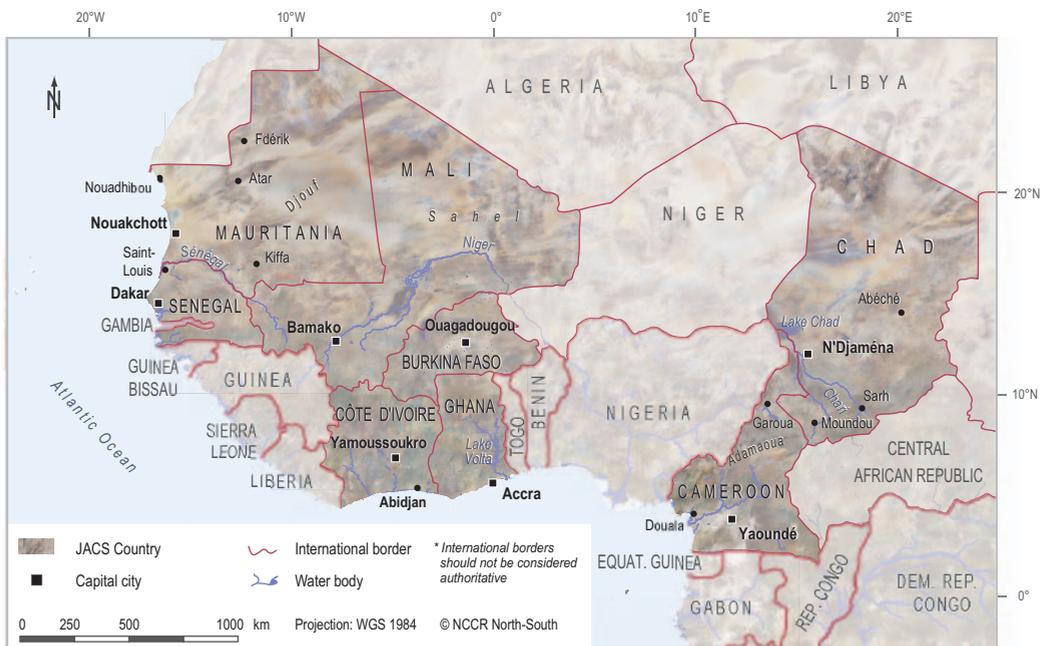
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References

- Hurni H, Wiesmann U. 2004a. Designing future research projects in an integrated framework. *In: Hurni H, Wiesmann U, Schertenleib R, editors. 2004. Research for Mitigating Syndromes of Global Change: A Transdisciplinary Appraisal of Selected Regions of the World to Prepare Development-oriented Research Partnerships.* Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 1. Bern, Switzerland: Geographica Bernensia, pp 425–439.
- Hurni H, Wiesmann U. 2004b. Towards transdisciplinarity in sustainability-oriented research for development. *In: Hurni H, Wiesmann U, Schertenleib R, editors. 2004. Research for Mitigating Syndromes of Global Change: A Transdisciplinary Appraisal of Selected Regions of the World to Prepare Development-oriented Research Partnerships.* Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 1. Bern, Switzerland: Geographica Bernensia, pp 31–41.
- Hurni H, Wiesmann U, Schertenleib R, editors. 2004. *Research for Mitigating Syndromes of Global Change: A Transdisciplinary Appraisal of Selected Regions of the World to Prepare Development-oriented Research Partnerships.* Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 1. Bern, Switzerland: Geographica Bernensia.
- Messerli P, Wiesmann U. 2004. Synopsis of syndrome contexts and core problems associated with syndromes of global change. *In: Hurni H, Wiesmann U, Schertenleib R, editors. 2004. Research for Mitigating Syndromes of Global Change: A Transdisciplinary Appraisal of Selected Regions of the World to Prepare Development-oriented Research Partnerships.* Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 1. Bern, Switzerland: Geographica Bernensia, pp 383–423.
- Wiesmann U, Hurni H. 2004. The transdisciplinary approach to regional pre-syntheses: A basis for syndrome mitigation research. *In: Hurni H, Wiesmann U, Schertenleib R, editors. 2004. Research for Mitigating Syndromes of Global Change: A Transdisciplinary Appraisal of Selected Regions of the World to Prepare Development-oriented Research Partnerships.* Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 1. Bern, Switzerland: Geographica Bernensia, pp 43–57.

Part I

Research for Development in West Africa: Vulnerability, Health Risks and Institution Building





1 Health, Sanitation, Autochthony and Integration: Urban and Rural Development Challenges in West Africa

Guéladio Cissé¹

1.1 Selected development-relevant research themes

1.1.1 Core problems, potentials and contexts in the region

West African countries are facing major changes and problems that require a conjunction of different efforts and disciplinary skills to find the most appropriate and sustainable solutions. Core problems requiring careful consideration in West Africa were identified, classified and synthesised during a participatory workshop organised in Abidjan, Côte d'Ivoire, by the Swiss National Centre of Competence in Research (NCCR) North-South “Syndrome Pre-Synthesis Project” (SPSP) in 2001. All 21 core problems identified (Tanner et al 2004) in the NCCR North-South’s Joint Area of Case Studies (JACS)² West Africa (WAF) were linked to sustainable development challenges in the region. Poverty, environmental degradation, conflicts, poor sanitation, health and institutions – in both urban and rural contexts – were the issues that workshop participants emphasised most.

The NCCR North-South programme made it possible to launch several research projects as well as Partnership Actions for Mitigating Syndromes (PAMS)³ in West Africa, with a focus on analysis of syndromes of global change (Hurni et al 2004) on the one hand, and on mitigating syndromes, on the other. The projects were primarily concerned with three themes: 1) *Vulnerability and Resilience*; 2) *Health Risk Management and Equity Effectiveness*; and 3) *Institutions, Public Space and Conflicts*.

1.1.2 Approach and selection of three themes

The burdens of malaria, HIV/AIDS, gastro-intestinal parasites and several major diseases in both rural and peri-urban contexts are linked to poverty, vulnerability and resilience among the populations affected (Cham-

bers 1989; Moser 1998; Tanner and Mtasiwa 2001; Kjellstrom et al 2007; Obrist and Tanner, in preparation). Success in combating these diseases thus depends on taking the related issues into account. Due to the complexity of social and economic problems in the two targeted contexts in West Africa, the multidisciplinary team of scientists from the North and the South working in the JACS WAF adopted a common conceptual framework for a first regional synthesis theme concerned with *Vulnerability and Resilience* (Cissé and Tanner 2006; see Chapter 2 in the present volume).

The costs of inadequate water supply and sanitation (WSS) are high (WHO 2009; World Bank 2009). About 1.6 million children die every year from diarrhoea, mainly as a result of inadequate sanitation, water supply and hygiene (Feachem et al 1983; Esrey et al 1991; WHO 2009; World Bank 2009). By 2020, half of the developing world's population will be living in urban centres, including the informal settlements that now account for 40–70% of the population in many cities in developing countries. Thus, the main challenge for team research carried out in West Africa concerned a second synthesis theme, *Health Risk Management and Equity Effectiveness*: to come up with innovative approaches and hypotheses for managing health and sanitation risks and providing sanitation and health equitably to neglected populations, in urban and semi-arid areas (see Chapter 3 in the present volume).

For decades several countries in West Africa have been marked by major social and political crises. Tensions are linked in many cases to discourse on and different interpretations of 'autochthony', 'citizenship', 'locals', 'non-locals', 'nationals', and 'foreigners' (Bayart et al 2001; Ceuppens and Geschiere 2005). The weakness of institutions and the 'presence-absence' of the state are at the heart of the issue. These factors benefit certain powerful local actors who attempt to maintain, revitalise or transform traditional rules to increase their power over resources (Geschiere 2005). A group of NCCR North-South researchers in the JACS WAF therefore focused on a third regional synthesis theme during Phase 2 of the programme: *Institutions, Public Space and Conflicts* (see Chapter 4 in the present volume). In parallel, small development projects related to some of the research projects were implemented (Table 1).

Table 1

PAMS	Location and duration	Main outcomes
Water supply delivery to the underprivileged neighbourhood of Yaosehi in Abidjan	Yaosehi, Yopougon, Abidjan, Côte d'Ivoire (September 2002 – October 2002)	Community water tap built; community-based committee created and trained for equitable management of the system
Local capacity-building for protection of lagoon water in a peri-urban village	Azito, Yopougon, Abidjan, Côte d'Ivoire (January 2003 – December 2003)	Joint training in water and environmental analysis for numerous laboratory technicians and researchers in Côte d'Ivoire; demonstrations performed by laboratory technicians for various social groups; construction of latrines and waste management infrastructure; delivery of material for sanitation and cleaning of the shore
Psycho-social, medical and nutritional care for poor people living with HIV/AIDS in deprived neighbourhoods	Yopougon, Abidjan, Côte d'Ivoire (September 2002 – October 2003)	Identification of and consultation with numerous infected women; purchase of necessary prescription medication for several women in need; psycho-social and nutritional assistance for sick people
Innovative tuberculosis treatment actions for nomadic pastoralists in remote zones of Mauritania	Bassiknou, Mauritania (December 2003 – November 2004)	Improved knowledge of therapeutic options among nomadic pastoralists; inclusion of nomadic representatives in village health committees; 30% increase in detection of tuberculosis suspects from nomadic communities in comparison to previous years; first patients have started successful treatment with new approach
Building capacity for preventing pollution of irrigation water	Ouagadougou, Burkina Faso (May 2004 – April 2005)	All stakeholders working in the domains of water, sanitation, health and environment informed about persistent organic pollutants (POPs) and chemical pollution risks in water and soils; the population (gardeners, farmers, horticulturists, municipalities, etc.) informed about various diseases they might contract due to polluted wastewater
Integration of a geographic information system (GIS) in the urban waste management and public health services information system	Ouagadougou, Burkina Faso (January 2005 – December 2005)	Information and sensitisation of professionals from the involved disciplines (sociologists, epidemiologists, doctors, geographers, urban planners), as well as of affected populations, via their associations and NGOs with local competence in the area of urban health and GIS tools; validation of a prototype with participants well informed about the potentials and pitfalls of GIS tools
Regional collaboration for prevention of HIV/AIDS in Nouakchott, Mauritania	Nouakchott, Mauritania (January 2007 – December 2007)	Dozens of participants benefited from regional exchange through one Autodidactic Learning for Sustainability (ALS) workshop; access for hundreds of young men and women to reliable information on sexuality and HIV/AIDS; main indicators of progress showed quantifiable satisfactory results; community relays (group for combating AIDS in colleges, association for combating AIDS among women in the district, care and support group) set up and supported
Strengthening local stakeholders' capacities to improve faecal sludge management	Ouahigouya, Burkina Faso	Promotion of mechanisms for service provision to the most vulnerable segments of Ouahigouya's population; training of stakeholders in the use of tools for monitoring and evaluating combined collection of faecal sludge (manual and mechanical emptiers); promotion of a new faecal sludge management strategy

Main outcomes of the Partnership Actions for Mitigating Syndromes (PAMS) implemented in West Africa during Phases 1 and 2 of the Swiss National Centre of Competence in Research (NCCR) North-South programme.

1.2 Outputs: activities, outcomes, integration

Chapters 2, 3 and 4 in the present volume highlight the main scientific outputs and the new evidence generated, which are summarised in Table 2 and briefly commented below. Furthermore, the various studies generated valuable transnational knowledge.

Table 2

	Vulnerability and resilience (see Chapter 2)	Risk assessment and equity effectiveness (see Chapter 3)	Institutions, public space and conflicts (see Chapter 4)
Main scientific outputs	<ul style="list-style-type: none"> – Conceptual framework linking vulnerability and resilience – Specific vulnerability of women living with HIV – Links between lack of education and sexual activity – Acute vulnerability according to national poverty indicators 	<ul style="list-style-type: none"> – New conceptual framework for the improvement of health and environmental sanitation – Appropriate treatment technologies and management framework for wastewater and faecal sludge in Southern contexts (vertical-flow constructed wetlands vegetated with indigenous plants, use of solar radiation, etc.) 	<ul style="list-style-type: none"> – Strong opposition between some population groups, rooted in colonial times – Local rules dismantled and lack of clear authority – The concept of autochthony as an instrument used by actors to serve their interests – Public spaces as places of protest and contestation; shared and disputed places
New evidence generated	<ul style="list-style-type: none"> – Vulnerability of people living near polluted lagoon waters exposed to bad odours and other bacterial and chemical contamination – Great economic burden of malaria, increasing vulnerability of people living on less than USD 1 per person per day 	<ul style="list-style-type: none"> – Household water conservation techniques to reduce diseases – People's knowledge and behaviour as a driving force to reduce vulnerability to risk 	<ul style="list-style-type: none"> – Resource boundaries no longer clearly defined, specific population groups easily cross borders to exploit pockets of resources on both sides – Local population often resorts to violence to claim their exclusive rights to resources and take advantage of the elasticity of the notion of citizenship
Main transnational knowledge generated	<ul style="list-style-type: none"> – Widespread absence of basic urban public services (water, sanitation and health) throughout the entire region is an important factor with regard to vulnerability – The fight against HIV/AIDS requires innovative approaches such as Autodidactic Learning for Sustainability (ALS), to be promoted at the regional level 	<ul style="list-style-type: none"> – The reuse of biosolids in peri-urban and urban agriculture can help to increase food security – New approach needed to improve access of nomadic populations to combined services – New wastewater and faecal sludge treatment options that consider nutrient recovery and waste reuse 	<ul style="list-style-type: none"> – Fearing loss of control over their own land and feeling excluded from resources by powerful 'outsiders', local people tend to develop animosity towards other social groups, even when these are citizens of the same country

Overview of the main results and outputs from the three syntheses conducted in the Joint Area of Case Studies (JACS) West Africa covering the period of 2001–2009. Each synthesis is presented in one of the three following chapters of the present volume.

1.2.1 Main findings on vulnerability and resilience

The specific vulnerability of women living with HIV in Côte d'Ivoire increases if their serological status is known by their friends or family members. Lack of education, as well as participation in sexual activity, are increasing the vulnerability of adolescents to HIV in Chad. In Mauritania, more than 65% of the households investigated in some poor urban areas face acute vulnerability according to national poverty indicators. The vulnerability of people who live near polluted lagoon waters and are exposed to bad odours and other bacterial and chemical contaminations is increasing the burden of diseases. The vulnerability of urban and peri-urban home gardeners is linked to land insecurity and associated health risks; and the great economic burden of malaria is increasing the vulnerability of people living on less than USD 1 per person per day.

1.2.2 Main findings on risks and equity effectiveness

A new conceptual framework was developed to improve health and environmental sanitation using an approach combining health, environmental, socio-economic and cultural assessments in urban and peri-urban areas in developing countries, based on the interrelations between environmental systems, health status and well-being. Wastewater treatment options and household water conservation techniques to reduce diseases were designed and tested, but their adoption depends to a large extent on people's knowledge and behaviour. These are important driving forces in reducing people's vulnerability to risk. An example of success in finding adapted technical solutions for wastewater treatment is research conducted on experimental vertical-flow constructed wetlands vegetated with indigenous plants: this research revealed that *Echinochloa pyramidalis* (antelope grass) and *Cyperus papyrus* (papyrus) were not significantly affected when loaded with faecal sludge at concentrations of up to 200 kg solid matter per m² per year (see Chapter 3 in the present volume; Figure 1).

1.2.3 Main findings on institutions, public space and conflicts

There is strong opposition between different social groups, rooted in colonial times and motivated by the need to safeguard ancestral land or their resources in general (see Chapter 4 in the present volume). While local rules have been dismantled, the new bureaucratic institutions that replaced them failed to put in place mechanisms of management, monitoring and fining,

Fig. 1
Visit of the
Yaoundé experi-
mental plant for
faecal sludge
treatment by a
delegation from
Cameroon's Minis-
try of Water and
Energy and local
authorities during
the UN Internation-
al Year of Sanitation
(2008). (Photo by
Ives M.Kengne)



thus confirming the lack of a clear authority at all levels in most West African states. In a context of natural resource scarcity, the concept of ‘autochthony’ is used as an instrument by actors to serve their own interests. Resource boundaries are no longer clearly defined, and some people easily cross transnational borders to exploit pockets of resources on both sides. Moreover, public spaces in urban contexts are shared and disputed places where various actors defend their interests (Figure 2). Local populations often resort to violence to claim their exclusive rights over resources in urban and rural contexts, and take advantage of the elasticity of the notion of citizenship (see Chapter 4 in the present volume).

1.3 Outlook: challenges ahead, responses and opportunities

The widespread absence throughout the entire region of basic urban public services such as water, sanitation and health is an important factor increasing people’s vulnerability. The fight against HIV/AIDS requires innovative approaches such as Autodidactic Learning for Sustainability (ALS) (Bachmann 2003; Kläy and Vasco Mutimucuo 2007) to be promoted at the regional level (Figure 3). The reuse of biosolids in peri-urban and urban agriculture



Fig. 2
Transformation of
pastoral produc-
tion systems:
urban pastoralism
in Nouakchott,
Mauritania.
(Photo by Patricia
Schwärzler)

can contribute to increased food security in many West African countries. A new approach aiming to improve nomadic populations' access to combined services was developed in response to the absence of infrastructure and markets in the region and needs to be further implemented. New wastewater and faecal sludge treatment options that take account of nutrient recovery and waste reuse were developed for regional contexts and are available for implementation. Finally, there is a need for political action to confront the fact that local people tend to develop animosity against other social groups, even when these are citizens of the same country, because they fear losing control over their own land and feel excluded from resources by powerful 'outsiders'.

In future, there is a need to address the following research and research-cum-action questions related to the three themes investigated in the JACS WAF:

- How can HIV/AIDS and malaria be better managed, considering vulnerability and resilience at the household level? What are the different interpretations of the illness *palu* at the regional level, and how do they compare? What are the links between vulnerability and resilience, bad governance, and institutional weakness?



Fig. 3
A mural painted in
2003 during a pre-
vention campaign
in N'Djamena,
Chad. (Photo by
Abdias Nodjiadjim
Laoubaou)

- What action-research projects should be implemented with a view to combining food quality, food security and the food production system? How can the World Health Organisation's Directly Observed Treatment Short-course (DOTS) approach to combating tuberculosis be better adapted to mobile pastoralists? How can adequate integration of health planning with other social service sectors (education, animal health and environment) be ensured?
- How can multilevel institutional frameworks be implemented to improve the livelihoods of people, indirectly improve their access to basic social services, and enhance social dialogue? How can more support be given to scientific research to help bridge the gap between state policies and groups of actors such as traditional authorities, local or regional governments, civil society, and domestic and global actors?

We expect that these questions, among many others, may be addressed in the third phase of the NCCR North-South programme (2009–2013) by a number of researchers who will work from a disciplinary perspective, with periods of interdisciplinary and transdisciplinary activities, with a view to ensuring effective integration of their research and having a meaningful impact on institutions, individuals and communities.

Endnotes

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² The NCCR North-South is based on research partnerships with researchers and research institutions in the South and East. These partnership regions are called JACS (Joint Areas of Case Studies). Regional Coordination Offices (RCOs) were established in each of these JACS at the outset of the programme. The original function of the RCOs was to coordinate research; in the third phase of the programme, RCOs will consolidate the existing research network in the South and will become hubs for generating new research projects and partnerships.

³ Partnership Actions for Mitigating Syndromes (PAMS) are projects implemented by local actors together with scientific and non-scientific stakeholders. As a component of the NCCR North-South programme they are designed to implement and validate approaches, methods and tools developed in research, with a view to finding promising strategies and potentials for sustainable development. Moreover, they are intended to promote mutual learning and knowledge-sharing between academic and non-academic partners in sustainable development.

References

Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- Bachmann F. 2003. *Assessment of Experience in the Implementation of the Training Approach 'Autodidactic Learning for Sustainability' (ALS)*. Bern, Switzerland: Centre for Development and Environment (CDE).
- Bayart JF, Geschiere P, Nyamjoh F. 2001. Autochtonie, démocratie et citoyenneté en Afrique. *Critique Internationale* 10:177–194.
- Ceuppens B, Geschiere P. 2005. Autochthony: Local or global? New modes in the struggle over citizenship and belonging in Africa and Europe. *Annual Review of Anthropology* 34:385–407.
- Chambers R. 1989. Editorial introduction: Vulnerability, coping and policy. *IDS Bulletin* 20(2):1–7.
- * Cissé G, Tanner M. 2006. Editorial. *Vertigo – La revue électronique des sciences de l'environnement* hors-série 3. <http://vertigo.revues.org/index1425.html>; accessed on 23 October 2009.
- Esrey SA, Potash J, Roberts L. 1991. Effects of improved water supply and sanitation on ascariasis, diarrhoea, dracunculiasis, hookworm infection, schistosomiasis and trachoma. *Bulletin WHO* 69:609–621.
- Feachem RG, Bradley DJ, Garelick H, Mara D. 1983. *Sanitation and Disease: Health Aspects of Excreta and Wastewater Management*. Hoboken, NJ: John Wiley and Sons.
- Geschiere P. 2005. Autochthony and citizenship: New modes in the struggle over belonging and exclusion in Africa. *Quest: An African Journal of Philosophy* 18:9–24.
- * Hurni H, Wiesmann U, Schertenleib R, editors. 2004. *Research for Mitigating Syndromes of Global Change: A Transdisciplinary Appraisal of Selected Regions of the World to Prepare Development-oriented Research Partnerships*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 1. Bern, Switzerland: Geographica Bernensia.
- Kjellstrom T, Mercado S, Satterthwaite D, McGranahan G, Friel S, Havemann K. 2007. *Our Cities, Our Health, Our Future: Acting on Social Determinants for Health Equity in Urban Settings*. Report to the WHO Commission on Social Determinants of Health from the Knowledge Network on Urban Settings. Kobe, Japan: World Health Organisation (WHO).
- Kläy A, Vasco Mutimucuo I. 2007. *Testing the 'Learning for Sustainability' Approach in a Training for Trainers*. Paper presented at the World Environmental Education Congress, Durban, South Africa, 2–6 July 2007. Available at: http://www.cde.unibe.ch/CDE/PubMed_Detail2_Cd.asp?ID=1553; accessed on 22 October 2009.
- Moser CON. 1998. The asset vulnerability framework: Reassessing urban poverty reduction strategies. *World Development* 26(1):1–19.
- * Obrist B, Tanner M. In preparation. Risk, vulnerability and resilience: A new approach to the study of health in diverse livelihood contexts. Manuscript available from Brigit Obrist (see Endnote 6 in Chapter 2 by Sy et al on p 43 of the present volume).
- * Tanner M, Mtasiwa D. 2001. *Risk and Vulnerability: New Approaches and a Framework for Poverty Alleviation in Urban Settings. Experience from the Health Sector*. SDC Report. Bern, Switzerland: Swiss Agency for Development and Cooperation (SDC).
- * Tanner M, Wyss K, Zinsstag J, Cissé G, Yémadji N, Obrist van Eeuwijk B, Schelling E. 2004. JACS West Africa. Urbanisation and nomadic lifestyle: Research on vulnerability and risks to improve well-being at household and population levels. In: Hurni H, Wiesmann U, Schertenleib R, editors. *Research for Mitigating Syndromes of Global Change: A Transdisciplinary Appraisal of Selected Regions of the World to Prepare Development-oriented Research Partnerships*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 1. Bern, Switzerland: Geographica Bernensia, pp 61–93.
- WHO [World Health Organisation]. 2009. Water, sanitation and health: Publications and facts. *World Health Organisation*. http://www.who.int/water_sanitation_health/; accessed on 8 September 2009.
- World Bank. 2009. Water supply and sanitation. *World Bank*. <http://go.worldbank.org/GJ7BOASPG0>; accessed on 10 September 2009.

2 **An Interdisciplinary Vulnerability and Resilience Approach to Health Risks in Underprivileged Urban Contexts in West Africa**

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Abstract

Vulnerability and resilience are very dynamic concepts with links to various processes. In West Africa, the vulnerability of underprivileged groups is aggravated by deficiencies in environmental and health services. Therefore, a vulnerability and resilience approach was taken as a frame of reference for a series of case studies on diseases, environment, poverty, livelihoods, and access to basic social services in urban areas in West Africa. The studies covered various aspects of exposure to different health risks: the sexual practices of schoolchildren in different urban settings in Chad; the social and sexual practices of young women in Ouagadougou in Burkina Faso; responses of women to the AIDS epidemic in Abidjan in Côte d'Ivoire; malaria in a precarious habitat in Abidjan; health problems related to urban agriculture; diseases linked to polluted water in Abidjan in Côte d'Ivoire, Rufisque in Senegal, and Nouakchott in Mauritania; and access to biomedical health care services in Nouakchott in Mauritania. These case studies show that a series of social, environmental, economic and political factors – and their interdependence – make some groups particularly vulnerable to infection; at the same time, these groups have limited options to effectively respond to health risks. In particular, social fragmentation leads to vulnerability with a multidimensional character that includes cultural, social and economic factors. Vulnerable urban populations suffer at several levels. This calls not only for research on urban environments and health issues, but also for processes that strengthen social and personal structures ('empowerment') and foster community mobilisation and social change.

Keywords: Vulnerability; resilience; health; urban contexts; West Africa.

2.1 Introduction: syndrome studies in urban contexts

Vulnerability and resilience are polysemic concepts developed in various academic fields, as well as in applied and development-related fields, by numerous authors representing different disciplines and approaches (Chambers 1989; Bohle 2001; Beck 2003). Some innovative approaches have combined perspectives on health risks in the natural sciences with perspectives on vulnerability and resilience in the social sciences. The adoption of a conceptual framework of vulnerability and resilience to urban contexts (Moser 1998; Obrist et al 2006) provides some tools for improving the effectiveness of interventions elaborated and applied in the health sphere. The interdisciplinary approaches developed in West Africa within the framework of the Swiss National Centre of Competence in Research (NCCR) North-South have helped to stimulate reflection on the concepts of vulnerability and resilience. In a larger partnership framework, groups of researchers in the region have carried out transdisciplinary consideration of these themes in different West African cities. They provide illustrations of urban centres facing environmental, demographic and socio-economic changes closely interlinked with problems of health and well-being. Studies concentrated on deprived zones in each city where several typical syndromes overlap. The density of syndromes is an important indicator for poverty and vulnerability. People living in disadvantaged urban areas are the populations most exposed to health risks.

By combining expertise from various disciplines (anthropology, geography, environmental sciences, epidemiology, public health, sociology, economy), the group of researchers represented here aimed to contribute to the production and dissemination of knowledge about the stakes of urban health while also developing new practices. The results produced by this interdisciplinary team contributed to further development of both the vulnerability and resilience concepts and tools that can be applied in health interventions. Reflection focusing on these concepts made it possible to enlarge the sphere of action for health policies by including cultural and social factors that are often neglected in analyses narrowly based on quantitative indicators of economic risk or poverty.

Inspired by different models and theories developed in other contexts, our multidisciplinary research team examined the concepts of vulnerability and resilience from the perspective of exposure to health risks in urban settlements, focusing principally on social fragmentation (HIV/AIDS, gender,

sexual and reproductive health), malaria and urban environments (livelihoods, poverty, popular practices, environmental health hazards) and access to urban services (water, sanitation, health facilities). Themes were developed as a product of joint reflection and based on a common view of examining the complex links between health problems and the increasing density of multiple syndromes in disadvantaged urban contexts. Our reflections on vulnerability and resilience to health risks helped us to understand many scientific approaches and yielded interesting results in many fields of investigation. These two concepts constitute the main theoretical focus of the various research teams. They were critically reviewed by various members of the NCCR North-South teams in West Africa. The diversity of the perspectives on which these various contributions focus confirms that vulnerability and resilience are very dynamic concepts linked to various processes. In order to analyse the potentials and the limits of these two concepts, the ideas that were derived from the different approaches are presented and commented on here.

2.2 Methods and approaches

One main focus of the studies was to analyse the links between transformations in urban contexts and their effects on health risks, taking the concepts of vulnerability and resilience as entry points. This is especially pertinent, because the themes (health risks, environmental factors, poverty, livelihoods and social fragmentation) interact at various levels. The different contributors show how these two concepts were integrated into their approaches and analyses to better understand and interpret their research results.

Scientific discourse based on the risk approach was further developed to include vulnerability and resilience. It examines how social groups and individuals exposed to risks are susceptible to vulnerability and how they react to cope with this situation and build resilience. Different authors have used various methods and approaches to define concepts and frameworks with regard to vulnerability and resilience within their own disciplines. The research reported on here draws on definitions and approaches developed by Chambers (1989), Moser (1998), Tanner and Mtasiwa (2001), Obrist and Tanner (2002), Obrist et al (2006), and Obrist (2010), considering vulnerability as a combination of exposure to risks and lack of adequate means to manage them, and resilience as the capacity to react to and manage or even prevent risks and shocks to which households, groups and communities are exposed. The concepts of vulnerability and resilience are relational and reciprocally linked (Obrist et al 2006).

Different dimensions of health and socio-economic aspects were studied in disadvantaged urban areas of Abidjan. Social fragmentation and commoditisation were addressed with an emphasis on social exclusion and access to resources among women living with HIV/AIDS in Abidjan (Kablan et al 2006), cultural and social practices in communication about sexuality between adults and adolescents exposing the latter to risk of HIV infection in N'Djamena (Nodjiadjim et al 2006), and representation of linkages between adolescents' sexual practices and HIV by their grandparents' generation in Ouagadougou (Schwartzler 2010). The two concepts were also applied in three studies involving malaria research in Abidjan, on experiences, meanings and practices in the daily lives of adults touched by the illness locally defined as *palu* (Granado et al 2006); an evaluation of the economic burden of malaria (Kouadio et al 2006); and the main problems of urban agriculture (Matthys et al 2006). Different aspects of poverty and access to resources (Bâ et al 2004) were investigated in Nouakchott. Other studies focused on health risks due to pollution of the urban environment and access to urban social services from the perspective of vulnerability and resilience, such as access to drinking water, solid waste evacuation, sanitation management, and capacity to react to crises in the urban contexts of Rufisque (Sy 2006), Abidjan (Koné et al 2006) and Nouakchott (Diop et al 2004; Koita et al 2004), and access to health facilities in Nouakchott (Keita et al 2004; Ould Taleb et al 2006).

Various sources of information, methods and analytical tools were applied and combined in our studies of vulnerability and resilience. The research approaches were both quantitative and qualitative. Quantitative information was collected in household surveys using questionnaires with various headings relating to vulnerability and resilience. Qualitative data were collected through in-depth interviews and focus group discussions, with interview guidelines targeting individuals as well as institutional, political and community actors.

2.3 Results

From a great number of rewarding contributions, it was possible to capitalise on many of the results derived from approaches using these concepts or conceptual frameworks. We decided to present only a selection of the most important ones here. The contributions in this article are organised around three orientations of the vulnerability and resilience concepts.

The first category of results shows that in urban areas, health risks are often aggravated by social fragmentation. Vulnerability associated with women infected with HIV/AIDS is translated into a break-up of social and marital ties after they share their serological status with their kin and friends and consequently experience the difficulty of finding a means of livelihood (Kablan et al 2006). Two further studies in N'Djamena and Ouagadougou showed that socio-cultural norms and values have a determining influence on the sexual practices of adolescents that put them at high risk of contracting HIV (Nodjiadjim et al 2006; Schwärzler 2010). In these three settings, these phenomena are worsened by many different factors: lack of communication, be it with HIV-positive persons or between parents and children; lack of sexual education of adolescents, who seek information among peers or in the media and succumb to peer pressure to prove sexual activity, especially when girls have sexual relationships with older men for commodities; isolation of people living with HIV; and dissociation from people thought to be contaminated. Vulnerability of HIV-infected persons or adolescents is linked with lack of education, leading to a scarceness of resources for coping with the problem. Thus social fragmentation leads to vulnerability with a multidimensional character, including cultural, social and economic factors.

The second category of results demonstrates that health risks are linked to poverty, livelihoods and environmental contexts. Poverty is one of the reasons for the development of urban agriculture as a source of livelihood. This environmental context is one of the driving factors in vulnerability to health risks. The results of a study conducted in Abidjan link the vulnerability of market gardeners to insecurity of land ownership and to marketing difficulties (Matthys et al 2006). Health problems are related not only to weariness and sanitation problems, but other preoccupations of daily subsistence. In analyses of malaria in precarious urban areas, a close link was found between environmental risks, which are cited as factors in urban vulnerability among other assigned causes of malaria, and the locally defined illness *palu* (Granado et al 2006). Thus, risks of malaria contamination are factors in vulnerability directly linked to the environment of a city undergoing uncontrolled urbanisation. People living in disadvantaged areas are the most exposed and the most continuously exposed to risk of malaria. Their capacity to react to this risk is associated with resilience. From the population's point of view, commoditisation opens resilience pathways, and actors can choose between different medicines to treat malaria. Commoditisation is also a major cost factor in the management of the illness. In urban areas, availability and geographical accessibility often are not a problem. Rather, vulnerability is relat-

ed to problems of equity effectiveness. On the other hand, the commoditisation of drugs offers a possibility to face urban vulnerability induced by environmental risks and to fight the illness. Observations related to the economic burden of the disease and poverty in urban households in Abidjan (Kouadio et al 2006) revealed that malaria is a very great burden for financially weak households. The economic pressure linked to this disease is even greater for people living on less than USD 1 per person per day. In this context vulnerability is a matter of the significance of economic risks linked to malaria and the fragility of the economic power and social potentialities of a household. Social capital in terms of 'belonging to social networks' is less important than expected. Vulnerability grows when people make use of different medical options without considering cost-effectiveness or co-efficacy. The impact of a disease on economic vulnerability is confirmed by an analysis of the socio-economic conditions in precarious districts of Nouakchott which indicates that more than 65% of the households are in a situation of acute vulnerability according to national poverty indicators (Bâ et al 2004).

The third category of results concerns access to urban services (water, sanitation, health) and the consequences with regard to the propagation of diseases. A study carried out in Abidjan (Koné et al 2006) on the effects of lagoon pollution on peri-urban populations living at the seashore shows aspects of vulnerability related to bad odours emanating from polluted water, to increase of bacteria, and to flies and mosquitoes as vectors of diseases such as cholera, diarrhoea, malaria, and others. Aspects of resilience are related to initiatives undertaken by individuals for maintenance of the lagoon shores and to the financial, human and social capital of households where episodes of illness occur. Other studies in Nouakchott and Rufisque on the frequency of diseases such as malaria, acute respiratory infections and diarrhoeic diseases (Koita et al 2004; Sy 2006), or on environmental risks such as lack of drinking water or absence of appropriate systems for waste removal (Diop et al 2004; Sy 2006), illustrate the consequences of vulnerability linked to health risks, lack of hygiene and environmental sanitation in urban areas. The absence of basic city services needed for urban management is an important factor in a population's vulnerability. Vulnerability grows with increasing spatial and social discrimination. The most striking example of resilience is the reactive capacity of a population leading to self-governance in sanitation. In the study areas, even in urban settings, populations still have very limited access to health facilities and basic social services. Populations in Abidjan, Nouakchott and Rufisque consider that they are exposed to numerous health risks and that they have difficulty accessing modern health care services when illness occurs. This is

aggravated by the insufficiencies of these services. The reasons put forward by inhabitants of disadvantaged urban neighbourhoods range from geographical and financial to social and cultural factors. Thus, disease episodes are managed with the support of numerous networks – be they familial, ethnic, associative or professional – which manifest through group solidarity.

The results of these studies are also interesting with regard to the numerous scientific implications of their findings, which lead to important new perspectives and lines of further inquiry and application. Only the most important studies have been chosen here to demonstrate the specificities of a given context or potentials for generalisation.

Social networks such as associations of people living with AIDS should be carefully examined in terms of benefits for the leaders and the members, and in terms of relations with the government and other non-governmental organisations and community-based organisations (Kablan et al 2006). As sexual practices are closely linked to cultural, social and religious norms and values, preventive strategies against HIV/AIDS should always be adapted to the respective context and target specific age and gender groups (Nodjiadjim et al 2006; Schwärzler 2010). Comparative studies should be conducted on associations of persons living with HIV/AIDS in other regional contexts and on associations of people with other diseases (Kablan et al 2006).

Analyses of the implications of poverty, livelihoods and environmental contexts show that urban malaria is different from rural malaria, and that urban malaria in adults differs from malaria in under-fives (Granado et al 2006). Moreover, malaria is overestimated in urban areas due to inflated perceptions. The vulnerability approach in health economics makes it possible to explain the links between economic insecurity – both resulting from and causing disease – and scarce livelihood resources (Kouadio et al 2006). New lines of inquiry for research could be multi-level analyses of home management of urban malaria, comparative studies of the local interpretation of *palu* with other interpretations of urban vulnerability (stress, nerves), or more in-depth studies on the process of appropriation in a historical perspective. Study of the social vulnerability to malaria risk would be especially important in urban contexts (Granado et al 2006). To reduce vulnerability in the economic sphere, future studies should try to develop an econometric model of the factors influencing vulnerability (risk and capability), and co-efficacy studies should identify pathways to resilience in urban settings for equity effectiveness (Kouadio et al 2006).

The studies that applied the vulnerability approach to access to social urban services illustrate that small geographic units allow for a better understanding of pathogenic systems in heterogeneous urban contexts (Koné et al 2006; Sy 2006). Also, combined approaches yield the best results for disease incidences in urban areas, and longitudinal approaches are more valid than transversal ones (Sy 2006). In disadvantaged areas, the results make it possible to gain new perspectives on the organisation of health systems (Keita et al 2004; Ould Taleb et al 2006). Future studies should investigate whether sanitation governance is the best solution to improve management practices and hygiene in urban areas (Koné et al 2006; Sy 2006). Given the wide range of water and environmental sanitation problems in urban areas, the approaches of risk perception, vulnerability and resilience can be further deepened and enriched (Sy 2006). It would be interesting to explore the reactive capacities of populations with respect to sustainability and to helping them increase effectiveness (Keita et al 2004; Ould Taleb et al 2006).

2.4 Potentials and limits of the two concepts

The concepts of vulnerability and resilience generate some focal points for scientific evaluation and political negotiation, leading to locally appropriated and adapted public health actions that are more than simple interventions because they also initiate processes of transformation (Obrist 2006). These concepts provide a framework not only for establishing values and objectives in development processes, but also for evaluating impacts and directing actions (Obrist and Wyss 2006). By using different entry points and approaches, the authors of these studies showed that vulnerability and resilience are polyvalent concepts that allow different disciplines to deal with transversal topics concerned with several aspects of urban health. Vulnerability is most often conceived as being constituted by components that include exposure to risks or perturbations and the capacity to adapt. Resilience is conceived as the ability of groups or communities to cope with external hazards as a result of social, economic and environmental change. In explaining the capacity to respond or to adapt, the different approaches show the ability of groups or communities to adjust to health risks, to moderate potential damage, to take advantage of opportunities, or to cope with negative consequences (Gallopín 2006).

The diverse orientations of these approaches and definitions, as well as the pertinence of these concepts, show the great potential they have as a basis

for pursuing interesting new topics in the field of urban health. A conceptual framework addressing questions of vulnerability and resilience from several angles allows new research questions to be generated and provides a deeper understanding of urban health problems. Based on a series of case studies in West Africa, this paper argues that new starting points and innovative concepts arise by linking vulnerability and resilience approaches, especially those focusing on access to basic services such as health, education, water, sanitation, decent habitation, and others. Urbanisation will remain a challenge in the coming years and will continue to have important implications for the health of city dwellers (Obrist et al 2006). The links between urbanisation, poverty, environment and health will continue to constitute a particular interest and a major challenge for research (Kjellstrom et al 2007).

One noteworthy limitation of the vulnerability and resilience concepts is that they are not geared to action. Moreover, regarding the nature of the approaches, vulnerability is considered as a negative property, especially in the economic, environmental and sanitary domains. In cases where change leads to a beneficial transformation, such as the emergence of a given social group, and where it becomes a window of opportunity for improvement of health systems, it is possible to speak of positive vulnerability (Gallopín 2006). With reference to the progressing epidemiological transition and the dual burden in many developing countries of both infectious and chronic diseases, it is important to direct research on urban health towards approaches that allow examination of vulnerability and resilience with a broader understanding, and that recommend concrete solutions to the problems faced by populations in their communities. Investigation of the effects of social change and transformation on health systems requires interdisciplinary collaboration among social and natural scientists and could be an appropriate item in a research agenda on syndromes of urbanisation and global change.

2.5 Conclusion

Application of the vulnerability and resilience concepts in various studies in West Africa resulted in dual enrichment, at both the conceptual and the methodological levels. The studies, which considered the two interrelated concepts of vulnerability and resilience, have made it possible to explore the risks to which populations are exposed in a more integrated way and from different angles, and to analyse the effectiveness of solutions for coping with them. The various approaches applied in our studies allow for generation

of a scientific basis to develop and validate adapted, efficient and innovative strategies in health planning and health interventions that will improve health and well-being in disadvantaged urban and peri-urban areas. The frequently very theoretical research results on vulnerability and resilience would gain importance if they could be followed by and/or linked to concrete, effective and equitable implementation dynamics.

Endnotes

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References

Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- * Bâ A, Salem A, Cissé G. 2004. *Evaluation des conditions socio-économiques (pauvreté et vulnérabilité) dans trois quartiers de Nouakchott (Hay Saken, Médina 3 et Kebba Recasée) en Mauritanie*. Rapport d'étude sur l'évaluation des conditions environnementales et sanitaires en milieu urbain défavorisé. Nouakchott, Mauritania: Swiss National Centre of Competence in Research (NCCR) North-South Mauritania and Institut National de Recherches en Santé Publique (INRSP).
- Beck U. 2003. *Risikogesellschaft. Auf dem Weg in eine andere Moderne* [1986¹]. Frankfurt am Main, Germany: Suhrkamp.
- Bohle HG. 2001. Vulnerability and criticality: Perspectives for social geography. *Update IHDP* (2):1–5.
- Chambers R. 1989. Editorial introduction: Vulnerability, coping and policy. *IDS Bulletin* 20(2):1–7.
- * Diop B, Lô B, Koné Y, Cissé G. 2004. *Etude des systèmes d'approvisionnement en eau potable et d'assainissement dans trois quartiers de Nouakchott (Hay Saken, Médina 3 et Kebba Recasée) en Mauritanie*. Rapport d'étude sur l'évaluation des conditions environnementales et sanitaires en milieu urbain défavorisé. Nouakchott, Mauritania: Swiss National Centre of Competence in Research (NCCR) North-South Mauritania and Institut National de Recherches en Santé Publique (INRSP).
- Gallopín CG. 2006. Linkages between vulnerability, resilience and adaptive capacity. *Global Environmental Change* 16:293–303.
- * Granado S, Ettien Alban AM, Adjoua Boko N, Kouakou Yao A, Tanner M, Obrist B. 2006. La vulnérabilité des citoyens à Abidjan en relation avec le *palu*. Les risques environnementaux et la monnayabilité agissant à travers le *palu* sur la vulnérabilité urbaine. *VertigO Hors-série* 3. Also available at: <http://vertigo.revues.org/index1767.html>; accessed on 19 May 2009.
- * Kablan C, Obrist B, Cissé G, Wyss K, Touré I, Tanner M. 2006. VIH/SIDA, genre et vulnérabilité: lutte contre la vulnérabilité des femmes infectées par une association de femmes vivant avec le VIH/sida à Abidjan (Côte d'Ivoire). *VertigO Hors-série* 3. Also available at: <http://vertigo.revues.org/index1844.html>; accessed on 19 May 2009.
- * Keita M, Sall A, Cissé G. 2004. *Connaissances, perceptions et comportements à risque face aux IRA, à la diarrhée et à la santé maternelle des populations dans trois quartiers de Nouakchott (Hay Saken, Médina 3 et Kebba Recasée) en Mauritanie*. Rapport d'étude sur l'évaluation des conditions environnementales et sanitaires en milieu urbain défavorisé. Nouakchott, Mauritania: Swiss National Centre of Competence in Research (NCCR) North-South Mauritania and Institut National de Recherches en Santé Publique (INRSP).
- Kjellstrom T, Mercado S, Satterthwaite D, McGranahan G, Friel S, Havemann K. 2007. *Our Cities, Our Health, Our Future: Acting on Social Determinants for Health Equity in Urban Settings*. Report to the WHO Commission on Social Determinants of Health from the Knowledge Network on Urban Settings. Kobe, Japan: World Health Organization (WHO).
- * Koita M, Lô B, Cissé G. 2004. *Fréquence et distribution des maladies dans trois quartiers de Nouakchott (Hay Saken, Médina 3 et Kebba Recasée) en Mauritanie*. Rapport d'étude sur l'évaluation des conditions environnementales et sanitaires en milieu urbain défavorisé. Nouakchott, Mauritania: Swiss National Centre of Competence in Research (NCCR) North-South Mauritania and Institut National de Recherches en Santé Publique (INRSP).
- * Koné B, Cissé G, Houenou PV, Obrist B, Wyss K, Odermatt P, Tanner M. 2006. Vulnérabilité et résilience des populations riveraines liées à la pollution des eaux lagunaires de la métropole d'Abidjan, Côte d'Ivoire. *VertigO Hors-série* 3. Also available at: <http://vertigo.revues.org/index1828.html>; accessed on 19 May 2009.

- * Kouadio AS, Cissé G, Obrist B, Wyss K, Zinsstag J. 2006. Fardeau économique du paludisme sur les ménages démunis des quartiers défavorisés d'Abidjan, Côte d'Ivoire. *VertigO Hors-série 3*. Also available at: <http://vertigo.revues.org/index1776.html>; accessed on 19 May 2009.
- * Matthys B, Adiko FA, Cissé G. 2006. Le réseau social des maraîchers à Abidjan agit sur la perception des préoccupations et des risques sanitaires liés à l'eau. *VertigO Hors-série 3*. Also available at: <http://vertigo.revues.org/index1857.html>; accessed on 19 May 2009.
- Moser CON. 1998. The asset vulnerability framework: Reassessing urban poverty reduction strategies. *World Development* 26(1):1–19.
- * Nodjiadjim LA, Wyss K, Schwärzler P, Obrist B, Bergman MM. 2006. Communication socio-culturelle comme outil de prévention des maladies sexuellement transmissibles et le VIH chez les adolescents au Tchad. *VertigO Hors-série 3*. Also available at: <http://vertigo.revues.org/index1852.html>; accessed on 19 May 2009.
- * Obrist B. 2006. Risque et vulnérabilité dans la recherche en santé urbaine. *VertigO Hors-série 3*. Also available at: <http://vertigo.revues.org/index1483.html>; accessed on 19 May 2009.
- * Obrist B. 2010. Soziale Vulnerabilität im städtischen Kontext: Eine medizinethnologische Perspektive. In: Dilger H, Hadolt B, editors. *Medizin im Kontext: Krankheit und Gesundheit in einer vernetzten Welt*. Frankfurt am Main, Germany: Peter Lang, pp 411–430.
- * Obrist B, Cissé G, Koné B, Dongo K, Granado S, Tanner M. 2006. Interconnected slums: Water, sanitation and health in Abidjan, Côte d'Ivoire. *The European Journal of Development Research* 18(2):319–336.
- * Obrist B, Tanner M. 2002. *Risk and Vulnerability: Some Conceptual Considerations*. Paper on Health and Well-being presented at the Swiss National Centre of Competence in Research (NCCR) North-South Integrated Training Course (ITC) 2002, Schwarzsee, Switzerland, 9–20 September 2002. Paper available from Brigit Obrist.
- * Obrist B, Wyss K. 2006. Lier la recherche en milieu urbain avec l'approche "livelihood": défis et perspectives. *VertigO Hors-série 3*. Also available at: <http://vertigo.revues.org/index1876.html>; accessed on 19 May 2009.
- * Ould Taleb M, Essane S, Cissé G, Lô B, Obrist B, Wyss K, Zinsstag J. 2006. Le désert existe aussi dans la ville: regard sur la lutte contre la maladie chez des populations défavorisées en milieu périurbain de Nouakchott (Mauritanie). *VertigO Hors-série 3*. Also available at: <http://vertigo.revues.org/index1805.html>; accessed on 19 May 2009.
- * Schwärzler P. 2010. Sex and the City: Erzählungen alter Männer und Frauen über jugendliche Sexualität und AIDS in Ouagadougou (Burkina Faso). In: Dilger H, Hadolt B, editors. *Medizin im Kontext: Krankheit und Gesundheit in einer vernetzten Welt*. Frankfurt am Main, Germany: Peter Lang, pp 389–409.
- * Sy I. 2006. *La Gestion de la salubrité à Rufisque. Enjeux sanitaires et pratiques urbaines* [PhD dissertation]. Strasbourg, France: Faculty of Geography, University Louis Pasteur Strasbourg.
- Tanner M, Mtasiwa D. 2001. *Risk and Vulnerability: New Approaches and a Framework for Poverty Alleviation in Urban Settings. Experience from the Health Sector*. SDC Report. Bern, Switzerland: Swiss Agency for Development and Cooperation (SDC).

3 **From Risk Management to Equity Effectiveness in Environmental Sanitation and Health in Africa**

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Abstract

Achieving the MDGs in water and sanitation as well as in food and nutrition in developing countries will require new strategies. Among other things, this implies 1) accurate diagnosis of problems and their consequences; 2) a variety of solutions adapted to the realities of heterogeneity and complexity in the target context; 3) revision of the implementation process for solutions. Research was carried out in West and Central Africa with the aim of developing innovative approaches and hypotheses for equitable management of health and sanitation risks among neglected populations. Classical methods of social science (epidemiological household surveys, focus groups, stakeholder analysis, contingent valuation method, psycho-social modeling), methods from the biological and chemical sciences (serological testing, physico-chemical and parasitological analyses) and pilot-scale experiments were used to address specific questions related to the improvement of environmental sanitation in urban areas and to the well-being of nomadic pastoralists. Results indicated that anarchic wastewater discharge due to poor and inadequate infrastructure, people's knowledge and behaviour, their willingness to improve, the 'one medicine concept', and implementation of low-cost technologies such as vertical-flow constructed wetlands for wastewater and faecal sludge treatment are factors to focus on when trying to reduce vulnerability to risk. Equity effectiveness in environmental sanitation calls for a transdisciplinary approach combining health, environmental, socio-economic and cultural aspects.

Keywords: Africa; equity effectiveness; health; pollution; sanitation; risk management.

3.1 State of the art and problem setting

Lack of health and sanitation services is a major cause of suffering and death for millions of children and their families. Every year between two and three million people die because of inadequate sanitation, insufficient hygiene and contaminated food and water. A contaminated environment puts people at obvious risk of exposure to pathogens, harmful organisms that lead to infection and disease. Those most affected are poor people, children, and people living on marginal rural land and in urban slums (Esrey et al 1991). An evaluation of waste management practices in most African countries reveals that the main shortcomings relate to the widespread lack of planning and management capacity in municipalities, a paucity of effective legal provisions and organisation, the absence of stakeholder coordination, and the lack of affordable treatment options (Koné and Strauss 2004; Dongo 2006; Koanda 2006; Kengne 2008). This situation is responsible for increasing malnutrition and disease, loss of biodiversity and agricultural production, and reduced economic growth and social stability, sometimes leading to conflicts over water resources (Koné et al 2006; Fokou 2008).

In Africa, liquid and solid waste management practices are more at odds with safeguarding the environment and with the principle of sustainable development than in industrialised countries. For instance, faecal sludge emptied manually or mechanically from on-site sanitation devices is most often discharged without treatment whatsoever (Figure 1). Such practices have disastrous effects in the short and long term on health and health conditions, as well as on soil and other resources (Feachem et al 1983; Koné and Strauss 2004). The situation is particularly critical in cities where high population density causes concentration of wastes, further complicating the situation. Despite concerted efforts to provide adequate latrines and sewers, sanitation needs are only rarely met in a satisfactory way. The pace of urbanisation continues to outstrip the capacities of urban authorities to manage and control it. Many cities have adopted conventional systems, but this single technological choice has most often proven inappropriate due to inadequate design and high operating and maintenance costs (Koné 2002). Where this service exists, only small segments of the population have access to it, and it often functions intermittently. Top-down planning has failed to produce tangible and sustainable improvements for either the population or the environment (Zurbrügg et al 2004). There are still knowledge gaps concerning the driving forces (technical and socio-economic alternatives) that could solve these problems.



Fig. 1
Anarchic discharge
of faecal sludge
from on-site sani-
tation systems in
Cameroon. (Photo
by Ives M. Kengne)

Great development disparities are apparent in semi-arid, peri-urban and urban areas in most developing countries, especially those located south of the Sahara. Indeed, in semi-arid areas, populations made up mainly of nomadic pastoralists are threatened by natural hazards such as repeated drought (almost every ten years), poor soils, inadequate rainfall, and scarcity of human and animal food resources. They are also vulnerable owing to a lack of access to drinking water, a lack of social services such as health care and education, and a lack of security of people and goods.

New strategies are needed to achieve the MDGs in water and sanitation, as well as in food and nutrition, in urban, peri-urban and semi-arid areas. Among other things, this implies accurate diagnosis of problems and their consequences, finding a variety of solutions adapted to the realities of heterogeneity and complexity in the target context, and revision of the implementation process for solutions. The main challenge for research carried out in West Africa was therefore to come up with innovative approaches and hypotheses for managing health and sanitation risks and providing sanitation and health equitably to neglected populations. The case studies carried out in West Africa within the framework of the Swiss National Centre of Competence in Research (NCCR) North-South programme focused on raising awareness and finding sustainable solutions to ameliorate the sanitation situations and the livelihoods of city dwellers and nomadic pastoralists, thereby reducing their vulnerability to environmental sanitation and health risks.

3.2 Methods and approaches

The approaches and methods used were based on an integration of classical methods developed in the natural and/or social sciences, participatory methods, and appropriate low-cost and low-input interventions developed together with actors.

3.2.1 Approaches for assessing health status and risk management in urban contexts

The methodology for assessing the status of health in urban contexts was based on epidemiological surveys and focus groups. This was complemented by laboratory analysis using standard methods commonly applied to analyse blood and wastewater treatment (Koné 2008). A geographical information system (GIS) was used to map health risks linked to livelihood, pollution, and people's practices and perceptions (Dongo 2006).

With respect to risk management, this diagnosis of health status was complemented by technology development. To this effect, experiments were conducted at yard- or pilot-scale plants to test low-cost and effective methods of wastewater and faecal sludge treatment, as the region enjoys tropical climatic conditions with good solar radiation throughout the year. These climatic conditions are favourable for the biological reactions that govern most of the processes involved in the eco-technologies tested (Kenfack 2006).

Finally, in the case studies in Ouahigouya (Burkina Faso), multi-stakeholder analysis was developed as an innovative strategic planning approach for sustainable faecal sludge management in urban areas to minimise public health and environmental risks (Koanda 2006). Stakeholder analysis, techniques for involving stakeholders, contingent valuation methods and a psycho-sociological model were used to develop a reproducible methodology for stakeholder analysis and involvement, in order to enhance awareness about improved faecal sludge disposal.

3.2.2 From risk management to equity effectiveness

Threats faced by poor populations are complex and should be tackled in a holistic manner. Accordingly, a new conceptual framework for the improvement of health and environmental sanitation, using an approach combining health, environmental, socio-economic and cultural assessments in urban

and peri-urban areas in developing countries, was developed based on the interrelations between environmental systems, health status and well-being in a particular area of interest (Nguyen Viet et al 2009).

In the semi-arid and peri-urban contexts, epidemiological surveys, serological testing and molecular biological methods were used to assess the level of different zoonotic diseases. Sociological and cultural methods, as well as economic assessments, were used to assess the health and well-being of populations, especially in Chad and Mali (Zinsstag et al 2007).

3.3 Results

3.3.1 Disease prevalence and the sanitation situation in urban contexts

Disease prevalence in most of the cities is associated with the level of sanitation and hygiene.

The working environment, waste dumps, and human defecation grounds were the main health risks. It was found in Abidjan that household water conservation techniques are one area in which action could be taken to reduce the prevalence of diarrhoea (Koné 2008). In urban and peri-urban areas, there is a link between urbanisation levels and malaria (Koné 2006). Human activity affects the nature of breeding sites, and the vector adapts to environmental change. Anarchic wastewater discharge due to poor and inadequate infrastructure, as well as people's knowledge and behaviour, are the driving forces on which action can be taken to reduce the population's vulnerability (Dongo 2006; Koné et al 2006).

3.3.2 Vertical-flow constructed wetlands and solar radiation: Low-cost options for faecal sludge and wastewater treatment in developing countries

Vertical-flow constructed wetlands with indigenous plants and Advanced Oxidation Processes (AOPs) are very promising technologies that could be used in developing countries to tackle the treatment of faecal sludge and contaminated wastewater containing non-biodegradable organic pollutants. Results gathered in yard-scale experiments in Cameroon revealed that the indigenous plant *Echinochloa pyramidalis* (antelope grass) was not sig-

nificantly affected when loaded with faecal sludge at concentrations up to 200 kg of solid matter/m²/year (Kengne et al 2008). Despite the high solid loading rates applied, the system performed relatively well for solids, nutrients and organics, with pollutant removal efficiencies greater than 80% for most parameters considered. Furthermore, the system generated large quantities of biosolids rich in nutrients for agriculture and generated high amounts of forage biomass when operated at full scale (Kengne et al 2006). The reuse of biosolids in peri-urban and urban agriculture can help to increase food security.

For the first time, a study of potential application in the field of helio-photocatalysis was explored in a sub-Saharan Africa country (Burkina Faso), profiting from the significant solar radiation in that country (Kenfack 2006). Use of this system also led to reduction of the organic content of sewage. However, studies are still needed to determine a good indicator that could confirm the biodegradability of the photo-treated effluent.

3.3.3 Stakeholder analysis as a new planning method for faecal sludge management

The stakeholder planning approach developed in Ouahigouya, relying on a combination of stakeholder identification and analysis and participatory planning techniques, appeared to be an efficient method for faecal sludge management in developing countries. Willingness to improve it depends greatly on psycho-sociological factors such as attitudes about and beliefs in an improved neighbourhood environment, social pressure on households from the neighbourhood, and the subjective costs and benefits of improved faecal sludge management. These factors are therefore levers that planners and decision-makers can use to encourage, increase and develop the demand for improved latrine emptying services, e.g. through social marketing. Research led to the development of decision support tools for professionals and policy-makers. These tools facilitate the development of a tariff-oriented policy to avoid uncontrolled faecal sludge discharge into the environment and to render investments by private operators profitable, while still making emptying services accessible to low-income households (Koanda 2006).

3.3.4 Improving the livelihoods of nomadic pastoralists

In semi-arid contexts, improvements in milk production led to increased income and pathogen load reduction. This allows micro-finance and farmer organisations to play a significant role in fostering this quality improvement.

In countries where there is lack of access to and lack of provision of health services, such as Chad and Mali, extreme dispersion of populations is a handicap. In the case of some zoonotic diseases (brucellosis, Q-fever, rabies) there are links between humans and animals. Furthermore, there is an absence of infrastructure and markets for improving access to combined services (Zinsstag et al 2007). Appropriate measures could thus be taken to improve the health status of nomadic pastoralists. This could be done by applying the concept of 'one medicine'. In Chad, for example, control of brucellosis and rabies was shown to be profitable and cost-effective for human health.

3.3.5 Conceptual approach for equity effectiveness in health and environmental sanitation

To understand the links between health and environmental sanitation more comprehensively, and to identify the most efficient and equity-effective interventions for reducing the disease burden, the conceptual framework developed for the improvement of health and environmental sanitation in urban and peri-urban areas of developing countries was based on an approach combining health, ecological, social, economic and cultural assessments (Nguyen Viet et al 2009). The framework has three main components: health status, physical environment, and socio-economic and cultural environment.

Information on each of these three components can be obtained by using standard disciplinary methods as well as an innovative combination of these methods. In this way analyses will lead to extended characterisation of health, ecological and social risks, while allowing the comprehensive identification of critical control points (CCPs) in relation to biomedical, epidemiological, ecological, socio-economic and cultural factors. The proposed concept complements the conventional CCP approach by including an actor perspective. The actor perspective considers vulnerability to risk and patterns of resilience. Interventions deriving from the comprehensive analysis consider biomedical, engineering and social science perspectives or a combination of these. In this way the proposed framework can jointly address health and environmental sanitation improvements as well as recovery and reuse of natural resources. Moreover, interventions encompass not only technical solutions (safety, sanitation) but also behavioural, social and institutional changes derived from the identified resilience patterns. The interventions are assessed in terms of their potential to eliminate or reduce specific risk factors, and also to reduce vulnerability, enhance health status and assure equity. The key methods proposed are Quantitative Microbial

Risk Assessment (QMRA), Epidemiology, Material Flow Analysis (MFA) and Social Science Assessment (SSA) (Figure 2).

Initially, the framework was conceived and validated for the context of urban and peri-urban settings in developing countries, focusing on wastes such as excreta, wastewater and solid waste, their influence on food quality, and their related pathogens, nutrients and chemical pollutants. We are currently testing this framework in three case studies in Southeast Asia (Vietnam and Thailand) and in West Africa. In Abidjan, a QMRA study on infection risk focusing on exposure to wastewater discharged in a canal has already shown that annual infection risks from involuntary ingestion of canal water at different points and with different activities, in particular collecting and cleaning solid wastes (e.g. plastic bags) in the canal, were largely higher than acceptable risks as defined by WHO. An MFA study has looked at wastewater management in the same area and identified on-site sanitation (septic tank and latrines) and drainage as the main contributors of

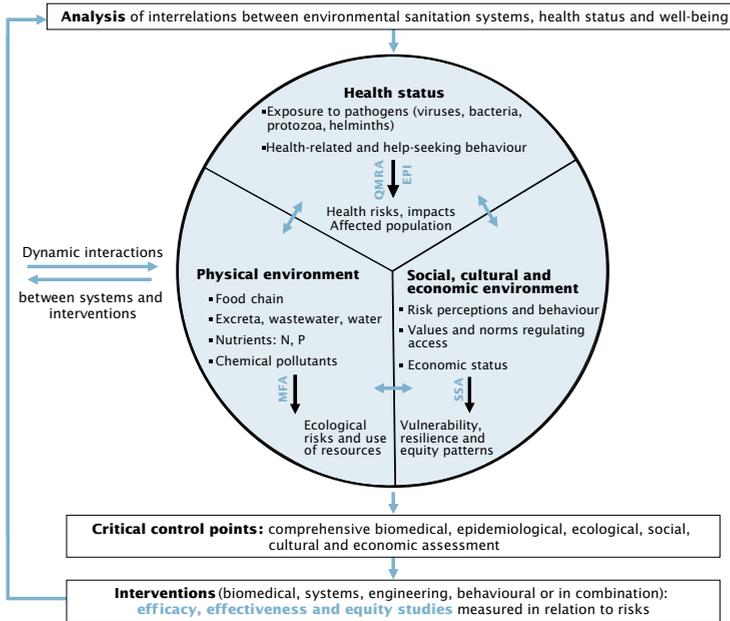


Fig. 2
Conceptual frame-
work for combin-
ing health and
environmental risk
assessment for
Health and Envi-
ronmental Sanita-
tion Planning.
(Based on Nguyen
Viet et al 2009)

Blue characters refer to methodologies used within the conceptual framework – EPI: Epide-
miology; QMRA: Quantitative Microbial Risk Assessment; MFA: Material Flow Analysis;
SSA: Social Science Assessment.

N and P discharge to soils and the lagoon (CCPs). Three scenarios proposing how to treat and reuse waste have been proposed; they have the potential of dramatically reducing the pollution load in the environment. To combine the three components, data collection and assessments still need to be done (Nguyen Viet et al 2009).

3.4 Conclusion and perspectives

The research carried out has yielded promising results for increased mitigation of core problems of global change. These results could be scaled up to a larger scale within the urban context, either to the national or to the regional level.

Indeed, new wastewater and faecal sludge treatment options that consider nutrient recovery and waste reuse are available for regional contexts. But research is still needed to gain acceptance for using biosolids and biomass among local farmers. In addition, composting and the best operational conditions for good performance of the system while producing high forage plants of better quality must be investigated. In poor urban settlements, the social networks formed can be used for improving combined services and for scaling up, but research must be done to seek the best ways of involving excluded stakeholders.

The malaria vector *Anopheles* can be controlled by adapting control measures to the local context, through breeding site management, and by monitoring urban breeding sites. However, there is a need to extend monitoring in the urban environment and to assess the control tools.

In peri-urban and semi-arid contexts, it is possible to combine food quality and food security and production systems. The importance of tuberculosis and selected zoonoses has been highlighted, but adaptations of Directly Observed Treatment, Short-course (DOTS) to the needs of mobile pastoralists are necessary. Moreover, health planning needs to be contextualised and integrated with other social service sectors (education, animal health and environment).

Given the complexity of some environmental concerns in developing countries, new approaches combining multiple scientific disciplines (engineering, epidemiology, social science, and others) and multi-stakeholder involvement must be encouraged.

Endnotes

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References

Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- * Dongo K. 2006. *Etude de la dégradation d'un milieu urbain défavorisé de Yopougon (Abidjan): influence de cadre physique et du déficit du système de gestion des déchets solides et liquides* [PhD dissertation]. Abidjan, Côte d'Ivoire: University of Cocody.
- Esrey SA, Potash J, Roberts L. 1991. Effects of improved water supply and sanitation on ascariasis, diarrhoea, dracunculiasis, hookworm infection, schistosomiasis and trachoma. *Bulletin WHO* 69:609–621.
- Feachem RG, Bradley DJ, Garelick H, Mara D. 1983. *Sanitation and Disease: Health Aspects of Excreta and Wastewater Management*. Hoboken, NJ: John Wiley and Sons.
- * Fokou G. 2008. *Gestion communautaire des ressources naturelles et relations de pouvoir. Etude anthropologique des changements institutionnels dans les plaines du Logone et du lac Tchad* [PhD dissertation]. Yaoundé, Cameroon: University of Yaoundé I.
- * Kenfack S. 2006. *Helio-photocatalytic Enhancement of the Biodegradation of Biorecalcitrant Pollutants in Water: Physicochemical and Technical Aspects* [PhD dissertation]. Lausanne, Switzerland: Ecole Polytechnique Fédérale de Lausanne (EPFL).
- * Kengne IM. 2008. *Potentials of Sludge Drying Beds Vegetated with Cyperus papyrus L. and Echinochloa pyramidalis (Lam.) Hitchc. & Chase for Faecal Sludge Treatment in Tropical Regions* [PhD dissertation]. Yaoundé, Cameroon: University of Yaoundé I.
- * Kengne IM, Akoa A, Bemmo N, Strauss M, Troesch S, Ntep F, Tsama Njitat V, Ngoutane Pare M, Koné D. 2006. Potentials of sludge drying beds vegetated with *Cyperus papyrus* L. and *Echinochloa pyramidalis* (Lam.) Hitchc. & Chase for faecal sludge treatment in tropical regions. *Proceedings 1 Vol. 2 of the 10th International Conference on Wetlands Systems for Water Pollution Control, Lisbon, 23–29 September 2006*. Lisbon, Portugal: International Water Association (IWA), pp 943–953.
- * Kengne IM, Akoa A, Soh EK, Tsama V, Ngoutane MM, Dodane PH, Koné D. 2008. Effects of faecal sludge application on growth characteristics and chemical composition of *Echinochloa pyramidalis* (Lam.) Hitchc. and Chase and *Cyperus papyrus* L. *Ecological Engineering* 34(3):233–242.
- * Koanda H. 2006. *Vers un assainissement urbain durable en Afrique subsaharienne: approche innovante de planification de la gestion des boues de vidange* [PhD dissertation]. Lausanne, Switzerland: Ecole Polytechnique Fédérale de Lausanne (EPFL).
- * Koné B. 2008. *Pollution lagunaire, risques sanitaires et environnementaux dans trois villages périurbains de la commune de Yopougon (Abidjan, Côte d'Ivoire)* [PhD dissertation]. Abidjan, Côte d'Ivoire: University of Abobo-Adjamé.
- * Koné B, Guéladio C, Houenou PV, Obrist B, Wyss K, Odermatt P, Tanner M. 2006. Vulnérabilité et résilience des populations riveraines liées à la pollution des eaux lagunaires de la métropole d'Abidjan, Côte d'Ivoire. *Vertigo Hors-série* 3. Available at: <http://vertigo.revues.org/index1828.html>; accessed on 19 May 2009.
- Koné D. 2002. *Epuration des eaux usées par lagunage à macrophytes et à microphytes en Afrique de l'Ouest et du Centre: état des lieux, performances épuratoires et critères de dimensionnement* [PhD dissertation]. Lausanne, Switzerland: Ecole Polytechnique Fédérale de Lausanne (EPFL). Available at: <http://library.epfl.ch/theses/?display=detail&nr=2653/>; accessed on 19 May 2009.
- Koné D, Strauss M. 2004. *Low-cost Options for Treating Faecal Sludge (FS) in Developing Countries: Challenges and Performance*. Paper presented at the 9th International IWA Specialist Group Conference on Wetlands Systems for Water Pollution Control and at the 6th International IWA Specialist Group Conference on Waste Stabilisation Ponds, Avignon, France, 27 September – 1 October 2004. Available at: http://www.eawag.ch/organisation/abteilungen/sandec/publikationen/publications_ewm/downloads_ewm/FS_treatment_Avignon.pdf; accessed on 19 May 2009.
- * Nguyen Viet H, Zinsstag J, Schertenleib R, Zurbrügg C, Obrist B, Montangero A, Surinkul N, Koné D, Morel A, Cissé G, Koottatep T, Bonfoh B, Tanner M. 2009. Improving environmental sanitation, health, and well-being: A conceptual framework for integral interventions. *EcoHealth, Online First*. doi: 10.1007/s10393-009-0249-6.

- Zinsstag J, Schelling E, Roth F, Bonfoh B, De Savigny D, Tanner M. 2007. Human benefits of animal interventions for zoonosis control. *Emerging Infectious Diseases* 13(4):527–531.
- Zurbrügg C, Morel A, Schertenleib R. 2004. *New Approaches for Improved Sustainability in Urban Environmental Sanitation Infrastructure and Services*. Paper presented at the Swiss Federal Institute of Aquatic Science and Technology, Department of Water and Sanitation in Developing Countries (Eawag/Sandec) Conference on Social Sustainability of Environmental Technologies in Developing Countries, Desenzano del Garda, Italy, 21 October 2004. Paper available from the authors of the present article or also at: http://www.eawag.ch/organisation/abteilungen/sandec/publikationen/publications_sesp/downloads_sesp/CETAMB-paper.pdf; accessed on 19 May 2009.

4 **Autochthony, Natural Resource Management and Conflicting Rights in West Africa**

Gilbert Fokou¹, Henri Michel Yéré², Mathieu Gasparini³, Jérôme Chenal⁴, and Bassirou Bonfoh⁵

Abstract

Global phenomena such as nationalism, extremism and xenophobia are related today to discourses on autochthony and citizenship. Given current processes of democratisation and economic liberalisation, and the scarcity of natural resources, interaction between people of diverse origins is becoming increasingly violent. In West Africa, the declining resource base and power relations are important factors in conflicts between different communities. Many outbreaks of violence are caused by attempts on the part of 'autochthons' to safeguard 'ancestral lands' against 'newcomers' accused of overusing this patrimony. This seems paradoxical at a time of political and socio-economic change, when official discourse invites national and regional integration. The present article draws on studies carried out in West Africa between 2002 and 2007. Data extracted from various individual studies on institutions concerned with natural resource management, livelihood and territory, and negotiated statehood were compiled, analysed and discussed in two interdisciplinary meetings involving researchers from many scientific backgrounds. Focusing on pastoralism and access to land, this article aims to demonstrate that management institutions are eroded in a context of resource scarcity, and that certain groups build discourse and strategies on fuzzy notions of nationhood or identity in order to exclude other users. In this process, the notion of autochthony appears to be an ideological tool in the hands of native people to express their social malaise and difficulties in sustaining their livelihoods in a context of global development. The article concludes that in a context of 'presence-absence' of the state, negotiations between various stakeholders at different levels could foster sustainable development.

Keywords: Autochthony; citizenship; conflicting rights; institutions; public space; West Africa.

4.1 Introduction

Tensions and conflicts generated by socio-political crises in West Africa should not be regarded only as ‘popular agitation’ or spontaneous street demonstrations. Conflicts and violence are often fomented by political actors with great bargaining power to enhance their personal position and interests (Richards and Chauveau 2007). Even though the Ivorian crisis is an example of conflict located within a single country, cases such as this should invite scientists to question the political, economic, social and cultural determinants used as a basis for defining citizenship in African states (Bayart et al 2001). In many cases, national citizenship is shaped by encounters between ‘locals’ and ‘non-locals’, or ‘nationals’ and ‘foreigners’. It is challenging to understand how these different constellations contribute to the political, social and economic development of a nation – especially in Africa, a continent characterised by fluidity of borders due to weak state control and cross-border social organisation.⁶ Even though national physical boundaries are fixed, social boundaries are still shifting due to artificial foundations of states and an unclear notion of nationhood. Migrants and mobile populations are often animated by the desire to achieve their livelihood goals whatever the conditions and the cost. Opportunistic uses of the notion of citizenship by ‘outsiders’ create many tensions in areas where local people believe that newcomers (pastoralists, migrant workers) have nothing to lose if resources are completely depleted. The autochthony discourse that emerges from these confrontations is rooted in the strategy of local people to safeguard their assets and secure their livelihoods. But it is very often forged by political and economic entrepreneurs for their personal benefit (Socpa 2003). Thus, autochthony has become a strong catalyst for specific actors in building their socio-political personality and also in establishing new ways of accumulating wealth.

This article aims to demonstrate that, in a context of land and resource scarcity, the notion of autochthony leads some actors (autochthons or powerful outsiders) to base their discourses and strategies on a fuzzy notion of nationhood or identity in order to exclude other users (Dozon 2000; Dembélé 2002). Today, there is a growing tendency to exclude alleged ‘strangers’ and unmask ‘fake’ autochthons, who are often citizens of the same nation-state (Socpa 2003; Ceuppens and Geschiere 2005).

Based on the results of several studies carried out in West Africa, this article examines concepts of institutions, public space and conflict, focusing on the

notion of autochthony as the entry point in analysing the dynamics of natural resource management in West Africa. It takes a three-fold approach. Firstly, it focuses on the notion of autochthony, which appears as an ideological tool used by native populations to express their frustration and difficulty in achieving their livelihood goals in territories they consider as theirs, but where the resources bring greater benefit to 'foreigners'. Secondly, it tries to demonstrate that, contrary to the common explanation of conflicts between resource users as the consequence of scarcity (ecological factor), conflicts in West Africa have strong socio-economic and political roots. Thirdly, it shows that rather than excluding people, the notion of autochthony can become a tool of national development when various segments of a population are given real incentives for sustainable management of resources.

The article begins with a review of hotly debated questions of citizenship in Africa in which 'in' and 'out' or inclusion/exclusion dichotomies are very flexible. Based on examples from studies in the semi-arid context of West Africa, it then analyses the question of shifting boundaries marked by rapid institutional transformations, resulting in resource scarcity and outbreaks of violence. Finally, it discusses the stakes of regional integration for sustainable development in a context marked by strengthening of the feeling of belonging.

4.2 Methodology

This article draws on an analytical synthesis of studies carried out in West Africa between 2002 and 2007 within the framework of the Swiss National Centre of Competence in Research (NCCR) North-South and addresses questions of sustainable development. Data presented here are extracted from completed or ongoing studies that have applied various research methods of the social, veterinary and epidemiological sciences. Investigations were conducted in both semi-arid and urban contexts. The main focus of these studies was on livelihood and institutions, with an emphasis on transformations of institutions for natural resource management in wetlands, particularly in the Lake Chad floodplains (Landolt 2003; Fokou 2008); livelihood and territory, with a look at urbanisation, city design and the urban model in West African countries such as Mauritania, Senegal and Côte d'Ivoire (Chenal 2009); and negotiated statehood, with a focus on historical and socio-political perspectives.⁷

Data from empirical results and conceptual analyses in various studies were compiled, analysed and discussed during two interdisciplinary meetings involving researchers from different scientific backgrounds (anthropology, sociology, urban planning, history, political science and veterinary science) in Côte d'Ivoire (September 2007) and Mauritania (March 2008).

4.3 Results and discussion

4.3.1 The 'in' and the 'out' in African citizenship

Human relationships are always marked by dichotomous categories such as local and non-local, autochthons and *allogènes*, indigenous and foreigners, sedentary and mobile. These categories constitute the determinants of the 'in' and the 'out', or factors relating to inclusion and exclusion in various societies. However, the term 'indigenusness' is unclear and multidimensional. The United Nations and its subsidiary organisations use the term 'indigenous peoples' to characterise ethnic groups of people who inhabit a geographic region with which they have the earliest known historical connection, along with immigrants who have also populated the region and are greater in number (WGIP 2001). Even though many criteria such as territory, race, history, and lifestyle are often mentioned when defining the indigenusness of a given people, the most important are the political role played and access to decision-making arenas. Thus an indigenous group could be considered as a politically underprivileged population group which shares a similar ethnic identity that is different from the one of the nation in power, and which constituted an ethnic entity in the locality before the present ruling nation assumed power. This definition of indigenusness primarily emphasises colonisation or annexation of a minority group by a nation-state or a powerful socio-political group. However, in more restricted terms, indigenous people may be regarded as groups of populations with collective rights in a given territory. This definition is close to the notion of 'autochthonous', derived from Greek and meaning 'sprung from the earth'. In the present article, 'autochthony' is preferable to 'indigenusness' for two reasons. Firstly, several of the studies on which this article is based were carried out in French-speaking countries where the term *indigène* has a pejorative connotation owing to its use by colonial rulers to designate less advanced native peoples. Secondly, we do not consider indigenous peoples or autochthons in marginal terms, but rather as groups of people who are recognised as having primacy of settlement in a given territory and the right to regulate access to natural resources.

The notion of autochthony as it is used here is a dynamic social construction that often tends to exclude categories of people previously accepted as locals. This is illustrated by clashes between various groups of populations since the 1990s in West Africa, with the beginning of the democratisation process that gave more power to people who had previously been less involved in decision-making processes. The autochthony discourse was then used as a tool to repair ethnic disparities in access to natural resources in areas such as the Lake Chad floodplains (Socpa 2003). In Côte d'Ivoire, local people found an opportunity to exclude communities who had recently settled in their homeland due to difficulties in access to scarce natural resources (Richards and Chauveau 2007). However, strong opposition between groups is rooted in colonial times and motivated by the need for locals to safeguard ancestral land or their resources in general (Bayart et al 2001). Exclusion discourses always express 'natural' emotions and desires, such as protection of ancestral heritage, the fear of being 'contaminated' by foreign influences (Geschiere 2005), or the need for security in regulating access to scarce resources.

Religious dimensions are often important in understanding how political identity affects the build-up to and the continuation of a conflict. From his study in Côte d'Ivoire and neighbouring Ghana, which has the same socio-religious and geographical characteristics, Nordas (2007) concludes that although the conflict does not show many of the characteristics of a religious war, religion has become an important label that increases identity polarisation. However, based on the example of Ghana, this author recognised that the existence of religious fault lines does not predetermine bloodshed. Many authors in Côte d'Ivoire have developed arguments about the main cause of the war, following the same lines and making 'identity' the central issue at stake (Dembélé 2002; Akindès 2004). However, Marshall-Fratani (2006) showed in her study of Côte d'Ivoire that mobilisation of the categories of 'autochthony' and 'territorial belonging' among different actors involves redefinition of the notion of citizenship and the conditions of sovereignty.

During colonial times and after independence, cocoa production in West African coastal countries was a magnet for immigrants from the north who first came as labourers, but soon managed to establish their own farms (Ceuppens and Geschiere 2005). This trend was favoured by local authorities that deliberately encouraged immigrants to push the 'frontier' of cocoa production ever further south (Dozon 2000). However, during the 1980s, when economic crisis was followed by structural adjustment programmes, cash crop prices col-

lapsed and forests quickly diminished. This resulted in a drastic change in the affective relationships between indigenous and immigrants.

One major change occurred in the 1990s with multiparty systems and democratisation processes. Ceuppens and Geschiere (2005) argue that during the 1990s, the question of autochthony became a burning issue in many parts of Africa, inspiring violent efforts to exclude 'strangers' who suddenly turned into political rivals of the local elite (see Socpa 2003). This movement was closely linked to the trend of democratisation, which has often relied upon ethnicity. Thus, in a context of democratisation, autochthons take it for granted that they should rule in their own area, but some groups of people, due to their primacy of settlement, see themselves as more 'autochthonous' than others and try to exclude the latter from natural resources and political power (Socpa 2003; Fokou 2008).

This analysis indicates that in West Africa, the influence of both internal and external factors helps to shape the dichotomy between 'local' and 'non-local' autochthons and strangers. Conflicts often emerge on the grounds of deep disparities between ethnic groups over access to natural resources (land, pastures and water), commercial exchanges, and access to political power (Socpa 2003). This was demonstrated by case studies carried out in West Africa (Schelling 2002; Landolt 2003; Fokou et al 2004; Fokou and Landolt 2005; Fokou 2008; Chenal 2009). These studies have helped to demonstrate that notions of institutions, public space and conflicts are interrelated and affect access to resources by groups of actors. This is best illustrated by analysis of institutions for pastoral resource management in semi-arid areas.

4.3.2 Shifting boundaries in access and natural resource management

In West Africa today, natural resource users such as mobile pastoralists in the Sahel are having increasing difficulty earning a livelihood. Very often, they have to move far beyond national boundaries. Voluntary or forced, mobility has affected notions of autochthony and belonging, causing changes in institutions concerned with resource management. Boundaries here are not only political, geographical and national – types of boundaries that are very fluid in the West African context – but ecological, socio-economic and professional as well. This is illustrated by: 1) the dynamics of the production system (livelihood diversification); 2) re-creation of new borders in West Africa through treaties⁸ aimed at removing obstacles to the free movement

of goods, capital and people in the sub-region; 3) ecological changes and increased competition over land; 4) rural migration: rural people are increasingly migrating to towns while absentee owners, mostly city dwellers, are gaining more bargaining power in the development of rural areas.

As demonstrated by a case study in Togo (Tezike and Dewa-Kassa 2008), West African countries are rapidly moving towards political and economic regional integration marked by free movement of people and goods across borders. Therefore, pastoralists from the Sahel (Mali, Burkina Faso and Niger) are increasingly moving to coastal countries (Togo, Ghana, Côte d'Ivoire) for better living conditions. If mobility is vital for pastoralists from the Sahel, the arrival of foreign herders in coastal countries poses problems of regulation of access to pasture, as well as social problems (conflicts over resources) and animal sanitation problems (bovine tuberculosis, foot-and-mouth disease, uncontrolled breeding). These issues help to reinforce the animosity of sedentary populations (Tezike and Dewa-Kassa 2008). Thus, access to natural resources becomes more complex and helps to bring about change in institutions, and also reshapes notions of autochthony and belonging. This change in physical, financial, socio-professional and legal borders has affected interactions between groups of users and institutions concerned with natural resource management.

Studies in the Lake Chad area (Landolt 2003; Fokou and Landolt 2005; Fokou 2008) have shown that natural resource management is made more difficult in a context where legal pluralism prevails. Across Africa, the management of natural resources is often based on several types of legal systems: statutory and customary systems and combinations of both coexist in the same territory, resulting in overlapping rights, contradictory rules and competing authorities (Cotula 2005). In this process, external factors such as new political structures, infrastructure and technologies have reduced access costs for external users who, due to difficult economic conditions, see key resources (game, fish and cattle) as valuable sources of income, just as locals do. But while local rules have been dismantled, the new bureaucratic institutions which have replaced them failed to put in place mechanisms of management, monitoring and penalties, thus confirming the lack of a clear authority. Fokou (2008) demonstrated that in the Lake Chad floodplains most resources are increasingly under open access or have been privatised. In open access constellations, politically stronger individuals and outsiders obtain the biggest share, ignoring rules governing access and use of natural resources. In the Sahel or around Lake Chad, for instance, institutional

cross-border modalities exist but do little to give transhumant pastoralists better access to natural resources or basic social services such as health facilities for human and animals, drinking water, and markets (Schelling 2002; Fokou 2008). In this open access situation, several trends concerning the use of resources were observed: firstly, boundaries are no longer clearly defined, as foreigners easily cross borders to use pockets of resources; secondly, local populations often claim their exclusive rights over resources by means of violence; thirdly, less powerful actors lose out and are forced to use natural resources even more intensively. Finally, this leads to depletion of pockets of natural resources and to outbreaks of conflict.

4.3.3 Presence-absence of the state, mismanagement of natural resources, and outbreaks of conflict

Throughout the African Sahel, scarce pockets of resources are increasingly under pressure as a result of the intensification of agricultural activities, pastoral settlement, and privatisation of land (Niamir-Fuller 1998, p 253). Natural resources have been put under different management regimes in order to promote sustainable use. This trend is visible in discourses used by diverse groups of actors to justify their access to resources. In a context of migration, newly arrived 'strangers' have developed a new rhetoric to challenge the management regimes of the autochthons considered as 'sons of the soil'. Very often, they argue that with democracy, the majority determines how resources should be used. Democracy is then reinterpreted as the freedom to access and use resources as one pleases (Fokou and Landolt 2005). This attitude is reinforced by the high social status acquired by some of the newcomers, who are 'rich' pastoralists. In the new institutional context where poorly paid members of the local bureaucracy initiate various strategies to generate personal profit, livestock owners often use their wealth to attain a better socio-economic position (e.g. by paying for exclusive rights to rangelands or bribing authorities during conflict settlement). As a result, management of resources is 'autochthonised', and the so-called outsiders, due to their late arrival, are increasingly excluded. The recent emergence of patriotic movements (e.g. Côte d'Ivoire) and rebellions (e.g. Tuareg of northern Mali) illustrates the new discourse of autochthons based on the willingness of socio-political actors to impose sovereignty on a territory or a nation-state. However, it could also be interpreted as the expression of social frustration among groups of people confronted with difficulties in achieving their livelihood goals. The emergence of conflicts in arid areas such as northern Mali, where there are no other ethnic groups with competing land claims, recalls

the debate about autochthony and land rights. With a feeling of being threatened over their own land and excluded from resources by powerful ‘outsiders’, local people tend to develop animosity toward other social groups, even when they consist of citizens of the same country (Landolt 2003; Fokou and Landolt 2005; Haller and Helbling 2005; Fokou 2008). In a context of diminishing natural resources and insecure access, the ideological opposition between ‘locals’ and ‘strangers’ or ‘real autochthons’ and ‘fake autochthons’ is growing and resulting in outbreaks of conflict.

4.4 Autochthony and integration: the inevitable collaboration for sustainable development in West Africa

4.4.1 A malleable notion of citizenship in West Africa

The notion of citizenship, which can be considered as a regime of rights and duties that links an individual to a state, centres on the status of the citizen acting in accordance with the law, their position as a political agent actively participating in a society’s political institutions, and their membership in a political community that furnishes a distinct source of identity (Bayart et al 2001). In the African context, these characteristics change constantly. In Côte d’Ivoire, for instance, the notion of autochthony has taken a new trajectory. It was first directed against people from outside the country: mostly against the Burkinabe, who, since the 1950s, have migrated in great numbers to the south in order to participate in the booming plantation economy of Côte d’Ivoire (Tokpa 2006). As long as the autochthony discourse was directed against immigrants from beyond Côte d’Ivoire, the fear of ‘outsiders’ rather strengthened the idea of Ivorian national citizenship. However, developments in the last few years have shown how quickly the term can be re-interpreted and re-directed against fellow Ivoirians (Geschiera 2005). The question is: what does citizenship mean today? Is a citizen the local leader who considers that “the goat grazes wherever it is tied” to justify corrupt practices? Is it a migrant who actively contributes to the booming national economy but is nevertheless considered a foreigner? Can it be the nomadic pastoralist who keeps changing nationality according to the countries visited during transhumance in order to pursue pastoral activities peacefully?

The answer lies somewhere in between. This elasticity in the notion of citizenship could be seen as a need to recreate rules to provide various groups

of people with 'institutional incentives' for natural resource management, social dialogue and peaceful consolidation. This could be made possible by clearly defining the role of the state in satisfying the basic needs of citizens. In many cases, frustration among groups of resource users is caused by the feeling they have of bearing the costs of national development but not clearly benefiting from profits generated by their activities or from the resources in their region. Rural populations are often confronted with many difficulties: exclusion from their land due to public activities such as the establishment of protected areas, damage to their assets (animals and crops), levying of taxes by the state, and overuse of resources such as forests, fishing or mining reserves by multi-national companies without any social investment (Geschiere 2005; Fokou and Haller 2008). Transhumant pastoralists, for instance, feel that they are regarded as citizens only when they contribute to state income (Fokou 2008). Most of the time taxes collected by the state are not converted into basic social infrastructure and services (wells, delimited transhumance corridors, public health, veterinary facilities, etc.). As expressed by local populations in the Lake Chad area, their losses are far greater than their gains (Fokou and Haller 2008).

The situation could be reversed through more scientific research to help bridge the gap between policies and groups of actors. In this process, many studies have been initiated to analyse how the state interacts with different actors such as traditional authorities, local or regional governments, civil society, and domestic and global actors.

4.4.2 Negotiating statehood and sustainable development

In West Africa today, the paradoxical situation emerging from the opposition between the strong appeal for regional integration and the exclusionary behaviour of some local people poses the question of negotiating statehood for sustainable development. One should not trivialise the collective action of local groups to exclude other users from land and resources. However, the important aspect is the 'presence-absence' of the state, which benefits some local powerful actors trying to keep, revitalise or transform certain traditional institutions because the rules give them power and access to common-pool resources (CPRs) for commercial reasons. The analytical setting for the relationship between statehood and livelihood can be found in public space. As defined by Habermas (1993), public space is a platform to explain conflicts but also a place to analyse the spatial distribution of conflicts. If public space reveals the strategies of private actors to gain ownership of

land, form social groups and exclude other users, it remains for many people a place of contest (in its spatial and political dimensions) and protest; a place where poor and voiceless people have an occasion to express themselves. It is above all a shared and disputed space (Chenal 2009).

Analysis of public space shows that nowadays interactions between constituted social groups are taking a particular trajectory, with the emergence of youth movements trying to show their patriotic ideologies through clear political positions.⁹ Youth, women, natural resource users, politicians and other social categories use public space to express their frustrations and malaise. These dynamics of the means and spaces of protest and affirmation of one's identity sound like an appeal to revisit the political, economic, social and cultural criteria on which citizenship has been based and how this notion has changed through time. The central question in this diachronic perspective is to examine the way the encounter between 'locals' and 'foreigners' has helped to shape national citizenship.¹⁰ This process passes through tensions and conflicts which should be situated in a context of political economy or access to livelihoods. Thus relationships between power, violence and wealth accumulation appear to be central to analysis of the interaction between social groups. In Côte d'Ivoire these relationships, which are part of an iterative process, help to understand and explain the new status of the cocoa sector.¹¹ Here the cocoa sector is understood as a site of conflicting social relations in which different actors deploy different strategies in order to benefit from the surplus of capital.

4.5 Conclusion

This analytical process has demonstrated how, in a context of natural resource scarcity, the concept of autochthony is instrumentalised by actors to serve their interests. The notion of autochthony is above all socially constructed and the result of power struggles. The main agenda of the new autochthony movements is the exclusion of supposed 'strangers' and the unmasking of 'fake' autochthons, who are often citizens of the same nation-state. It is understood that resources are becoming scarcer and, in response, groups of users adopt various strategies to guarantee their livelihoods. To achieve this, they build their discourses and strategies on shifting views of nationhood or identity so as to be able to exclude other users.

Today, discourse on autochthony is easily adapted to the ongoing redrawing of borders and public spaces that seems to be inherent to processes of decentralisation and globalisation. The emphasis in development policies on by-passing the state, decentralisation and support for NGOs seems to have worrying consequences on the ground (Geschiere 2005). Many blueprint development solutions appear to contribute to conflict exacerbation and to redirecting the notion of autochthony in a dangerous direction. Inversely, the notion of autochthony can contribute to national development when various segments of populations are given real incentives for sustainable management of resources. But this is still a big challenge for African nation-states. For many resource users in West Africa, “frontiers do not matter”, they move across countries in search of better living conditions. To control this flux and avoid conflict, there is a need to implement multi-level institutional frameworks such as updated pastoral codes and norms for natural resource management that could directly improve the livelihoods of people, indirectly improve their access to basic social services, and enhance social dialogue.

Endnotes

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⁶ Examples of such cross-border social groups include the Tuareg in Niger and Mali, the Arab Choa in Nigeria, Chad and Cameroon, the Fulani in the whole of West Africa, and others.

⁷ Three PhD studies on the historiography of citizenship, the political economy of cocoa, and the emergence of youth patriotic movements are currently in progress in Côte d’Ivoire.

⁸ Treaties of the Economic Community of West African States (ECOWAS), signed by 15 countries in Lagos, Nigeria, on 28 May 1975.

⁹ Cf. PhD research by Gnangadjomon Koné on “Emergence of the patriotic youth movement in Côte d’Ivoire” currently in progress.

¹⁰ Cf. PhD research by Henri-Michel Yéré on “Negotiating citizenship in 20th-century Côte d’Ivoire” currently in progress.

¹¹ Cf. PhD research by Mathieu Gasparini on “Power, violence and accumulation in Côte d’Ivoire: The cocoa sector in transition” currently in progress.

References

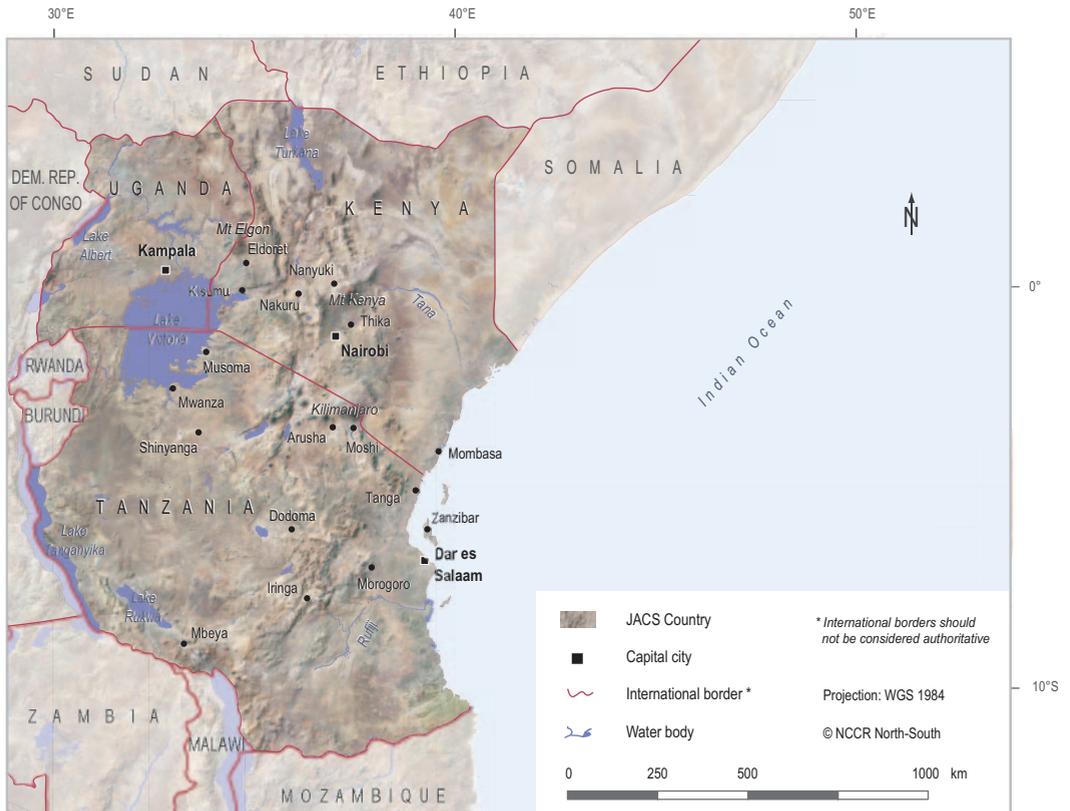
Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- Akindès F. 2004. *The Roots of the Military-political Crises in Côte d'Ivoire*. Research Report No. 128. Uppsala, Sweden: The Nordic Africa Institute.
- Bayart JF, Geschiere P, Nyamjoh F. 2001. Autochtonie, démocratie et citoyenneté en Afrique. *Critique Internationale* 10:177–194.
- Ceuppens B, Geschiere P. 2005. Autochthony: Local or global? New modes in the struggle over citizenship and belonging in Africa and Europe. *Annual Review of Anthropology* 34:385–407.
- * Chenal J. 2009. *Urbanisation, planification urbaine et modèles de ville en Afrique de l'Ouest: jeux et enjeux de l'espace public* [PhD dissertation 4268]. Lausanne, Switzerland: Ecole Polytechnique Fédérale de Lausanne (EPFL).
- Cotula L. 2005. Can research help bridge the gap between local rules and national legal frameworks? The case of local conventions for natural resource management in the Sahel. In: Reenberg A, Marcussen HS, editors. *Bridging Research and Policy: The Experience of the SEREIN Research Project*. Copenhagen, Denmark: The Sahel–Sudan Environmental Research Initiative (SEREIN), Institute of Geography, University of Copenhagen, pp 125–132.
- Dembélé O. 2002. La construction de la catégorie 'étranger' en Côte d'Ivoire. In: Le Pape M, Vidal C, editors. *Côte d'Ivoire: l'année terrible 1999–2000*. Paris, France: Karthala, pp 123–171.
- Dozon JP. 2000. La Côte d'Ivoire entre démocratie, nationalisme et ethnonationalisme. *Politique Africaine* 78:45–63.
- * Fokou G. 2008. *Gestion communautaire des ressources naturelles et relations de pouvoir. Etude anthropologique des changements institutionnels dans les plaines du Logone et du lac Tchad* [PhD dissertation]. Yaoundé, Cameroon: University of Yaoundé I.
- * Fokou G, Haller T. 2008. Are local stakeholders conservationists? Livelihood insecurity and participatory management of Waza National Park, North Cameroon. In: Galvin M, Haller T, editors. *People, Protected Areas and Global Change: Participatory Conservation in Latin America, Africa, Asia and Europe*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 3. Bern, Switzerland: Geographica Bernensia, pp 325–360.
- * Fokou G, Haller T, Zinsstag J. 2004. A la recherche des déterminants institutionnels du bien-être des populations sédentaires et nomades dans la plaine du Waza-Logone de la frontière camerounaise et tchadienne. *Médecine Tropicale* 64(5):464–468.
- * Fokou G, Landolt G. 2005. "We have democracy now": The impact of institutional change on the Logone floodplain, Cameroon. *The Common Property Resource Digest* 74:4–5.
- Geschiere P. 2005. Autochthony and citizenship: New modes in the struggle over belonging and exclusion in Africa. *Quest: An African Journal of Philosophy* 18:9–24.
- Habermas J. 1993. *L'espace public*. French translation [1962']. Paris, France: Payot.
- * Haller T, Helbling J. 2005. Disputing the floodplains: Comparison and conclusions from AFWeP case studies. *The Common Property Resource Digest* 74:9–10.
- * Landolt G. 2003. *Changing Institutions Among the Musgum and Kotoko of the Village Lahāi in the Waza-Logone Floodplain* [MA thesis; in German with English summary]. Zurich, Switzerland: Department of Social Anthropology, University of Zurich.
- Marshall-Fratani R. 2006. The war of "Who is who": Autochthony, nationalism, and citizenship in the Ivoirian crisis. *African Studies Review* 49(2):9–43.
- Niamir-Fuller M. 1998. The resilience of pastoral herding in Sahelian Africa. In: Berkes F, Folke C, editors. *Linking Social and Ecological Systems: Management Practices and Social Mechanisms for Building Resilience*. Cambridge, UK: Cambridge University Press, pp 250–284.

- Nordas R. 2007. *Identity Polarization and Conflict: State Building in Cote d'Ivoire and Ghana*. Paper prepared for the Conference on Polarization and Conflict held in Gail-lac, France, 7–9 June 2007. Available at: <http://www.polarizationandconflict.org/Papers/IdentityPolarization.pdf>; accessed on 3 June 2009.
- Richards P, Chauveau JP. 2007. *Land, Agricultural Change and Conflict in West Africa: Regional Issues from Sierra Leone, Liberia and Côte d'Ivoire*. Paris, France: Sahel and West Africa Club, Organisation for Economic Co-operation and Development (OECD).
- * Schelling E. 2002. *Human and Animal Health in Nomadic Pastoralist Communities of Chad: Zoonoses, Morbidity and Health Services* [PhD dissertation]. Basel, Switzerland: University of Basel.
- Socpa A. 2003. *Démocratisation et autochtonie au Cameroun: variations régionales divergentes*. Münster, Germany: LIT.
- * Tezike M, Dewa-Kassa AK. 2008. *La transhumance inter-états au Togo: causes, organisation et conséquences* [Diploma thesis]. Lomé, Togo: University of Lomé.
- Tokpa J. 2006. *Côte d'Ivoire: l'immigration des Voltaïques (1919–1960)*. Abidjan, Côte d'Ivoire: Centre d'Etudes et de Recherches en Arts Plastiques (CERAP).
- WGIP [Working Group on Indigenous Populations]. 2001. *Indigenous Peoples and the United Nations System: An Overview*. Geneva, Switzerland: Office of the High Commissioner for Human Rights (OHCHR). Also available at: <http://www.ohchr.org/Documents/Publications/GuideIPleaflet1en.pdf>; accessed on 3 June 2009.

Part II

Water Resources, Adaptation to Climate Change and Social Action in East Africa





5 Collaborative Research in East Africa: Towards More Sustainable Development in Highly Dynamic Settings

Boniface P. Kiteme¹

5.1 Introduction

5.1.1 Main problems and potentials of sustainable development

The East African region has traditionally included Kenya, Uganda and Tanzania, although Rwanda and Burundi joined recently after the revival of the East Africa Community (EAC). The former three countries share a similar political history as well as similar social, cultural and ecological characteristics. They have more or less similar development potentials, and face common development challenges in terms of environmental and economic issues (Hurni et al 2004).

The region is facing a myriad of problems and challenges related to unsustainable development (Hurni et al 2004). Poverty and livelihood insecurity have the greatest impact in rural areas, but are also becoming worse in urban areas and in all contexts. These problems are exacerbated by factors such as a declining natural resource base and growing water scarcity (Figure 1), inequality of ownership and access to land, natural and common-property resources; conflicting land-use systems and inappropriate technologies; and poor water supply and environmental sanitation. The region also faces the problem of loss of biological diversity (in protected areas in highlands and semi-arid areas) and agro-biological diversity (in smallholder agro-pastoral communities) (Emerton 1995; Gathaara 1999; Kiteme 2000; Lambrechts 2000; Jambiya and Sosovele 2001). Efforts to address these problems have been hindered by contradictory policies, weak formal institutions, and governance failures, among other factors.

Despite the challenges presented by these problems, the region has an unmatched wealth of great potentials that can be tapped to enhance problem-

solving and achieve sustainable development. In the context of the above-mentioned problems of sustainability, these potentials can be summarised as diversity of formal and informal institutions; diversity of service providers; conducive policies and legislation for natural resource management, especially in the water sector; diversity within and among livelihoods; relative political stability in spite of recurrent turbulence as experienced in Kenya since the 2007 general elections; human resources capacity; a strong knowledge base; diverse producer and consumer markets; diversified formal and informal economic sectors; and diverse environmental and natural resource management capacities – to mention but a few.

5.1.2 The NCCR North-South research approach in East Africa

The main aim of the Swiss National Centre of Competence in Research (NCCR) North-South programme in East Africa is to develop a participatory and comprehensive approach to syndrome mitigation research and find pathways for sustainable development in the contexts of urban and peri-urban areas, semi-arid areas, and highland–lowland systems (Hurni et al 2004). Research activities implemented in the region pertain to three overarching

Fig. 1
A group of food-security trainees visiting a small-holder drip irrigation system in the semi-arid footzone of Mt. Kenya. The area has undergone dramatic land-use transformation and is characterised by severe water scarcity as a result of growing demand and low and unreliable rainfall. (Photo by Boniface P. Kiteme)



themes: natural resource management; livelihoods, vulnerability and resilience; and integrative knowledge for syndrome assessment and mitigation. Individual research projects are located in three main geographical areas: in the Mt. Kenya and Mt. Kilimanjaro regions and their related highland–lowland systems; the Eastern Arc Mountains; and the semi-arid areas of Kenya and Tanzania. Alongside these three clusters, studies based on the urban and peri-urban context are concentrated in Kisumu, Nakuru, Nanyuki, Dar es Salaam, Morogoro, and Dodoma.

5.1.3 The three synthesis themes

The contribution of the East Africa region to the present synthesis book consists of findings related to three themes: 1) *Managing Water Resources in Dynamic Settings: A Multi-level and Multi-stakeholder Perspective*; 2) *Strengthening Policies and Institutions to Support Adaptation to Climate Variability and Change in the Drylands of East Africa*; and 3) *Features of Successful Syndrome Mitigation: Enhancing Resilience and Empowering the Vulnerable*. These three themes were designed to ensure joint authorship by the involved researchers and to achieve both topical and methodological integration. Broad topical inclusion and integration in these themes demonstrate how NCCR North-South research has helped to address some of the key problems of unsustainability in the region as listed in the initial section above.

5.2 Main outputs

Research in the broad area of *Managing Water Resources in Dynamic Settings* (see Chapter 6 in the present volume) focused on hydrological monitoring and modelling (Figure 2), multi-dimensional approaches and the role of geo-information technology in sustainability, water resources accounting, water-related environmental services, institutional arrangements, spatially differentiated stakeholder analysis, and system dynamics modelling for irrigation water. Research on the theme *Strengthening Policies and Institutions to Support Adaptation to Climate Variability and Change in the Drylands of East Africa* (see Chapter 7 in the present volume) focused on drought vulnerability and risk assessment, agro-pastoral strategies, policy frameworks for enhancing adaptation to climate change, institutions and power relations in common-property regimes, and efficient water use for crop production in dryland environments. The key findings regarding these two themes are summarised in Table 1.

Table 1

Theme	Key findings
Managing Water Resources in Dynamic Settings	<ol style="list-style-type: none"> 1. Discharge prediction (using streamflow model) in the Mt. Kenya region under two scenarios of land use and climate change revealed that conversion of forest area to cropland (up to 3200 m) will increase annual flow by 11%, mainly due to increased flood flows and slightly reduced low flows. With respect to climate change as projected by the Intergovernmental Panel on Climate Change (IPCC) Task Group on Scenarios for Climate Impact Assessment (IPCC-TGCI 1999), a 17% increase in annual rainfall will result in an increase of annual runoff by 26%, with a severe increase in flood flows, and a reduction of the lowest flows to about a tenth of the base case (IPCC-TGCI 1999; IPCC 2000; Notter et al 2007; Kiteme et al 2008). 2. The decline in dry-season river flows in the catchments was driven by land-use transformation experienced in the past decades, rather than by the effects of climate change (Notter et al 2007; Kiteme et al 2008). 3. In planning for ecological sustainability, a river basin is the best level for awareness creation, multi-stakeholder negotiations and policy dialogue; however, it is limited as a decision-making unit due to its lack of requisite elements such as authority, technical capacity, and political support for implementing desired interventions (Wiesmann 1998; Kiteme 2006; Kiteme and Wiesmann 2008). 4. River water users' associations (RWUAs) are important grassroots institutions with a potential for endogenous solutions to problems of sustainable resource use and management (Kiteme and Gikonyo 2002; Liniger et al 2005; Kiteme 2006).
Strengthening Policies and Institutions to Support Adaptation to Climate Variability and Change	<ol style="list-style-type: none"> 1. The household strategies of peasants in rural Kenya continue to be highly dynamic and adaptive, and reveal a progressive erosion of traditional African social security networks and a corresponding trend towards individualisation (Wiesmann 1998; Holdener 2007; Wiesmann 2008). 2. The dominance of maize in the semi-arid farm and market systems has led to a neglect of indigenous crops such as millet and sorghum, and this has had adverse impacts on food security in the affected semi-arid areas (Ifejika Speranza 2006a; Ifejika Speranza et al 2007). 3. Conservation agriculture (mulching) has the potential to improve crop yields by up to 4 times in semi-arid environments (Njeru 2005). 4. No single harmonised policy framework exists to deal with the effects of climate variability and climate change. The many existing sectoral policy instruments indirectly address this problem through drought, and only focus on securing production and food availability without addressing the issues of securing access to resources, which are a major concern of the vulnerable (Ifejika Speranza 2006a, 2006b; Ifejika Speranza and Wiesmann 2006; Ifejika Speranza et al 2007). 5. The effective traditional institutions for management of common-property resources have been replaced over the years with modern structures that are inherently weak and already compromised. This change has resulted in a shift from a common-property regime to a private- and state-property regime; the related changes in power relations have shifted endowment and entitlement structures within the communities, thereby disempowering those most dependent on resources (Mbeyale 2008).

Key findings of research done under Themes 1 and 2.

Scientific capacities and competences have been enhanced by these research activities and a huge body of knowledge has been built and disseminated. In particular, some of the key findings in the area of water resources have been instrumental in furthering water sector reforms and project planning in



Fig. 2
Rainfall variability
in Kenya; more
precise informa-
tion about rainfall
patterns is a key to
sustainable water
resource manage-
ment. (Photo by
Urs Wiesmann)

Kenya, and have helped to mobilise relevant stakeholders to form grassroots institutions that enhance participation in water resource management and reduce user conflicts in the Ewaso Ng'iro (Mt. Kenya) and Pangani (Mt. Kilimanjaro) basins (Mujwahuzi 2001; Kiteme and Gikonyo 2002; Lini-ger et al 2005; Kiteme 2006). Similarly, results related to the second theme helped to deepen understanding of key concepts and methodologies – for example, in relation to drought impact and vulnerability assessment – and triggered specific mitigation actions such as the design of a short course on food security and drought management, and negotiations for funding to promote conservation agriculture in semi-arid areas.

Furthermore, other research innovations were implemented in pilot projects within the Partnership Actions for Mitigating Syndromes (PAMS)² frame-
work, the results of which form the core focus of the third theme, *Features of Successful Syndrome Mitigation* (see Chapter 8 in the present volume). In total, five PAMS projects were implemented in various places in Kenya and Tanzania between 2003 and 2007. Table 2 lists the five PAMS and summarises their main outcomes.

Table 2

PAMS	Main outcomes
Local Urban Observatory for the Municipal Council of Nakuru (January 2003–October 2004)	A functional local urban observatory for Nakuru Municipality; a database on development priorities; a participatory spatial database, containing about 40 individual information layers; the NakInfo software as a tool; strategically positioned dissemination centres; capacity-building was extensively provided to the project team and to potential beneficiaries.
Strengthening local natural resources governance capacity in the Rufiji floodplains in Tanzania (2003–2005)	Highly sensitised and empowered communities resulting in increased participation; grass-roots institutions (Village Environmental Management Committees and Village Natural Resources Scouts Committees) and instruments (Village Environmental Management Plans and village by-laws) for participatory management of common-property resources in the Rufiji floodplains.
Supporting the efforts of the Likii slums community in Nanyuki, Kenya to establish a voluntary counselling and testing (VCT) centre and a dispensary to address HIV/AIDS (2004)	A VCT Centre; Likii Intersectorial HIV/AIDS Control Group (LISHACG); increased awareness and voluntary counselling and testing through the VCT centre; broadened financial support: from the Municipal Council of Nanyuki (for a dispensary) and from SAFARICOM (for a library).
Implementation of flood-flow abstraction devices to demonstrate and test irrigation with flood flow and to guarantee secure low flow for downstream water users on Burguret River on Mt. Kenya (September 2003–2005)	Two self-regulating weirs (SRWs) on the Burguret and Likii rivers; two small-scale flood storage structures; awareness (at River Water Users Associations and Water Officials levels) of the impacts of SRWs on river flows and individual water supplies; improved stream-flow and abstraction data on the two rivers; and documentation of experience and knowledge for further implementation of water allocation and abstraction projects.
Promotion of low-cost biogas digesters for renewable fuel production on small-scale farms on the Kenyan coast in Kilifi district (2004–2005)	Community awareness and capacity to install and use biogas digesters; a biogas training manual in the local language; 2 biogas projects initiated on the basis of community demand: one at a local Institute of Agriculture and the other at a local slaughterhouse with a capacity of 100 cows per day.

Main outcomes of the Partnership Actions for Mitigating Syndromes (PAMS) implemented in East Africa during Phases 1 and 2 of the Swiss National Centre of Competence in Research (NCCR) North-South programme.

As can be seen from the main outputs in Table 2, these interventions made significant contributions to mitigating the targeted problem(s) of unsustainability by empowering local people through participation, reducing local people's vulnerability and strengthening their resilience to adverse conditions of global change.

5.3 Outlook for future research

5.3.1 Research challenges

Before outlining the main research areas that will constitute the future NCCR North-South research agenda in East Africa, it is important to briefly highlight some of the challenges that hindered optimal engagement in the eight years of research implementation. These include 1) a technological divide and infrastructural inadequacies that affected communication between collaborators, data capture and processing, and further dissemination; 2) database limitations, especially due to lack of baseline data in areas with no prior research results, or outdatedness and low spatial and temporal resolution of data; and 3) the challenge of dealing with the complexity of policy and practice. Although considerable investments have since been made to improve IT facilities and support geographical expansion and regular review of base layers (to the appropriate resolutions), these challenges will require further attention if performance is to be improved.

5.3.2 Future research focus and questions

The three overarching themes outlined in section 5.1.3 will continue to guide future research activities in the region. The broad areas of water resources, biodiversity and livelihoods will continue to dominate the research scene. In particular, the following key areas will constitute the agenda for research in East Africa in the coming years:

- *Livelihood options and social exclusion*: Research in this area is intended to create a deeper understanding of the tension between existing livelihoods, livelihood options (Figure 3), and related conflicts and processes of exclusion/inclusion.
- *Sexual and reproductive resilience*: Here, the main focus will be on identifying and understanding supportive environments for female adolescents



Fig. 3
The creativity of
populations bur-
dened by poverty
can lead to
successful multi-
ple livelihood
strategies. (Photo
by Urs Wiesmann)

in a particular locality, in order to deal with reproductive health challenges; moreover, research will focus on how the interplay between female adolescents and other social actors (male adolescents, family members, peers, community members), institutions and organisations contributes to resilience-building processes and supports the scope of decision-making and action available to female adolescents.

- *Genderised sanitation*: In giving special attention to this topic, research on user-driven sanitation will explore the question of what stimulates changes in behaviour and demand for improved sanitation facilities.
- *People's access to services and resources*: Research will address the question of the spatial, economic and social factors that limit people's access to services and to natural resources, as well as how this limited access impacts on their household welfare.
- *Land resource potentials*: Here, the goal will be to identify sustainable land management systems that promote effective use of land resource potential for increased agricultural production, enhanced resilience to climate change, and carbon sequestration, as well as to quantify these effects at local and regional scales.

- *Landscape transformation*: Future research will also focus on landscape transformation and its impacts on respective spatial configuration and the related ability of the land to perform its functions, including essential environmental services.
- *Features of resilience and transformability*: Finally, future research will seek to identify features of resilience and transformability that enhance adaptive capacities and contribute to adaptive governance in dynamic socio-ecological systems driven by climate change and other stressors.

5.3.3 Opportunities for collaboration

East Africa will continue to explore opportunities for collaboration that help to achieve a more effective partnership between academic and non-academic partners. The current network will consolidate into regional nodes anchored in key academic and non-academic NCCR North-South partner institutions in Kenya and Tanzania, including the Centre for Training and Integrated Research in Arid and Semi-arid Land Development (CETRAD), the University of Nairobi, Egerton University, the University of Dar es Salaam, and Sokoine University. The Centre for Development and Environment (CDE) of the University of Bern, Switzerland will continue to be the main partner at the international level. The regional nodes, together with CDE, will provide a platform for collaboration with a second tier of associated partners, such as the Eastern and Southern Africa Partnership Programme (ESAPP) and the Volkswagen Foundation, among others.

Endnotes

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² Partnership Actions for Mitigating Syndromes (PAMS) are projects implemented by local actors together with scientific and non-scientific stakeholders. As a component of the NCCR North-South programme they are designed to implement and validate approaches, methods and tools developed in research, with a view to finding promising strategies and potentials for sustainable development. Moreover, they are intended to promote mutual learning and knowledge-sharing between academic and non-academic partners in sustainable development.

References

Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- Emerton L. 1995. *Socio-Economic Notes on Mount Kenya Forest Reserve*. Nairobi, Kenya: Centre for Biodiversity, National Museums of Kenya.
- Gathaara GN. 1999. *Aerial Survey of the Deforestation of Mt. Kenya, Imenti and Ngare Ndare Forest Reserves*. Nairobi, Kenya: Wildlife Service.
- * Holdener K. 2007. *The Importance of Trans-spatial Economic and Social Networks in Household Strategies of Peasants in Rural Kenya* [Master's thesis]. Bern, Switzerland: University of Bern.
- * Hurni H, Wiesmann U, Schertenleib R, editors. 2004. *Research for Mitigating Syndromes of Global Change: A Transdisciplinary Appraisal of Selected Regions of the World to Prepare Development-oriented Research Partnerships*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 1. Bern, Switzerland: Geographica Bernensia.
- * Ifejika Speranza C. 2006a. *Drought Vulnerability and Risk in Agro-pastoral Areas: An Integrative Approach and Its Application in Kenya* [PhD dissertation]. Bern, Switzerland: University of Bern.
- * Ifejika Speranza C. 2006b. Gender-based analysis of vulnerability to drought among agro-pastoral households in semi-arid Makueni district, Kenya. In: Premchander S, Müller C, editors. *Gender and Sustainable Development*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 2. Bern, Switzerland: NCCR North-South, pp 119–146.
- * Ifejika Speranza C, Kiteme BP, Wiesmann U. 2007. Droughts and famines: The underlying factors and the causal links among agro-pastoral households in semi-arid Makueni district, Kenya. *Global Environment Change Journal* 18(1):220–233. doi:10.1016/j.gloenvcha.2007.05.001.
- * Ifejika Speranza C, Wiesmann U. 2006. Post-harvest management strategies, drought vulnerability and food security. In: Ammann WJ, Dannenmann S, Vulliet L, editors. *Coping with Risks Due to Natural Hazards in the 21st Century – RISK21*. London, UK: Taylor and Francis, pp 127–138.
- IPCC [Intergovernmental Panel on Climate Change]. 2000. *Special Report on Emissions Scenarios*. Cambridge, UK: Cambridge University Press. Also available at: http://www.grida.no/publications/other/ipcc_sr/?src=/climate/ipcc/emission/; accessed on 26 August 2009.
- IPCC-TGCI [Intergovernmental Panel on Climate Change Task Group on Scenarios for Climate Impact Assessment]. 1999. *Guidelines on the Use of Scenario Data for Climate Impact and Adaptation Assessment*. Version 1. Geneva, Switzerland: IPCC-TGCI.
- Jambiya G, Sosovele H. 2001. *Conservation and Poverty: The Case of Amani Nature Reserve*. Dar es Salaam, Tanzania: Institute of Resource Assessment (IRA), University of Dar es Salaam.
- Kiteme BP. 2000. *Conservation and Protection of Mt. Kenya Global Heritage Site: A Baseline Survey on Biological Ecosystem, People and Land (Resources) Use in and Around the Site*. Unpublished report prepared for the United Nations Development Programme (UNDP) Global Environment Facility (GEF) Small Grants Programme (SGP). Available from Boniface P. Kiteme.
- * Kiteme BP. 2006. *Multidimensional Approaches to More Sustainable Natural Resources Management in Highly Dynamic Contexts in East Africa* [PhD dissertation]. Bern, Switzerland: University of Bern.
- * Kiteme BP, Gikonyo J. 2002. Preventing and resolving water use conflicts in the Mount Kenya highland–lowland system through water users' associations. *Mountain Research and Development* 22(4):332–337.
- * Kiteme BP, Liniger HP, Wiesmann U, Notter B, Kohler T. 2008. Dimensions of global change in African mountains: The example of Mount Kenya. *IHDP Update* 2008(2):18–22. Also available at: <http://www.ihdp.unu.edu/category/44?menu=23>; accessed on 26 August 2009.

- * Kiteme BP, Wiesmann U. 2008. Sustainable river basin management in Kenya: Balancing needs and requirements. In: Hirsch Hadorn G, Hoffmann-Riem H, Biber-Klemm S, Grossenbacher-Mansuy W, Joye D, Pohl C, Wiesmann U, Zemp E, editors. *Handbook of Transdisciplinary Research*. Berlin, Germany: Springer Verlag, pp 63–78.
- Lambrechts C. 2000. The highlands of Kenya: The threatened forests of Mount Kenya. In: Mountain Agenda, editor. *Mountains of the World: Mountain Forests and Sustainable Development*. Bern, Switzerland: Mountain Agenda, pp 30–31. Also available at: <http://www.cde.unibe.ch/CDE/pdf/MountainAgenda2000.pdf>; accessed on 26 August 2009.
- * Liniger HP, Gikonyo J, Kiteme BP, Wiesmann U. 2005. Assessing and managing scarce tropical mountain water resources: The case of Mount Kenya and the semiarid Upper Ewaso Ng'iro basin. *Mountain Research and Development* 25(2):163–173.
- * Mbeyale GE. 2008. *The Impact of Institutional Changes on the Management of Common Pool Resources in Pangani River Basin: A Case of Same District, Tanzania* [PhD dissertation]. Dar es Salaam, Tanzania: University of Dar es Salaam.
- Mujwahuzi MR. 2001. Water use conflicts in the Pangani Basin: An overview. In: Ngana JO, editor. *Water Resources Management in the Pangani River Basin: Challenges and Opportunities*. Dar es Salaam, Tanzania: University Press, pp 128–137.
- * Njeru L. 2005. *Monitoring and Modeling Crop Growth, Water Use and Production Under Dryland Environment: NW Foot-slopes of Mount Kenya* [PhD dissertation]. Bern, Switzerland: University of Bern.
- * Notter B, McMillan L, Viviroli D, Weingartner R, Liniger HP. 2007. Impacts of environmental change on water resources in the Mount Kenya region. *Journal of Hydrology* 343(3/4):266–278.
- Wiesmann U. 1998. Balancing ecological sustainability and short-term needs: A regional approach to water supply planning. *Eastern and Southern Africa Geographical Journal* 8:77–90.
- Wiesmann U. 2008. *Sustainable Regional Development in Rural Africa: Conceptual Framework and Case Studies from Kenya*. African Studies 14. Bern, Switzerland: Geographica Bernensia.

6 **Managing Water Resources in Dynamic Settings: A Multi-level, Multi-stakeholder Perspective**

James Ngana¹, Benedikt Notter², Peter Messerli³, Urs Wiesmann⁴, Gimbage Mbeyale⁵, Tuli Msuya⁶, and Alfred Chitiki⁷

Abstract

The aim of the present article is to contribute to the debate on the role of research in sustainable management of water and related resources, based on experiences in the Upper Ewaso Ng'iro and Pangani river basins in East Africa. Both basins are characterised by humid, resource-rich highlands and extensive semi-arid lowlands, by growing demand for water and related resources, and by numerous conflicting stakeholder interests. Issues of scale and level, on the one hand, and the normative dimension of sustainability, on the other hand, are identified as key challenges for research that seeks to produce relevant and applicable results for informed decision-making. A multi-level and multi-stakeholder perspective, defined on the basis of three minimal principles, is proposed here as an approach to research for informed decision-making. Key lessons learnt from applying these principles in the two river basins are presented and discussed in the light of current debate.

Keywords: Water management; scale; level; sustainability; decision-making; contextuality; generalisation; East Africa.

6.1 Introduction

Water poses serious challenges to resource management. Growing populations and increasing economic activity are resulting in greater demand for water-related ecosystem services such as the provision of drinking water, food and energy. At the same time, supply is becoming less predictable as a result of environmental degradation and climate change in many parts of the world. The great dynamics of the changes that affect water supply, coupled with the fact that negative outcomes can occur spatially and temporally removed from their causes, lead to highly unpredictable situations for individual stakeholders. Informed decision-making is therefore a prerequisite for sustainable resource management.

Research is expected to provide a basis for informed decision-making, but there is a growing concern that the results of research are not necessarily useful in making management decisions (FAO 2006; Hermans 2008). The causes cited to explain the lack of relevance and applicability of research results include an incomplete understanding of natural processes (Calder 2002; FAO 2006), issues of scale and resulting challenges (Kiersch 2000; Cash et al 2006), lack of incentives for efficient resource use (Aylward 2004; MA 2005), insufficient participation of and collaboration between scientists and stakeholders (Pahl-Wostl et al 2007), and institutional rigidity (Bohensky 2008).

The Upper Ewaso Ng'iro Basin in Kenya and the Pangani Basin in Tanzania exemplify the complex human–environment interactions that characterise watersheds. These basins have similar physical settings, with humid highlands surrounded by semi-arid lowlands (Figure 1). Favourable conditions in the footzones of the mountains have attracted in-migration and economic development. The resulting increase in water demand is a cause of water scarcity and a source of conflicts between different user groups (e.g. farmers versus pastoralists, or farmers versus hydropower producers) and also within user groups (upstream versus downstream farmers, large-scale versus small-scale farmers). The authorities lack both the information and the financial means to correctly allocate resources and implement rules (Wiesmann 1998; Wiesmann et al 2000; Mbonile 2002; IUCN 2003).

Research carried out by the Swiss National Centre of Competence in Research (NCCR) North-South programme in the two basins offers an opportunity to study the role of research in sustainable management of

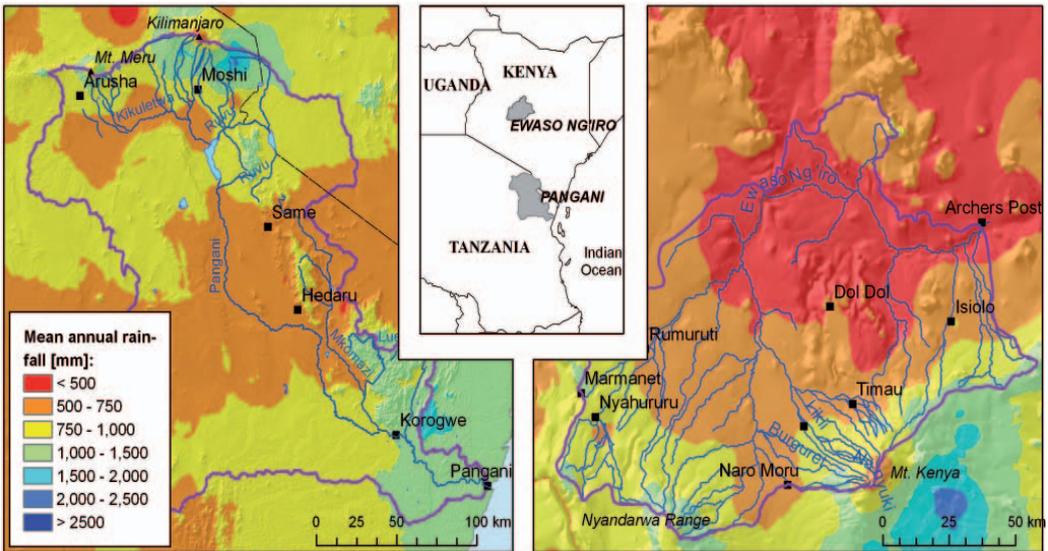


Fig. 1
 Overview of the two river basins. (Map by B. Notter; data sources: B. Notter, CETRAD – Centre for Training and Research in Arid and Semi-Arid Lands Development)

water and related resources. Based on practical experience (Wiesmann 1998; Wiesmann et al 2000; Kiteme and Gikonyo 2002; Aeschbacher et al 2005; Ehrensperger 2006; Notter et al 2007) and a review of existing literature, the present article identifies two key challenges posed by: a) issues of scale and level, and b) the normative dimension of sustainability. A multi-level and multi-stakeholder perspective based on three minimum principles is proposed as a way of addressing these challenges, and experience from the application of these principles in research in the two river basins is presented and discussed.

6.2 Challenges for research in watershed management

Various constraints affect the relevance and applicability of research results in the two river basins. These can be attributed to two key challenges: 1) issues of scale and level that arise because different actors and processes are active at different levels and scales and interact across them; and 2) the normative dimension of sustainability, which is defined by differences in the values that actors attach to resources, processes, or institutions.

6.2.1 Issues of scale and level

In the following sections we use the definition of Gibson et al (2000) that differentiates between “scale” as the analytical dimension for assessing a certain phenomenon, and “level” as the respective unit of analysis. The spatial scale ranges from micro- to macro-levels, for example, or from the local to the international level; the temporal scale ranges from short- to long-term, e.g. daily, monthly, annual and inter-annual levels. The fact that processes, actors and perceptions differ between levels or scales and interact across different levels and scales can result in serious constraints on the applicability and relevance of research results.

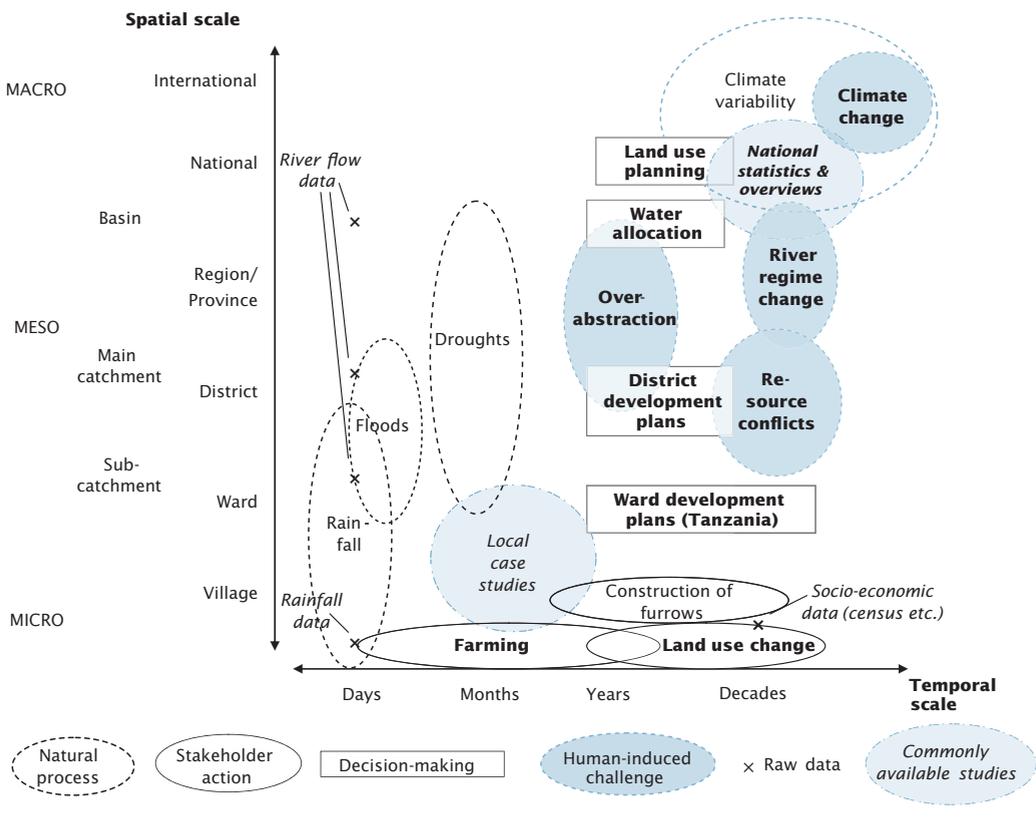
An inappropriate spatial and temporal extent or resolution of assessments limits the applicability of outputs. Hydrological studies typically describe river catchments; national overviews present socio-economic information on countries or provinces; and numerous case studies contain detailed information about specific aspects of small areas. It is very difficult for non-scientist decision-makers to take decisions concerning their unit of responsibility (e.g. a district) based on such research results. Moreover, assessments are often carried out based on time series that are too short to capture long-term variability, resulting in biased resource allocation. Some studies are not explicit about the temporal and spatial timeframes considered, which limits their applicability and re-usability. Finally, the most serious challenges to watershed management, such as declining dry-season flows, resource conflicts or climate change, unfold at spatial and temporal scales covered by few scientific assessments and are thus insufficiently taken into account in decision-making processes (Figure 2).

Lack of awareness of issues of scale and level can be an obstacle to the implementation of research results. For example, most farmers in the footzones of the mountains are unaware of water scarcity at the basin level. Faced with inter-annual variability in rainfall, which they do perceive, they irrigate their fields with river water, thereby unknowingly contributing to problems further downstream.

Finally, *decision-making at inappropriate levels* can be an obstacle to sustainable management. At the temporal scale, decisions are too often taken with a perspective of 5–10 years, depending on the period of time considered appropriate for assessment of decision-makers’ success – e.g. an election interval or a project phase. At the spatial scale, a large-scale paddy irrigation

scheme in the Pangani Basin can serve as an illustration for decision-making at an inappropriate level: The scheme was managed by the regional government, which commissioned a foreign consultant to do a study but did not consider the knowledge of district authorities or local stakeholders about ongoing irrigation projects undertaken by villages and clans in upstream areas and about existing downstream water demand. Nowadays, only half of the area covered by this scheme is productive, owing to increased irrigation upstream, while downstream areas have been left degraded by farmers engaging in illegal charcoal production in a nearby forest reserve due to lack of irrigation water for their fields.

Fig. 2
 Visualisation of scale and level challenges in the Upper Ewaso Ng'iro and Pangani river basins. Processes and challenges, as well as institutions and information necessary for decision-making, are found at different levels on the spatial and temporal scales. (Source: Adapted from an original figure by Clark [1987])



6.2.2 The normative dimension of sustainability

“Sustainable development” is a normative concept. Different actors attach different values to resources, processes and institutions. This represents a second key challenge to research for sustainable watershed management, since it implies that sustainable development is driven by values and norms that cannot be identified by scientific research alone but which must emerge from negotiations among relevant stakeholders in a concrete societal and political context (Wiesmann 1998).

Unclear research objectives are a major constraint on the relevance and applicability of research results. Sustainability-related problems are often complex and controversial. A potentially unlimited number of elements could be included in the “system” assessed by a study or research project. This situation, which has been referred to as the “systemic trap of sustainability” (Wiesmann and Messerli 2007), often means that research projects are initiated without a clear aim and with multiple interlinked objectives that are difficult to operationalise and to distinguish from each other. For example, in both river basins, a variety of studies (e.g. Rohr 2003; McMillan and Liniger 2005) aimed to develop a “hydrological model” of the basin or parts of it; however, there was no explicit reflection in each case on what the model should do: Was the primary aim to assess the impacts of change, to gain a better understanding of processes, or to obtain information about unmeasured locations? Who were the stakeholders interested in the outputs, and how were their interests captured by the output variables of the model? At which level and scale were outputs needed? All these questions need to be answered in order to avoid including too high a number or an inappropriate selection of elements in the model structure or system.

The fact that *societal contexts in which sustainability goals can be negotiated change rapidly in time and space* represents another challenge. Each context becomes a unique case, and the concrete aims of sustainable development cannot be transferred from one to another. Correspondingly, we observe a growing number of highly contextualised and frequently local-level case studies (see Figure 2) with clear limitations on generalisation and comparability. This phenomenon has been referred to as the “ideographic trap” of sustainability (Hurni et al 2004). It is a significant cause of limitations on the production of scientific knowledge that informs decision-making at higher levels.

6.3 A multi-level and multi-stakeholder research perspective

A multi-level and multi-stakeholder research perspective can serve as a possible response to the challenges arising from issues of scale and level and from the normative dimension of sustainability. Its goal is to help bridge the gap between knowledge production and decision-making in sustainable management of water and related resources. Based on the practical challenges and theoretical considerations outlined above, such a perspective can be defined on the basis of the three principles listed in Table 1.

Table 1

Principle	Requirements	The three minimum principles underlying the proposed multi-level and multi-stakeholder research perspective on sustainable river basin management.
Transdisciplinary, value-based system delineation	<ul style="list-style-type: none"> – System delineation based on collaboration of stakeholders concerned and experts – Elements valued by stakeholders form the core of the system – System boundaries determined by scientific expertise 	
Explicit reference to multiple levels	<ul style="list-style-type: none"> – Assessment at multiple levels in order to capture level-specific characteristics and cross-level interactions – Explicitness about level and scale as a prerequisite for integration of findings 	
Balance between contextuality and generalisation	<ul style="list-style-type: none"> – Focus on recurring linkages and patterns instead of context-specific characteristics allows generalisation without giving up context-boundedness of sustainability 	

The NCCR North-South’s syndrome mitigation approach (Hurni et al 2004) offers a way of designing research that adheres to these principles. The research projects currently implemented in the Upper Ewaso Ng’iro and Pangani river basins have contributed to application of and experimentation with the syndrome mitigation approach. Experiences and lessons learnt in this process are presented below.

6.4 Experiences in the two river basins

6.4.1 Transdisciplinary value-based definition of system boundaries

Application of the first principle in Table 1 in the Ewaso Ng'iro and Pangani basins indicates that it can yield well-targeted research results if a transdisciplinary definition of relevant values and value scales (see Wiesmann 1998) is used from the beginning of the research programme, involving stakeholders at all levels, and is consequently implemented in spatio-temporal system delineation for individual assessments.

Priority research themes in the East African region were identified at the outset of the NCCR North-South programme in a workshop attended by local scientists and decision-makers (Hurni et al 2004). Multiple levels were considered when it came to the selection of stakeholders to be consulted. A sole focus on local-level participation can be counterproductive, since a given situation will not improve without the commitment of decision-makers and authorities. Workshops at the local and basin levels, involving farmers and government representatives, and surveys in the field confirmed the finding that dry-season water from perennial rivers is the resource that is most highly valued, mainly by stakeholders in the footzones of the mountain ranges, while water-related resource conflicts and pressure on the land are among the most pressing problems (Wiesmann 1998; Kiteme and Gikonyo 2002; Ehrensperger 2006).

Findings from stakeholder consultations were implemented in spatio-temporal system delineation for individual assessments. For example, without stakeholder consultation, watershed boundaries are usually an obvious choice for spatial system delineation in water-related research due to upstream–downstream linkages. Based on data availability, scientists often focus on the drainage areas of existing gauges. Often, however, delineated study areas match neither the areas of greatest stakeholder interest nor decision-making units. In the Upper Ewaso Ng'iro studies, to respond to the needs of stakeholders, additional river gauges were therefore installed in the course of long-term research projects, and a simple hydrological model was developed to estimate flow at ungauged locations (Liniger et al 2005; McMillan and Liniger 2005). With respect to the temporal dimension, statistical flow analyses and model calibration focused on dry-season flows (Aeschbacher et al 2005; Notter et al 2007). This made it possible to obtain

results that directly matched stakeholder-valued resource components (i.e. water in the dry season) and areas of interest (i.e. the lower footzones). In the water use plan for Laikipia District (Upper Ewaso Ng'iro Basin), outputs are not given for hydrological catchments but for planning units (Wiesmann 1998).

6.4.2 Explicit reference to multiple levels

Application of the second principle in Table 1 yields important and sometimes unexpected results for decision-making in the two basins.

Modelling the influence of land-use and climate change on river discharge, for example, has indicated that deforestation on the slopes of Mt. Kenya would have little overall impact on dry-season flows at the catchment level. However, model outputs at the grid cell level (50–500 m resolution) suggest that forests at high elevations have a potential to sustain base flow, while forests at lower altitudes drain more water from soils by transpiration than they cause to infiltrate during storms. At the temporal scale, climate change scenarios show an expected overall increase in annual discharge; disaggregation to the monthly level reveals that rainy seasons may shift in time and cause destructive flood flows, while periods of drought may be prolonged with discharge reduced almost to zero for several consecutive months (Notter et al 2007). These modelling results are made possible and supported by long-term monitoring – not only of trends in climate, discharge, and water use from plot to basin levels, but also of population and settlement dynamics (Mungai et al 2004). Based on such results, decision-makers can elaborate spatially differentiated land-use policies and plan for increased water storage capacity in priority locations, the urgency of which would be less perceivable if assessments were carried out at single or discrete levels on the spatial and temporal scales.

6.4.3 Balance between contextuality and generalisation

The third principle in Table 1 can be illustrated by a conceptual model of processes related to watershed management in the two river basins (Figure 3). It represents a synthesis of findings from studies already completed in both basins in the areas of natural science, socio-economics and governance (Wiesmann et al 2000; Ngana 2001, 2002; Kiteme and Gikonyo 2002; Aeschbacher et al 2005; Ehrensperger and Kiteme 2005; Gitonga 2005; Liniger et al 2005; Notter et al 2007), as well as the experience of the authors, who are

currently working in the area. The conceptual model is an attempt to strike a balance between contextuality and generalisation by opening up the context of interest from specific watersheds to a more general context that could be defined as “East African river basins with an ecological gradient from humid to semi-arid”. Consequently, patterns and processes that are present in both the Upper Ewaso Ng’iro and Pangani basins, and which are also likely to be present in other basins conforming to the context definition – although some might be more pronounced in one basin than in another – are included in the model. This allows for a transfer of findings concerning patterns that lead to problems, on the one hand, and potentials for mitigation, on the other hand, to areas that may not have been subject to sustainability-related research so far. The following paragraphs provide an explanation of the selected problems and potentials in Figure 3, and show how processes currently considered to be problems could be transformed into future potentials.

On the problem side, declining dry-season river flows due to expanding agriculture, population pressure and environmental change are presently leading to conflicts between different water user groups. These problems are compounded by conflicting policies between different government sectors, over-allocation of water due to limited and fragmented databases and inadequate stakeholder representation, and weak law enforcement. Irrigation infrastructure is poorly maintained, leading to water losses and higher abstractions.

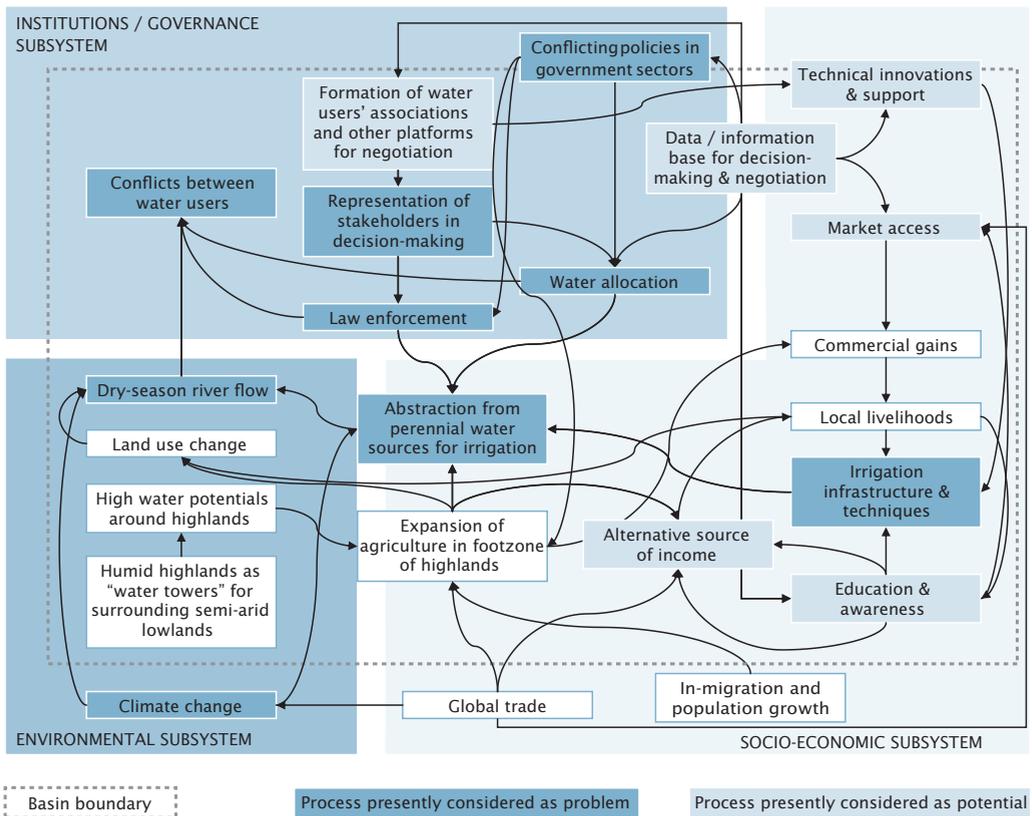
On the potential side, technical innovations such as drip irrigation, rock and roof catchments, and mulching, as well as support from NGOs and the authorities for expanding water storage capacity, are helping to ease the pressure on dry-season water resources. If such innovations can be scaled up, the ‘irrigation infrastructure and techniques’ element could also be transformed from a problem into a potential. The formation of Water Users’ Associations (WUAs) fosters self-regulation, improves participation by stakeholders in decision-making, and helps farmers to secure technical support. The procedure of allocating water could become a potential rather than a problem if farmers were represented by WUAs in the process. Alternative sources of income that do not rely on river water can also help to provide adequate livelihoods and ease pressure on this scarce resource. Education and awareness are needed, however, for farmers to take advantage of these sources. Most such potentials rely on or benefit from a comprehensive and reliable knowledge base. The same knowledge is also needed to allocate available resources equitably and to design coherent government policies.

In the Upper Ewaso Ng'iro Basin, the Centre for Training and Research in Arid and Semi-Arid Lands Development (CETRAD), the main partner institution of the NCCR North-South in East Africa, has been actively working to enhance such potentials, with activities ranging from database maintenance and awareness creation campaigns to supporting the formation of WUAs and lobbying for their formal recognition during the process of reforming Kenyan water policy (Ehrensperger and Kiteme 2005; Liniger et al 2005).

6.5 Conclusions

The Upper Ewaso Ng'iro and Pangani river basins are faced with considerable challenges but also share important potentials for sustainable development. Research in the framework of the NCCR North-South has shown

Fig. 3
Patterns of potentials and problems identified as common to both the Upper Ewaso Ng'iro and Pangani basins.



that a perspective which considers multiple stakeholders at multiple levels is required and can lead to more relevant and applicable outputs. At the same time, the normative dimension of sustainability and the resulting complexity of values, dimensions and contexts represent a challenge that has to be met by striking a balance between contextuality and generalisation.

Although these findings largely concur with the substance of current discourses in watershed management, some important differences can be identified. First, systems processes and dynamics can only be meaningfully investigated with a clear analytical scope. As this scope cannot be defined by researchers alone, it is crucial to collaborate with the stakeholders concerned. However, the goal should not be merely to include stakeholders, but to establish which components of the environment are valued in which way, so that research outputs can be tailored to these interests. Second, processes and the ways in which they are perceived and valued by stakeholders have very specific manifestations in time and space, i.e. they refer to a specific context. These contexts are often not congruent, and hence the context of water-related problems may not be identical with an overlapping context of economic development, the sphere of influence of a specific stakeholder, or the extent of a new land-tenure policy. Therefore, the a priori choice of the watershed as the relevant context for water development should not be an imperative, as more important opportunities for achieving sustainable development in a region may emerge from a different definition of the context of the human–environment system. Finally, while newer-generation watershed management approaches (e.g. FAO 2006) underline the importance of multi-stakeholder collaboration in a framework of light institutions, as opposed to bottom-up or top-down approaches under heavy donor or government programmes, experience in the Ewaso Ng'iro and Pangani basins demonstrates the need for a more careful focus on knowledge-based decision- and policy-making. Merely by ensuring participation, supporting negotiation, and building multi-level institutions, the resulting knowledge base will be nothing more than the sum of individual contributions. Fragmented and need-based knowledge can be an obstacle to successful negotiation processes and collaborative management. Experience in the Ewaso Ng'iro and Pangani basins underlines the importance of producing scientific knowledge that: a) not only focuses on immediate needs but also on long-term requirements; b) strives for a balance between specialisation and generalisation by studying patterns of problems and potentials; and c) pursues system boundaries that are identified in a transdisciplinary manner rather than by a priori choices relating to watersheds.

Endnotes

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References

Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- * Aeschbacher J, Liniger HP, Weingartner R. 2005. River water shortage in a highland–lowland system: A case study on the impact of water abstraction in the Mt. Kenya region. *Mountain Research and Development* 25(2):155–162.
- Aylward B. 2004. Land use, hydrological function and economic valuation. In: Bonnell M, Bruijnzeel LA, editors. *Forests, Water and People in the Humid Tropics*. Cambridge, UK: Cambridge University Press, pp 99–120.
- Bohensky E. 2008. Discovering resilient pathways for South African water management: Two frameworks for a vision. *Ecology and Society* 13(1):19. Also available at: <http://ecologyandsociety.org/vol13/iss1/art19/>; accessed on 29 April 2009.
- Calder IR. 2002. Forests and hydrological services: Reconciling public and science perceptions. *Land Use and Water Resources Research* 2:2.1–2.12. Also available at: <http://purl.umn.edu/47860>; accessed on 7 May 2009.
- Cash DW, Adger WN, Berkes F, Garden P, Lebel L, Olsson P, Lowell P, Young O. 2006. Scale and cross-scale dynamics: Governance and information in a multilevel world. *Ecology and Society* 11(2):8. Also available at: <http://www.ecologyandsociety.org/vol11/iss2/art8>; accessed on 28 April 2009.
- Clark WC. 1987. Scale relationships in the interactions of climate, ecosystems, and societies. In: Land KC, Schneider SH, editors. *Forecasting in the Social and Natural Sciences*. Dordrecht, the Netherlands: Reidel, pp 337–378.
- * Ehrensperger A. 2006. *Potentials, Limitations and Risks of Geo-Information Technology for Sustainable Development Approaches in Kenya* [PhD dissertation]. Bern, Switzerland: Institute of Geography, University of Bern.
- * Ehrensperger A, Kiteme B. 2005. *Upper Ewaso Ng'iro River Basin Water Management Information Platform: Survey on Development Priorities, Information Needs, and Conflict Management Efforts*. Nanyuki, Kenya: Centre for Training and Research in Arid and Semi-Arid Lands Development (CETRAD). Also available at: http://www.nccr-north-south.unibe.ch/publications/Infosystem/On-line%20Dokumente/Upload/Survey_report_ewaso_2b.pdf; accessed on 30 March 2009.
- FAO [Food and Agriculture Organisation of the United Nations]. 2006. *The New Generation of Watershed Management Programmes and Projects: A Resource Book for Practitioners and Local Decision-makers Based on the Findings and Recommendations of a FAO Review*. FAO Forestry Paper No. 150. Rome, Italy: FAO.
- Gibson C, Ostrom E, Ahn TK. 2000. The concept of scale and the human dimensions of global change: A survey. *Ecological Economics* 32:217–239.
- * Gitonga JNL. 2005. *Monitoring and Modeling Crop Growth, Water Use and Production under Dry Land Environment North-West of Mt. Kenya* [PhD dissertation]. Bern, Switzerland: Institute of Geography, University of Bern.
- Hermans LM. 2008. Exploring the promise of actor analysis for environmental policy analysis: Lessons from four case studies in water resources management. *Ecology and Society* 13(1):21. Also available at: <http://www.ecologyandsociety.org/vol13/iss1/art21/>; accessed on 17 July 2009.
- * Hurni H, Wiesmann U, Schertenleib R, editors. 2004. *Research for Mitigating Syndromes of Global Change: A Transdisciplinary Appraisal of Selected Regions of the World to Prepare Development-oriented Research Partnerships*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 1. Bern, Switzerland: Geographica Bernensia.
- IUCN [International Union for Conservation of Nature]. 2003. *The Pangani River Basin: A Situation Analysis*. Nairobi, Kenya: IUCN, Eastern Africa Programme.
- Kiersch B. 2000. Land–water linkages in rural watersheds: A literature review. *FAO Land and Water Bulletin* 9:35–44.
- * Kiteme BP, Gikonyo J. 2002. Preventing and resolving water use conflicts in the Mount Kenya highland–lowland system through water users' associations. *Mountain Research and Development* 22(4):332–337.

- * Liniger HP, Gikonyo J, Kiteme B, Wiesmann U. 2005. Assessing and managing scarce tropical mountain water resources: The case of Mount Kenya and the semiarid Upper Ewaso Ng'iro basin. *Mountain Research and Development* 25(2):163–173.
- MA [Millennium Ecosystem Assessment]. 2005. *Ecosystems and Human Well-Being: Synthesis*. Washington, D. C.: Island Press.
- Mbonile MJ. 2002. Rural population mobility in the Pangani basin, Tanzania. In: Ngana JO, editor. *Water Resources Management: The Case of Pangani River Basin. Issues and Approaches*. Dar es Salaam, Tanzania: Dar es Salaam University Press Ltd., pp 14–27.
- MacMillan L, Liniger HP. 2005. Monitoring and modelling for the sustainable management of water resources in tropical mountain basins: The Mount Kenya example. In: Huber UM, Bugmann HKM, Reasoner MA, editors. *Global Change and Mountain Regions: An Overview of Current Knowledge*. Berlin, Germany: Springer Verlag, pp 605–616.
- * Mungai DN, Ong CK, Kiteme B, Elkaduwa W, Sakthivadivel R. 2004. Lessons from two long-term hydrological studies in Kenya and Sri Lanka. *Agriculture, Ecosystems and Environment* 104:135–143.
- Ngana JO, editor. 2001. *Water Resources Management in the Pangani River Basin: Challenges and Opportunities*. Dar es Salaam, Tanzania: Dar es Salaam University Press Ltd.
- Ngana JO, editor. 2002. *Water Resources Management: The Case of Pangani River Basin. Issues and Approaches*. Dar es Salaam, Tanzania: Dar es Salaam University Press Ltd.
- * Notter B, MacMillan L, Viviroli D, Weingartner R, Liniger HP. 2007. Impacts of environmental change on water resources in the Mount Kenya region. *Journal of Hydrology* 343(3/4):266–278.
- Pahl-Wostl C, Craps M, Dewulf A, Mostert E, Tabara D, Taillieu T. 2007. Social learning and water resources management. *Ecology and Society* 12(2):5. Also available at: <http://www.ecologyandsociety.org/vol12/iss2/art5/>; accessed on 28 April 2009.
- Rohr PC. 2003. *A Hydrological Study Concerning the Southern Slopes of Mt Kilimanjaro, Tanzania* [PhD dissertation]. Trondheim, Norway: Norwegian University of Science and Technology (NTNU).
- Wiesmann U. 1998. *Sustainable Regional Development in Rural Africa: Conceptual Framework and Case Studies from Kenya*. African Studies 14. Bern, Switzerland: Geographica Bernensia.
- * Wiesmann U, Gichuki FH, Kiteme BP, Liniger HP. 2000. Mitigating conflicts over scarce water resources in the highland–lowland system of Mount Kenya. *Mountain Research and Development* 20(1):10–15.
- * Wiesmann U, Messerli P. 2007. Wege aus den konzeptionellen Fallen der Nachhaltigkeit – Beiträge der Geographie. In: Kaufmann R, Burger P, editors. *Nachhaltigkeitsforschung – Perspektiven der Sozial- und Geisteswissenschaften*. Bern, Switzerland: Schweizerische Akademie der Geistes- und Sozialwissenschaften (SAGW), pp 123–142.

7 **Strengthening Policies and Institutions to Support Adaptation to Climate Variability and Change in the Drylands of East Africa**

Chinwe Ifejika Speranza¹, Elias Ayiemba², Gimbage Mbeyale³, Eva Ludi⁴, Paul Ong'anyi⁵, and Davis Mwamfupe⁶

Abstract

We analysed how policies in Tanzania and Kenya address the strategies of agro-pastoralists for coping with and adapting to climate variability and climate change, based on data from semi-structured household surveys, group discussions, policy documents and other material. Many policies indirectly address climate variability and change by focusing on drought, suggesting that some form of mainstreaming already exists. Although the United Nations Framework Convention on Climate Change (UNFCCC) National Communications and the Tanzania National Adaptation Programme of Action propose technological rather than social adaptation measures, they address a broader range of adaptation strategies than development policies do and can be used as vehicles for improving adaptation planning. Some policies focus on securing production and food availability but do not address access to resources, a major concern for the vulnerable. Despite overlaps, few policies focus on key agro-pastoral strategies such as diversification, migration and multi-locality. Mixed cropping – a core agro-pastoral strategy – needs to be re-examined to ascertain the use of key crops that reduce vulnerability. Strategies promoted in policies related to soil conservation are not widely adopted, and land-use regulations are difficult to enforce: this needs to be re-examined. The multitude of policies translates into a multitude of institutions, duplication of activities, and conflicting goals, making it difficult to achieve synergies or set priorities. Creating enactments can offer guidelines for policy implementation. We show that by integrating the perspective of agro-pastoralists, i.e. the majority of the rural poor, policies and pro-poor adaptation strategies can be strengthened.

Keywords: Climate variability; climate change; vulnerability; adaptation; livelihoods; agro-pastoralists; institutions; policies.

7.1 Introduction

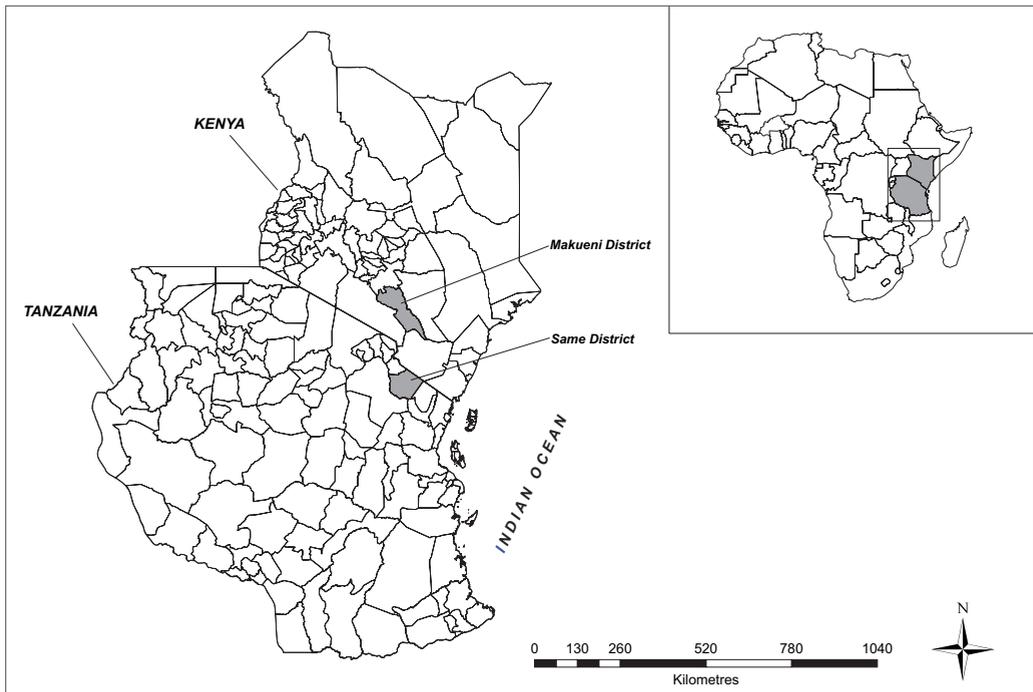
The rising atmospheric concentrations of greenhouse gases, their lagged effect on climate, and the observed effects of climate variability and change⁷ highlight that besides mitigation, adaptation is crucial (IPCC 2007). This recognition led to Decisions 5/CP.7, 7/CP.7 and 28/CP.7 of the 7th session of the Conference of Parties of the United Nations Framework Convention on Climate Change (UNFCCC) in 2001 to support the Least Developed Countries (LDC), inter alia, in the preparation and implementation of National Adaptation Programmes of Action (NAPAs; UNFCCC 2001a, 2001b).

Widespread climate-induced food insecurity and disruption of natural resources-based livelihoods in sub-Saharan Africa (Ifejika Speranza 2006; Boko et al 2007) and inadequate capacity to deal with these phenomena indicate a close link between development on the one hand and climate variability and climate change on the other. This close link (Burton et al 2002; RoK 2002; URT 2003; Adger et al 2007; McGray et al 2007) and projections of future climate change (Hulme et al 2001; Thornton et al 2006; Notter et al 2007) imply that development policy and practice must account for climate risks in order to deal with the consequences of climate change. However, since reducing poverty does not always reduce vulnerability (Adger et al 2003; Eriksen and Kelly 2007), mainstreaming climate change into development policy and practice can pre-empt maladaptation to climate change (Huq et al 2003; Klein 2008).

Thus public policy and its importance in facilitating adaptation to climate change (Adger et al 2007) remain a major focus of adaptation studies (Smith and Lenhart 1996; Burton et al 2002; Tompkins and Adger 2005). Because policies define issues, offer guidance and influence decision-making and societal action, mainstreaming adaptation into development policies will ensure that climate change risks are considered in decision-making and that activities are aimed at *reducing vulnerability* and *increasing adaptive capacities*. Therefore, identifying available policy options (Smith and Lenhart 1996) and assessing how they, together with development practice, reduce vulnerability (Burton et al 2002) are major steps in adaptation. In such an assessment, understanding societal responses and their implications for adaptation is a crucial element (Burton et al 2002) and a useful starting point in developing a national climate policy framework (Tompkins and Adger 2005).

This article analyses how specific policies in Kenya and Tanzania either support or undermine the strategies of agro-pastoralists for adapting to climate variability and climate change. The consequences of national-level climate policy are experienced at local, national, regional and international scales (Tompkins and Adger 2005). Thus national-level climate policy needs to account for such consequences – in particular, it needs to take account of how adaptation is practised on the ground and offer guidance on how to reduce vulnerability and promote adaptation to climate change. Few previous studies have focused on how to integrate global climate policy into national development policies in Africa (Olsen 2006), or on how national policies take account of coping and adaptation practices at local levels (Eriksen 2000; Orindi and Eriksen 2005). The present article, accordingly, reflects on how to mainstream adaptation into development policies and how to strengthen such policies in their responses to climate variability and climate change in smallholder agriculture. It uses agro-pastoral responses to drought in arid and semi-arid lands (ASALs) as an analytical lens. The findings are based on research conducted in Kenya and Tanzania (Figure 1) from 2002 to 2004.

Fig. 1
The Kenyan and
Tanzanian case
study areas. (Map
by Chinwe Ifejika
Speranza)



About 80% of Kenya is ASAL, while between 45% and 75% of Tanzania consists of semi-arid areas (Morris et al 2001).⁸ Drylands comprise arid, semi-arid and hyper-arid areas. ASALs cover more than 70% of East Africa, with pockets of humid and sub-humid high-potential resource islands. Drylands have growing periods of less than 120 days (FAO 1993), high temperatures and erratic rainfall, poor soils, and vegetation consisting of shrubs, scrub and grasses. The ecosystems are fragile, with low crop and livestock production, except in areas where irrigation is possible. Subsistence agriculture, consisting of sedentary agriculture, agro-pastoralism and nomadic pastoralism, is the major land use. Wildlife conservancy is practised as well. Due to population increase and changes in land tenure, areas once used for extensive grazing or fallow have in many cases been converted to permanent cropping.

The predominance of rainfed subsistence agriculture, chronic poverty, poor governance, population pressure and use of marginal lands for rainfed agriculture (Ogallo 2000; Williams 2000), the dominance of water-demanding maize (Williams 2000), poor infrastructure and HIV/AIDS (WHO 2002) make agro-pastoralists vulnerable to climate variability. In addition, climatic hazards are likely to increase in frequency and severity due to climate change (Paavola 2003; Christensen et al 2007; Notter et al 2007). Climate projections indicate increases in precipitation only for a few parts of East Africa. Climate change will likely worsen the adverse effects of climate variability in the region by increasing droughts, floods and water stress, diminishing the amount of land suitable for agriculture, and reducing agricultural production, food security and livelihood security (Hulme et al 2001; Boko et al 2007). Hence reducing vulnerability and increasing adaptive capacity are fundamental to reducing the adverse impacts of climate variability and climate change.

7.2 Conceptual framework and methodology

Adaptation refers to adjustment in practices, processes or structures, in response to actual or expected changes in climate or their effects, which moderates harm or exploits beneficial opportunities (modified from Dixon et al 2003; IPCC 2007). Adaptation can be anticipatory, i.e. taking place before the impacts of climate change are observed. It can also be autonomous, i.e. constitute a conscious response not to climatic stimuli but rather to ecological changes in natural systems and to market or welfare changes in

human systems. Planned adaptation is the result of a deliberate policy decision, based on an awareness that conditions have changed or are about to change and that action is required to return to, maintain, or achieve a desired state (IPCC 2007). Adaptation thus involves building adaptive capacity to increase the ability to adapt to changes and to transform adaptive capacity into action by implementing adaptation actions (Adger et al 2005). Therefore, formulating or reviewing policies in response to actual or expected changes in climate is a form of adaptation.

The ability of agro-pastoralists to cope with and adapt to climate variability and climate change depends on their adaptive capacities, their resilience, and their vulnerability. Vulnerability to climate variability and climate change expresses the degree to which a person, group or human–environment system is likely to be exposed to, adversely affected by, and unable to cope with and recover from the impacts of climate variability and climate change (modified from Bohle et al 1994 and IPCC 2007). Vulnerability is, among other things, a function of adaptive capacity, i.e. the ability of an actor or a system to adjust to climate variability and climate change, to moderate potential damage, to take advantage of opportunities, or to cope with the consequences (IPCC 2007). This relates to resilience – the ability to maintain livelihoods in the face of disturbances or stresses arising from social, political, economic and environmental change (Adger 2000; Quinlan 2003; IPCC 2007). The livelihoods assets of an actor or actor group and the political and institutional frameworks in which actors are embedded are crucial determinants of adaptive capacity. Institutions refer to norms and values (e.g. ownership rights), both formal and informal, as well as agencies and organisations (e.g. water bodies).

The present synthesis was informed by two studies carried out within the Swiss National Centre of Competence in Research (NCCR) North-South programme, on drought vulnerability and risk in the agro-pastoral areas of Makueni District, Kenya (Ifejika Speranza 2006) and on management of common-pool resources in the Pangani Basin, Eastern Same District, Tanzania (Mbeyale 2008). The studies were conducted to find out why agro-pastoralists and pastoralists remain highly vulnerable to the adverse impacts of climate variability (including drought) and how the nature of access to natural resources influences their capacities to meet their livelihood needs. The assumptions were that livelihood assets, actor strategies, policies and institutions shape livelihood outcomes and vulnerability to climate variability and climate change. The aforementioned factors were analysed in both case studies. This synthesis presents some of the results of the studies.

7.3 Overview of the case studies

The links between policies, institutions and livelihood strategies are explored using data from semi-structured surveys of 127 and 339 households in Makueni District, Kenya and Same District, Tanzania, respectively, conducted between 2002 and 2004. The questions asked covered household livelihood strategies, climatic hazards such as droughts and floods, access to natural resources, the impact of institutional changes on the management of common-pool resources, and interactions between the households and various government departments. Other data sources were focus group discussions, workshops, policy documents and other literature. Each case study is introduced below, followed by a synthesis of adaptation practices and their links to policies and institutions. The two case studies depict different socio-ecological contexts (Table 1).

In both areas, agriculture is the major source of livelihood and accounts for more than 75% of household income. About 40% live below the poverty line (USD 1 per day per person). A mainly young population, increasing population density, subsistence agriculture and recurrent droughts are major features. Both areas derive advantages from their location between major urban centres: trading centres have emerged at which travellers are offered services and sold local produce. However, these centres have attracted people from other

Table 1

Characteristics of the two study areas.	Features	The semi-arid areas of former Makueni District, Kenya (now Makueni, Mbooni, Kibwezi, and Nzaui districts)	The semi-arid areas including the wetlands and floodplains of Same District, Tanzania
Location		Southeast Kenya lat. 1°35'S and 3°S / lon. 37°10'E and 38°30'E	Northeast Tanzania lat. 4°15'S and 10°S / lon. 35°10'E and 40°E
Altitude		400 m to around 600 m	500 m to around 900 m
Socio-ecological context		Semi-arid lowland agro-pastoral subsistence system with maize-dominant mixed cropping, cowpeas, pigeon peas, as well as cattle and goats	A densely populated highland-lowland subsistence/irrigation system with maize for subsistence and rice and ginger as cash crops
Inhabitants		Mainly Kikamba	Pare farmers, agro-pastoralists and charcoal makers; Maasai pastoralists

Sources: Ifejika Speranza 2006; Mbeyale 2008.

areas. As a result, the benefits for local people in terms of wage labour and paid employment are not sufficient to significantly reduce the widespread poverty.

The Makueni study area in its lower stretches is crossed by the Athi River, one of the longest perennial rivers in Kenya with a length of about 390 km. Although the Athi and other smaller perennial rivers (Kambu, Kiboko and Mtito-Andei) hold potential for irrigation, agro-pastoralists have not used them widely, mainly due to inadequate resources and land tenure-related constraints in access to river water. The few that do practise irrigation grow crops such as onions, cabbage, okra and sugarcane, but only at a small scale along the Athi River and the seasonal streams of the Kibwezi. The lowland semi-arid Same study area is directly dependent on the mountain zone for water. The forests of the South Pare Mountains are the source of all rivers and streams that feed the lowlands. The interspersed wetlands are important grazing areas, especially during dry seasons. Over the years, springs and streams have dried up (Ngana 2002) due to watershed degradation and high-water stress as a result of increased use by the population upstream. The situation is worsened by the institutional setup, which no longer provides for equitable water allocation for irrigation to both lowland and mountain communities, and does not take account of the differential vulnerabilities and risks that the communities face.

7.4 Agro-pastoral strategies and adaptation to climate variability and change

The purpose of this section is to examine agro-pastoral strategies and how these (can) serve as strategies for adapting to climate variability and change. The major strategies of agro-pastoralists (for details see Ifejika Speranza 2006; Ifejika Speranza et al 2007; Mbeyale 2008) are summarised below in terms of crop- and livestock-based strategies and cross-cutting strategies.

7.4.1 Crop- and livestock-based strategies

Mixed cropping: Households practise mixed cropping primarily to reduce risks, including climatic risks. However, maize remains dominant, covering most of the cropland. Despite climatic risks, people prefer to grow and eat maize, as it has multiple uses. It is the major staple, can easily be sold, and the stover is used for fodder. While rice and ginger are important cash

crops in the Same area, in the Makueni study area maize is sold to generate income. There is therefore a need to expand the potential of mixed cropping as an adaptation strategy by increasing the proportion of drought-tolerant crops and maize varieties in the cropping strategies.

Adoption of drought-tolerant crops/maize species: Although the actors widely acknowledge the advantages of drought-tolerant crops and maize species, only about 10% of the households use exclusively drought-tolerant maize species. This is due to their lower production, higher seed costs, and less preferable consistency and taste by comparison with the traditional variety. This low adoption exposes agro-pastoralists to drought impacts.

Adaptive/flexible cropping practices: This is done by intercropping, planting crops to coincide with the rains, or forfeiting planting for the season for the purpose of reducing crop loss.

Adaptive livestock production: Agro-pastoralists keep a mix of livestock such as local zebu cattle, goats, sheep and poultry to reduce risks and to produce meat for various purposes. Few improved breeds are kept for milk production.

Ensuring access to feed: Pastures are preserved and fodder is stored. Security and pasture conditions determine where livestock is grazed.

Livestock as 'banks': Actors bank their savings in livestock. However, drought causes livestock to emaciate and depreciate.

Food preservation and storage: This strategy is limited, as most agro-pastoralists produce less than they need to ensure their subsistence.

Securing access to natural resources (land and water): Actors harvest rainwater and secure access to other water resources by joining water cooperatives, or to land through arrangements with other land owners.

Accessing knowledge and information: Actors learn from one another, from radio programmes, from outreach workshops with researchers, and from public and private extension services. The aim of learning is to improve farm practices and diversify into non-farm activities.

7.4.2 Cross-cutting strategies

Cross-cutting strategies are not directly linked to agro-pastoralism, but the income derived is invested in crop and livestock production and is thus crucial for increasing households' adaptive capacities. The overarching strategy is diversification in various forms, including:

- charcoal production and casual labour;
- migration and multi-locality of livelihoods;
- investing in the education of children;
- nurturing social and family networks;
- copying what others are doing ('copy-cat' strategies).

'Copy-cat' is used here as an analogy to describe uniform adoption of other actors' strategies that often ends with adverse outcomes. It is frequently observed that shortly after a community member has started an enterprise – e.g. opened a village shop – many other community members copy this livelihood activity and open their own shops, leading to a mushrooming of village shops. By doing so they increase the supply of goods and services on offer, thereby causing demand to diminish and stagnate, and ultimately reducing the economic viability of such enterprises. Diffusion of innovations requires that people copy what others are doing to achieve better livelihood outcomes. Copying could thus be a viable strategy, provided that it is based on experience from best practices, also with regard to conducive overall conditions. However, our research shows that those who copy do not adequately consider the overall situation and factors such as limited demand and market saturation in rural areas. This leads to short-lived diversification and economic loss.

Faced with drought, agro-pastoralists reduce their food and water consumption, work as temporary labourers, produce charcoal, sell off livestock, buy food, and collect food aid. Even in 'normal' years most agro-pastoralists have difficulties building up assets; under drought conditions they are forced to dispose of these assets. Generally, they are in a position to maintain their asset level but need external support to increase it. The following section analyses how policies and institutions take these strategies into account.

7.5 Policies, institutions, and adaptation to climate variability and change

In Kenya and Tanzania there are no separate drought, flood or disaster preparedness policies (although one is being prepared in Kenya); nor do any specific climate variability and climate change policies exist. Issues related to climate are addressed in various policies and planning documents (Table 2) including the UNFCCC National Communications (NCs) and the Tanzanian National Adaptation Plan of Action (NAPA). Although not yet a policy, the UNFCCC-initiated NCs and the Tanzanian NAPA may evolve into one in the future. Most policies target the agricultural sector (Eriksen 2000). They aim to improve production and enhance drought resistance by developing and promoting drought-resistant crops and increasing water supply and irrigation. Nevertheless, these efforts do not specifically consider the extreme variability that confronts households (Eriksen 2000). This section discusses how the various policies relate to the agro-pastoral strategies listed above. The discussion is organised according to the list of strategies presented in Section 6.4; a non-exhaustive overview of how policies relate to strategies is provided in Table 2.

Mixed cropping and adoption of drought-tolerant crops/maize species: Many policies relate to mixed cropping (Table 2) but do not explicitly consider how and under what cultural, socio-economic and biophysical conditions it is practised. Only at the policy implementation level do extension officers actively promote mixed cropping, although maize remains dominant. The policies encourage farmers to grow drought-resistant crops, e.g. adapted maize varieties, millet and cassava. Some research centres have developed disease- and drought-resistant crops such as maize, sorghum, millet and cassava varieties that also take a shorter time to mature (URT 1997a; Oluoch-Kosura and Karugia 2005; URT 2007). Yet actors prefer maize to drought-tolerant crops like millet and sorghum, and mainly use maize varieties that are not drought-tolerant. The low rate of adoption shows that links remain weak between policies and agro-pastoralists' practices, as well as between crop researchers and agro-pastoralists' realities. To improve this situation, crop development approaches should allow for cooperation between agro-pastoralists and scientists. Besides the focus on maize, there is a need to promote adoption of drought-tolerant crops like millet and sorghum and to increase their acceptability. Accessing external markets for these crops is an option that can generate additional income.

Table 2

	Mixed cropping	Adoption of drought-tolerant crops/maize species	Adaptive/flexible cropping practices	Adaptive livestock production	Ensuring access to feed	Livestock as 'banks'	Food preservation and storage	Securing access to natural resources (incl. land)	Securing access to water	Accessing knowledge and information	Livelihood diversification	Charcoal production	Migration and multi-locality of livelihoods	Investing in education	Nurturing social and family networks	'Copy-cat' strategies
Agro-pastoral strategies																
Policies																
RoK Strategy for revitalising agriculture 2004	e					o	e			e	a					
RoK Food policy – Sessional paper No. 4, 1981	e						e			e						
URT National agriculture and livestock policy 1997a	e		e	d	d		d			e	e			e		
RoK Draft national livestock policy 2007a			e	d	d					e						
URT National livestock policy 2006			e	d	d					e						
RoK National environment action plan 1994	e											d				
RoK Environmental action plan for ASALs 1992	e						d									
URT National environmental policy 1997b							d		e							
RoK Forest policy 2000a					d							d				
URT Forest policy 1998a	e											d				
RoK Draft wildlife policy 2007b					d											
URT Wildlife policy 1998b	e															
RoK Draft national land policy 2006a			e	d			d	d								
URT Land policy 1997c	e		e				d									
URT Energy policy 1992	e											d				
URT National employment policy 1996						o				e				e		
URT Cooperative development policy 1997d						o				e				e		
RoK Water policy 2006b									d							
URT Water policy 2000a									d							
URT Water sector development strategy 2004									d							
RoK Vision 2030 (2007c)									d	e	a					
URT Development vision 2025 (2000b)									d	e						
RoK Free primary education 2003										e				e		
URT Education and training policy 1995										e				e		
RoK Poverty reduction strategy paper 2000b						o				e	e			e		
URT Poverty reduction strategy paper 1997e						o				e	e			e		
URT Rural development strategy 2001		a	e	e		o	a	d	e	e	e	d		e	e	
RoK first National Communication to the UNFCCC 2002		a	a	a	e					o	o					
URT initial National Communication to the UNFCCC 2003		e	e	e	e		e			o	o	e				
URT National Adaptation Plan of Action (NAPA) 2007	e	a	e	e	e			e	e	e	e	d				

Agro-pastoral adaptation strategies and related policies. Key: e = encouraged; d = discouraged; a = acknowledged; o = indirectly addressed through related options that can lead to positive outcomes; empty field = not addressed.

Adaptive/flexible cropping practices: Apart from the NCs and the Tanzanian NAPA (RoK 2002; URT 2003, 2007), flexible cropping practices are not targeted in any policies. Meteorological departments provide seasonal outlooks based on which some actors adapt their practices. However, extension services have inadequate resources and decision-making power to enable fast and flexible responses to climate variability and climate change.

Adaptive livestock production: The Tanzanian national-level agriculture and livestock policy discourages traditional pastoral practices; the district government encourages people to maintain no more than 50 head of livestock to avoid resource conflicts with farmers and land degradation. However, farmers have trouble reducing herds due to their importance to household income as well as the cultural values attached to livestock. Nevertheless, this culture is likely to change gradually through education; the Maasai have now started to farm in addition to keeping animals.

Ensuring access to feed: While many policies encourage adaptive livestock production, they rather discourage access to public grazing resources. Yet under drought conditions flexible access to grazing resources is crucial. The NCs and the Tanzanian NAPA do encourage provision of such access. The various policies guiding rangeland use (Table 2) have conflicting goals: wildlife policies aim to protect wildlife and provide a basis for tourism at the expense of fencing out those most dependent on resources such as grazing lands, wild plants and animals. In general, the benefits of tourism are rarely shared with local people. By accessing pastures in protected areas during droughts, agro-pastoralists risk penalisation by the government and conflict with wildlife. Buffer grazing zones for livestock during droughts are needed, but policies only make provisions for buffer zones for wildlife. In the Tanzanian study area, policies (URT 1998a, 1998b) remain silent regarding the problems that communities face during droughts, and although district governments can permit pastoralists to migrate to other areas with better pastures, they rarely do so.

Livestock as 'banks', focused asset accumulation and divestment: Savings and Credit Co-operatives (SACCOs) are widespread, but many agro-pastoralists continue to accumulate their wealth in the form of livestock even though the traditional strategy of 'storing wealth' in livestock no longer suits current conditions. Policies (e.g. URT 1996, 1997d) support the formation of savings and credit societies, but these are still in their infancy in Tanzania. Rural banking and credit services are needed as complementary sav-

ings and credit options for agro-pastoralists. Yet there are few financial and credit services in rural areas. Where they do exist, defaulting on repayments, low capitalisation, and poor capacity among communities to use available funds limit their potential to secure rural livelihoods effectively. While policies (URT 2000b, 2001; RoK 2007c) acknowledge the importance of livelihood diversification, no provision is made to train rural actors with regard to investment opportunities and their management. There is thus a need to increase awareness about financial services and to provide such training.

Food preservation and storage: Several policies (Table 2) and institutions address food availability, as well as food distribution and its coordination between the national, district and village levels. In this context, climate variability and climate change are addressed indirectly through their impacts, i.e. in this case through food insecurity. In order to discourage relief-food dependency, measures were introduced to couple relief-food distribution with productive work (RoK 2007d). Corruption is another problem: some politicians will want to send food to their constituencies even when there is no food shortage. Yet verification measures that aim to combat fraudulent food distribution increase bureaucracy and delay food distribution. Thus, there is a need to depoliticise food distribution and make it transparent.

Secure access to natural resources (including land): Policies that promote secure access to land (Table 2) also have provisions for managing conflict over natural resources (URT 1997b, 1997c, 2000a). Still, governments appear to have conflicting goals as areas that pastoralists and agro-pastoralists need for their livelihoods are converted into protected areas. Alternatives for the actors to bridge crisis periods are not considered (URT 1997a, 2001, 2006). Other policies have elements that can reduce vulnerability by allowing communities to participate in tourism. Yet there are very few examples where these principles of access and benefit sharing, community participation in tourism, and compensation for damage by wildlife are implemented.

Ensuring access to water: Agro-pastoralists harvest rainwater and runoff, but the potentials of these practices have not yet been fully exploited. Implementation of the Water Sector Development Strategy (URT 2004) led to the constitution of Water Users Associations (WUAs) in Same district. In the Makueni study area, the government also supports irrigation by smallholders in the few areas where it is viable. While WUAs have already been incorporated into policies in Kenya (RoK 2006b), they have not yet been implemented in the Makueni study area. Studies in similar areas in Kenya

show that WUAs are effective in reducing water conflicts related to over-abstraction (Liniger et al 2005; Kiteme and Wiesmann 2008). Plans call for making water available in ASALs and rehabilitating existing irrigation schemes (URT 2000a, 2000b; RoK 2007a, 2007c). In the Same study area, separation into upstream and downstream management led to a mismatch between the social and ecological scales of Common Properties Resources (CPRs) management and institutional failure. It worsened resource use conflicts and degradation of the CPRs. The ensuing reduction in access to water for irrigation reduced the capacity of communities to cope with climate variability and climate change. However, it has to be noted that the potentials for irrigation have not yet been fully explored.

Accessing knowledge and information: Many policies in both countries (Table 2) aim to improve access to knowledge and information for the rural population. In Kenya, the Ministry of Agriculture (MoA) and the Ministry of Livestock and Fisheries Development (MLFD), through their extension services, are major providers of agricultural and related information. The private sector and NGOs disseminate information as well. The meteorological departments provide seasonal outlooks, collaborate with the media, and produce a radio and internet programme in Kenya. Yet various challenges such as inadequate historical data and sparse distribution of stations (Ogallo 2000) hamper provision of reliable climate information and need to be addressed. Hence, these institutions require sustained financial and technical support.

Charcoal production: Various policies (Table 2) aim to promote a sustainable environment, increase forest cover, and ensure access to energy (RoK 1994, 2000a, 2007c; URT 1997b), as well as reduce land degradation, lack of accessible good quality water, and loss of wildlife habitat (URT 1998b; RoK 2007b). Yet no viable strategies have been proposed to reduce dependence of both rural and urban populations on fuelwood. In Kenya, the forest policy (RoK 2000a) aims at forest protection. It does not foresee co-management with the local population. However, reducing or avoiding deforestation can help reduce CO₂ emissions, thereby sequestering carbon and reducing the greenhouse effect and global warming. In both countries there is currently no viable alternative to charcoal and fuelwood; charcoal production thus remains an important strategy for the poor. Efforts to develop alternatives have either not been successful or failed to be widely adopted. Continued research is thus needed.

Education: Agro-pastoralists value education. They believe that educated persons are more likely to escape poverty by engaging in non-farm income generating activities (Mortimore 2003). Educational policies in both countries (Table 2) aim to achieve universal primary education. These policies have indeed led to increasing numbers of enrolled pupils (Vos et al 2004). However, the aim of raising literacy levels has been easier to meet than the aim of fostering growth and development through education, as a growing number of graduates find employment only months after graduation. There is thus a need to harmonise the various existing education policies and adapt them to emerging trends in the employment sector.

Activating social and family networks: Rural actors, especially women, organise themselves in Self Help Financial Groups (SHFGs) to increase their financial capacity. However, experience has shown that SHFGs collapse in a crisis. Ensuring a stable capital base for such groups is crucial in order to enable them to provide financial services continuously. No policies explicitly encourage remittances to rural areas despite the demonstrated positive effects on the household and rural economies (Ifejika Speranza 2006) or, internationally, to the recipient national economies. The proven positive effect should encourage governments to create incentives for such transfers through measures such as tax exemption. ‘Social/familial insurance’, which depends solely on family networks, needs to be formalised into social insurance and micro-insurance to improve resilience. No policies explicitly address these existing forms of insurance that rural actors use.

Adaptation in agriculture features prominently in the first NCs of both Kenya and Tanzania (RoK 2002; URT 2003). According to the first NC of Kenya, “[a]daptation options in the agriculture sector would include: development of early maturing and high-yielding crop varieties and adaptation of agricultural technologies from analogue environments” (RoK 2002, p xx in summary). In relation to drought, the proposed adaptation strategies include the

[i]ntroduction of drought-tolerant/escaping crops, irrigation and fertilizers; development of high-yielding, more resistant, early maturing and disease- and pest-tolerant crops. Adaptation strategies will include disposing of stocks early before the onset of drought. (RoK 2002, p 44)

For Tanzania,

the proposed adaptation measures for crop production mainly involve land-use and management related changes. Changes in land use involve changes in farmed area, changes in the crop type to suit the changes in climate conditions, and changes in crop location. Changes in management require the introduction of an irrigation system and different crop cultivars, improved manure/fertilizer use, control of pests, weeds and diseases, change in planting dates, and better exploitation of climate and weather data. (URT 2003, p 44)

Apart from the technological adaptation measures, the measures proposed do not directly address the major agro-pastoral strategies identified in the previous section. They do not consider the underlying socio-economic factors that cause vulnerability, impair livelihoods and hinder the adoption of adaptation strategies. Orindi and Eriksen (2005) published similar findings on the Ugandan initial national communication on climate change.

This shows that many policies do not adequately address issues that are of concern to agro-pastoralists. Many policies are cross-sectoral; their addressing multiple issues bears the risk of conflicting goals and overlap with sectoral policies. It is not clear whether such cross-sectoral policies supersede sectoral policies. There is thus a risk of duplication of activities, as several institutions focus on ensuring food security and promoting the development of drought-tolerant crop species. Some key aspects of agro-pastoral strategies, such as diversification, migration and multi-locality, are not addressed at all in many policies. Strategies prominently promoted in some policies (e.g. RoK 2002, p 119), such as forest protection and soil conservation practices (e.g. no tillage or mulching), are not widely adopted, and specifications on land use are often not adhered to or difficult to enforce.

The policies displayed in Table 2 show that agro-pastoral strategies are not limited to the agricultural sector but span various socio-economic sectors. The diversification strategies of agro-pastoral actors call for a shift from perceiving them as being active exclusively in the agricultural sector to seeing them as partly earning their livelihood from non-agricultural sectors. Accordingly, policies should take account of these cross-sectoral diversification strategies. Table 2 also shows that some strategies, such as mixed cropping, need to be explicitly addressed and re-examined in more detail, as they form the core of agro-pastoral cropping strategy.

The multitude of policies addressing agro-pastoral strategies call for some form of policy coordination. While the Kenya Environmental Management and Coordination Act of 1999 (in force since January 2000) aims to harmonise environmental policies and mainstream environmental concerns into national planning and management processes in Kenya, including facilitating implementation of climate change mitigation, enforcement and coordination remain challenging (RoK 2002). The Tanzanian government acknowledges that “the institutional framework for climate change in Tanzania should take into account the need for an economy-wide holistic approach to mitigation and adaptation” (URT 2003, p 63). It sees the exploitation of sectoral synergies as an important element and involves all relevant sectors. Hence, perspectives from rural development and from agro-pastoralists, who constitute a large proportion of the rural poor, offer insights into how to strengthen policies and pro-poor adaptation strategies.

7.6 Conclusions

This study analyses how national policies consider local coping and adaptation strategies. The analysis shows that apart from drought, climate variability and climate change are not explicitly addressed in policy documents. Floods, storms, frost and extreme heat also need to be addressed. Several activities concerned with enhancing rural actors’ adaptive capacities need continued support in order to secure agro-pastoral livelihoods.

The various policies addressing different responses to climate variability and change show that an adaptation policy (Burton et al 2002) and some degree of mainstreaming already exist. The fact that these policies were developed to address development in the context of climate variability and other driving factors rather than focusing more exclusively on climate change impacts reflects the close link between climate change adaptation and development.

However, policies do not adequately address agro-pastoral strategies. In some cases, strategies prominently promoted in policies are not widely adopted by agro-pastoralists. There is a need to re-examine the adoption and non-adoption of certain policy-proposed strategies. Failure to do so will limit the adoption and effectiveness of adaptation measures.

The proposed activities of the NAPA (URT 2007; Osman-Elasha and Downing 2007) and the planned national strategies on adaptation are some proc-

esses that could integrate climate variability and climate change into the development process. However, a holistic policy on rural development that focuses on securing production, availability of and access to natural resources, thereby reducing poverty and vulnerability, will most likely capture local actor realities in adaptation planning. The conflicting goals of some policies can be reduced by adopting the perspectives of the vulnerable. This is imperative when the aim is to reduce poverty and where the majority of the poor are rural actors.

This contribution used agro-pastoral coping and adaptation practices as a lens to analyse how policies and institutions take them into account in the context of climate variability and climate change. This does not mean that other perspectives and levels are not important. Nevertheless, this article highlights issues that need to be addressed from a rural pro-poor perspective in order to achieve resilience to climate variability and climate change.

Endnotes

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⁷This article uses the definitions for climate variability and climate change coined by the Intergovernmental Panel on Climate Change (IPCC): “Climate variability refers to variations in the mean state and other statistics (such as standard deviations, the occurrence of extremes, etc.) of the climate on all spatial and temporal scales beyond that of individual weather events” (IPCC 2007, p 944); “Climate change refers to a change in the state of the climate that can be identified (e.g. by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer” (IPCC 2007, p 943).

⁸Various definitions of arid and semi-arid areas in Tanzania exist due to difficulties in delineating them (Morris et al 2001).

References

Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- Adger WN. 2000. Social and ecological resilience: Are they related? *Progress in Human Geography* 24(3):347–364. doi:10.1191/030913200701540465.
- Adger WN, Agrawala S, Mirza MMQ, Conde C, O'Brien K, Pulhin J, Pulwarty R, Smit B, Takahashi K. 2007. Assessment of adaptation practices, options, constraints and capacity. In: Parry ML, Canziani OF, Palutikof JP, van der Linden PJ, Hanson CE, editors. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, UK: Cambridge University Press, pp 717–743.
- Adger WN, Arnell NW, Tompkins EL. 2005. Successful adaptation to climate change across scales. *Global Environmental Change* 15(2):77–86. doi:10.1016/j.gloenvcha.2004.12.005.
- Adger WN, Huq S, Brown K, Conway D, Hulme M. 2003. Adaptation to climate change in the developing world. *Progress in Development Studies* 3(3):179–195. doi:10.1191/1464993403ps0600a.
- Bohle HG, Downing TE, Watts MJ. 1994. Climate change and social vulnerability: Toward a sociology and geography of food insecurity. *Global Environmental Change* 4(1):37–48. doi:10.1016/0959-3780(94)90020-5.
- Boko M, Niang I, Nyong A, Vogel C, Githeko A, Medany M, Osman-Elasha B, Tabo R, Yanda P. 2007. Africa. In: Parry ML, Canziani OF, Palutikof JP, van der Linden PJ, Hanson CE, editors. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, UK: Cambridge University Press, pp 433–467.
- Burton I, Huq S, Lim B, Pilifosova O, Schipper EL. 2002. From impacts assessment to adaptation priorities: The shaping of adaptation policy. *Climate Policy* 2(2–3):145–159.
- Christensen JH, Hewitson B, Busuioc A, Chen A, Gao X, Held I, Jones R, Kolli RK, Kwon WT, Laprise R, Magaña Rueda V, Mearns L, Menéndez CG, Räisänen J, Rinke A, Sarr A, Whetton P. 2007. Regional climate projections. In: Solomon S, Qin D, Manning M, Chen Z, Marquis M, Averyt KB, Tignor M, Miller HL, editors. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, UK: Cambridge University Press, pp 847–940.
- Dixon RK, Smith J, Guill S. 2003. Life on the edge: Vulnerability and adaptation of African ecosystems to global climate change. *Mitigation and Adaptation Strategies for Global Change* 8(2):93–113. doi:10.1023/A:1026001626076.
- Eriksen SH. 2000. *Responding to Global Change: Vulnerability and Management of Local Agro-ecosystems in Kenya and Tanzania* [PhD dissertation]. Norwich, UK: University of East Anglia.
- Eriksen SH, Kelly PM. 2007. Developing credible vulnerability indicators for climate adaptation policy assessment. *Mitigation and Adaptation Strategies for Global Change* 12(4):495–524. doi:10.1007/s11027-006-3460-6.
- FAO [Food and Agriculture Organization]. 1993. *Key Aspects of Strategies for the Sustainable Development of Drylands*. Rome, Italy: FAO.
- Hulme M, Doherty R, Ngara T, New M, Lister D. 2001. African climate change: 1990–2100. *Climate Research* 17(2):145–168. doi:10.3354/cr017145.
- Huq S, Rahman A, Konate M, Sokona Y, Reid H. 2003. *Mainstreaming Adaptation to Climate Change in Least Developed Countries (LDCs)*. London, UK: International Institute for Environment and Development (IIED). Also available at: <http://www.un.org/special-rep/ohrls/ldc/LDCsreport.pdf>; accessed on 16 June 2009.
- * Ifejika Speranza C. 2006. *Drought Vulnerability and Risk in Agro-pastoral Areas: An Integrative Approach and Its Application in Kenya* [PhD dissertation]. Bern, Switzerland: University of Bern.

- * Ifejika Speranza C, Kiteme BP, Wiesmann U. 2007. Droughts and famines: The underlying factors and the causal links among agro-pastoral households in semi-arid Makueni district, Kenya. *Global Environment Change* 18(1):220–233. doi:10.1016/j.gloenvcha.2007.05.001.
- IPCC [Intergovernmental Panel on Climate Change]. 2007. *Climate Change 2007: IPCC Fourth Assessment Report. Workgroup I. Annex 1: Glossary*. Cambridge, UK: Cambridge University Press.
- * Kiteme BP, Wiesmann U. 2008. Sustainable river basin management in Kenya: Balancing needs and requirements. In: Hirsch Hadorn G, Hoffmann-Riem H, Biber-Klemm S, Grossenbacher-Mansuy W, Joye D, Pohl C, Wiesmann U, Zemp E, editors. *Handbook of Transdisciplinary Research*. Berlin, Germany: Springer Verlag, pp 63–78.
- Klein RJT. 2008. *Mainstreaming Climate Adaptation into Development*. A Stockholm Environment Institute Briefing Note for the European Parliament Temporary Committee on Climate Change. Stockholm, Sweden: Stockholm Environment Institute.
- * Liniger HP, Gikonyo J, Kiteme BP, Wiesmann U. 2005. Assessing and managing scarce tropical mountain water resources: The case of Mount Kenya and the semi-arid Upper Ewaso Ng'iro Basin. *Mountain Research and Development* 25(2):163–173. doi:10.1659/0276-4741(2005)025[0163:AAMSTM]2.0.CO;2.
- * Mbeyale GE. 2008. *The Impact of Institutional Changes on the Management of Common Pool Resources in Pangani River Basin: A Case of Same District, Tanzania* [PhD dissertation]. Dar es Salaam, Tanzania: University of Dar es Salaam.
- McGray H, Hammill A, Bradley R. 2007. *Weathering the Storm: Options for Framing Adaptation and Development*. Washington, D.C.: World Resources Institute. Also available at: http://pdf.wri.org/weathering_the_storm.pdf; accessed on 27 August 2008.
- Morris M, Butterworth J, Lamboll R, Lazaro E, Maganga F, Marsland N. 2001. *Household Livelihood Strategies in Semi-arid Tanzania: Synthesis of Findings*. Annex A of the Final Technical Report of Project R7805. London, UK: Department for International Development (DFID). Also available at: <http://www.nrsp.org/database/documents/730.pdf>; accessed on 11 May 2008.
- Mortimore M. 2003. Long-term change in African drylands: Can recent history point towards development pathways? *Oxford Development Studies* 31(4):503–518. doi:10.1080/1360081032000146654.
- Ngana J, editor. 2002. *Institutional Framework for the Management of Water Resources in the Pangani Basin: Water Resources Management, the Case of Pangani River Basin*. Dar es Salaam, Tanzania: Dar es Salaam University Press Ltd.
- * Notter B, McMillan L, Viviroli D, Weingartner R, Liniger HP. 2007. Impacts of environmental change on water resources in the Mount Kenya region. *Journal of Hydrology* 343(3/4):266–278. doi:10.1016/j.jhydrol.2007.06.022.
- Ogallo LA. 2000. Predicting drought in Kenya. In: Wilhite DA, editor. *Drought: A Global Assessment*. Vol. 1. London, UK and New York, NY: Routledge, pp 52–67.
- Olsen KH. 2006. National ownership in the implementation of global climate policy in Uganda. *Climate Policy* 5(6):599–612.
- Oluoch-Kosura W, Karugia JT. 2005. Why the early promise for rapid increases in maize productivity in Kenya was not sustained: Lessons for sustainable investment in agriculture. In: Djurfeldt G, Holmén H, Jirstrom M, Larsson R, editors. *The African Food Crisis: Lessons from the Asian Green Revolution*. Wallingford, UK: CABI Publishing, pp 181–196.
- Orindi VA, Eriksen S. 2005. *Adaptation to Climate Change in the Development Process in Uganda*. Ecopolicy Series No. 15. Nairobi, Kenya: African Centre for Technology Studies (ACTS).
- Osman-Elasha B, Downing TE. 2007. *Lessons Learned in Preparing National Adaptation Programmes of Action in Eastern and Southern Africa*. European Capacity Building Initiative (ecbi) Policy Analysis Report. Oxford, UK: ecbi. Also available at: http://www.eurocapacity.org/downloads/ecbi_NAPA_PA_Project_2007.pdf; accessed on 12 May 2008.
- Paavola J. 2003. *Vulnerability to Climate Change in Tanzania: Sources, Substance and Solutions*. Paper presented at the Inaugural Workshop of the Southern Africa Vulnerability Initiative (SAVI), Maputo, Mozambique, 19–21 June 2003. Available at: http://www.gechs.org/savi/workshop/maputo/papers/paavola_tanzania.pdf; accessed on 11 May 2009.

- Quinlan A. 2003. *Resilience and Adaptive Capacity: Key Components of Sustainable Socio-ecological Systems*. IHDP Update. Bonn, Germany: International Human Dimensions Programme on Global Environmental Change (IHDP).
- RoK [Republic of Kenya]. 1981. *Sessional Paper No. 4 of 1981 on National Food Policy*. Nairobi, Kenya: Republic of Kenya.
- RoK [Republic of Kenya]. 1992. *Environmental Action Plan for Arid and Semi-Arid Lands (ASAL) in Kenya*. Nairobi, Kenya: Republic of Kenya.
- RoK [Republic of Kenya]. 1994. *National Environment Action Plan*. Nairobi, Kenya: Republic of Kenya.
- RoK [Republic of Kenya]. 2000a. *Forest Policy*. Nairobi, Kenya: Republic of Kenya.
- RoK [Republic of Kenya]. 2000b. *Poverty Reduction Strategy Paper*. Nairobi, Kenya: Republic of Kenya.
- RoK [Republic of Kenya]. 2002. *First National Communication of Kenya to the Conference of The Parties to The United Nations Framework Convention on Climate Change (UNFCCC)*. Nairobi, Kenya: Ministry of Environment and Natural Resources, National Environment Secretariat. Also available at: <http://unfccc.int/resource/docs/natc/kenncl.pdf>; accessed on 11 May 2009.
- RoK [Republic of Kenya]. 2003. *Free Primary Education*. Nairobi, Kenya: Republic of Kenya.
- RoK [Republic of Kenya]. 2004. *Strategy for Revitalising Agriculture*. Nairobi, Kenya: Republic of Kenya.
- RoK [Republic of Kenya]. 2006a. *Draft National Land Policy*. Nairobi, Kenya: Republic of Kenya.
- RoK [Republic of Kenya]. 2006b. *Water Policy*. Nairobi, Kenya: Republic of Kenya.
- RoK [Republic of Kenya]. 2007a. *Draft Sessional Paper No... of... (year) on National Livestock Policy*. Nairobi, Kenya: Republic of Kenya.
- RoK [Republic of Kenya]. 2007b. *Draft Wildlife Policy*. Nairobi, Kenya: Republic of Kenya.
- RoK [Republic of Kenya]. 2007c. *Vision 2030*. Nairobi, Kenya: Republic of Kenya.
- RoK [Republic of Kenya]. 2007d. *The Third Annual Progress Report 2005–2006 on Economic Recovery Strategy 2003–2007*. Nairobi, Kenya: Monitoring and Evaluation Directorate, Ministry of Planning and National Development. Available at the library of the Central Bureau of Statistics, Nairobi, Kenya.
- Smith JB, Lenhart SS. 1996. Climate change adaptation policy options. *Climate Research* 6:193–201.
- Thornton PK, Jones PG, Owiyo T, Kruska RL, Herrero M, Kristjanson P, Notenbaert A, Bekele N, Omolo A, Orindi V, Otiende B, Ochieng A, Bhadwal S, Anantram K, Nair S, Kumar V, Kulkar U. 2006. *Mapping Climate Vulnerability and Poverty in Africa*. Report to the Department for International Development. Nairobi, Kenya: The International Livestock Research Institute (ILRI). Also available at: <http://www.research4development.info/PDF/Outputs/ClimChangePovInAfrica.pdf>; accessed on 20 June 2008.
- Tompkins EL, Adger WN. 2005. Defining response capacity to enhance climate change policy. *Environmental Science and Policy* 8(6):562–571. doi:10.1016/j.envsci.2005.06.012.
- UNFCCC [United Nations Framework Convention on Climate Change]. 2001 a. *Addendum Part Two: Action Taken by the Conference of the Parties*. Report of the Conference of the Parties on its Seventh Session, Marrakesh, Morocco, 29 October–10 November 2001, Vol. 1. Bonn, Germany: UNFCCC. Also available at: <http://unfccc.int/resource/docs/cop7/13a01.pdf>; accessed on 11 May 2009.
- UNFCCC [United Nations Framework Convention on Climate Change]. 2001 b. *Addendum Part Two: Action Taken by the Conference of the Parties*. Report of the Conference of the Parties on its Seventh Session, Marrakesh, Morocco, 29 October–10 November 2001, Vol. 4. Bonn, Germany: UNFCCC. Also available at: <http://unfccc.int/resource/docs/cop7/13a04.pdf>; accessed on 11 May 2009.
- URT [United Republic of Tanzania]. 1992. *Energy Policy*. Dar es Salaam, Tanzania: Ministry of Water, Energy and Minerals.
- URT [United Republic of Tanzania]. 1995. *Education and Training Policy*. Dar es Salaam, Tanzania: Ministry for Education and Vocational Training.
- URT [United Republic of Tanzania]. 1996. *National Employment Policy*. Dar es Salaam, Tanzania: Ministry of Labour and Youth Development.

- URT [United Republic of Tanzania]. 1997a. *National Agriculture and Livestock Policy*. Dar es Salaam, Tanzania: Ministry of Agriculture and Cooperatives.
- URT [United Republic of Tanzania]. 1997b. *National Environmental Policy*. Dar es Salaam, Tanzania: Vice President's Office.
- URT [United Republic of Tanzania]. 1997c. *Land Policy*. Dar es Salaam, Tanzania: United Republic of Tanzania.
- URT [United Republic of Tanzania]. 1997d. *Cooperative Development Policy*. Dar es Salaam, Tanzania: United Republic of Tanzania.
- URT [United Republic of Tanzania]. 1997e. *Poverty Reduction Strategy Paper*. Dar es Salaam, Tanzania: United Republic of Tanzania.
- URT [United Republic of Tanzania]. 1998a. *Forest Policy*. Dar es Salaam, Tanzania: United Republic of Tanzania.
- URT [United Republic of Tanzania]. 1998b. *Wildlife Policy*. Dar es Salaam, Tanzania: Ministry of Natural Resources and Tourism.
- URT [United Republic of Tanzania]. 2000a. *The National Water Policy*. Dar es Salaam, Tanzania: Ministry of Natural Resources and Tourism.
- URT [United Republic of Tanzania]. 2000b. *Development Vision 2025*. Dar es Salaam, Tanzania: United Republic of Tanzania.
- URT [United Republic of Tanzania]. 2001. *Rural Development Strategy*. Dar es Salaam, Tanzania: United Republic of Tanzania.
- URT [United Republic of Tanzania]. 2003. *Initial National Communication under the United Nations Framework Convention on Climate Change (UNFCCC)*. Dar es Salaam, Tanzania: Vice President's Office. Also available at: <http://unfccc.int/resource/docs/natc/tannc1.pdf>; accessed on 20 June 2008.
- URT [United Republic of Tanzania]. 2004. *Water Sector Development Strategy*. Dar es Salaam, Tanzania: Ministry of Natural Resources and Tourism.
- URT [United Republic of Tanzania]. 2006. *National Livestock Policy*. Dar es Salaam, Tanzania: Ministry of Natural Resources and Tourism.
- URT [United Republic of Tanzania]. 2007. *National Adaptation Plan of Action*. Dar es Salaam, Tanzania: Vice President's Office. Also available at: <http://unfccc.int/resource/docs/napa/tza01.pdf>; accessed on 20 June 2008.
- Vos R, Bedi A, Kimalu PK, Manda DK, Nafula NN, Kimenyi MS. 2004. *Achieving Universal Primary Education: Can Kenya Afford It?* Department of Economics Working Paper Series No. 47. Storrs, CT: Department of Economics, University of Connecticut. Also available at: <http://www.econ.uconn.edu/working/2004-47.pdf>; accessed on 16 June 2009.
- WHO [The World Health Organisation]. 2002. *World Health Report 2002: Reducing Risks, Promoting Healthy Life*. Geneva, Switzerland: WHO.
- Williams J. 2000. Drought risk management in Africa: Developing institutions to transform 'belated disaster response' into informed preparedness. In: Wilhite DA, editor. *Drought: A Global Assessment*. Vol. 1. London, UK and New York, NY: Routledge, pp 168–169.

8 **Features of Successful Syndrome Mitigation: Enhancing Resilience and Empowering the Vulnerable in East Africa**

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Abstract

This paper examines how knowledge-based interventions improve the quality of life in communities where they are implemented. It draws on case studies of three interventions implemented as Partnership Actions to Mitigate Syndromes (PAMS) within the Swiss National Centre of Competence in Research (NCCR) North-South programme. The case studies consist of a qualitative evaluation based on experience, knowledge and expertise gained through participants' observations, as well as relevant documents and reports. The concepts of 1) syndrome mitigation; 2) participation and empowerment; and 3) vulnerability and resilience are used as assessment indicators to demonstrate the levels of and differences in contributions by and among the respective interventions. The assessment reveals that although each of the three projects contributed to syndrome mitigation in its respective context, there are marked disparities in the level of individual achievement that are influenced by the nature of problems of unsustainability, technological requirements, and the implementation costs of the preferred intervention.

Keywords: Syndrome mitigation; participation; empowerment; vulnerability; resilience; East Africa.

8.1 Background

Syndromes are a combination of problems of unsustainability that occur in a given context (WBGU 1997). The Swiss National Centre of Competence in Research (NCCR) North-South supports societies in partner countries in their efforts to address syndromes in their regions and find strategies to mitigate them (Hurni et al 2004). The Partnership Actions to Mitigate Syndromes (PAMS) constitute one of the programme strategies designed to achieve this goal by making it possible to implement, test and validate research outcomes through short-term partnership actions involving researchers and the societies concerned. PAMS focus on problems of unsustainable development, as well as the potentials and societal processes that support sustainable development (Messerli et al 2007). Although PAMS are not designed as pure development projects, they constitute NCCR North-South development interventions in the areas where they are implemented.

PAMS are unique in their innovative, real-time knowledge-based approach combining research and development, but like with any development intervention the aim of PAMS is to help improve the quality of life among their target populations. Between 2003 and 2007, the NCCR North-South implemented five PAMS in East Africa focusing on 1) low-cost renewable fuel production on small-scale farms; 2) participatory urban planning and management; 3) community-based HIV/AIDS control through voluntary counselling and testing; 4) capacity development for local governance of common pool resources; and 5) river water resources management and conflict resolution, respectively. In addition, the NCCR North-South collaborated with associated programmes such as the Eastern and Southern Africa Partnership Programme (ESAPP) to implement other similar interventions in the region.

Using three interventions as a basis, this article examines whether the PAMS approach, through the respective interventions, made a measurable contribution to the goal of improving the quality of life in target communities. It discusses the assessment methodology and assessment indicators, and then describes the three case studies, examining how they helped to reduce problems of unsustainability. A comparative assessment of individual projects is then made with respect to their levels of contribution and possible explanatory factors. The article concludes by drawing four key lessons from the assessment process.

8.2 Approach and methodology

The present synthesis article uses *syndrome mitigation*, *participation and empowerment*, and *vulnerability and resilience* as assessment indicators to examine how the three interventions enhanced sustainability and improved the quality of life in the target communities. *Syndrome mitigation* is used because the PAMS were grounded in the basic assumption that sustainability problems occur in clusters and should be addressed with this in mind when mitigation approaches are sought (Messerli et al 2007). Secondly, *participation and empowerment* allow us to examine whether the interventions helped the communities to attain greater freedom for and extended their margins or spheres of action in negotiations and decision-making processes. Thirdly, *vulnerability and resilience* point to whether the interventions helped to improve livelihoods at household or community levels, not in terms of levels of income, but in terms of greater ability not only to cope with and adjust to adverse conditions but also to create sustainable options and responses that open new pathways for living with change (Obrist et al 2009).

Two PAMS projects focusing on local governance capacity for common pool resources and on river water resources management and conflict resolution, respectively, and a project by a NCCR North-South associate on wheat production in Kenya's semi-arid districts of Makueni and Machakos serve as case studies (see Figure 1). Their assessment is based on experience, knowledge and expertise gained through participants' observations during implementation, as well as available documents, including baseline survey reports. A matrix is used for comparative assessment with a view to detecting any differences in the level of success of the projects.

8.3 Conceptual considerations concerning assessment indicators

Syndrome mitigation consists of measures taken by individuals or institutions in one or more areas of intervention that help to reduce the effects of single or combinations of several core problems, thereby actually or potentially reducing negative impacts of global change and contributing to sustainable development (Hurni et al 2004).

Participation refers generally to the active involvement of the public or stakeholders concerned in decision-making and actions (Arnstein 1969; Connor

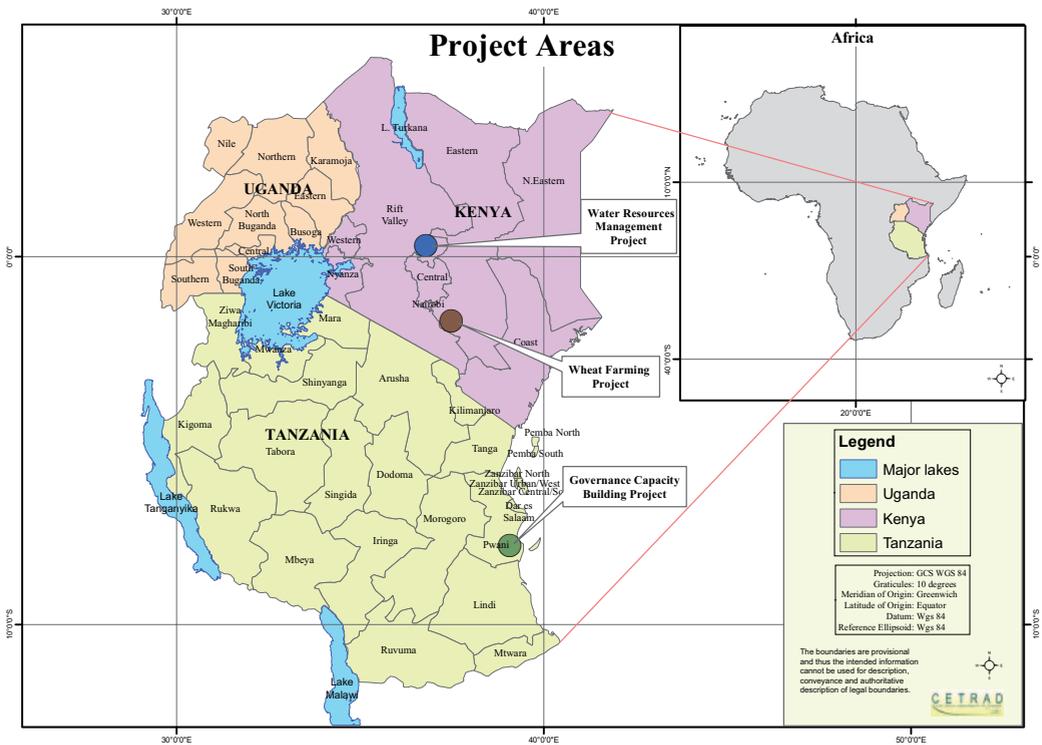


Fig. 1 Map showing the project areas of the three Partnership Actions for Mitigating Syndromes (PAMS) examined in this study.

1988; Chambers 1989; Wiedemann and Femers 1993; Dorcey et al 1994; World Bank 1996). Participation can take different forms (Arnstein 1969; Collier 2002) and may involve different stakeholder groups at different levels depending on need (Collier 2002; Kiteme and Wiesmann 2008). If properly managed, a participatory process can promote sustainability by building on existing potentials and capacities, and by enhancing ownership and increasing commitment on the part of the stakeholders, among other things.

Empowerment as defined in different socio-cultural and political contexts (Cheater 1999) is more than simply opening up space for decision-making: It entails understanding the dynamics of oppression and internalised oppression, since these affect the ability of less powerful groups to participate in decision-making and influence the world around them (Mosse 1994). Empowerment should help vulnerable populations gain power to negotiate and build capacity for active involvement in decision-making and implementation.

In the social sciences, *resilience* refers to the ability of social actors not only to cope with and adjust to adverse conditions (reactive), but also to create sustainable options and responses (proactive) that open new pathways for living with change (Obrist et al 2009). *Vulnerability*, on the other hand, is the likelihood of being harmed by a given adverse event, and has an external side consisting of risks, shocks and stress to which individuals or households are subjected, and an internal defenceless side characterised by a lack of means to cope without a damaging loss (Chambers 1989). Both concepts have been linked with ‘sustainable livelihoods’ to underscore their interrelation with livelihood assets and the institutions that mediate access to these assets, which together shape the way in which people build ‘layers of resilience’ to cope with various disturbances (Glavovic et al 2003).

Syndrome mitigation, participation and empowerment can help to reduce vulnerability and enhance resilience. By learning from those who manage certain risks and hazards better, we can identify processes and principles of resilience-building that can be strengthened and applied through empowerment and participation.

8.4 Selected case studies

8.4.1 River water resources management and conflict resolution in the upper Ewaso Ng’iro North River Basin

Long-term studies in the upper Ewaso Ng’iro catchment revealed increased overuse of low-flow water for irrigation (Aeschbacher et al 2005; Liniger et al 2005; MacMillan and Liniger 2005; Notter et al 2007), leading to reduced dry-season flow and user conflicts (Wiesmann et al 2000; Kiteme and Gikonyo 2002; Notter 2003; Ehrensperger and Kiteme 2005; Kiteme 2006; Kiteme and Wiesmann 2008). Water users continue to take advantage of institutional weaknesses in law enforcement and manipulate individual abstraction works and control devices in order to maximise off-take during prolonged dry periods. This problem has persisted despite sustained corrective efforts by the government as well as water users’ associations, which have gained some legislative backing through recent water-sector reforms (GoK 2002; Liniger et al 2005).

These findings informed the decision to develop the technology of a self-regulating weir (SRW) and test its potential contribution to guaranteeing

secure low flow for downstream water users in the catchment. This was further justified through a feedback process between researchers and key stakeholders during a series of water awareness campaigns, as well as the desire expressed by the Burguret River Water Users' Association to strengthen its regulatory role pertaining to river water use in its area of jurisdiction.

An engineering firm was commissioned to design the project and provide technical supervisory support. Subsequently, the different stakeholder groups, including relevant government departments, large-scale commercial farmers, smallholder farmers, and local administration and leadership, were mobilised for necessary negotiations and implementation of the project. After approval and acceptance by all stakeholders was secured, construction work was carried out over about 18 months, at a total cost of around USD 40,000 (2004/2005 factor prices).

The preceding discussions underline that systems knowledge was critical to triggering and sustaining successful negotiation and implementation of the innovative idea of a SRW. The SRW abstracts only the flood flow and cannot be manipulated by the water user(s), thus guaranteeing a secure low flow for downstream users. To this extent, the device has the potential to effectively address the problem of over-abstraction of river water and related user conflicts. Availability of river water to downstream users during the dry season increases their spheres of action (in crop production) and enhances their livelihood systems, thereby increasing their layers of resilience to future threats. The inclusive negotiation process helped to create a sense of ownership and commitment among the different stakeholder groups – an important element in social sustainability.

The technology became popular with the government, and the Ministry of Water approved the device for replication in areas faced with similar problems. However, the prohibitive costs and the inability of stakeholders concerned to mobilise the required resources have hindered replication plans. This limits the overall potential of the technology to contribute to sustainable management of river water in the basin and elsewhere in the country.

8.4.2 Wheat production for improved food security in the semi-arid districts of Makueni and Machakos in Kenya

A NCCR North-South study revealed that despite high rainfall variability and recurrent droughts, maize remains the dominant crop in the semi-arid

districts of Makueni and Machakos in Kenya. It is grown by all households and accounts for about 82% of the area under crop production. The reason for this is that maize doubles as a subsistence crop and a commercial crop. However, this practice constrains crop diversification as a strategy to minimise risks of crop failure associated with moisture stress (Ifejika Speranza 2006; Ifejika Speranza et al 2007). Despite the availability of alternative crops, such as the recently developed wheat varieties (*Duma* and *Njoro 1*) that were recommended for smallholder production in areas like the one examined in the above-mentioned study, uptake was hindered by a lack of seed to supply to the farmers. Based on these findings, the “Smallholder Wheat Production in Arid and Semi-arid Lands” project was developed to promote wheat farming in the semi-arid districts of Kenya through community-based seed bulking and distribution in selected areas of Makueni and Machakos districts.

Before seed bulking, selected farmers and the facilitating organisations were trained in the basics of wheat farming, harvesting and primary processing, as well as packaging and utilisation of wheat and wheat products. The training benefited over 160 farmers drawn from 13 villages in the two test areas. The facilitating community-based organisations (CBOs) were provided with 50 kg of wheat seed and basic farm inputs for initial multiplication. After the first season, the seed generated by the CBOs was distributed to 100 farmers for further multiplication. In the two subsequent seasons, enough seed was accumulated to supply over 600 farmers, increasing the initial area under production from about 6.5 acres to over 600 acres in 13 villages.

This intervention was based on knowledge derived from research that helped to understand the agronomic and socio-economic factors contributing to food insecurity in the areas concerned. This knowledge informed the design of targeted campaigns for crop diversification and suitable alternative crop varieties that meet farmers’ subsistence and commercial expectations, on the one hand, and are adapted to ecological conditions in the test areas, on the other hand. Compared with maize, the two wheat varieties *Duma* and *Njoro 1* have higher yields, fetch better prices, require less moisture and mature early, thus guaranteeing successful harvests and improved income. This broadened the spheres of action for smallholder farmers and provided them with an additional layer of resilience, greatly influencing uptake and the success of the innovation.

The intervention has a high degree of replicability, as already evidenced by the rapid increase in the number of farmers growing wheat after the initial

seed-bulking process. Due to its availability from CBOs and participating farmers, wheat seed became affordable even for poor farmers. This was a boost to upscaling efforts, as more farmers went into wheat farming beyond the initial test areas.

8.4.3 Local governance capacity development for common pool resources in the Rufiji floodplain, Tanzania

The Rufiji floodplain has very high biodiversity and provides a livelihood for more than 150,000 people. However, it is threatened by unsustainable exploitation of its natural resources by a rapidly growing population, and due to poor management and inadequate resource governance capacity at the local level (Durand 2003; Milledge and Kaale 2005). Initial field campaigns by the NCCR North-South research team identified this as a critical area of ecological unsustainability, and a PAMS project was then designed to address this. The project aimed to improve the capacity for local governance in order to enhance ownership and control of natural resources, increase the technical ability to manage physical production sustainably, and augment financial returns from common pool resources (Mottier 2005).

The project built on five years of pre-investments by the IUCN, through the Rufiji Environment Management Programme, and involved communities in seven villages in Ngumburuni Forest and three villages on Lake Zumbi, as well as IUCN Tanzania, the Rufiji District Council, specialists, and local leaders and administration. A NCCR North-South research team provided backstopping for the process. This case study focuses on interventions in Ngumburuni Forest.

Before the PAMS was launched, a stakeholders' workshop was organised in order to create awareness and analyse the situation. The project was endorsed during this workshop, and a work programme was agreed upon. The awareness campaigns aimed to educate stakeholders with regard to the status, threats and consequences of prevailing user practices, as well as potential pathways for addressing the problems observed. An integrated campaign team was formed and appropriate dissemination materials were developed to support the campaigns. A series of workshops and other events, such as screening of environmental management documentaries, role-playing and concerts, were held. Moreover, an award scheme was set up to promote active involvement by the participating villages and collaboration among local organisations. The capacity-building process involved a series of train-

ing and educational events at different levels. Two grassroots institutions (the Village Environment Management Committees and the Village Natural Resources Scouts Committees) were formed and used as entry points for capacity-building interventions. Key areas of focus included legislative and policy instruments governing natural resource management, good governance, drafting of by-laws, preparation of Village Environment Management Plans, and participatory approaches to natural resource governance, among other things.

The main outcomes of the capacity-building process and resultant institutions were the following: 1) Village Environment Management Plans for the seven villages were formulated and implemented, with the respective by-laws providing the principal instruments for enforcement; 2) the communities negotiated and gazetted boundaries for the Ngumburuni Forest Reserve (see Tanzania's Forest Act [URT 2002]); and 3) management responsibilities were transferred to the Village Natural Resources Scouts Committees.

This intervention built on pre-investments made by the IUCN in Rufiji and derived its integrative approach from knowledge innovation in NCCR North-South research (Meroka 2006). This approach led to success in empowering the communities and enhancing stakeholder participation. And although it may take more time for impacts on biodiversity conservation to manifest, a monitoring and evaluation workshop at the end of the project (i.e. after two years) reported remarkable reduction of the main threats to the Ngumburuni Forest Reserve as a result of increased surveillance by forest scouts.

The training process, together with the new governance institutions, empowered the local communities to participate actively in the management of the forest reserve, particularly in negotiating and delineating forest boundaries, setting revenue targets and making investment plans, and defining incentive and disincentive measures to curb misuse. The project interventions did not, however, create immediate resilience-building elements, especially at the household level. This can be justified by the fact that it was not one of the initial project objectives to do so. Still, it is expected that the intervention's contribution to resilience-building will become evident in the medium to long term, when degraded ecosystems services are restored and assume their optimal functions.

8.5 Comparative assessment

This section presents a comparative assessment of the three selected projects to highlight their levels of success and provide explanations for similarities and differences. The results are presented in a matrix (Table 1): the project focus and the nature of knowledge innovation, as well as the key elements of preferred interventions, are summarised in the first column; the level of the contributions made by each project, based on four assessment indicators, is summarised in the other columns, ranging from strong (+++) to medium (++) and weak (+).

The comparative assessment reveals that all three pilot projects were based on knowledge innovation that made targeting easy and effective. Each project contributed significantly at different levels to mitigating (a) problem(s) of unsustainability. There follows a brief discussion of the factors that explain these differences, based on the four assessment indicators.

Potential for syndrome mitigation: Although all three interventions have the potential to address problem(s) of unsustainability, the SRW is considerably limited because it is only effective if the technology is adapted for a majority of water abstractions in the catchment. Wheat production has the greatest potential because the technology is easily adopted and the direct benefits to the participating households motivate widespread application. The Rufiji intervention also has potential, provided that adequate awareness creation and training are conducted and appropriate grassroots institutions are created and legitimately embedded in existing structures.

Participation and empowerment: The SRW contributed little to participation and empowerment compared to the other two projects because the technological preconditions of the project limited the extent to which some stakeholder groups, especially poor and semi-literate smallholder farmers, were able to participate in making key decisions or in influencing the implementation process.

Resilience and vulnerability: None of the three projects revealed a strong impact on building resilience and reducing vulnerability. This situation can be explained by the fact that each of these interventions is subject to a multitude of preconditions for optimal performance. The contributions of both the wheat production and the local governance capacity development projects were moderate because the success of the former was also subject to a given

Table 1

	Syndrome mitigation	Participation and empowerment	Vulnerability and resilience	Replicability
<p>1. River water resources management and conflict resolution in the upper Ewaso Ng'iro North River Basin</p> <p><i>Knowledge innovation:</i> Long-term hydrological monitoring (declining dry-season flows) and socio-economic studies (increasing water abstractions for irrigation)</p> <p><i>Intervention:</i> Installation of self-regulating flood flow abstraction device</p>	++	++	+	+
<p>2. Wheat production for improved food security in semi-arid districts of eastern Kenya</p> <p><i>Knowledge innovation:</i> Agronomic and socio-economic factors contributing to food insecurity; dominance of maize in agro-ecologically marginal areas</p> <p><i>Intervention:</i> Community-based seed bulking and smallholder wheat farming</p>	+++	+++	++	+++
<p>3. Local governance capacity development for common pool resources (CPRs) in the Rufiji floodplain</p> <p><i>Knowledge innovation:</i> Stakeholder analysis in traditional and modern institutional arrangements for management of CPRs</p> <p><i>Intervention:</i> Capacity development through training, awareness creation and formation of grassroots institutions and support instruments</p>	+++	++	++	++

level of rainfall, while the latter required more time for impacts on livelihoods to manifest. By contrast, the SRW was assessed as weak because it broadened spheres of action only for a small segment of the local population. The limited scale of application of this technology downstream limits its potential to help reduce vulnerability and enhance resilience at household and community levels.

Replicability: The high costs of installing the SRW in terms of technical expertise and inputs make this technology unfeasible for individual smallholder water users; hence it has very limited replicability. Although dupli-

Summarised results of the comparative assessment of the three projects.

cation of the grassroots structures for local governance of common pool resources elsewhere is possible, the potential is curtailed by the costs of providing the required professional expertise for the training process. In this sense, these two interventions were assessed as having made weak and moderate contributions, respectively. On the other hand, the wheat production intervention was rapidly adopted due to its technological simplicity and comparatively low costs of implementation.

8.6 Conclusion

The three projects followed different paths of intervention depending on the nature of the problem(s) of unsustainability on which they focused. The river water resources management and conflict resolution project installed a self-regulating device to regulate water abstraction and guarantee a secure low flow for downstream users. The wheat production project focused on community-based seed bulking to promote smallholder wheat farming in semi-arid areas, while the project concerned with capacity development for common pool resources emphasised training, awareness creation, formation of grassroots institutions and support for legislative instruments. Overall, the wheat and governance capacity development projects performed better than the SRW project. Compared to the other two projects, the SRW project was limited by its technological preconditions and high cost of implementation. Therefore, the extent to which a given type of intervention will succeed in addressing problem(s) of unsustainability and contributing to the overall quality of life of beneficiaries is greatly influenced by its technological requirements, implementation costs, and level of integration in existing institutional structures. Based on the results of the comparative assessment and these conclusions, we derive the following key lessons:

Integrative knowledge matters: Knowledge innovation, i.e. the approach of combining research and development interventions, helps to design more effective interventions.

Grassroots structures are indispensable: Appropriate grassroots institutional structures and support instruments are necessary to promote legitimate and effective stakeholder participation and empowerment.

Costs and technologies are a very sensitive issue: Technological complexity or simplicity and project implementation costs play an important role in

hindering or promoting the rate of adoption and replicability of any given innovation.

Short-term stand-alone interventions are shaky: PAMS and associated projects are pilot actions, and their 12–24-month timeframe for implementation is not adequate to trigger and sustain the social processes associated with vulnerability and resilience. However, this can be effectively addressed if interventions are embedded in existing structures or ongoing long-term interventions.

Endnotes

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References

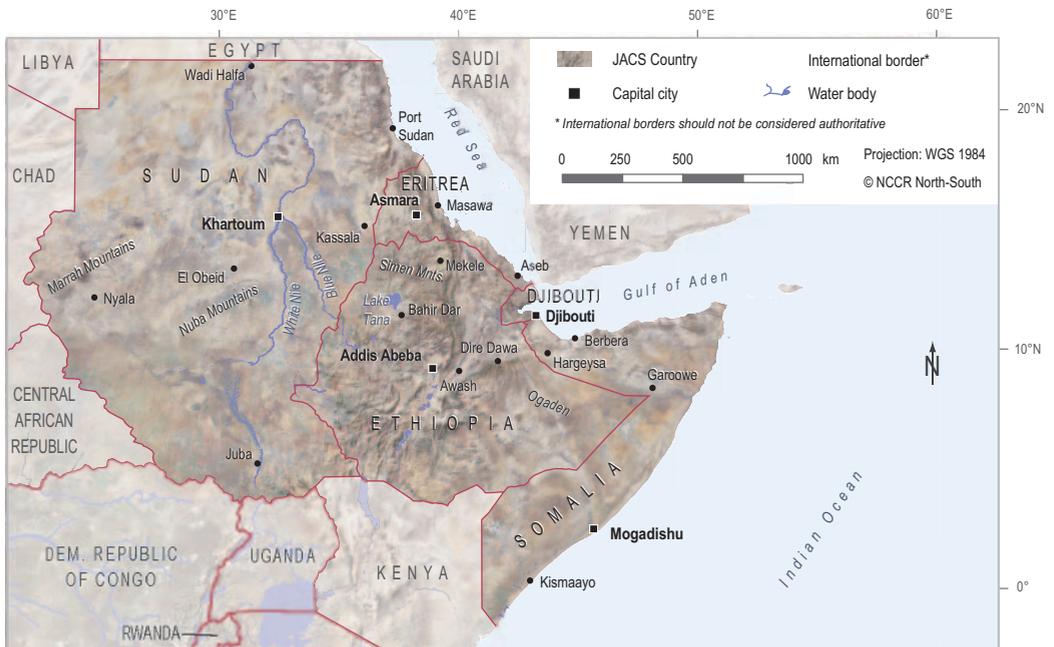
Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- Aeschbacher J, Liniger HP, Weingartner R. 2005. River water shortage in a highland–lowland system: A case study of the impacts of water abstraction in the Mount Kenya region. *Mountain Research and Development* 25(2):155–162.
- Arnstein SR. 1969. A ladder of citizen participation. *American Institute of Planners Journal* 35(4):216–224.
- Chambers R. 1989. Editorial introduction: Vulnerability, coping and policy. *IDS Bulletin* 20(2):1–7.
- Cheater A, editor. 1999. *The Anthropology of Power: Empowerment and Disempowerment in Changing Structures*. London, UK and New York, NY: Routledge.
- Collier D. 2002. *Community Stakeholder Involvement*. Berkshire, UK: Greenstreet Berman Ltd.
- Connor DM. 1988. A new ladder of citizen participation. *National Civic Review* 77(3):249–257.
- Dorcey A, Doney L, Rueggeberg H. 1994. *Public Involvement in Government Decision-making: Choosing the Right Model*. Victoria, Canada: Round Table on the Environment and the Economy.
- Durand JM. 2003. *Implementation of the Rufiji Forest Action Plan with Special Emphasis on Community Based Natural Resource Management and a Case Study of Ngumburuni Forest*. Rufiji Environment Management Project (REMP) Technical Report 45. Dar es Salaam, Tanzania: International Union for Conservation of Nature (IUCN).
- Ehrensperger A, Kiteme BP. 2005. *Upper Ewaso Ng'iro River Basin Water Management Information Platform: A Survey on Development Priorities, Information Needs, and Conflict Management Efforts*. Nanyuki, Kenya: Centre for Training and Integrated Research in Arid and Semi-Arid Lands Development (CETRAD).
- Glavovic B, Scheyvens R, Overton J. 2003. Waves of adversity, layers of resilience: Exploring the sustainable livelihoods approach. *Proceedings of the Third Biennial Conference of the Aotearoa New Zealand International Development Studies Network Conference 'Contexting Development: Pathways to Better Practice', 5–7 December 2002*. Palmerston North, New Zealand: Massey University, pp 289–293.
- GoK [Government of Kenya]. 2002. *Water Act 2002. Kenya Gazette Supplement*. Nairobi, Kenya: Government of Kenya.
- * Hurni H, Wiesmann U, Schertenleib R, editors. 2004. *Research for Mitigating Syndromes of Global Change: A Transdisciplinary Appraisal of Selected Regions of the World to Prepare Development-oriented Research Partnerships*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 1. Bern, Switzerland: Geographica Bernensia.
- * Ifejika Speranza C. 2006. *Drought Vulnerability and Risk in Agro-pastoral Areas: An Integrative Approach and Its Application in Kenya* [PhD dissertation]. Bern, Switzerland: University of Bern.
- * Ifejika Speranza C, Kiteme BP, Wiesmann U. 2007. Droughts and famines: The underlying factors and the causal links among agro-pastoral households in semi-arid Makueni district, Kenya. *Global Environmental Change* 18(1):220–233.
- * Kiteme BP. 2006. *Multidimensional Approaches to More Sustainable Natural Resources Management in Highly Dynamic Contexts in East Africa* [PhD dissertation]. Bern, Switzerland: University of Bern.
- * Kiteme BP, Gikonyo J. 2002. Preventing and resolving water use conflicts in the Mount Kenya highland–lowland system through water users' associations. *Mountain Research and Development* 22(4):332–337.
- * Kiteme BP, Wiesmann U. 2008. Sustainable river basin management in Kenya: Balancing needs and requirements. In: Hirsch Hadorn G, Hoffmann-Riem H, Biber-Klemm S, Grossenbacher-Mansuy W, Joye D, Pohl C, Wiesmann U, Zemp E, editors. *Handbook of Transdisciplinary Research*. Berlin, Germany: Springer Verlag, pp 63–78.

- * Liniger HP, Gikonyo J, Kiteme BP, Wiesmann U. 2005. Assessing and managing scarce tropical mountain water resources: The case of Mount Kenya and the semiarid Upper Ewaso Ng'iro Basin. *Mountain Research and Development* 25(2):163–173.
- MacMillan L, Liniger HP. 2005. Monitoring and modelling for the sustainable management of water resources in tropical mountain basins: The Mount Kenya example. In: Huber UM, Bugmann HKM, Reasoner MA, editors. *Global Change and Mountain Regions: An Overview of Current Knowledge*. Berlin, Germany: Springer Verlag, pp 605–616.
- * Meroka P. 2006. *Common Pool Resource Management and Conflict Resolution in Rufiji Floodplain, Tanzania* [PhD dissertation]. Zurich, Switzerland: Department of Social Anthropology, University of Zurich.
- * Messerli P, Salmi A, Herweg K, Pfister F, Breu T. 2007. *Bridging Research and Development: Partnership Actions for Mitigating Syndromes (PAMS) in the Swiss National Centre of Competence in Research (NCCR) North-South: Capitalising on Experience*. NCCR North-South Dialogue No. 17. Bern, Switzerland: Swiss National Centre of Competence in Research (NCCR) North-South.
- Milledge SAH, Kaale BK. 2005. *Bridging the Gap: Linking Timber Trade with Infrastructure Development in Southern Tanzania – Baseline Data before Completion of Mkapa Bridge*. Dar es Salaam, Tanzania: The Wildlife Trade Monitoring Network (TRAFFIC).
- Mosse D. 1994. Authority, gender, and knowledge: Theoretical reflections on the practice of participatory rural appraisal. *Development and Change* 25:497–526.
- Mottier E. 2005. *Final Report of the PAMS Project “Strengthening Local Natural Resource Governance Capacity in the Rufiji floodplain, Tanzania”*. Dar es Salaam, Tanzania: International Union for Conservation of Nature (IUCN) Tanzania Country Office.
- Notter B. 2003. *Rainfall–Runoff Modelling of Meso-scale Catchments in the Upper Ewaso Ng'iro Basin, Kenya* [MSc thesis]. Bern, Switzerland: Institute of Geography, University of Bern.
- * Notter B, MacMillan L, Viviroli D, Weingartner R, Liniger HP. 2007. Impacts of environmental change on water resources in the Mount Kenya region. *Journal of Hydrology* 343(3/4):266–278.
- * Obrist B, Pfeiffer C, Henley B. 2009. *Multi-layered social resilience: A new approach in mitigation research*. Unpublished article available from Brigit Obrist.
- URT [United Republic of Tanzania]. 2002. *The Forest Act*. Dar es Salaam, Tanzania: Ministry of Natural Resources and Tourism.
- WBGU [German Advisory Council on Global Change]. 1997. *World in Transition: The Research Challenge*. Berlin, Germany: Springer Verlag.
- Wiedemann PM, Femers S. 1993. Public participation in waste management decision making: Analysis and management of conflicts. *Journal of Hazardous Materials* 33:355–368.
- Wiesmann U, Gichuki FH, Kiteme BP, Liniger HP. 2000. Mitigating conflicts over scarce water resources in the highland–lowland system of Mount Kenya. *Mountain Research and Development* 20(1):10–15.
- World Bank. 1996. *The World Bank Participation Source Book: Environmentally Sustainable Development*. Washington, D.C.: The World Bank.

Part III

Development Challenges and Mitigation Pathways in the Horn of Africa





9 From Institutional Constraints and Ethnic-related Conflicts to Better Governance of Natural Resources in the Horn of Africa

Berhanu Debele¹

9.1 Introduction

A large number of core problems hinder development in the region of the Horn of Africa (Yacob Arsano et al 2004), which has both highland and lowland contexts and includes the five countries of Djibouti, Eritrea, Ethiopia, Somalia and Sudan. These countries are socially, economically and ecologically diverse and, at the same time, are related geographically, historically and demographically. The region is known for its long history of armed conflict, massive influxes of refugees, weak state capacity and governance, and contradictory policies (Hagmann and Alemmaya Mulugeta 2008). Moreover, colonial boundaries add to the political instability of this region, in many parts of which the movement of persons and exchange of goods across borders are integral parts of local livelihoods. The region is highly food insecure, owing to recurrent droughts and natural disasters that hamper crop and livestock production. Core problems are conflict in the lowlands and degradation of natural resources in the highlands (Yacob Arsano et al 2004). There are many general interconnections among these broad categories of problems and syndromes. For example, poor governance and limited alternative livelihoods lead to excessive mining of natural resources, which in turn leads to soil erosion, land degradation and loss of biodiversity (see Chapter 12 in the present volume). This situation culminates in poverty, insecure livelihoods, weak socio-economic infrastructure and migratory movements.

But the region does not only have problems. It also has potentials, such as favourable climatic conditions – moderate temperatures and adequate rainfall for crop production and animal rearing – in the highlands. The lowlands have potential for livestock and biofuel production as well under the prevailing extensive production system, and an even better potential for irrigated agricultural production both for domestic consumption and for export (tropical fruits, vegetables, flowers, industrial crops such as sugar cane, and others).

A considerable amount of research has been done in the Swiss National Centre of Competence in Research (NCCR) North-South's Joint Area of Case Studies (JACS)² Horn of Africa (HOA), which covers all five countries in the Horn of Africa, to shed light on the causes of the core problems mentioned above, as well as pathways to mitigating them. Research was grouped around three major themes: conflicts in the pastoral areas; water management and conflict transformation; and land degradation and sustainable land management in the highlands. These thematic groupings were the basis for selection of three synthesis themes: 1) *Pastoral Conflicts and State-building in the Horn of Africa*; 2) *Water Management and Conflict Transformation in the Horn of Africa*; and 3) *Land Degradation and Sustainable Land Management in the Highlands of Ethiopia*.

The lowlands of the Horn of Africa are inhabited by pastoralists (Afars, Somalis, Oromos, Benamirs, and others). Conflict is a common phenomenon among these ethnic groups. There are several reasons for this. Many scholars are of the opinion that this conflict is over access to and use of scarce natural resources (Hagmann 2006). Research topics under the theme *Pastoral Conflicts and State-building in the Horn of Africa* were generally chosen to prove or disprove this hypothesis and also to identify pathways to mitigating the problems observed. A total of 13 studies (3 post-doctoral, 3 PhD and 7 Master's projects) were carried out in the lowlands from different perspectives.

The fundamental reason for conflict among the riparian states of the Nile Basin is unfair apportionment of rights to water use, especially for agricultural production (Luzi 2007). It is believed that eminent conflict over this resource will result in the future unless appropriate action is taken on the basis of prevailing realities. The absence of properly formulated water policies in the states concerned has led to increased tensions and conflicts, even among local users (Luzi 2007; Moges Shiferaw 2007). The team of researchers examining these problems grouped under the theme *Water Management and Conflict Transformation in the Horn of Africa* produced 9 studies (4 PhD and 5 Master's projects).

The alarming rate and extent of land degradation in the highlands, as well as pathways to its mitigation, were the focus of study under the theme *Land Degradation and Sustainable Land Management in the Highlands of Ethiopia*. Encroachment of cultivation onto steep slopes and into areas inhabited by wildlife and forested areas continues to increase, while the size of landholdings and fallow periods have declined due to population growth (Hurni

2005; Ludi 2005). Productivity decline has meant that production is insufficient even for subsistence economies. A total of 30 studies (2 post-doctoral, 2 PhD and 26 Master's projects) were conducted to examine these issues.

The main purpose of synthesis work is to generate value added beyond the findings of the individual studies, by rendering a holistic picture of the research endeavours undertaken for each theme and thus revealing additional findings that may not have been clearly visible from the individual studies alone. The study approaches for research on the three themes outlined above were chosen such that:

- Some studies were done in tandem arrangements;
- Study areas for different themes overlapped;
- Similar topics were studied in different areas;
- PhD-level studies were associated with Master's-level studies (which treated specific aspects of the PhD-level studies);
- The research topics chosen correlated directly with the core problems as they were identified in multi-stakeholder workshops at the outset of the NCCR North-South programme (Yacob Arsano et al 2004).

9.2 Main research outputs

During the first phase of the NCCR North-South programme, 6 post-doctoral, 9 PhD and 38 Master's projects were implemented, along with 6 Partnership Actions for Mitigating Syndromes³ (PAMS; see Table 1 for a brief description of each of these projects). These studies produced significant results that led to a deeper understanding of the nature of the problems facing the region as a result of global change, and made it possible to identify pathways to mitigating them.

The results synthesised under Theme 1, *Pastoral Conflicts and State-building in the Horn of Africa* (see Chapter 10 in the present volume), reveal that although pastoral (lowland) area resources have been degrading and diminishing since the 1990s, the violent inter-group conflicts that took place there were mainly the result of inadequate power relations between the state and the customary authorities (Hagmann 2006; Alemmaya Mulugeta 2007; Figure 1). The state is only nominally present in these areas, since it lacks the required resources – especially qualified personnel – and is therefore unable to exercise its authority. Indeed, the state was found to play more the role of

Table 1

Selected Partnership Actions for Mitigating Syndromes (PAMS) carried out in the Horn of Africa (HOA), and their main outcomes.

Title	Location and duration	Main outcomes
<p>HOA-2: Mitigating the Impact of Resource-based Violent Conflict in Gambella Regional State, Western Ethiopia</p>	<p>Gambella, Ethiopia</p> <p>12 months</p>	<p>Conflict prevention and awareness-raising activities had an immediate mobilising effect on the community.</p> <p>Service-based interventions (training in upgrading of skills and provision of safe drinking water) responded to the immediate needs of the community, leading to reduced occurrence of conflicts between sub-clans.</p>
<p>HOA-6: Practising Sustainable Land Management Options for Improved Livelihoods of the Rural Community, Lake Tana Basin (LTB), Ethiopia</p>	<p>Amhara Region, Ethiopia</p> <p>(Conder in Arenkaya watershed and Gojjam in Genet watershed)</p> <p>6 months</p>	<p>Watershed maps were produced; bio-physical and socio-economic baseline data collected; priority activities, based on the needs of farmers, identified; nursery sites established; seedlings raised and distributed to farmers; basic equipment purchased; and farmers taken on visits to other areas where watershed management has been successfully implemented.</p> <p>Sustainable land management was initiated. Combating land degradation had always been perceived as the responsibility of the government, i.e. the legal owner of the land, and not the farmers, who merely used the land. This PAMS initiated a process of self-reflection, and farmers in the project area became eager to participate in safekeeping of the land they use.</p> <p>Both scientists and non-scientific actors involved in the project learned from each other.</p>
<p>HOA-8: Nile Capacity Building Forum on Water Development and Cooperation</p>	<p>Ethiopia, Sudan, Egypt</p> <p>(The workshop was held in Addis Abeba, Ethiopia)</p> <p>1 week</p>	<p>10 participants from Egypt, Sudan and Ethiopia (Master's-level students, young professionals in water ministries and foreign ministries, other employees) were brought together in a workshop.</p> <p>The objective of the workshop was to enhance the knowledge and capacity of the participants. The aims were 1) to increase knowledge about hydro-political cooperation; 2) to increase skills related to communication, diplomacy, conflict analysis, negotiation and conflict transformation; and 3) to understand the different Egyptian, Ethiopian and Sudanese perceptions, and exchange perspectives.</p> <p>Four days of interactive work created an atmosphere of understanding among the participants from the 3 countries, who were known to have diametrically opposed positions regarding use of the waters of the Nile.</p> <p>The forum provided an excellent opportunity for knowledge-sharing among the participants, including the facilitators. It can be said that this constituted a mutual learning process.</p>

a spoiler than a role characterised by constructive engagement (Hagmann 2006). This fact, coupled with the breakdown of customary institutions, has led to open-access resource tenure of communal property.

Moreover, ‘ethnic federalism’ has reinforced the domination of powerful pastoral groups over weaker ones, leading to politicisation of resource use in the lowlands as pastoralists equated the concept of ‘majority rule’ with ‘exclusive resource control’ (Getachew Kassa 2005). For example, the Ethiopian government in place since 1991, recognising weaknesses in structure and staffing and engaging in a face-saving exercise, regularly established ‘joint peace committees’ composed of local government officials and elders to resolve violent pastoral conflicts (Ayele Gebre Mariam 2007).⁴ However, these groups often deliberately engineered and perpetuated pastoral area conflicts in order to obtain political and financial gain from such tension and violence (Hagmann 2005a, 2005b). These findings are highly significant and contradict the widely held view of ‘herder–farmer conflicts’.

Regarding Theme 2, *Water Management and Conflict Transformation in the Horn of Africa* (see Chapter 11 in the present volume), it became appar-



Fig. 1
Livestock grazing in the Awash Basin, Ethiopia, is facing pressure from irrigation agriculture as well as from claims of the Awash National Park. Mitigating these pressures on the pastoralist people's ecological and social system is a key focus of research done in the Horn of Africa by the Swiss National Centre of Competence in Research (NCCR) North-South. (Photo by Brigitte Portner, 2006)

ent that disputes over the utilisation of water resources (national and international) are not primarily a function of the physical availability of water, but rather of users' access to it, which is determined by policies, institutions, and technological capacities (Luzi 2007; Moges Shiferaw 2007; see also Chapter 11 in the present volume). Moreover, the efficiency of agricultural production is not a function of the physical availability of water, but of access to water and the security of water entitlements (Moges Shiferaw 2007).

The conflict in the Nile Basin is driven by four main claims: 'equitable allocation', 'prior use rights', 'national sovereignty', and 'agricultural water demands' (Mason 2004). All Nile countries set their water resources development targets unilaterally, without due consideration of demand and supply in the other riparian countries. This is a consequence of the lack of basin-wide legal and institutional agreements to regulate allocation, utilisation and conservation of water resources (Figure 2). The main conflict parties are riparian states at the basin level, and farmers or farmer communities at the local level. The mitigation aspect of the studies conducted in the Nile Basin is prominently illustrated by four problem-solving dialogue workshops organised by the researchers involved in 2002–2004 (Yacob Arsano 2004; Mason 2004).

Fig. 2
The Blue Nile River during the rainy season: A situation in 2009 where most runoff from Lake Tana is diverted for hydropower production (A) and a situation in 2006 where all water is flowing over the fall (B). Negotiating Nile water management is a crucial but complex international issue addressed both tacitly and explicitly. (Photos by Hans Hurni and Veronika Elgart)



The synthesis work done on Theme 3, *Land Degradation and Sustainable Land Management in the Highlands of Ethiopia*, clearly illustrated that debates over explanations of the land degradation process as well as the search for mitigation options were clustered around the approaches taken, priorities and agenda setting, and identification of the root causes (see Chapter 12 in the present volume). All studies on land-use and land-cover changes and underlying causes identified highly dynamic systems of change (Amare Bantider 2007; Birru Yitafaru 2007). The rapid loss of forest cover, diminution of the wildlife population and its habitats, and the expansion of cultivation in the recent past coincided with land policy and institutional changes in the 1970s, 1990s and early 2000s (Amare Bantider 2007; Birru Yitafaru 2007). Periods of active deforestation also correlated with phases of rapid population growth (Amare Bantider 2007). These were again coupled with little institutional concern about or insufficient enforcement of measures to combat environmental degradation.

Soil erosion by water remains a major threat to agricultural production. The most important bio-physical determinants of soil degradation are vegetation cover and agricultural management practices (Amare Bantider 2007; Birru Yitafaru 2007). Decrease in soil cover has been the most important driver of increasing soil erosion rates. As Ethiopian farmers do not perceive soil degradation as an agricultural problem, their responses to soil degradation have been remarkably minor. Government-induced soil conservation efforts are estimated to be effective on less than 10% of the area requiring attention (see Chapter 12 in the present volume).

The above results are significant contributions to regional development efforts. Outcomes already observed include: a) adoption of some research findings in the curricula of academic institutions (e.g. Political Science and International Relations Department of Addis Abeba University); b) renewed importance of sustainable land management and soil and water conservation practices at most universities (e.g. Haramaya, Mekelle, etc.) and government institutions; and c) findings relating to government policy issues that are expected to stimulate governments to revisit their policies of adjustment.

9.3 Outlook for future research

The most widespread and urgent problem in the region is limitation of livelihood options for the largely agrarian population. This situation leads to

excessive mining of the available natural resources, resulting in their degradation and even greater poverty among the population. Hence the major challenge, both for research and for development, is creation and development of alternative means of livelihood such as ecotourism, handicrafts and rural industries, as well as strengthening of rural–urban linkages and payment for environmental services (in addition to identification and promotion of easily adoptable conservation measures and workable policies). Integrated and concerted efforts will need to be made on this issue by researchers concerned with natural resources and by social scientists.

Most of the governments in the region do not command the trust and confidence of their populations, as they were not elected democratically. Nor do the governments trust the people. Consequently, governments are sensitive about studies undertaken in the field of social sciences. To overcome this problem, research topics were often camouflaged to avoid negative reaction and resistance.⁵ Moreover, researchers were met with suspicion by both the people and the government – the people considered them government spies, while governments considered them agents of opposition parties or spies for foreign countries. This made work extremely difficult for the researchers. Research into means of confidence-building and enhancing institutional stability are thus among the areas to be focused on in future. Furthermore, frequent change of government structures has led to feelings of uncertainty and to loss of data and institutional memory.

The other major challenge is the refusal of riparian states to accept the objective realities of each other's situations while pursuing only their own agendas, although the needs of other parties are clearly known and need to be addressed as well. Nonetheless, this situation is better appreciated and understood at the private individual level. Here the promising results obtained through the 'Nile Forum' PAMS (see Table 1) should be pursued and further developed.

Framework conditions for collaboration are now established: an agreement on capacity building and research partnership was signed between Switzerland and Ethiopia in 2008. This provides ample opportunity for expanding and strengthening already initiated informal collaboration with a large number of academic institutions (local as well as regional and international), government institutions, and other bilateral and multilateral institutions and organisations, including NGOs.

Endnotes

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² The NCCR North-South is based on research partnerships with researchers and research institutions in the South and East. These partnership regions are called JACS (Joint Areas of Case Studies). Regional Coordination Offices (RCOs) were established in each of these JACS at the outset of the programme. The original function of the RCOs was to coordinate research; in the third phase of the programme, RCOs will consolidate the existing research network in the South and will become hubs for generating new research projects and partnerships.

³ Partnership Actions for Mitigating Syndromes (PAMS) are projects implemented by local actors together with scientific and non-scientific stakeholders. As a component of the NCCR North-South programme they are designed to implement and validate approaches, methods and tools developed in research, with a view to finding promising strategies and potentials for sustainable development. Moreover, they are intended to promote mutual learning and knowledge-sharing between academic and non-academic partners in sustainable development.

⁴ These committees are paid by the government for the services they render; thus, membership in a 'joint peace committee' is often a lucrative business.

⁵ The situation was difficult during the first two phases of the NCCR North-South programme, as the Regional Coordination Office of the JACS HOA could not legally be established until Switzerland and Ethiopia signed a bilateral research framework agreement on 27 November 2008. The Regional Coordination Office was formally recognised on the occasion of the first meeting of the two countries' Joint Committee on 10 February 2009 in Addis Abeba, Ethiopia.

References

Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- * Alemmaya Mulugeta. 2007. *The Transformation of Conflicts Among Ethiopian Pastoralists: An Ethnography of the Notion of Conflict Among the Karrayu* [PhD dissertation]. Basel, Switzerland: Institute of Social Anthropology, University of Basel.
- * Amare Bantider. 2007. *Landscape Transformation and Opportunities for Sustainable Land Management Along the Eastern Escarpment of Wello (EEW), Ethiopia* [PhD dissertation]. Bern, Switzerland: University of Bern.
- * Ayele Gebre Mariam. 2007. *The Critical Issue of Land Ownership: Violent Conflict Between Abdalla Tolomogge and Awlihan in Godey Zone, Somali Region of Ethiopia*. 2nd, revised edition [2005']. NCCR North-South Dialogue No. 11. Bern, Switzerland: Swiss National Centre of Competence in Research (NCCR) North-South. Also available at: <http://www.north-south.unibe.ch/content.php/page/id/230>; accessed on 23 October 2009.
- * Birru Yitaferu. 2007. *Land Degradation and Options for Sustainable Land Management in the Lake Tana Basin (LTB), Amhara Region, Ethiopia* [PhD dissertation]. Bern, Switzerland: University of Bern.
- * Getachew Kassa. 2005. *Human Security of Minority Groups in South-Eastern Ethiopia: The Case of the Garrimarro Community in Dollo Oddo District, Liban Zone, Somali Regional State of Ethiopia*. Draft research report. Addis Abeba, Ethiopia: Institute of Ethiopian Studies, Addis Abeba University.
- Hagmann T. 2005a. Beyond clannishness and colonialism: Understanding political disorder in Ethiopia's Somali Region, 1991–2004. *Journal of Modern African Studies* 43 (4):509–536.
- Hagmann T. 2005b. Challenges of decentralisation in Ethiopia's Somali region. *Review of African Political Economy* 32 (104–105):449–455.
- * Hagmann T. 2006. *Pastoral Conflict and Resource Management in Ethiopia's Somali Region* [PhD dissertation]. Lausanne, Switzerland: Swiss Graduate School of Public Administration (IDHEAP), University of Lausanne.
- * Hagmann T, Alemmaya Mulugeta. 2008. Pastoral conflicts and state-building in the Ethiopian lowlands. *Africa Spectrum* 43(1):19–37.
- * Hurni H. 2005. *Decentralised Development in Remote Areas of the Simen Mountains, Ethiopia*. Dialogue Series. Bern, Switzerland: Swiss National Centre of Competence in Research (NCCR) North-South. Also available at: <http://www.nccr-north-south.unibe.ch/document/document.asp?ID=3743&refTitle=Horn%20of%20Africa&Context=jacs>; accessed on 25 August 2009.
- * Ludi E. 2007. *Simen Mountains Study 2004: Intermediate Report on the 2004 Field Expedition to the Simen Mountains in Northern Ethiopia*. 2nd, revised edition [2005']. NCCR North-South Dialogue No. 6. Bern, Switzerland: Swiss National Centre of Competence in Research (NCCR) North-South. Also available at: <http://www.nccr-north-south.unibe.ch/document/document.asp?ID=3744&refTitle=the%20NCCR%20North-South&Context=NCCR>; accessed on 25 August 2009.
- * Luzi S. 2007. *Double-edged Hydropolitics on the Nile* [PhD dissertation]. Zurich, Switzerland: Swiss Federal Institute of Technology Zurich (ETHZ).
- * Mason S. 2004. *From Conflict to Cooperation in the Nile Basin* [PhD dissertation]. Zurich, Switzerland: Swiss Federal Institute of Technology Zurich (ETHZ). Also available at: <http://www.north-south.unibe.ch/content.php/filterpage/id/27>; accessed on 27 October 2009.
- * Moges Shiferaw. 2007. *The Economics of Shared Irrigation Water Rights* [PhD dissertation]. Basel, Switzerland: University of Basel.
- * Yacob Arsano. 2004. *Ethiopia and the Nile: Dilemmas of National and Regional Hydropolitics* [PhD dissertation]. Zurich, Switzerland: University of Zurich. Also available at: <http://www.north-south.unibe.ch/content.php/filterpage/id/27>; accessed on 27 October 2009.

- * Yacob Arsano, Berhanu Debele, Ludi E, Seyoum Gebre Selassie. 2004. JACS Horn of Africa: Managing resources and disputes in uncertain environments. *In*: Hurni H, Wiesmann U, Schertenleib R, editors. *Research for Mitigating Syndromes of Global Change: A Transdisciplinary Appraisal of Selected Regions of the World to Prepare Development-oriented Research Partnerships*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 1. Bern, Switzerland: Geographica Bernensia, pp 141–182.

10 Pastoral Conflicts and State-building in the Ethiopian Lowlands

Tobias Hagmann¹ and Alemmaya Mulugeta²

Abstract

This article draws attention to the central role played by the Ethiopian state in reconfiguring contemporary (agro-)pastoral conflicts in Ethiopia's semi-arid lowlands. Contrary to primordialist and environmental conflict theories of pastoralist violence, we shed light on the changing political rationality of inter-group conflicts by retracing the multiple impacts of state-building on pastoral land tenure and resource governance, peace-making and customary authorities, and competition over state resources. Based on an extensive comparative review of recent case studies, post-1991 administrative decentralisation is identified as a major driving force in struggles over resources between transhumant herders in Ethiopia's peripheral regions. Our analysis emphasises the politicisation of kinship relations and group identities and the transformation of conflict motives under the influence of the gradual incorporation of (agro-)pastoral groups into the Ethiopian nation-state. Ethnic federalism incites pastoralists to engage in parochial types of claim-making, to occupy territory on a more permanent basis, and to become involved in 'politics of difference' (Schlee 2003) with neighbouring groups.

Keywords: Violence; pastoralism; state-building; federalism; lowlands; Ethiopia.

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10.1 Introduction

With the federalisation of Ethiopia under the stewardship of the Ethiopian Peoples' Revolutionary Democratic Front (EPRDF), the fortunes of its pastoral communities have seized the attention of aid agencies, academics and politicians. The incumbent regime has vowed to 'decolonise' the country's 'backward' or 'emerging' regions where most of Ethiopia's transhumant herders and agro-pastoralists are found. Pastoralist interests have been institutionalised in the House of Peoples' Representatives in 2002 by dint of forming a Pastoralist Standing Affairs Committee that brings together all members of parliament from predominantly pastoralist constituencies (Lister 2004). Following the major droughts of 1995–1997 and 2000–2001, large-scale humanitarian aid and development programmes have been expanded to the eastern, southern and western lowlands, which cover 60% of the territory (Sandford and Yohannes Habtu 2000).

It is within this particular context that one has to situate the discussion about the causes, dynamics and peaceful transformation of pastoral conflicts in Ethiopia and the Horn of Africa. The concomitant degradation and shrinkage of the natural resource base and the proliferation of armed confrontations have paved the way for a "disaster and emergency" discourse (Nori et al 2005, p 12) that associates pastoralism with uncontrolled violence. Numerous studies have reported the militarisation of pastoralist societies, an increase in the severity of resource conflicts, and the augmentation of casualties of warlike confrontations in Ethiopia (Farah 1997; Said 1997; Ayele Gebre Mariam 2001; Getachew Kassa 2001a; Dereje Feyissa 2003; Markakis 2003; Abdulahi 2005). Whether or not one endorses Unruh's statement that "violent confrontation has become more frequent" (Unruh 2005, p 230) in the Ethiopian lowlands, outbursts of pastoralist violence have challenged the federal and regional governments.

This article draws attention to the central role played by the Ethiopian state in reconfiguring contemporary pastoral conflicts. Based on a comprehensive review of recent publications on local resource conflicts and management in the Ethiopian lowlands we elaborate a conceptual perspective on the interrelations between statehood and pastoral conflicts. This analysis also draws on our recently concluded doctoral research on conflict and resource management in Ethiopia's Somali region (Hagmann 2006) and indigenous conceptions of violence among Karrayu pastoralists in the Upper and Middle Awash Valley (Alemmaya Mulugeta 2008). A number of authors have

argued that the state represents a major bone of contention for pastoralists in the Horn of Africa (Markakis 1994). However, to this day, established explanations of pastoral violence tend to propagate a depoliticised interpretation of inter-group conflicts, which are thought to be the product of primordial antagonisms and resource scarcity. In contrast, we argue that pastoral conflicts must be understood within the context of the historical and ongoing expansion of the Ethiopian state from Ethiopia's central highlands to the remoter parts of its peripheral lowlands.

Before expounding on the nexus between pastoral conflicts and state-building, a number of terminological and conceptual clarifications are required in addition to details concerning the scope of our argument. We use 'pastoralism', 'pastoralists' and 'pastoral' to refer to rural dwellers whose livelihood depends predominantly on transhumant livestock or agro-pastoral livestock production. Although marked by important socio-economic and political differences that defy sweeping generalisations, Ethiopia's pastoralists share three broad characteristics. These include a segmentary kinship structure "on the basis of moiety, clan, or lineage", the existence of "age- or generation-grade organisation[s]" and the eminent role played by religious and ritual "mediators, priests, or prophets" in managing public affairs (Abbinck 1997, p 4). Across Ethiopia's regional states a great variety of interactions can be observed between different administrative levels from the *kilil* (regional state) to the *wereda* (district) and the *kebele* (village or sub-location) on the one hand, and pastoral groups' customary institutions and organised political interests on the other hand (Unruh 2005).

10.2 Pastoral land tenure and resource governance

Conflicts over pastoral economies' life-sustaining resources are embedded in the evolution of natural resource management practices and their wider political economy. In the past decade, the Ethiopian state has effectively contributed to the transformation of how pastoral groups relate to their natural environment. Since 1991 ethnic federalism and other public policies have produced more sedentary lifestyles based on more permanent and less flexible territorial boundaries. In many lowland areas the concomitant break-down of customary institutions and the inability of central and local governments to enforce communal property have led to de facto open-access tenure regimes. These open-access regimes promote violent confrontations triggered by multiple claims to the same resource pool.

Over the decades, land tenure policies and state-led development programmes strongly undermined the communal land tenure traditions that characterised pastoral production (Abdulahi 2007). Past government interventions have decreased livestock mobility, promoting sedentarisation, mixed agro-pastoral production, and shorter migration routes of herds in the vicinity of water points. The 1955 Revised Constitution determined that pastoral territory, referred to as *zelan* land, was state property (Yacob Arsano 2000). Starting from the 1960s, consecutive livestock development programmes propagated modern input delivery systems such as veterinary services, water development stock routes, holding ground and marketing facilities (Taffesse Mesfin 2000). In the 1970s these interventions aimed to increase the number of perennial water sources by excavating ponds, dams and shallow wells, drilling boreholes, and building cisterns. The ensuing multiplication of water points weakened customary water and grazing management and triggered rangeland degradation in parts of today's Oromiya (Helland 2000) and Somali regions (Sugule and Walker 1998).

In terms of formal land tenure, "no fundamental differences" (Berhanu Nega et al 2003, p 109) exist between the former *Derg* and the current government, as the latter maintained state ownership of land, including the rangelands. Ethiopia's federal constitution determines that "Ethiopian pastoralists have the right to free land for grazing and cultivation as well as the right not to be displaced from their own lands" (FDRE 1995, Art. 40). Attempts to restore or enforce communal land-holding in the Ethiopian lowlands have been made in the framework of decentralised community-based natural resource management projects. In the 1990s, NGOs began implementing participatory forest management and land-use planning in pastoral areas in order to enhance land tenure security, promote capacity-building in local institutions, and minimise conflicts over the commons (Tache and Irwin 2003). Accelerated by droughts, economic destitution and more intensive patterns of livestock production, the individualisation of resource tenure is concomitant to the erosion of reciprocal grazing rights and a decrease in herd mobility.

An additional and critical dimension of the transformation of dryland resource governance emanates from ethnic federalism. While it is difficult for pastoralists to claim constitutionally enshrined land-use rights, the 'right to self-determination' has been broadly promoted and vulgarised by the EPRDF. The principle according to which political recognition depends on a group's ability to control and claim a distinct area of land encourages conflicts over spatially concentrated natural resources. Despite its name,

Ethiopia's ethnic-based decentralisation (*yaltmakele astedader*) relies on a territorially defined type of federalism, as territory, and not people, is the organising principle of politico-administrative units. As a result, since 1991 resource-based conflicts have become increasingly intertwined with a quest for territorial control for political purposes.

10.3 Co-optation of customary authorities and peace-making

Consecutive Ethiopian regimes have co-opted and partially incorporated customary authorities and their peace-making repertoires in order to uphold security and state interests at the local level. Over time, the formal recognition of selected clan leaders by the imperial and the current EPRDF regimes and – to a much lesser degree – by the *Derg* has multiplied titled elders who compete over the representation of their kin group vis-à-vis local government and aid agencies. After 1991, the regional states' embracement of customary authorities has been particularly visible in the realm of conflict resolution and efforts to maintain or re-establish peace, as ethnographic studies in the Upper and Middle Awash Valley (Alemmaya Mulugeta 2008) and Somali region (Hagmann 2006) demonstrate. Similarly, Kelemework Tafere (2006, p 69) documented how in the Afar region “the state seems to adopt a de facto policy of encouraging the Afar to settle disputes on their own”. The selective state appropriation of local reconciliation mechanisms that fuse customary and religious elements both undermines and ‘retraditionalises’ customary authorities of pastoral groups.

The overwhelming majority of inter-personal and inter-group disputes – both violent and non-violent – in Ethiopia's lowland regions are arbitrated by elders. Customary conflict resolution is deeply embedded in social norms and rituals, and often involves the negotiation and payment of blood compensation. Recent studies have documented these peace-making mechanisms among the Afar (Getachew Kassa 2001b), the Boran (Bassi 2005), the Karrayyu (Alemmaya Mulugeta 2008), the Suri and Dizi (Abbink 2000), and the Somali (Hagmann 2007). With the exception of urban dwellers, pastoralists by and large prefer customary conflict resolution to the formal legal system when resolving disputes and grievances. Various authors have described the local administrations' inability to provide for “lasting solutions” to longstanding resource conflicts at the communal level (Ahmed Ali Gedi 2005, p 46). State officials often lack the necessary evidence to

file charges against the perpetrators, as large parts of the population turn to customary authorities and mechanisms for dispute settlement (Alemmaya Mulugeta 2008).

In cases of highly escalated and protracted conflicts that threaten the institutional architecture of or the power balance within regional states, the federal government – first through the Prime Minister’s Office and later on through the Ministry of Federal Affairs – has established so-called ‘joint peace committees’. The success of these committees, which exist even at the lowest administrative level and are composed of local government officials and elders, has been mixed at best (Abdulahi 2005; Alemmaya Mulugeta 2008). Overall, most government efforts to contain or resolve pastoral conflicts have been characterised by coercion, short-term approaches and limited spatial outreach. In his analysis of herder–farmer conflicts in the Dawa-Genale river basin, Ahmed Ali Gedi (2005, p 31) concluded that “government officials interfere in some disputes which take place in [...] accessible areas, while they often neglect those disputes which take place in remote or distant pastoral areas”.

In the past decade, government-sponsored conflict resolution in Ethiopia’s pastoral areas has effectively commercialised peace-making. In many cases, elders of pastoral communities who engage in mediation and reconciliation are paid either by the government or by NGOs. Conflict resolution thereby became a lucrative activity for customary leaders who implement local government agendas in return for per diems, *khat* and other personal benefits. Many NGOs working in Ethiopia’s pastoral areas assume that conflicts arise from resource competition and thus regard training in conflict management as a strategy to prevent an outbreak of violence.

10.4 Political economy of ethno-national claims-making

The Ethiopian government has rationalised ethnic federalism as a political project that accommodates ethno-linguistic diversity by generalising ‘the right to self-determination’ on all administrative scales (Turton 2006). As a result, many of the previously marginalised pastoral groups were for the first time ever recognised as ‘nations and nationalities’ within the Ethiopian polity, obtaining self-government at the regional, zonal and district levels. This process of ‘matching’ ethno-linguistic groups with administrative units proved highly conflictual. On the one hand, pastoralists’ reliance on mobil-

ity and flexible resource tenure in accordance with seasonal variations contradict the idea of permanent territorial occupation. On the other hand, ethnic federalism postulates a primordial concept of unchanging and bounded group identities, which does not take into account the historical flux, constructedness, and flexibility of group identities (Aalen 2006).

Pastoralists mostly interpreted ethnically defined administration as the exclusive rule by a dominant group within a given home territory. Demographically bigger and more powerful groups had much better chances of achieving this goal than smaller and minority clans. In the Somali regional state and elsewhere the right of self-determination to be enjoyed by ethnic groups was “taken as the rights of clans” (Asnake Kefale 2006, p 5). Historical animosities over grazing resources and water points were revived by administrative decentralisation as pastoralists sought to expand the boundaries of their *kebele* and district to claim sole possession of disputed localities. Changing the names of areas where strategic rangelands, water wells and settlements were concentrated in order to legitimise their incorporation into one’s home territory became another strategy of ethnic claims-making (Alemmaya Mulugeta 2008). Although important inter-ethnic tensions persisted through the 1990s, particularly at the boundary between the Oromiya, Afar and Somali regional states, prolonged confrontations mostly involved individual clan lineages and not entire ethnic groups. Since access to political representation depends on the ability to control administrative units, genealogical groups struggled to establish their own districts in order to ‘gain a better political position’ within their zone and their larger clan family (Ayele Gebre Mariam 2005).

A major incentive for pastoralists to identify with pre-defined ethnic collectivities and to adopt expansionist political tactics to the detriment of neighbouring groups was the extension of fiscal and administrative resources from regional capitals to districts. Particularly for the small educated elite who qualified for civil service, employment in a regional, zonal or district office became a lucrative source of income. Local and regional administrations provided important opportunities to appropriate petty cash in the form of both regular salaries and irregular funds. Concomitantly with the ‘trickling down’ of public resources into Ethiopia’s pastoral areas, neo-patrimonial relations between state representatives and pastoral groups expanded (Hagmann 2005). These networks, linking rural constituencies to urban gatekeepers, determined the allocation of state resources and assured the politicians popular support on election day.

10.5 Conclusion

In this article we have argued that contemporary conflicts in Ethiopia's lowland regions must be viewed within the context of the current state-building process in the semi-arid periphery, which strongly shapes the rationality of inter-group conflicts by both integrating and excluding pastoral communities. Although violence between herders and agro-pastoralists is perpetrated in 'non-state spheres' (Alemmaya Mulugeta 2008), it is directly related to the state, which mediates resource governance, peace-making and group identity. Administrative decentralisation has reconfigured pastoralists' relation to their territory, interactions between customary authorities and government officials, and relations between competing ethnic or clan groups. Since 1991 ethnic federalism has permitted local groups to establish and appropriate administrative and political spoils at local and regional levels. These processes are partly in continuity with previous interactions between the Ethiopian state and pastoral communities, which have shaped pastoralists' attitudes towards state institutions. In this sense, post-1991 decentralisation has accelerated a historically unfolding state-building process and its transformative impacts on pastoral life-worlds, politics and resource management.

As pastoral societies are incorporated into wider political and economic systems, the rationale of conflicts and violence is changing. Without completely losing its ritual and customary referents, collective violence in the pastoral areas is 'modernised' as its connections with modern state politics and capitalist modes of production intensify. The term 'pastoral conflict' seems increasingly inappropriate to grasp the current logics of violence, as it embodies a nostalgic connotation of herders and conflict. Contemporary disputes in the Ethiopian lowlands are sparked by competition over urban real estate, electoral campaigns or contested access to public budgets as much as by competition over wells and pastures. Consequently, there is a need to consider the changing logics of resource conflicts in the semi-arid parts of the Horn of Africa as the 'same' groups fight – from a historical perspective – over increasingly diversified natural, political and economic resources.

Endnotes

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References

Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- Aalen L. 2006. Ethnic federalism and self-determination for nationalities in a semi-authoritarian state: The case of Ethiopia. *International Journal on Minority and Group Rights* 13(2–3):243–261.
- Abbink J. 1997. The shrinking cultural and political space of East African pastoral societies. *Nordic Journal of African Studies* 6(1):1–15.
- Abbink J. 2000. Violence and the crisis of conciliation: Suri, Dizi and the state in south-west Ethiopia. *Africa: Journal of the International African Institute* 70(4):527–550.
- Abdulahi M. 2005. *The Changing Nature of Pastoral Conflicts in South-eastern Ethiopia: The Case of the Boran and Digodi Pastoralists*. Nairobi, Kenya: Africa Peace Forum.
- Abdulahi M. 2007. The legal status of the communal land holding system in Ethiopia: The case of pastoral communities. *International Journal on Minority and Group Rights* 14(1):85–125.
- * Ahmed Ali Gedi. 2005. *Herder–Farmer Conflicts in the Dawa-Ganale River Basin Area: The Case of Intra-clan Conflict Among the Degodia Somali of Dollo Ado District in the Somali Regional State of Ethiopia*. WP 1 “Governance and Conflict Transformation”, Working Paper No. 1. Bern, Switzerland: Swiss National Centre of Competence in Research (NCCR) North-South. Also available at: http://www.nccr-north-south.unibe.ch/publications/Infosystem/On-line%20Dokumente/Upload/AAG_Herder-farmer-Conflicts.pdf; accessed on 5 January 2010.
- * Alemmaya Mulugeta. 2008. *The Transformation of Conflicts Among Ethiopian Pastoralists: Ethnography of the Notion of Conflict Among the Karrayu in the Upper and Middle Awash Valley* [PhD dissertation]. Basel, Switzerland: University of Basel.
- Asnake Kefale. 2006. *Ethiopian Federalism: Autonomy and Conflicts in the Somali Region*. Paper presented at a Workshop on Decentralisation, Federalism and Conflict, Oxford, UK, 5–7 October 2006. Available from Tobias Hagmann.
- Ayele Gebre Mariam. 2001. Conflict management, resolution and institutions among the Karrayu and their neighbours. In: Salih MAM, Dietz T, Ahmed AGM, editors. *African Pastoralism: Conflict, Institutions and Government*. London, UK: Pluto Press, pp 81–99.
- * Ayele Gebre Mariam. 2007. *The Critical Issue of Land Ownership: Violent Conflict Between the Abdalla Tomolge and the Awlihan in Godey Zone, Somali Region, Ethiopia*. 2nd, revised edition [2005¹]. NCCR North-South Dialogue No. 11. Bern, Switzerland: Swiss National Centre of Competence in Research (NCCR) North-South. Also available at: <http://www.north-south.unibe.ch/content.php/page/id/230>; accessed on 5 January 2010.
- Bassi M. 2005. *Decisions in the Shade: Political and Juridical Processes Among the Oromo-Borena*. Trenton, NJ: Red Sea Press.
- Berhanu Nega, Berhanu Adenew, Samuel Gebre Selassie. 2003. Current land policy issues in Ethiopia. In: Groppo P, editor. *Land Reform, Land Settlement and Cooperatives*. Rome, Italy: Food and Agriculture Organisation (FAO), pp 103–124.
- Dereje Feyissa. 2003. *Ethnic Groups and Conflict: The Case of Anywaa–Nuer Relations in the Gambela Region, Western Ethiopia* [PhD dissertation]. Halle-Wittenberg, Germany: Martin Luther University.
- Farah AY. 1997. From traditional nomadic context to contemporary sedentization: Past relations between the Isaq and Gadabursi clans of Northern Somalia and south-east Ethiopia. In: Hogg R, editor. *Pastoralists, Ethnicity and the State in Ethiopia*. London, UK: HAAN, pp 81–104.
- FDRE [Federal Democratic Republic of Ethiopia]. 1995. *Constitution of the Federal Democratic Republic of Ethiopia*. Addis Abeba, Ethiopia: Federal Negarit Gazeta.
- Getachew Kassa. 2001a. Resource conflicts among the Afar of north-east Ethiopia. In: Salih MAM, Dietz T, Ahmed AGM, editors. *African Pastoralism: Conflict, Institutions and Government*. London, UK: Pluto Press, pp 145–171.

- Getachew Kassa. 2001b. *Among the Pastoral Afar in Ethiopia: Tradition, Continuity and Socio-economic Change*. Utrecht, the Netherlands: International Book.
- * Hagmann T. 2005. Beyond clannishness and colonialism: Understanding political disorder in Ethiopia's Somali region, 1991–2004. *Journal of Modern African Studies* 43(4):509–536.
- * Hagmann T. 2006. *Pastoral Conflict and Resource Management in Ethiopia's Somali Region* [PhD dissertation]. Lausanne, Switzerland: Swiss Graduate School of Public Administration (IDHEAP), University of Lausanne.
- * Hagmann T. 2007. Bringing the sultan back in: Elders as peacemakers in Ethiopia's Somali region. In: Buur L, Kyed HM, editors. *State Recognition and Democratisation in Sub-Saharan Africa: A New Dawn for Traditional Authorities?* New York, NY: Palgrave, pp 31–51.
- Helland J. 2000. Institutional erosion in the drylands: The case of the Borana pastoralists. In: Manger L, Ahmed AGM, editors. *Pastoralists and Environment: Experiences from the Greater Horn of Africa*. Addis Abeba, Ethiopia: Organisation for Social Science Research in Eastern and Southern Africa (OSSREA), pp 19–49.
- Kelemework Tafere. 2006. *Indigenous Institutions of Conflict Resolution among the Ab'ala Afar of North-eastern Ethiopia*. Addis Abeba, Ethiopia: Addis Abeba University.
- Lister S. 2004. *The Processes and Dynamics of Pastoralist Representation in Ethiopia*. Brighton, UK: Institute of Development Studies (IDS).
- Markakis J. 1994. Ethnic conflict and the state in the Horn of Africa. In: Fukui K, Markakis J, editors. *Ethnicity and Conflict in the Horn of Africa*. London, UK: James Currey, pp 217–237.
- Markakis J. 2003. Anatomy of a conflict: Afar & Ise Ethiopia. *Review of African Political Economy* 30(97):445–453.
- Nori M, Switzer J, Crawford A. 2005. *Herding on the Brink: Towards a Global Survey of Pastoral Communities and Conflict*. London, UK: International Institute for Environment and Development (IIED).
- Said A. 1997. Resource use conflicts in the Middle Awash Valley of Ethiopia: The crisis of Afar pastoralism. In: Hogg R, editor. *Pastoralists, Ethnicity and the State in Ethiopia*. London, UK: HAAN, pp 123–141.
- Sandford S, Yohannes Habtu. 2000. *Emergency Response Interventions in Pastoral Areas of Ethiopia*. London, UK: Department for International Development (DFID).
- Schlee G. 2003. Redrawing the map of the Horn: The politics of difference. *Africa: Journal of the International African Institute* 73(3):343–368.
- Sugule J, Walker R. 1998. *Changing Pastoralism in the Ethiopian Somali National Regional State (Region 5)*. Addis Abeba, Ethiopia: United Nations Emergencies Unit for Ethiopia.
- Tache B, Irwin B. 2003. *Traditional Institutions, Multiple Stakeholders and Modern Perspectives in Common Property*. London, UK: International Institute for Environment and Development (IIED).
- Taffesse Mesfin. 2000. *An Overview and Analysis of the History of Public Policy towards the Development of Pastoralism in Ethiopia*. Paper presented at the National Conference on Pastoral Development in Ethiopia. Addis Abeba, Ethiopia, 2 February 2000.
- Turton D. 2006. *Ethnic Federalism: The Ethiopian Experience in Comparative Perspective*. Oxford, UK: James Currey.
- Unruh J. 2005. Changing conflict resolution institutions in the Ethiopian pastoral commons: The role of armed confrontation in rule-making. *GeoJournal* 64(3):225–237.
- Yacob Arsano. 2000. *Pastoralism in Ethiopia: The Issues of Viability*. Paper presented at the National Conference on Pastoral Development in Ethiopia, Addis Abeba, Ethiopia, 2 February 2000. Available from Tobias Hagmann.

11 Research on Water Management and Conflict Transformation in the Eastern Nile Basin Region

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Abstract

The challenges of water resources management and the mitigation of water allocation conflicts have gained increasing attention among policy makers and researchers as population growth and changing consumption patterns intensify the competition for limited freshwater resources. This article synthesises four studies of ‘water conflicts’ in the Horn of Africa, three of which investigated the issue of transboundary river management in the Nile Basin, while the fourth addressed the role of irrigation water property rights at community level. At both levels, disputes over the utilisation of water resources are not primarily a function of overall scarcity or abundance of water, but rather of users’ access to water resources and related services. Access is influenced by policies and institutions. The mitigation of ‘water conflicts’ depends, among other things, on reform of domestic water policies and water sector institutions, and on enforcement of clearly defined property rights.

Keywords: Transboundary river management; irrigation water property rights; water conflict; conflict transformation; Nile Basin; Ethiopia.

11.1 Water-management challenges and inter-group conflicts

Although rainfall patterns and corresponding conditions of ‘water scarcity’ vary in time and space, population growth is causing a steady increase in the number of countries facing ‘physical water scarcity’ (i.e. limited water availability per capita at national scale). Land-use changes alter the water retention capacity of the soil and vegetation and affect river runoff patterns. Hydraulic infrastructure and policies governing the allocation and utilisation of water also influence access to water for different uses in a given river basin. Budgetary constraints force water authorities to evaluate trade-offs between strategies to enhance infrastructural capacity for flow regulation, increase water use efficiency, and ensure long-term environmental conservation, respectively.

Modifications in runoff patterns and/or water quality can entail externalities in downstream locations separated by political or administrative boundaries. Fragmentation of watersheds affects the decision-making processes and the behaviour of riparian stakeholders at both the local and the basin scale. The present contribution focuses on conflicts between stakeholder groups over the allocation and utilisation of scarce water that can arise in this context.

11.2 Four studies on ‘water conflict and cooperation’ in the Nile Basin

The ‘water conflicts’ studied in the Horn of Africa within the framework of the Swiss National Centre of Competence in Research (NCCR) North-South programme primarily concern quantity allocation and flow regulation. The irrigation sub-sector, as the major consumer of river water, was of particular interest in these studies. Two specific fields of research were addressed: 1) transboundary conflict and cooperation in the Eastern Nile Basin, and 2) the role of property rights with respect to irrigation water at local scale (Figure 1). Three PhD studies focusing on regional hydro-politics in the Nile Basin (Mason 2004; Yacob Arsano 2004; Luzi 2007) were closely aligned in terms of research questions and methodology. They drew on conceptual approaches from political science and from conflict studies, and methods used included stakeholder interviews, policy analysis and network analysis. A PhD study on property rights and irrigation water management (Moges



Fig. 1
Geographical foci of studies on water management and conflict transformation carried out in the Horn of Africa within the framework of the Swiss National Centre of Competence in Research (NCCR) North-South programme. (Map by Marco Zanoli and Samuel Luzi, 2008)

Shiferaw 2007) applied an econometric framework to assess the correlation between characteristics of property rights regimes and the efficiency of water use across different case study areas.

The overall analytical approach adopted in these studies on water management and conflict transformation in the Horn of Africa was based on two key elements: 1) a focus on complex *patterns of interrelations* between resources, resource users and the institutions influencing users' behaviour – as opposed to unidirectional relationships linking 'causes' to the occurrence of (violent) conflict – and 2) a focus on factors and specific interventions that can foster the *mitigation* of 'water conflicts'.

Based on the results of these studies, this article highlights three aspects that link water management conflicts at the local and international scales, namely the question of access vs. physical scarcity, the specific role of actors and institutions, and particular strategies for mitigating conflicts over water allocation and utilisation.

11.2.1 Hydro-politics in the Nile Basin

The Horn of Africa and the lower Nile Basin are among the most water-scarce regions in the world. Egypt was first in the race to transform the Nile's flow into productive use, and consolidated its control of the river both by constructing a dam on its own territory and by signing international treaties that are considered unfair by upstream states. The 1990s saw an intensification of efforts to manage the shared river in a cooperative manner, despite intra- and international tensions that continue to threaten stability and development in the region.

The 'Nile Basin' studies conducted by NCCR North-South researchers in the Horn of Africa contribute to the broader discourse on conflict and cooperation in transboundary river basins (Toset et al 2000; Yoffe et al 2003; Luzi 2006). The conceptual frameworks adopted in the three studies advance understanding of the Nile conflict along different dimensions. First, they make an explicit distinction between riparian *positions* (ideology-based claims), *interests* (written or unwritten water development targets and underlying economic and political rationales) and *needs* (ultimate goals of water resources development, i.e. food security, economic welfare). Second, they integrate different perspectives on transboundary cooperation (i.e. 'security', 'legal/institutional', 'socio-economic' and 'environmental') and take account of the cultural and historical significance of the shared river. Third, they analyse the interface between domestic and transboundary decision-making processes and the institutions of water governance through the lens of a 'two-level game'.

The studies generally challenge two assumptions that are often applied in the analysis of transboundary river conflicts and are held by certain actors involved in the hydro-politics of the Nile Basin: 1) allocation of water in the Nile Basin is a 'zero-sum game', with gains for one country necessarily coming at the expense of other riparian states, and 2) riparian states act as unitary actors; the positions adopted by their leaders and negotiators correspond to a unitary 'national interest'. Refined conceptual frameworks are

applied with regard to complex hydrological and socio-economic implications of different river management scenarios and the motivations behind the behaviour of basin states. The results can be summarised as follows:

- The conflict in the Nile Basin is driven mainly by ideological claims (for ‘equitable allocation’, ‘prior use rights’ or ‘national sovereignty’) and by claims to higher water shares to meet national irrigation expansion targets. All Nile countries set targets for development of water resources unilaterally, irrespective of the supply and demand situation in other riparian countries. The mythical significance of the Nile as a common heritage and a uniting factor at the basin level is under-valued.
- Incompatible negotiating *positions* are manifestations of more compatible *interests* and *needs* (i.e. water security for Egypt, economic development for upstream states). Transboundary cooperation is more likely if negotiators focus on these needs rather than on positions. The potential to improve the efficiency of water use is still substantial in both downstream and upstream states. Many water management options exist in upstream regions that have no major negative effects on downstream water uses, e.g. watershed management, flood control, and hydropower production.
- Both the claims for a greater share of the Nile and the interest of riparian countries in specific collaborative river development projects have important underpinnings in policy processes within the basin states. National negotiators’ ability to make concessions in the transboundary negotiations is constrained by the interests of domestic actors and the institutions determining their influence in decision-making processes. For example, the inability of national water ministries to implement demand-management strategies (water pricing, shifts in cropping patterns, etc.) contrary to the interests of certain domestic stakeholders is an obstacle to transboundary cooperation, as it results in even more inflexible national claims for more water (Luzi et al 2008). Trade-offs between domestic and basin-wide water development strategies must be addressed comprehensively, which necessitates better integration of national and sectoral policies, more stakeholder participation, and greater commitment by political leaders to advancing the transboundary negotiation process.
- In the absence of confidence-building measures and tangible benefits from cooperation, a rapid convergence of ideologically motivated claims for higher national water quotas is unlikely. Initiatives to mitigate conflicts in

shared river basins should aim to foster multi-track communication, target 'win-win' packages, exploit comparative advantages, pursue tighter economic integration, and employ well-balanced third party mediation and financial incentives. A broad range of joint efforts should be considered, including the adoption of a shared vision and the creation of a 'community of interests' drawing among other things on spiritual, cultural and cross-border community interactions, exchange of students, and intensified trade relations.

All three authors hold a differentiated view as to the impact of the donor-supported Nile Basin Initiative (NBI). While progress made in terms of broadening the scope of transboundary interactions is remarkable, several key challenges have been only partially addressed. Mistrust and unilateralism are still common, the momentum for domestic policy reform generated by the transboundary process has been limited, joint investment projects are progressing slowly, and a shared vision of long-term regional development remains vague.

The focus on mitigation in NCCR North-South research on the Nile Basin is illustrated by a series of problem-solving dialogue workshops organised by the researchers involved (2002–2004), which aimed to foster exchange of ideas among key water sector representatives from Egypt, Ethiopia and the Sudan (see Amer et al 2005; Mason 2005). A training workshop for 30 young water professionals from the same countries was organised in 2006.

11.2.2 Irrigation water management and property rights

Despite the importance and potential scarcity of water, this common pool resource is often utilised inefficiently and maintained poorly (Ostrom and Gardner 1993). Moges Shiferaw's study (2007) is concerned with the inefficiencies and conflicts related to the allocation and utilisation of irrigation water at the local level, i.e. between farmers or communities relying on the same source of water. This study applies an innovative conceptual framework to assess the characteristics and impacts of different water property rights regimes. It refines the commonly applied typology of property rights regimes (Ostrom 2000) by distinguishing specific combinations of 'bundles' and related 'qualities' of rights. The following results were obtained:

- The efficiency of agricultural production in the case study areas is not necessarily a function of the physical availability of water, but rather of farmers' access to water and the security of water entitlements.

- Ethiopia has an untapped potential to increase irrigated production. Productive efficiency and water use efficiency among small-scale producers can be increased by improving the structure of irrigation water rights, i.e. without increasing the volume of water. The policies governing irrigation water rights in Ethiopia have failed to capture essential elements of ‘ideal’ property rights regimes – e.g. regarding the security and tradability of rights – and have resulted in substantial resource degradation and social conflict.
- An ideal water property rights regime increases both the incentive to invest in irrigation systems and the incentive to use water for its most valuable purpose. Equitable distribution of essential bundles of regulatory rights among irrigators (e.g. the right to sell entitlements) significantly enhances the level of multilateral bargaining over ‘the rules of the game’, which in turn fosters the establishment of optimal governance systems. If the initial allocation of rights can be defined correctly, e.g. by the government, the desired outcome of high water use efficiency can be achieved by the right-holders themselves without substantial government intervention.

The findings of this study have influenced water policy reform processes at national and regional levels in Ethiopia. The issue of property rights is politically sensitive, however, and the success of property rights reforms depends on general political reforms and the capacity of the government to assign and enforce initial rights.

11.3 Synthesis: water resources, actors, institutions and interventions

This section attempts a synthesis of the findings of the NCCR North-South studies on ‘water conflicts’ in the Horn of Africa. The focus is on 1) the linkages between ‘water scarcity’ and riparian conflicts, 2) the actors and institutions involved, and 3) conflict mitigation approaches.

11.3.1 The status of resources: water scarcity and conflict

The insights provided by the NCCR North-South studies on water management and conflicts in the Horn of Africa support the criticism of Malthusian narratives that directly link water scarcity to (violent) conflict (see also Ohlsson 2000). ‘Water scarcity’ is a function of water supply and demand,

and both these parameters depend on technological and institutional capacities in a given watershed. For users, supply is defined primarily by their *access* to water of good quality, regardless of overall water scarcity or abundance. With respect to the multiple factors influencing water availability at the user level, different types of ‘water scarcity’ can be defined, e.g. physical, economic, managerial, institutional or political water scarcity (Molle and Mollinga 2003).

In both the Nile Basin and the case study areas in Amhara Regional State, the total availability of water is sufficient to satisfy current demand. At both levels, however, water is used inefficiently, and the entitlements of water users (i.e. basin states or individual farmers/communities, respectively) to a share of the water are ill defined. High uncertainty and the threat of water scarcity for downstream water users fuel persistent conflicts between farmers, neighbouring communities and riparian states over *de jure* and *de facto* access to water. Tensions between riparian stakeholders can prevent the establishment of more efficient water-management regimes, even if no violent conflict erupts.

Water conflict studies need to distinguish clearly between physical water scarcity and lack of access to water. Recognition of water conflicts as disputes over ‘access’ also broadens the range of possible mitigation strategies.

11.3.2 Actors, their motivations, and the institutions governing their behaviour

The main parties in conflicts over the utilisation of water considered here are riparian states at basin level, and farmers or farmer communities at local level. Claims for a greater share of water (i.e. the conflicting parties’ *positions*) often relate to inadequate access to timely water for different productive uses (i.e. their *interests*). Underlying *needs* relate to issues of household food security and livelihoods (local level), or national development indicators such as food security, economic growth, and rural employment (basin level). At both levels, interests and needs can be satisfied at least partly without increasing the overall availability of water, i.e. by increasing irrigation efficiency and by diversifying income opportunities. The persistent focus on increased water supply often overshadows the need for reformed policies on the *utilisation* of water.

The behaviour of conflicting parties vis-à-vis each other, as well as intra-group decision-making processes also depend on the institutions in place.

At local level, the institutional setting is defined, among other things, by the property rights regime and the ability of the authorities to enforce regulations. The institutions governing transboundary relations (international law, Nile Basin Initiative) are weak and only peripherally govern the behaviour of the riparian states.

National water authorities are key players in the context of both reform of property rights systems at local level and basin-wide harmonisation of water policies. However, their ability to reform water-management systems and mitigate 'water conflicts' is limited, as they are faced with various constraints such as limited influence on the formulation of overall national development targets, inadequate inter-sectoral coordination, and limited planning and implementation capacities.

11.3.3 Water conflict mitigation

The studies summarised here agree that negotiations and dialogue between the conflicting parties support the transformation of riparian conflicts into mutually beneficial arrangements, potentially resulting in greater efficiency of water use. Such interactions, however, need to take place on a level playing field. The allocation of clearly defined water use rights – at both basin and local levels – can at least partly provide the security that encourages water users to engage in the joint design of more efficient systems of water resources development and management.

A major difference between the local and international levels exists with regard to the appropriate mechanism for allocating water use rights. The reform of irrigation property rights systems at local level depends on the ability of a higher-level authority (i.e. the state) to define an initial allocation of rights and to enforce a corresponding legal framework. Dialogue alone is not an efficient strategy to resolve water allocation disputes between individual farmers and between neighbouring communities. In contrast, no supra-national institution exists at the basin level with the authority to establish and enforce a basin-wide quota allocation system. Water sharing arrangements need to be defined through bi- or multilateral negotiations between the riparian states. Improved water use efficiency in this case is not primarily one of the key *outcomes* of a reformed water allocation system (as in the case of clearly defined irrigation water rights at local level), but must rather be a key element in the *design* of cooperative strategies in order to reduce national water demands and temper claims for increased national water shares.

In this sense, the mitigation of conflicts between irrigators through the reform of irrigation water property rights regimes can be an important component of efforts to use water more efficiently at national level, and thus to mitigate transboundary disputes. In turn, the establishment of a transboundary regime for joint river management can generate momentum and mobilise resources to address questions of irrigation efficiency and property rights regimes at the domestic level (see also Mason et al 2009).

11.4 Conclusions

The studies on water management and conflict transformation in the Horn of Africa conducted within the framework of the NCCR North-South provide insights into the linkages between water management and conflicts at different levels. The explicit analytical focus on patterns of interrelations between resources, actors and institutions helped researchers to address the complexity of cooperative water management and to evaluate conflict mitigation strategies. The studies show that a focus on institutions, understood as property rights regimes and governance structures, is essential both in the analysis of water utilisation conflicts and in efforts to mitigate such conflicts.

Endnotes

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References

Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- * Amer SED, Yacob Arsano, Battahani AE, Hamad OET, Hefny MAEM, Imeru Tamrat. 2005. Sustainable development and international cooperation in the Eastern Nile Basin. *Aquatic Sciences* 67(1):3–14.
- * Luzi S. 2006. Les Bassins hydrographiques internationaux: conflits et gestion des ressources hydriques. *Les Cahiers de la Sécurité* 63:35–59.
- * Luzi S. 2007. *Double-edged Hydropolitics on the Nile* [PhD dissertation]. Zurich, Switzerland: Swiss Federal Institute of Technology Zurich (ETHZ).
- * Luzi S, Hamouda MA, Sigrist F, Tauchnitz E. 2008. Water policy networks in Egypt and Ethiopia. *The Journal of Environment and Development* 17(3):238–268.
- * Mason SA. 2004. *From Conflict to Cooperation in the Nile Basin* [PhD dissertation]. Zurich, Switzerland: Swiss Federal Institute of Technology Zurich (ETHZ). Also available at: <http://www.north-south.unibe.ch/content.php/filterpage/id/27>; accessed on 27 October 2009.
- * Mason SA. 2005. Are we scorpions? The role of upstream–downstream dialogue in fostering cooperation in the Nile Basin. *Mountain Research and Development* 25(2):115–120.
- * Mason SA, Hagmann T, Bichsel C, Ludi E, Yacob Arsano. 2009. Linkages between sub-national and international water conflicts: The Eastern Nile Basin. In: Brauch HG, Oswald Spring U, Grin J, Mesiasz C, Kameri-Mbote P, Behera NC, Chourou B, Krumpal H, editors. *Facing Global Environmental Change: Environmental, Human, Energy, Food, Health and Water Security Concepts*. Hexagon Series on Human and Environmental Security and Peace, Vol. 4. Berlin, Germany: Springer-Verlag, pp 325–334.
- * Moges Shiferaw. 2007. *The Economics of Shared Irrigation Water Rights* [PhD dissertation]. Basel, Switzerland: University of Basel.
- Molle F, Mollinga P. 2003. Water poverty indicators: Conceptual problems and policy issues. *Water Policy* 5(5):529–544.
- Ohlsson L. 2000. Water conflicts and social resource scarcity. *Physics and Chemistry of the Earth, Part B: Hydrology, Oceans and Atmosphere* 25(3):213–220.
- Ostrom E. 2000. Private and common property rights. In: Bouckaert B, De Geest G, editors. *Encyclopedia of Law and Economics, Vol. 2: Civil Law and Economics*. Cheltenham, UK: Edward Elgar, pp 332–379.
- Ostrom E, Gardner R. 1993. Coping with asymmetries in the commons: Self-governing irrigation systems can work. *Journal of Economic Perspectives* 7(4):93–112.
- Toset HPW, Gleditsch NP, Hegre H. 2000. Shared rivers and interstate conflict. *Political Geography* 19(8):971–996.
- * Yacob Arsano. 2004. *Ethiopia and the Nile: Dilemmas of National and Regional Hydropolitics* [PhD dissertation]. Zurich, Switzerland: University of Zurich. Also available at: <http://www.north-south.unibe.ch/content.php/filterpage/id/27>; accessed on 27 October 2009.
- Yoffe S, Wolf AT, Giordano M. 2003. Conflict and cooperation over international freshwater resources: Indicators of basins at risk. *Journal of The American Water Resources Association* 39(5):1109–1126.

12 Land Degradation and Sustainable Land Management in the Highlands of Ethiopia

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Abstract

The Ethiopian Highlands cover over 50% of the country and are home to more than 90% of Ethiopia's population of over 80 million people (estimate for 2010); 60% of the livestock and 90% of the area suited for agriculture are also located here. Although more than 90% of the Highlands was once forested, today a mere 20% of this area is covered by trees, and the percentage of forest cover is less than 4%. This is evidence of a high incidence of degradation of vegetation in the past, which has continued to the present. Land-use and land-cover changes have been particularly dynamic in the 20th century, during which climate change also began to have effects; wildlife in natural habitats have been restricted to those few areas that were preserved naturally due to rugged topography or natural aridity. Soil erosion has been severe throughout the Highlands, but mainly on agricultural land; the current severity and extent of soil degradation seriously threaten food security. In response, a number of soil and water conservation measures have been successfully implemented over the past 35 years in some parts of the Highlands. This is highly encouraging, but greater emphasis must be given to conservation in the coming decades.

Keywords: Ethiopian Highlands; research partnership; land degradation; land-cover change; sustainable land management; soil and water conservation; protected area management.

12.1 Introduction

12.1.1 The Ethiopian Highlands

The Ethiopian Highlands are defined here as an area extending from about 1000 metres above sea level up to the highest peak in Ethiopia, at 4533 m. In this zone there are normally sufficient rainfall and suitable temperatures for rainfed agriculture. Due to temperature constraints, the upper limit of cropping lies at about 3800 m, while the lower limit is defined by dryness, which makes rainfed cultivation impossible in areas below about 800 m on the western side of the Highlands, and below 1200 m on the eastern side. Given these boundaries, favourable agro-climatic conditions prevail over an area of 570,000 km², or 52% of the country (Hurni 1998). Human-induced climate change has been impacting agro-ecological belts since about the 1970s, a fact that is evident not only in terms of rainfall variability but particularly in terms of observed temperature increases (Hurni 2005). This has considerable implications for the suitability of agricultural cropping patterns for crops such as coffee (Rüegsegger 2008).

In 2007 about 84% of the Ethiopian population, or about 64 million out of about 77 million persons, lived in a rural environment (extrapolated from CSA 2006), mostly in the Highlands; at the same time, the Highlands are also where most of the urban population lived. The rural population has grown from approximately 12 million people around 1900 to approximately 64 million in 2007 (Hurni et al, in preparation), while the urban population increased from nearly 0 to about 13 million in the same period. Farm sizes today are less than one hectare per household on average; the livestock population, while considerable and exceeding the capacity of grazing land, is still insufficient to provide enough labour to plough the land. Farm productivity is at a minimal grain output between 0.3 and 1.5 tonnes per hectare, and land degradation due to agricultural practices is widespread, amounting to an average of over 40 tonnes of soil lost per hectare of cropland every year (Hurni 1993).

Sustainable management of natural resources, particularly soil and water, is of utmost importance to Ethiopian agriculture. Since the inception of agriculture several millennia ago, little has been done by peasants and societies to conserve natural resources, as land was abundant. The Highlands were deforested for agriculture, a process that was intensified especially in the past century when the population started to grow exponentially. Conservation

measures on agricultural land were applied in very few instances only, and had to be introduced on a broader scale by the government and by foreign programmes in the aftermath of the great famine of 1972–1973, which was drought-induced but caused by a lack of political response.

12.1.2 Key issues in land degradation and sustainable land management

According to the Millennium Ecosystem Assessment (MA 2005) the term ‘land’ includes renewable natural resources, i.e. soils, water, vegetation and wildlife, in their terrestrial ecosystems. Land degradation, in turn, includes all processes that diminish the capacity of land resources to perform essential functions and services in these ecosystems, i.e. deforestation, loss of biodiversity, soil degradation and disturbance of water cycles. Sustainable land management consists of technical and institutional measures initiated by individuals or societies to maintain land productivity and other functions of land resources for present and future generations.

There have been numerous and controversial debates about explaining land degradation processes in Ethiopia and seeking mitigation options. They have focused on:

1. Approaches applied to implement land rehabilitation activities, e.g. incentive-based approaches (Webb and Kumar 1995; Holden et al 2006); (in)voluntary campaigns; multi-level stakeholder and participatory approaches (Hurni and Ludi 2000); and top-down approaches versus bottom-up and community-based approaches (Alemneh Dejene et al 2003);
2. Priorities and agenda-setting involving land rehabilitation work as well as the general rural development activities and policies of the country (Keeley and Scoones 2000, 2003; Nyssen et al 2004a);
3. Identifying the root causes of land degradation that have an impact on decision-making, e.g. traditional agricultural practices (Hurni 1990), land tenure insecurity (Yeraswork Admassu 1995; Dessalegn Rahmato 2001, 2004) and pressure from accelerated population growth (EHRS 1986).

Considerable efforts have been made to establish monitoring and research throughout the Ethiopian Highlands, particularly at the level of small watersheds, but generalisations about the processes of land use and land degrada-

tion, as well as conservation approaches as a whole, have yet to be developed from the case study sites. This requires debates among scientists from different disciplines and other stakeholders at large.

12.1.3 Research partnership approaches

Research on processes of land-use change, land degradation and sustainable land management was initiated in the Ethiopian Highlands by the Soil Conservation Research Programme (SCRP) in 1981 in conjunction with the country-wide soil conservation campaign (Hurni 1982; SCRCP 2000). Prior to this initiative, only a limited number of studies existed. In 2001, the Swiss National Centre of Competence in Research (NCCR) North-South chose the Ethiopian Highlands as one of its syndrome contexts (Yacob Arsano et al 2004) and initiated a number of PhD and Master's studies on this region, taking a transdisciplinary approach to identify research topics, involving scholars from different disciplines as well as development specialists. The results of these studies constitute the main base of information used here, though emphasis is also given to studies done outside the NCCR North-South programme.

12.2 Status and dynamics of land cover, land use and land degradation

12.2.1 Deforestation and forest dynamics

Most areas in Ethiopia that currently have more than 3% tree cover are assumed to have been forested about 5000 years ago, before deforestation for agriculture began (Hurni 1987; Darbyshire et al 2003; Nyssen et al 2004b). The north-central Highlands were a focus of agricultural development over the past 2–3 millennia, according to historical records (Bard et al 2000) and carbon dating (Hurni 1987); this was also where most deforestation occurred as early as many centuries ago (Ritler 2001). Today these areas have 3–19% tree cover (Figure 1). By contrast, in the present-day 19–40% tree cover zone, which is found primarily in the western and southern Highlands, heavy deforestation has taken place particularly since the 1950s (Solomon Abate 1994; Gete Zeleke 2000).

Deforestation was always followed by a change in land use and land cover, from forest to grassland and cropland. A particular increase in cropland was observed in the second half of the 20th century, largely at the expense of grassland and forestland – a fact that is widely acknowledged in the scien-

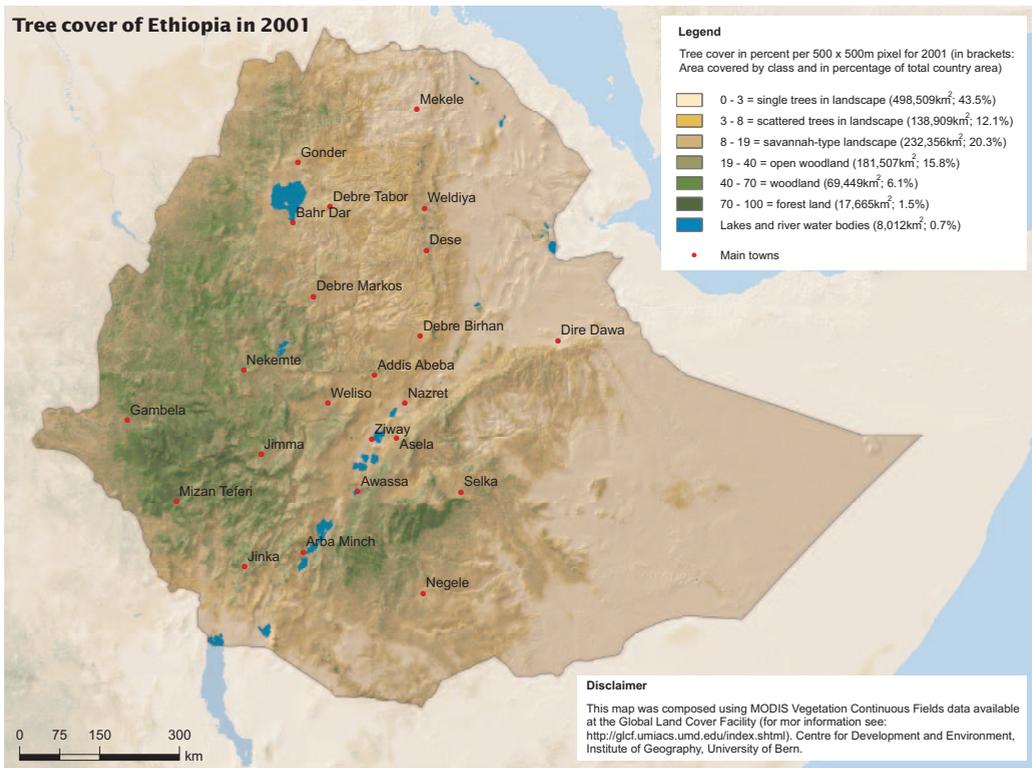


Fig. 1
Tree and forest cover in Ethiopia in 2001 as modified by agricultural activities during about 5000 years. (Map composed by Kaspar Hurni; to be published in Hurni et al, in preparation)

tific literature. During specific periods throughout history entire landscapes were abandoned for a variety of reasons, such as famines, pests or political turmoil, causing the land to regenerate and develop secondary bush and tree vegetation, which was later again slashed and burnt for recultivation; at present, however, this hardly occurs any more.

12.2.2 Land-use and land-cover changes

Within the NCCR North-South programme, Birru Yitaferu (2007), Schild (2006), Amare Bantider (2007), Hurni (2005) and Solomon Abebe (2005) studied land-use and land-cover changes as well as their underlying causes. All studies revealed highly dynamic systems, but changes observed among the various land-cover types were not all similar, mainly due to different initial situations. In the recent past, more intense loss of forest cover and expansion of cultivation land coincided with changes in land policies and institutions in the 1970s, 1990s and early 2000s (Amare Bantider 2007).

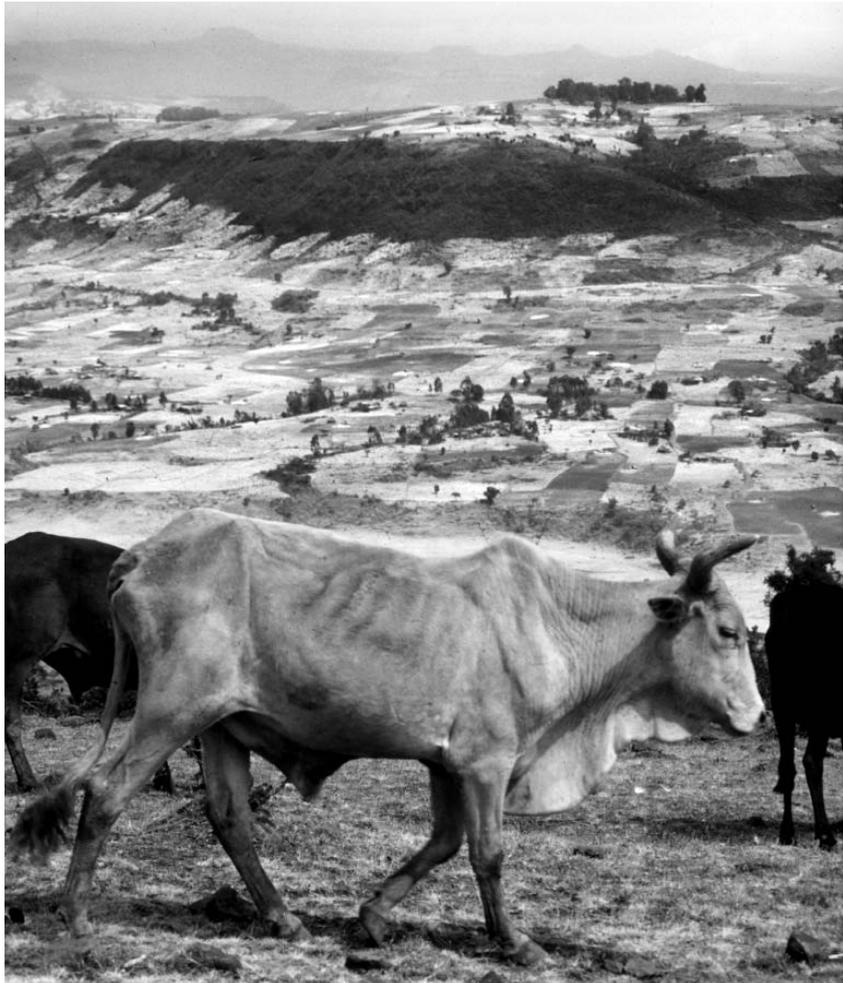


Fig. 2
Intensive land-
cover and land-use
changes around
the Anjeni Soil
Conservation
Research Pro-
gramme (SCR)
Research Site in
Gojam mainly
occurred between
1950 and 1980
according to Gete
Zeleeke (2000).
(Photo by Hans
Hurni, 1984)

During the 20th century the highest deforestation rates were found in areas where the forest cover was still between 8% and 40% (Figure 2). Periods of active deforestation occurred during phases of rapid population growth and were coupled with little institutional concern about, or insufficient enforcement of, measures to combat environmental degradation. On the other hand, reduced deforestation and even reforestation were accompanied by increased government support and international assistance, as in the 1980s, but also during the past decade since 2000, when increased government awareness and more conducive approaches were observed, particularly in the Tigray region in the north (Nyssen et al 2009).

12.2.3 Wildlife dynamics

The Ethiopian Highlands today are characterised by an extreme sparseness of natural habitats where wildlife could have survived during the extended period of agricultural use over the past 5000 years. Hence current wildlife is limited to animals that are less dependent on natural habitats, such as predators or birds, while ruminants, which depend on distinct habitats, have been reduced to very low numbers or few areas, and in some cases even became extinct long ago. Only a few wildlife habitats have been preserved in their natural form, such as high mountaintops above about 4000 m, steep escarpments on the borders of the Highlands, and semi-arid areas in the lower parts. Well-known places in the Highlands with natural wildlife habitats include the Simen Mountains in the north and the Bale Mountains in the south, both of which have been designated as national parks. Research within the NCCR North-South focused on the Simen Mountains (Grünenfelder 2005; Hurni 2005; Bircher 2006; Schild 2006; Ludi 2007), where some wildlife remained in natural habitats that are unsuitable for cropping due to steep topography, high altitude, or both.

12.2.4 Soil degradation due to water erosion

In Ethiopia agricultural land is tilled using an ox-plough system; this exposes the soil to rain, particularly during the onset of the rainy season. The process of soil erosion is a consequence of rainfed farming on steep slopes in the absence of sufficient counter-measures (Figure 3). Soil erosion processes were monitored by the Soil Conservation Research Programme (SCRIP), a long-term research network initiated in 1981 (Hurni 1982). Long-term analysis shows that the amount of soil loss on cultivated slopes ranges from a few tonnes per hectare and year (t/ha/yr) to more than 300 t/ha/yr (SCRIP 2000). In the long term, an average of approximately 40 t/ha/yr of soil loss was measured on cropland plots, while much less was measured on plots covered by grassland and forestland (Hurni 1993). The impact on soil productivity and agricultural production was shown to be very significant, exhibiting an almost linear correlation with soil depth (Belay Tegene 1990).

In the Ethiopian mountains, soil degradation due to water erosion remains a major threat to sustained agricultural production, as soils on slopes are washed away within a few human generations of land use. Both soil erosion models (Kaltenrieder 2007) and field observations confirm the importance of vegetation cover or, alternatively, structural measures such as soil

Fig. 3
Ploughing a steep slope at the Andit Tid Soil Conservation Research Programme (SCRCP) Research Site in Northern Shewa has led to extreme soil degradation, as the area has been agriculturally used for over 600 years. (Photo by Hans Hurni, 1982)



or stone bunds for protecting the soil against degradation. In addition, soil conservation measures have the potential to significantly improve agricultural production (Amare Bantider 2007; Birru Yitaferu 2007), not only in the accumulation areas behind the bunds but also in larger catchments. This has been shown by monitoring yields over extended periods of time (Kohler 2004; Loetscher 2004).

12.2.5 Water regime and pollution changes

Throughout the Highlands, immediate surface runoff has generally been augmented by intensified land use and advanced soil degradation, thereby benefiting the lowland areas in Sudan and Egypt to which part of the surface runoff is drained. Comparison of long-term data from small test plots throughout the Highlands (Hurni et al 2005), but also in the larger Lake Tana Basin, clearly confirmed this trend, despite the fact that rainfall amounts remained more or less similar during the observation periods of 13 to 44 years (Birru Yitaferu 2007). In terms of pollution, increased soil erosion in the catchments also augmented the sedimentation rates. This poses a problem for irrigation reservoirs in the lowlands, which are being filled with sediment. Soil and water conservation reduces sediment delivery not only on farm plots but, to a lesser extent, in entire catchments (Schum 2004; Admasu Amare 2005).

12.3 Drivers and impacts of soil degradation

While the previous section looked at the direct and indirect drivers of land degradation (MA 2005), this section focuses more closely on the drivers of soil degradation by water erosion. This is the key land degradation process in the Ethiopian Highlands once land has been deforested.

In assessments of soil degradation the direct drivers are typically termed 'bio-physical', as they are factors included e.g. in soil erosion models such as the Universal Soil Loss Equation (USLE) (Wischmeier and Smith 1978; Hurni 1987; Kaltenrieder 2007). Indirect drivers are usually found in the psychological, social, political, economic and institutional spheres, impacting livelihoods based on rural farming and livestock rearing, as well as in the institutions governing the populations that engage in these activities. Determinants of land degradation were analysed using primary and secondary data at the household and farm plot levels for selected watersheds (e.g. Getachew Adugna 2005).

12.3.1 Bio-physical drivers of soil degradation

The most important bio-physical drivers of soil degradation in the Ethiopian Highlands are (a) removal of vegetation cover, and (b) harmful agricultural management practices (Hurni 1990). Relating to (a), negative changes in soil cover are the most important drivers of the increase in natural rates of soil erosion by a factor between 100 and 1000, i.e. from much less than 1 t/ha/yr under natural forestland up to 300 t/ha/yr (Herweg and Stillhardt 1999; Alebachew Mamo 2006) on cultivated or degraded land. Once the vegetation cover is removed, factors such as the steepness, length and shape of a slope become important, as does rainfall erosivity. Another key factor in soil loss modelling is that soils in the Ethiopian Highlands are surprisingly resistant to water erosion due to their favourable depth, texture, structure and organic matter content, which give them good qualities in terms of infiltration and water-holding capacity, at least before they are heavily degraded (Hurni 1987).

Concerning (b), improved agricultural management practices have the potential to reduce soil erosion on farm plots by a factor of up to 100, provided that farmers take appropriate measures to combat soil erosion. Indigenous soil and water conservation practices have been documented; their effectiveness, however, is limited, and their extent is only local and not sufficiently widespread

to control soil erosion significantly. Inappropriate infrastructure such as foot-paths or steep drainage ditches also contributes to accumulated surface runoff and accelerated soil erosion (Herweg and Stillhardt 1999).

12.3.2 Socio-economic drivers of soil degradation

Ethiopian farmers do not perceive soil degradation to be a problem for agriculture, let alone a life-threatening issue affecting the productivity of the soil (Hurni 1979). Of course some runoff processes are perceived as immediately dangerous, e.g. when a gully expands backwards into the back yard of a homestead, which is rare. The psychological factor of individual perception of soil erosion as a non-threatening process can be explained by the slow overall pace of soil erosion; normally, it takes 5–10 human generations of intensive land use before a deep soil is totally exhausted. Consequently, when conservation programmes tried to retain water and sediment in a field by introducing soil and water conservation structures, farmers usually considered this to be a counter-measure against better drainage; they failed to perceive the important beneficial effect of long-term sustainable use of the soil (Herweg and Stillhardt 1999).

From a sociological point of view, many forms of cooperation between farm households exist, particularly in relation to specific farming operations, such as sharing oxen or maintaining common waterways between field boundaries. The latter also helps to reduce the severity of soil erosion. At the economic level, farming was largely subsistence-oriented in the past and remains so in remote areas, where about 80% of Ethiopia's farmers live. Institutionally, land security has not been granted to farmers over longer periods of time, thus preventing them from developing a keen interest in investing in the land for long-term productivity (Ludi 1994, 2002; Amare Bantider 2007). Present land regulations provide relative security, although the land is still owned by the regional states. Moreover, land security has been negatively influenced by political instability.

12.3.3 Impacts of soil degradation

In a spatial context, the overall progress of soil degradation is relatively slow in the Ethiopian Highlands; this has to do with the fact that even today only about 30% of the Highlands are cultivated, while the rest consists of fallow land, grassland and some forestland. On steep land that is currently cultivated, however, the rate of soil degradation is high in global terms. The bio-

physical impacts of soil erosion are both short- and long-term. In the short term, many rills develop on cultivated fields during the rainy seasons, which can damage crop seedlings. In the longer term, the cumulative effect of rill erosion has negative impacts on the soil, reducing soil depth, water-holding capacity, soil fertility and organic matter content or cation exchange capacity, which, in turn, leads to reduced vegetation growth and diminishes crop production. Furthermore, soil accumulation in valley bottoms and at the foot of slopes negatively affects agriculture there as well, and the sediments are prone to gully erosion. Many examples of these impacts have been documented both within the framework of the NCCR North-South programme (Amare Bantider 2007; Birru Yitafaru 2007; Gebeyaw Tilahun 2007; Hurni 2007) and in earlier studies (Hurni 1993; Solomon Abate 1994; Herweg and Stillhardt 1999; Gete Zeleke 2000).

The socio-economic impacts of soil erosion are also considerable, since decline in soil productivity leads to decreased yields (Belay Tegene 1990). This was the case particularly in the last century, during which the rural population of Ethiopia grew by a factor of 5–6 (Hurni et al, in preparation); together with increased pressure on the land and slow economic development, this led to widespread poverty. Increased land-use competition has been observed in the rural context at the expense of forestland and grassland, leading to problems with livestock feed and health, particularly among draught animals (Grünenfelder 2005; Amare Bantider 2007).

12.3.4 Farmers' responses to soil degradation

Responses by farmers to soil degradation have been minimal, as expected, despite the obvious cumulative effects of soil degradation and the threat of its acceleration in the second half of the 20th century. A number of known indigenous soil and water conservation technologies and management systems have been documented (Hurni 1984; Krüger et al 1997; Ludi 2002; Amare Bantider 2007; Birru Yitafaru 2007) and partially applied. However, their effectiveness, and particularly their overall extent, are estimated to be less than 10% of what would be needed to reduce soil erosion to tolerable levels (Hurni 1984). The main response to extreme soil degradation is that farmers stop cultivating the land and let it go fallow, in the hope that soil regeneration will take place at an accelerated rate. This process, however, is 10 to 100 times slower than the process of soil erosion (Hurni 1993); thus a 10–100 year fallow period would be needed for every year of cropping. Another strategy is to change land use from cropping to reforestation. For-

est plantations, however, require rural access roads for commercialisation; hence this strategy has been implemented only in places where distances to roads were small (Amare Bantider 2007).

12.4 Experiences with sustainable land management

Sustainable land management addresses land in its broader sense, i.e. including soil, water, vegetation and wildlife resources and their spatial contexts. Sustainable land management means that land is managed in such a way that future generations will be able to fulfil their needs just as the present generation can (WCED 1987). In this section, however, we will address only those aspects on which NCCR North-South research has focused since 2001: soil and water conservation, protected area management, and improved water management.

12.4.1 Soil and water conservation

The need for introducing soil and water conservation measures on agricultural land is an issue of concern not only to the international research and development communities, where the debate originated, but increasingly to Ethiopian scholars, experts, and even farmers (Endris Damtew 2006; Alemayehu Assefa 2007). While food-for-work schemes gradually expanded as of the late 1970s, there was a general lack of guidance regarding what technologies would be most appropriate, and what approaches most suitable (Erny 2004).

From a methodological point of view, it is important to develop further the models used to predict soil erosion processes and the effects of soil conservation technologies (Figure 4). Future models should enable predictions not only within but also outside the catchments where SCRP research sites are located. Additionally, systemic extrapolations can be made based on qualitative assessments (Hurni et al 2008) or by drawing synthetic conclusions (e.g. Hösli 2005; Hurni 2005, 2007). Guidelines for planning, designing and implementing appropriate technologies of soil and water management have been developed since the early 1980s; they were upgraded (e.g. Hurni, in press) and have been widely applied since then.

12.4.2 Protected area management

The NCCR North-South was engaged in one of the protected areas of Ethiopia in 2004, following up on studies carried out by Swiss and Ethiopian



Fig. 4
Development of bench terraces over a 20-year period from soil bunds that were implemented in 1983, leading to sustainable agricultural production even on this steep slope at the Maybar Soil Conservation Research Programme (SCRPR) Research Site in Wello. (Photo by Sabina Erny, 2003)

researchers since 1965. Eva Ludi and her team carried out a study in the Simen Mountains (Grünenfelder 2005; Hurni 2005; Bircher 2006; Schild 2006; Ludi 2007). This study was conducted 10 years after a comprehensive appraisal of sustainable development had been made in the area (Hurni and Ludi 2000). According to Hurni et al (2008), “institutional approaches have changed considerably since the establishment of the Simen Mountains National Park in 1969”. Prior to 1990 a top-down approach was used to park management; this sometimes led to violent conflicts. A more decentralised approach was introduced after the change of government in 1991, leading to more participation in management. At the time of writing the present synthesis, the government had prepared a proclamation to once again place the national parks under federal management. The Simen Mountains National Park, however, may continue to be administered by the regional authorities, as the national government acknowledges its successful management during the past 15 years.

12.4.3 Improved water management

The introduction of soil and water conservation measures in catchments is assumed to lead to improved water management regimes. Hurni et al (2005), in analysing their long-term test plot experiments, showed how land-use intensification and soil degradation had increased overall immediate surface

runoff and sediment concentration in rivers. Birru Yitaferu (2007) confirmed this trend observed in small catchments by providing evidence of increased total runoff in the Lake Tana Basin over the last few decades, despite no change in total annual rainfall. Schum (2004) showed that a small number of precipitation events in the rainy season lead to above-average erosion and account for a large portion of the sediment load. The time during which heavy precipitation occurs appears to be most decisive with respect to annual sediment load. Provided that sedimentation can be retarded, natural lakes could serve as sources of irrigation (Strebel 2007); their water tables may even be modified, as in the case of Lake Maybar in Wello (Strahm 2007), if conflicts over the use of the land and irrigation water can be negotiated and mitigated among stakeholders (Coendet 2007).

12.5 Research gaps and questions

12.5.1 Ongoing and emerging challenges

The challenges in developing rural Ethiopia lie in increasing productivity in all sectors in rural areas. As underlined by Hurni (2007), “sustainable land management must become the basis of agricultural activity on all land. Policies addressing rural–urban linkages, land tenure issues, and questions of demographic transition, as well as issues of education and health, can be particularly supportive in accelerating this change.” This would require a sectoral transition, with less dominance of agriculture and more development of the secondary and tertiary sectors. This would bear the potential of accelerating change, though probably not without generating social and public security problems, which would need to be given special attention. Demographic transition is an additional issue that needs to be taken into account; this transition may lead to new identities, “moving from association with traditional rural Ethiopia to association with a modern, interlinked rural–urban landscape” (Hurni 2007).

12.5.2 Research gaps

The following gaps in research appear most important with respect to the Ethiopian Highlands:

1. Locally effective direct and indirect drivers will have to be carefully accounted for in research. Furthermore, it will be important to observe how quickly the sectoral change in towns affects rural settings.

2. Global as well as more indirect drivers will increasingly affect sustainable development in Ethiopia. Climate change, particularly through changes in rainfall amounts and patterns and through temperature increases, will seriously affect agricultural production and ecology in both positive and negative terms that are still unknown. Globalisation in terms of trade, technology transfer and information exchange will become increasingly important and affect both urban and rural livelihoods – areas in which research has a key role to play.
3. A combination of local and global drivers will pose a most likely unprecedented challenge to the Ethiopian Highlands, for which traditional means of governance may not suffice.

Research capacity in Ethiopia is still relatively modest in view of these challenges; its development and appropriate focusing is most timely and important. A number of research questions are currently being addressed and will contribute to sustainable land management in the Ethiopian Highlands (see Box). Research partnerships between institutions in the North and in Ethiopia are a means by which new technologies and local knowledge can be shared in a way that each partner benefits from the relative competence of the other. Lessons to be learned will be pertinent not only in the Ethiopian context, but also for international stakeholders.

Box: Research questions relating to sustainable land management

- Soil and water conservation: what are the most suitable technologies and approaches for reducing soil erosion and other processes of land degradation to tolerable levels while enhancing the overall productivity of the land for sustainable rural development?
- Protected area management: what institutional mechanisms are most suitable for attaining the goals of conserving wildlife and wildlife habitats while mitigating existing or potential conflicts with local land users and other stakeholders interested in protected areas?
- Water management: what are the most suitable watershed development models that allow more intensive use of the water resources while taking account of climate and global change and fulfilling the needs of downstream users?
- Institutions and staffing: what is the most appropriate institution and staff development policy for proper natural resource management?

Endnotes

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References

Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- * Admasu Amare. 2005. *Study of Sediment Yield from the Watershed of Angereb Reservoir* [MSc thesis]. Alemaya, Ethiopia: Alemaya University. Also available at: http://www.cde.unibe.ch/University/TTD_Un.asp; accessed on 7 October 2009.
- * Alebachew Mamo. 2006. *Spatial and Temporal Variation of Soil Degradation under Different Land Use / Cover in the Eastern Escarpment of Wollo, Ethiopia: The Case of Golo-Tiso Catchment* [MSc thesis]. Mekele, Ethiopia: Mekele University. Also available at: http://www.cde.unibe.ch/University/TTD_Un.asp; accessed on 7 October 2009.
- * Alemayehu Assefa. 2007. *Impact of Terrace Development and Management on Soil Properties in Anjeni Area, West Gojam* [MSc thesis]. Addis Abeba, Ethiopia: Addis Abeba University. Also available at: http://www.cde.unibe.ch/University/TTD_Un.asp; accessed on 7 October 2009.
- Alemneh Dejene, Gete Zeleke, Solomon Abate, Lule M, editors. 2003. *Towards Sustainable Agriculture and Rural Development in the Ethiopian Highlands. Proceedings of the Technical Workshop on Improving the Natural Resources Base and Rural Well-being, Bahr Dar, Ethiopia, November 25–27, 2003*. Environment and Natural Resources Working Paper No. 18. Rome, Italy: Food and Agriculture Organization of the United Nations (FAO).
- * Amare Bantider. 2007. *Landscape Transformation and Opportunities for Sustainable Land Management along the Eastern Escarpment of Wollo (EEW), Ethiopia* [PhD dissertation]. Bern, Switzerland: University of Bern.
- Bard K, Coltorti M, Diblasi MC, Dramis F, Fattovich R. 2000. The environmental history of Tigray (Northern Ethiopia) in middle and late Holocene: A preliminary outline. *African Archaeological Review* 17(2):65–86.
- Belay Tegene. 1990. *Erosion: Its Effects on Properties and Productivity of Eutric Nitisols in Gununo Area, Southern Ethiopia and Some Techniques of Its Control* [PhD dissertation]. Bern, Switzerland: University of Bern.
- * Bircher K. 2006. *Wildtiere und ihre aktuellen and potentiellen Habitate im Osten des Simen Mountains National Park, Äthiopien* [MSc thesis]. Bern, Switzerland: University of Bern. Also available at: http://www.cde.unibe.ch/University/TTD_Un.asp; accessed on 7 October 2009.
- * Birru Yitaferu. 2007. *Land Degradation and Options for Sustainable Land Management in the Lake Tana Basin (LTB), Amhara Region, Ethiopia* [PhD dissertation]. Bern, Switzerland: University of Bern.
- * Coendet A. 2007. *Irrigation Development in the Lake Maybar Area, South Wollo, Ethiopia* [MA thesis]. Bern, Switzerland: University of Bern. Also available at: http://www.cde.unibe.ch/CDE/PubMed_Detail2_CD.asp?ID=1682; accessed on 26 November 2009.
- CSA [Central Statistical Agency of Ethiopia]. 2006. *Central Statistical Agency of Ethiopia*. Available at: <http://www.csa.gov.et>; accessed on 1 November 2006.
- Darbyshire I, Lamb H, Mohammed Umer. 2003. Forest clearance and regrowth in northern Ethiopia during the last 3000 years. *The Holocene* 13(4):537–546.
- Dessaiegn Rahmato. 2001. *Environmental Change and State Policy in Ethiopia: Lessons from Past Experiences*. Monograph Series 2. Addis Abeba, Ethiopia: Forum for Social Studies.
- Dessaiegn Rahmato. 2004. *Searching for Tenure Security? The Land System and New Policy Initiatives in Ethiopia*. Discussion Paper No. 12. Addis Abeba, Ethiopia: Forum for Social Studies.
- EHRIS [Ethiopian Highlands Reclamation Study]. 1986. *Ethiopia: Final Report*. Vol. 1. Rome, Italy: Food and Agriculture Organization of the United Nations (FAO).
- * Endris Damtew. 2006. *Comparative Financial Evaluation of Soil Conservation Measures in North Wollo: The Case of Golo River Catchment, Habru Wereda* [MSc thesis]. Alemaya, Ethiopia: Alemaya University. Also available at: http://www.cde.unibe.ch/University/TTD_Un.asp; accessed on 7 October 2009.

- * Erny S. 2004. *Long-term Effects of Soil Erosion and Soil Conservation Measures* [MSc thesis]. Basel, Switzerland: University of Basel.
- * Gebeyaw Tilahun. 2007. *Soil Fertility Status as Influenced by Different Land Uses in Maybar Areas of South Wello Zone, North Ethiopia* [MSc thesis]. Haramaya, Ethiopia: Haramaya University. Also available at: http://www.cde.unibe.ch/University/TTD_Un.asp; accessed on 7 October 2009.
- * Getachew Adugna. 2005. *Determinants of Land Degradation in the Lake Tana Basin and Its Implications for Sustainable Land Management: The Case of Angereb and Gishe Abbay Watersheds* [MSc thesis]. Haramaya, Ethiopia: Haramaya University. Also available at: http://www.cde.unibe.ch/University/TTD_Un.asp; accessed on 7 October 2009.
- Gete Zeleke. 2000. *Landscape Dynamics and Soil Erosion Process Modelling in the North-western Ethiopian Highlands*. African Studies Series A16. Bern, Switzerland: Geographica Bernensia.
- * Grünenfelder J. 2005. *Livestock in the Simen Mountains, Ethiopia: Its Role for the Livelihoods and Land Use of Local Smallholders* [MSc thesis]. Bern, Switzerland: University of Bern. Also available at: http://www.cde.unibe.ch/University/TTD_Un.asp; accessed on 7 October 2009.
- Herweg K, Stillhardt B. 1999. *The Variability of Soil Erosion in the Highlands of Ethiopia and Eritrea: Average and Extreme Erosion Patterns*. Soil Conservation Research Programme (SCRIP) Research Report No. 42. Addis Abeba, Ethiopia and Bern, Switzerland: Ministry of Agriculture and University of Bern.
- * Hösli C. 2005. *Visualisierung und Modellierung geographischer Daten von Äthiopien über Internet und Intranet zur Unterstützung von Planungs- und Entscheidungsfindungsprozessen* [MSc thesis]. Bern, Switzerland: University of Bern. Also available at: http://www.cde.unibe.ch/University/TTD_Un.asp; accessed on 7 October 2009.
- Holden S, Barrett CB, Fitsum Hagos. 2006. Food-for-work for poverty reduction and the promotion of sustainable land use: Can it work? *Environment and Development Economics* 11:15–38.
- Hurni H. 1979. Semien – Äthiopien: Methoden zur Erfassung der Bodenerosion. *Geomorphica* 4:151–182.
- Hurni H. 1982. *Soil Conservation Research Programme: Inception Report*. Bern, Switzerland and Tokyo, Japan: University of Bern and United Nations University.
- Hurni H. 1984. *Soil Conservation Research Programme: Third Progress Report (Year 1983)*. Bern, Switzerland and Tokyo, Japan: University of Bern and United Nations University.
- Hurni H. 1987. Erosion – productivity – conservation systems in Ethiopia. In: Pla Sentis I, editor. *Soil Conservation and Productivity*. Proceedings of the 4th International Soil Conservation Conference, Maracay, Venezuela, 3–9 November 1985. Maracay, Venezuela: Instituto de Edafologia, Universidad Central de Venezuela, pp 654–674.
- Hurni H. 1990. Degradation and conservation of soil resources in the Ethiopian Highlands. In: Messerli B, Hurni H, editors. *African Mountains and Highlands: Problems and Prospects*. Bern, Switzerland and Addis Abeba, Ethiopia: University of Bern and African Mountains Association.
- Hurni H. 1993. Land degradation, famine, and land resource scenarios in Ethiopia. In: Pimentel D, editor. *World Soil Erosion and Conservation*. Cambridge, UK: Cambridge University Press, pp 27–61.
- Hurni H. 1998. *Agroecological Belts of Ethiopia: Explanatory Notes on Three Maps at a Scale of 1:1,000,000*. Soil Conservation Research Programme (SCRIP) Research Report No. 43. Addis Abeba, Ethiopia and Bern, Switzerland: Ministry of Agriculture and Centre for Development and Environment (CDE).
- * Hurni H. 2005. *Decentralised Development in Remote Areas of the Simen Mountains, Ethiopia*. IP2 Working Paper No. 1. NCCR North-South Dialogue Series. Bern, Switzerland: Swiss National Centre of Competence in Research (NCCR) North-South. Also available at: http://www.nccr-north-south.unibe.ch/publications/Infosystem/On-line%20Dokumente/Upload/Decentralised%20Development%20Simen%20Ethiopia_Hurni%202005%281%29.pdf; accessed on 5 January 2010.

- * Hurni H. 2007. *Challenges for Sustainable Rural Development in Ethiopia*. Addis Abeba, Ethiopia: Faculty of Technology, Addis Abeba University.
- Hurni H. In press. *Soil and Water Conservation in Ethiopia: Guidelines for Development Agents*. 2nd edition [1986¹]. Addis Abeba, Ethiopia and Bern, Switzerland: Menschen für Menschen and Centre for Development and Environment (CDE).
- * Hurni H, Kebede Tato, Gete Zeleke. 2005. The implications of changes in population, land use, and land management for surface runoff in the Upper Nile Basin Area of Ethiopia. *Mountain Research and Development* 25(2):147–154.
- * Hurni H, Leykun Abune, Ludi E, Mulugeta Woubshet. 2008. The evolution of institutional approaches in the Simen Mountains National Park, Ethiopia. In: Galvin M, Haller T, editors. *People, Protected Areas and Global Change: Participatory Conservation in Latin America, Africa, Asia and Europe*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 3. Bern, Switzerland: Geographica Bernensia, pp 287–323.
- Hurni H, Ludi E. 2000. *Reconciling Conservation with Sustainable Development: A Participatory Study Inside and Around the Simen Mountains National Park, Ethiopia*. Bern, Switzerland: Centre for Development and Environment (CDE).
- * Hurni H, with contributing authors. In preparation. *Soil Erosion and Conservation in Ethiopia* [working title]. Book manuscript available from Hans Hurni.
- * Kaltenrieder J. 2007. *Adaptation and Validation of the Universal Soil Loss Equation (USLE) for the Ethiopian-Eritrean Highlands* [MSc thesis]. Bern, Switzerland: University of Bern. Also available at: http://www.cde.unibe.ch/University/TTD_Un.asp; accessed on 7 October 2009.
- Keeley J, Scoones I. 2000. Knowledge, power and politics: The environmental policy-making process in Ethiopia. *Journal of Modern African Studies* 38(1):89–120.
- Keeley J, Scoones I. 2003. *Understanding Environmental Policy Processes: Cases from Africa*. London, UK: Earthscan.
- * Kohler R. 2004. *The Status and Dynamics of Agricultural Production and Productivity in a Small Catchment Area in Anjeni* [MSc thesis]. Zurich, Switzerland: Swiss Federal Institute of Technology Zurich (ETHZ).
- Krüger HJ, Berhanu Fantew, Yohannes Gebre Michael, Kefeni Kejela. 1997. *Inventory of Indigenous Soil and Water Conservation Measures on Selected Sites in the Ethiopian Highlands*. Soil Conservation Research Programme (SCRIP) Research Report No. 34. Bern, Switzerland and Addis Abeba, Ethiopia: University of Bern and Ministry of Agriculture.
- * Loetscher M. 2004. *Long-term Dynamics of Agricultural Production and Productivity* [MSc thesis]. Zurich, Switzerland: Swiss Federal Institute of Technology Zurich (ETHZ).
- Ludi E. 1994. *Handlungsspielraum kleinbäuerlicher Familien und Handlungsstrategien zur Verbesserung ihrer Lebenssituation. Ein Fallbeispiel aus Anjeni, Äthiopien* [MSc thesis]. Bern, Switzerland: University of Bern.
- Ludi E. 2002. *Economic Analysis of Soil Conservation: Case Studies from the Highlands of Amhara Region, Ethiopia* [PhD dissertation]. African Studies Series A18. Bern, Switzerland: University of Bern, Geographica Bernensia.
- * Ludi E. 2007. *Simen Mountains Study 2004: Intermediate Report on the 2004 Field Expedition to the Simen Mountains in Northern Ethiopia*. 2nd edition [2005¹]. NCCR North-South Dialogue No. 6. Bern, Switzerland: Swiss National Centre of Competence in Research (NCCR) North-South.
- MA [Millennium Ecosystem Assessment]. 2005. *Ecosystems and Human Well-being: Synthesis*. Washington, D.C.: Island Press.
- Nyssen J, Mitiku Haile, Moeyersons J, Poesen J, Deckers J. 2004a. Environmental policy in Ethiopia: A rejoinder to Keeley and Scoones. *Journal of Modern African Studies* 42(1):137–147.
- Nyssen J, Poesen J, Mitiku Haile, Moeyersons J, Deckers J, Hurni H. 2009. Effects of land use and land cover on sheet and rill erosion rates in the Tigray Highlands, Ethiopia. *Zeitschrift für Geomorphologie* 53(2):171–197. doi:10.1127/0372-8854/2009/0053-0171
- Nyssen J, Poesen J, Moeyersons J, Deckers J, Mitiku Haile, Lang A. 2004b. Human impact on the environment in the Ethiopian and Eritrean highlands – a state of the art. *Earth-Science Reviews* 64(3–4):273–320.

- Ritler A. 2001. *Wald, Landnutzung und Landschaft im zentralen und nördlichen Äthiopien 1865–1930* [PhD dissertation]. Bern, Switzerland: University of Bern.
- * Rüeeggsegger M. 2008. *Kaffeeanbau in Äthiopien unter verschiedenen Klimaszenarien* [MSc thesis]. Bern, Switzerland: University of Bern. Also available at: http://www.cde.unibe.ch/University/TTD_Un.asp; accessed on 7 October 2009.
- * Schild R. 2006. *Wald und Waldmanagement im und um den Simen Mountains National Park, Äthiopien* [MSc thesis]. Bern, Switzerland: University of Bern. Also available at: http://www.cde.unibe.ch/CDE/PubMed_Detail2_Cd.asp?ID=1681; accessed on 5 January 2010.
- * Schum C. 2004. *Modelling River Discharge and Sediment Yield in a Small Catchment in the Highlands of Ethiopia: An Application of the Model Erosion 3D in Anjeni (Gojam) Using a Multi-annual Data Series* [MSc thesis]. Bern, Switzerland: University of Bern. Also available at: http://www.cde.unibe.ch/University/TTD_Un.asp; accessed on 7 October 2009.
- SCRIP [Soil Conservation Research Programme]. 2000. *Soil Erosion and Conservation Database 7*. Reports on the 7 research stations. Bern, Switzerland and Addis Abeba, Ethiopia: Centre for Development and Environment (CDE) and Ministry of Agriculture.
- Solomon Abate. 1994. *Land Use Dynamics, Soil Degradation and Potential for Sustainable Use in Metu Area, Illubabor Region, Ethiopia*. African Studies Series A13. Bern, Switzerland: Geographica Bernensia.
- * Solomon Abebe. 2005. *Land-use and Land-cover Change in Headstream of Abbay Watershed, Blue Nile Basin, Ethiopia* [MSc thesis]. Addis Abeba, Ethiopia: University of Addis Abeba. Also available at: http://www.cde.unibe.ch/University/TTD_Un.asp; accessed on 7 October 2009.
- * Strahm I. 2007. *Modelling Hydrology and Sedimentation in the Lake Maybar Area, Wello, Ethiopia* [MSc thesis]. Bern, Switzerland: University of Bern. Also available at: http://www.cde.unibe.ch/University/TTD_Un.asp; accessed on 7 October 2009.
- * Strebel A. 2007. *Sedimentation Processes in the Assabol Watershed in North Ethiopia: Hydrogeomorphology of the Sediments Filling the Reservoir and Resulting Techniques of Reservoir Management* [MSc thesis]. Bern, Switzerland: University of Bern. Also available at: http://www.cde.unibe.ch/CDE/PubMed_Detail2_Cd.asp?ID=1680; accessed on 5 January 2010.
- WCED [World Commission on Environment and Development]. 1987. *Our Common Future*. Oxford, UK: Oxford University Press. Also available at: <http://www.un-documents.net/wced-ocf.htm>; accessed on 19 August 2009.
- Webb P, Kumar S. 1995. Food and cash for work in Ethiopia: Experiences during famine and macroeconomic reform. In: Webb P, Kumar S, editors. *Employment for Poverty Reduction and Food Security*. Washington, D.C.: International Food Policy Research Institute.
- Wischmeier WH, Smith DD. 1978. *Predicting Rainfall Erosion Losses: A Guide to Conservation Planning*. Agriculture Handbook No. 537. Washington, D.C.: United States Department of Agriculture.
- * Yacob Arsano, Berhanu Debele, Ludi E, Seyoum Gebre Selassie. 2004. JACS Horn of Africa: Managing resources and disputes in uncertain environments. In: Hurni H, Wiesmann U, Schertenleib R, editors. *Research for Mitigating Syndromes of Global Change: A Transdisciplinary Appraisal of Selected Regions of the World to Prepare Development-oriented Research Partnerships*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 1. Bern, Switzerland: Geographica Bernensia, pp 141–182.
- Yeraswork Admassu. 1995. *Twenty Years to Nowhere: Property Rights, Land Management and Conservation in Ethiopia* [PhD dissertation]. Uppsala, Sweden: Uppsala University.

Part IV

Coping with Change: Understanding Transformation Processes in Central Asia





13 Adapting Research in a Complex Highland–Lowland Context in Transition

Daniel Maselli¹ and Nazgulmira Arynova²

13.1 The long shadow of the past

For centuries, if not millennia, large parts of contemporary Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan were home to nomadic people who moved with their animals according to seasonal fluctuations, climatic conditions, and corresponding fodder availability. Clan structures developed, and mechanisms of spatio-temporal land use were reflected in regulatory institutions. With the emergence of Tsarist Russia in the 19th century, this traditional system underwent an initial major change as new permanent settlements were founded in fertile lowlands, such as the Chuy Valley, which had previously been used as winter pastures. New agricultural practices based on extension of gravity-driven irrigation systems were introduced.

Land use broadened drastically in scope and intensified when, in the early 1920s, the Soviet Union took control of the region, creating the Tajik Autonomous Soviet Socialist Republic and the Uzbek Soviet Socialist Republic (both in 1924), and two years later the Kyrgyz Autonomous Soviet Socialist Republic, in order to expand its sphere of influence and action. The cultivated area and the number of livestock gradually multiplied owing to large-scale infrastructure development, resulting in increased productivity but also heavy pressure on natural resources.

The movement of animals traditionally followed seasonal rhythms, and livestock numbers were regulated by fodder shortages such as the well-known winter bottleneck. Nevertheless, the construction of access roads to summer pastures, transport of large numbers of animals by truck, and the provision of huge amounts of winter hay brought by train from neighbouring countries, particularly Kazakhstan, allowed for a substantial intensification of livestock rearing. This was complemented by veterinary, breeding and animal processing services as well as by large-scale fertilising and weed control mechanisms using airplanes in mountainous terrain. A large number

of animal barns were constructed above the valley bottoms, which kept the livestock away from intensively used agricultural fields in the lower and flatter areas.

This externally driven, highly mechanised and subsidised land-use system collapsed when the Soviet Union disintegrated in 1990 (Luong 2004). Russia's withdrawal also led to the breakdown of many highly specialised industrial production units, leaving people without an income. Given the natural conditions in Kyrgyzstan and Tajikistan, where more than 90% of the territory is covered by mountains, the population had to revert to self-subsistence, relying mainly on pastoral resources and small-scale agriculture and horticulture. However, the previous large-scale, top-down and technocratic orientation of both agriculture and livestock production during the Soviet period had tapped land and water resources in a way that made adaptation for individual livelihoods extremely difficult, for example with regard to the over-dimensioned water distribution infrastructure that was now no longer maintained, or the sophisticated livestock transport and feeding system described above. On top of this, challenges posed by global change, such as trade regulations for import and export of agricultural products, affect difficult transition processes (Figure 1); this is also a factor that needs to be taken into account when trying to understand processes of change, what triggers them, and possible solutions to problems in this highly dynamic and unstable region of the world.

Since independence in 1991, society at large as well as governmental and administrative structures have had to adapt to a completely new situation (Luong 2004). This led to an only partly controlled and rather complex set of reactions and adaptations, where traditional and new institutions, along with a political vacuum, emerged simultaneously. The collapse of support mechanisms – in particular for the industrial and agricultural sectors and for service sectors such as health and education – and the discontinuation of infrastructure construction brought about an era of total decline, with productivity in all sectors nearly coming to a complete halt. The struggle for mere survival caused many families to revert to subsistence farming, although they had little agricultural knowledge and experience and few tools. The repatriation of former Soviet inhabitants to their home country, Russia, added to the loss of both know-how and do-how. It took the former Soviet republics some time to recover from this shock and start developing appropriate new structures oriented towards a sustainable future in a now market-driven context (Dukenbaev and Hansen 2003).



Fig. 1
The importance of trade in Central Asia has been increasing over the past decade. This concerns domestic trade as well as trade among Central Asian states and beyond, in particular trade with China and Russia. (Photo by Daniel Maselli)

While this led to improvement with respect to previous over-utilisation of land resources in certain areas, it increased pressure in other areas, particularly on pastures near villages, because people could no longer afford transportation to the high summer pastures and had lost the habit of transporting animals there. Generally, people were confronted with a range of ‘existential’ questions, and uncertainty reigned. In this context, the research conducted in the framework of the Swiss National Centre of Competence in Research (NCCR) North-South sought to help find meaningful responses to some of the burning issues related in particular to sustainable land management.

13.2 Burning issues and a shift in paradigm

Before the first NCCR North-South PhD and Master’s studies were launched in the Joint Area of Case Studies (JACS)³ Central Asia (CAS), the major problems and potentials were assessed jointly with external and internal specialists. Most key issues identified were directly related to more sustainable use and management of natural resources: How could large-scale water management systems be adapted to small-scale farming? How could over-used pastures be rehabilitated and animal movements re-adapted to seasonal fluctuations of vegetation? How could land degradation be reduced and

soil conservation and fertility improved? Eventually, three guiding themes emerged towards the end of Phase 2 of the NCCR North-South programme: 1) *Water Management and Agriculture*; 2) *Pasture Management and Livestock*; and 3) *Livelihoods and Institutional Development*.

Initially, however, the work of the highly specialised scientists and academic institutions involved remained more or less detached from ‘field reality’; their research was based mainly on earlier Russian literature, as they were not used to collecting genuine primary data through field research. State-of-the-art Western approaches, methodologies and concepts required time to be absorbed and called for a profound shift in paradigm among local scientific partners as well as openness and a readiness to understand the local framework among the Swiss partners. Mutual administrative and procedural requirements and individual academic habits and mindsets posed further obstacles. Eventually, however, the partners succeeded in blending the two research traditions.

Against this background, a pragmatic approach was adopted to launching research activities in Kyrgyzstan and Tajikistan. Acknowledging the general lack of financial resources among academic and research institutions, as well as the dramatic exodus of former Russian faculty members, research activities were designed to compensate for these losses and to allow for adaptation to new scientific orientations as well as for a major shift in paradigm. Efforts had to be combined and synergies created, leading to linkage between several PhD and related Master’s studies (Figure 2) and allowing for shared coaching of students involving local professors from different backgrounds and corresponding Swiss partners. Joint training and regular field missions improved mutual understanding of people’s real problems, generated appropriate research methods, and led to expected scientific results; ultimately, these common activities made it possible to meet NCCR North-South standards and to respect the requirements of local academic host universities.

13.3 New primary field data and capacity strengthening

The jointly designed studies offered opportunities for fieldwork, generating considerable novel data, often from comparative case studies. This major output helped to enhance understanding of local dynamics and raise interest and participation in research activities among the local population and

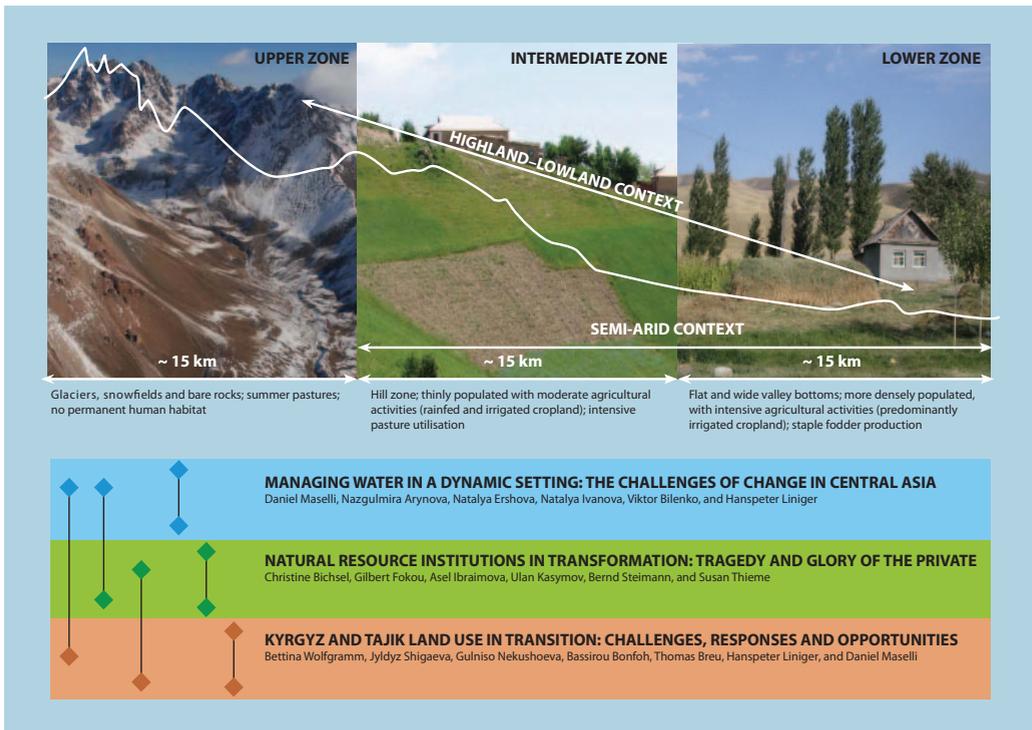


Fig. 2
Conceptual framework for an integrative approach in initial PhD and Master's studies in the Joint Area of Case Studies (JACS) Central Asia (CAS).
(Diagram and photos by Daniel Maselli and Bettina Wolfgramm, 2003, modified in 2009)

authorities. It also led to a blending of local/traditional and scientific knowledge. The studies helped to strengthen individual and institutional capacities as well as to widen partner networks and intensify collaboration. Presentations and discussions of results at village workshops, and the organisation of 'Open Days' for policy- and decision-makers also enabled validation of and capitalisation on research. Thanks to the primary data gathered, JACS CAS researchers were invited to participate in regional and international events and processes. This provided excellent opportunities for them to share their improved understanding of integrated water and land management, climate change, pasture utilisation and migration, and to increase the visibility of the programme.

13.4 Combined research foci for increased societal relevance

The implementation of transversal projects on migration, human security and pastoral production systems promoted more integrated approaches and innovative ways of producing and communicating research results. Documentary movies such as “The Other Silk Road” and “Voices from the Hills and Valleys” actively involved directly concerned stakeholders and disseminated important messages to a wider public, while stimulating lively debates with an impact on the views and the knowledge of people and decision-makers.

Similarly, the creation of a herders’ newspaper and radio programme in Kyrgyzstan generated highly positive reactions from rural inhabitants now receiving relevant information in their native language, and gave different target groups a voice for raising issues and concerns, commenting on political decisions, and publicising their own ideas and visions. This instrument has promoted strengthening of self-assurance and ownership among rural

Table 1

PAMS	Location and duration	Main outcomes
Cleaning and Reconstruction of Drainage Network on the Fields of Pervomaisky Village Council	August – September 2003, Sokuluk Rayon, Kyrgyzstan	This project made it possible for employees of the KOSS agricultural cooperative and several smaller farms to use the arable land on the territory of Pervomaisky Village Council. 205 ha of irrigated land – 178 ha belonging to KOSS, 37 ha to other farms – were improved. Salinity of the land decreased, improving the soil and enhancing the productivity of agricultural crops.
Cotton Growing Under Plastic Cover in Khorezm Region	February – November 2003, Khorezm Oblast, Uzbekistan	The newly introduced technology of growing cotton under oilcloth decreased water consumption by 30%, reduced the cotton seeds’ germination period by 5–6 days, improved the process of cotton development, lowered consumption of herbicides, and increased cotton yields.
Producing High-quality Kitchen-herb Seeds and Greengrocer’s Crops	March – December 2003, Issyk-Kul Oblast, Naryn Oblast and Bishkek, Kyrgyzstan	Local production of high-quality kitchen-herb and lettuce seeds was established; 1 agronomist and 5 jobless people were trained in producing and harvesting seeds. 7 lecture-excursions and 4 training events on growing technologies, procurement and storage of kitchen herbs and lettuce were held for 170 people from various stakeholder groups in 3 regions of Kyrgyzstan.
Description and Popularisation of Soil and Water Conservation (SWC) Technologies and Approaches on Farms of the Republic of Kazakhstan	September 2003 – August 2004, Kazakhstan	A database of farms in the Republic of Kazakhstan with existing land management problems was created, followed by a database of 45 SWC technologies applied in Kazakhstan. This was used to disseminate SWC technologies among farms. Documentations on 6 technologies and 5 approaches used in Kazakhstan were submitted to the World Overview of Conservation Approaches and Technologies (WOCAT).

Fish Protection in Mountain River Water Intake Structures for Irrigation and Power Production	July 2004 – August 2005, Sokuluk Rayon, Kyrgyzstan	Construction and demonstration of a fish protection system on Sokuluk River stopped the continuous decrease in the fish population, thus contributing to biodiversity restoration in the basin. The fish protection system was successfully replicated and installed on Djuuku River in Issyk-Kul Oblast, and patented in 2006. 3 scientific articles were published in local journals.
Rehabilitation of Soil and Vegetation on Desert Pastures of Aidarly Village for Sustainable Development of Rural Community	January – December 2005, Almaty Oblast, Kazakhstan	Implementation of a new pasture use strategy helped to solve problems of biodiversity rehabilitation, improve fodder reserves, conserve soil fertility, and stabilise ecological conditions, thus improving the living conditions of local rural communities. Following this strategy based on shifting pasture sites and on recommended animal grazing rates and plant alienation ratio also helped to achieve a certain cost-effectiveness.
Integrated Natural Resources Management for Poverty Reduction in Mountain Areas	April 2004 – October 2007, Zeravshan Valley, Tajikistan	Implementation of SWC measures reduced soil erosion on rainfed and irrigated cropland. Field trainings for farmers on SWC technologies were conducted. Newly released local varieties of seeds were purchased and tested during the winter of 2005/2006; 10 farmers were trained in plant nutrition management. The project contributed to a publication by WOCAT in 2006.
Pastoral Information System for Kyrgyzstan	March 2008 – July 2009, Kyrgyzstan	The newspaper “Aiyl Ajary” was registered and its editorial board established; personnel was trained and a multi-media studio set up. The newspaper is published monthly at a print run of 5000 copies, which are distributed free of charge; printing costs are largely covered through advertising. In addition, the studio produces a regular weekly radio programme and has also produced 2 TV broadcasts.

communities in Kyrgyzstan. It is likely to be replicated in Tajikistan with the help of local actors, as similar societal needs exist there and responses were very positive and enthusiastic. This project was one of several innovative Partnership Actions for Mitigating Syndromes (PAMS)⁴ carried out in Central Asia (Table 1).

For the PhD and Master’s students involved, as well as for local supervisors, an interesting mix of novel combined approaches and methodologies was introduced, culminating in jointly published peer-reviewed articles. Findings such as those concerning the anticipated impact of accelerated glacier melting on river flow and irrigation (see Chapter 14 in the present volume) were presented at various regional and international conferences and to the local population. Awareness of the problems of climate change and its likely impact on farmers has increased as a result of this type of research and its dissemination. Similarly, the problem of pasture degradation was tackled jointly with the herders concerned – the future custodians of these vast resources (see Chapter 15 in the present volume). Migrants were directly involved in analysing the pitfalls and dangers of long-distance migration

Main outcomes of the Partnership Actions for Mitigating Syndromes (PAMS) implemented in Central Asia during Phases 1 and 2 of the Swiss National Centre of Competence in Research (NCCR) North-South programme.

(see Chapter 16 in the present volume). This active involvement of target group representatives meant a major shift in paradigm for the local students and supervisors, which has contributed to a different way of addressing everyday societal issues.

13.5 Pathways for future research

The leading themes for Phase 3 reflect an intention to emphasise analysis of interlinkages between natural resources, people, and the governing institutional arrangements. This approach will help to find appropriate pathways to develop useful tools for reacting and effectively adapting to rapid changes. Studies will address burning issues such as climate change, its impact on livelihoods, and the necessary individual and collective adaptation and mitigation responses (Figure 3). This should then be complemented by and embedded into new regulatory frameworks to secure sustainable use of natural resources. In this sense research related to pasture and livestock management will be extended to Tajikistan in order to fill a gap and respond to the needs and requests of the local population.

Fig. 3
Nomadic life still plays an important role for Central Asia's people; however, it is unclear whether future generations can identify with this form of life given the hardships that characterise it. (Photo by Daniel Maselli)



Thanks to a new strategic partnership with the University of Central Asia (UCA), future research will be carried out involving relevant development actors such as the Aga Khan Foundation and the Aga Khan Development Network (AKDN). Research will be more closely linked to development partners and existing relevant programmes such as the Mountain Societies Development Support Program in Tajikistan, and research findings will benefit the target communities more directly. Further research will be conducted within the projects entitled “Migration and development revisited”, “Sustainable land management systems for enhancing food security and mitigating climate change”, and “Dynamic socio-ecological conditions, resource scarcity and adaptation to climate change”.

13.6 Communicating with societal actors

So far, effective communication of research specialists with both policy- and decision-makers as well as with society at large has been rather poor. This gap has already been addressed by a policy brief on migration, a fact sheet on brucellosis, and an ‘Open Day’ on pasture and livestock management produced and organised by the NCCR North-South.

In order to further increase the relevance and impact of research, it is important to create new instruments for exchanging ideas and information among different societal actors. A broader dialogue will be promoted through regional conferences addressing issues such as land-use change and livelihood adaptations or climate change and migration (Figure 4). A first regional workshop on brucellosis took place in 2008 involving participants from Kazakhstan, Tajikistan, Uzbekistan and Mongolia. The development and implementation of novel action research projects will lead to a new ‘meta-disciplinary approach’ involving policy and economic actors and paving the way for regular exchange fora. Results and findings will be disseminated using all appropriate instruments of the mass media.

13.7 Joining hands with national, regional and global partners

Based on existing partner networks and using new opportunities, strategic collaborations will be developed. The creation of a new research centre and a Central Asian Mountain Monitoring Network (CAMMoN) by UCA will



Fig. 4
A meeting among
the villagers of
Sogment, Kyr-
gyzstan, to dis-
cuss their next
steps in an escalat-
ing conflict over
water resources.
(Photo by
Christine Bichsel)

involve a variety of national, regional and international actors and promote collaboration among governmental and non-governmental entities. CAM-MoN will ensure long-term assessment of relevant parameters for understanding processes of change and provide valuable information for policy- and decision-making, education, training, research, analysis, publications, development interventions, global comparisons, etc. The open access nature of data storage is expected to become a landmark for information sharing in transboundary settings. The research centre will offer opportunities to enhance regional collaboration, and will act as an umbrella institution for new regional initiatives and programmes such as the Central Asian Countries Initiative for Land Management (CACILM) or projects funded through the Global Environmental Facility (GEF). This will also help to strengthen collaboration with the International Centre for Integrated Mountain Development (ICIMOD), thus establishing closer relationships with the neighbouring Hindukush, Karakorum and Himalayan mountain systems. At the global level, active participation in worldwide networks such as Mountain Forum or Mountain Partnership are opportunities to better link Central Asia with global discourse on sustainable mountain development, to facilitate exchange of experiences, and to promote collaboration, with the ultimate goal of improving people's livelihoods.

Endnotes

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³ The NCCR North-South is based on research partnerships with researchers and research institutions in the South and East. These partnership regions are called JACS (Joint Areas of Case Studies). Regional Coordination Offices (RCOs) were established in each of these JACS at the outset of the programme. The original function of the RCOs was to coordinate research; in the third phase of the programme, RCOs will consolidate the existing research network in the South and will become hubs for generating new research projects and partnerships.

⁴ Partnership Actions for Mitigating Syndromes (PAMS) are projects implemented by local actors together with scientific and non-scientific stakeholders. As a component of the NCCR North-South programme they are designed to implement and validate approaches, methods and tools developed in research, with a view to finding promising strategies and potentials for sustainable development. Moreover, they are intended to promote mutual learning and knowledge-sharing between academic and non-academic partners in sustainable development.

References

- Dukenbaev A, Hansen WW. 2003. *Understanding Politics in Kyrgyzstan*. DEMSTAR Research Report 16. Aarhus, Denmark: DEMSTAR [Democracy, the State, and Administrative Reforms] programme, University of Aarhus. Available at: <http://www.demstar.dk/papers/UPKyrgyzstan.pdf>; accessed on 25 August 2009.
- Luong PJ, editor. 2004. *The Transformation of Central Asia: States and Societies from Soviet Rule to Independence*. Ithaca, NY: Cornell University Press.

14 **Managing Water in a Dynamic Setting: The Challenges of Change in Central Asia**

Daniel Maselli¹, Nazgulmira Arynova², Natalya Ershova³, Natalya Ivanova⁴, Viktor Bilenko⁵, and Hanspeter Liniger⁶

Abstract

This paper summarises research activities related to water and water management carried out mainly in Kyrgyzstan and Tajikistan between 2002 and 2008, and anchors them in a broader regional water management context. Results show that climate change and socio-political transformation processes have heavy impacts on the condition of natural resources as well as on people's livelihoods. While rapid glacier retreat is providing more water for agriculture, river flow modelling suggests a forward shift of the main water discharge from the end of July to June. This may lead to more acute water shortages in the lowlands towards the end of the summer period. Dilapidated irrigation infrastructure, institutional failures, and inappropriate use of water by inexperienced farmers are the main reasons why less than 30% of the water reaches its final destination. The rapid proliferation of Water Users' Associations is an attempt to address these issues, while external actors try to influence water policies and actions at a larger scale.

Keywords: Water management; irrigation; Water Users' Association; transformation economy; climate change; Kyrgyzstan; Tajikistan; Central Asia.

14.1 Water management during the Soviet era and after independence

14.1.1 Water – an eternally pivotal resource in Central Asia

Water has always played and will continue to play a crucial role in Central Asia, particularly in irrigated agriculture and energy production (Molden and de Fraiture 2004). Traditional irrigation practices in the region date back more than three millennia. In Tajikistan, 93% of the total freshwater withdrawn is used for agriculture, but only 83% of it reaches the fields (UNEP/GRID 2002). The total area of irrigated land in the region has increased steadily, almost tripling during the 20th century, and now totals more than ten million ha (Bilik 1990). This tremendous increase is mainly due to the introduction and construction of large-scale irrigation schemes in favourable locations such as the Ferghana and Chuy valleys (Sobolin 1990). During this period water was understood to be a resource provided free of charge by authorities to collective farms and state farms, i.e. *kolkhozes* and *sovkhozes*. In general, water consumption is increasing steadily in the region. In Tajikistan it has increased by 40% over the last thirty years; currently 74% of the water consumed is used in agriculture, with an average consumption of 14–16 m³ per ha. This high amount could be reduced by up to 25% through more efficient irrigation methods (UNEP/GRID 2000).

14.1.2 Tapping land resources through irrigation infrastructure

During the Soviet era huge investments were made to develop the water sector, including water sanitation, irrigation and energy-generating infrastructure for local and regional needs (Mamatkanov et al 2006). While engineers created large-scale irrigation schemes such as channels and reservoirs, agricultural specialists elaborated specific sowing plans and irrigation norms on a technocratic basis, adapted to local climatic conditions and river flow regimes (Bilik 1990). In Tajikistan and Uzbekistan, the Soviet policy of acquiring a leading position in the world cotton market led to the cultivation of vast arid and semi-arid lowland areas, requiring huge amounts of irrigation water (Schaap et al 2004). This precious resource was abstracted from the Amudarya and the Syrdarya, the two major rivers flowing to the Aral Sea. Ultimately this led to the Aral Sea tragedy (Martius et al 2005; Pala 2005). The vast water resources of the Tajik Pamirs and the Kyrgyz Tien-Shan mountains were identified as having a huge hydro-electric potential.

Accordingly, large-scale power stations and water dams were constructed (Mamatkanov 2000). Water resources were managed through a range of independent institutions (Vinogradov and Langford 2001).

14.1.3 Losing the Soviet heritage

The rapid political, economic and social transformations that took place after 1991 had considerable negative impacts on water management, including already initiated as well as planned construction projects. The functioning of the institutions responsible for water management was affected, too. In agriculture, this led to a rapid and significant deterioration of irrigation infrastructure and a considerable decrease in productivity (Figure 1). Similar problems arose in relation to hydropower, drinking water supply, and sanitation. The shortage of energy led to an energy crisis with frequent power cuts in Tajikistan and Kyrgyzstan, resulting in considerable economic losses. In Tajikistan alone, the winter of 2007/08 saw damage and general loss of revenues estimated at USD 850 million (Rabejanova 2008). Economic losses have also occurred due to the reduction of cultivated irrigated land. In Kyrgyzstan this decrease was almost 13% between 1994 and 1999 (Schaap et al 2004). This heavily affected the country's overall economy and hence the living conditions of the population. In Tajikistan the civil war of 1992–1997 further aggravated the situation.

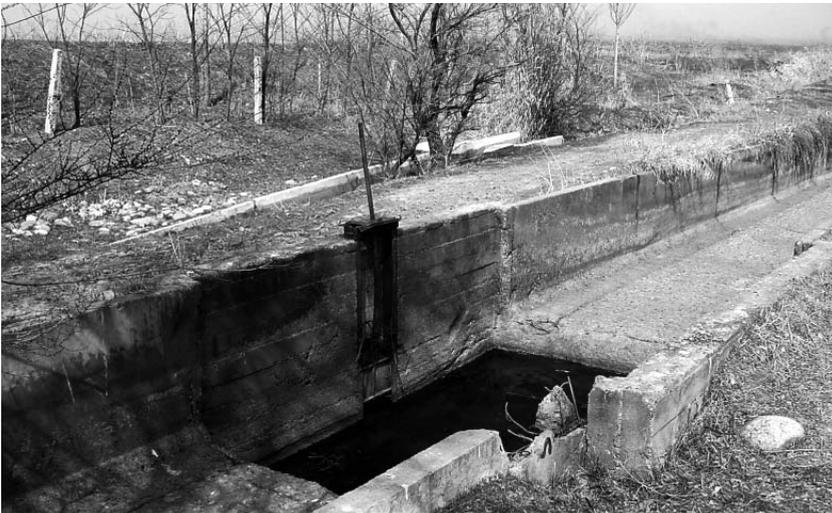


Fig. 1
Widespread broken water distribution devices hinder effective water management in the Chuy Valley. (Photo by Daniel Maselli, Sokuluk Rayon, 21 March 2003)

The dissolving of the *kolkhozes* and *sovkhozes*, combined with land reforms, led to the establishment of many small private farms in Kyrgyzstan and created both winners and losers (Shigaeva et al 2007). The fragmentation of large-scale production units had a deep impact on needs and requirements related to irrigation. The previous large-scale infrastructure was especially designed to provide water in accordance with determined crop norms on large areas up to 7000 ha. This system is no longer appropriate for many small-scale farmers and the diverse agricultural production in which they engage on plots of only 0.1 to 5 ha. While some agricultural fields receive too much water, others remain dry or receive water at too infrequent intervals. In this situation, both the previous technical irrigation infrastructure and the related Soviet water management system became obsolete (Spoor 1995). In Tajikistan, the dilapidation of the national electricity grid forced people to seek alternatives – cutting timber or using remnant forests, sparse trees, and wild bushes such as *teresken*. Wherever possible, micro-hydropower stations were constructed using any spare parts from previous mechanical installations (Hoeck et al 2007).

Since 1991 the governments of Central Asian countries have scaled down the agencies that formerly controlled irrigation and drainage infrastructure. Expenditures for operation and management in Kazakhstan dropped by a factor of 21 during the 1990s and only 31% of the required maintenance in the Kyrgyz Republic received funding (Bucknall et al 2003). The figures are similar for Tajikistan (UNDP 2003). The rapid and dramatic deterioration of infrastructure and services after independence raised questions about future institutional responsibility for rehabilitation and about payment for water and water delivery services (Schaap et al 2004; Herrfahrtdt et al 2006). The costs for rehabilitation of on-farm irrigation network operation systems were estimated at USD 100 per ha in 2000 (Wegerich 2000) and are likely to be higher now. As elsewhere, one of the key problems in the sustainable management of scarce water is the unavailability of reliable data on water supply and withdrawals and their seasonal fluctuations. During the Soviet era a well-developed hydro-meteorological measuring and monitoring system was established which later collapsed, leaving water users and water management bodies without up-to-date information.

14.1.4 Managing the new situation

The international community – in particular the World Bank (WB), the Asian Development Bank (ADB) and the United Nations Development Programme (UNDP) – reacted by promoting policies of decentralisation and democratisation. At farm and household level, two types of problems appeared: a technical one due to the mismatch in infrastructure, and a managerial one related to lack of experience. Many household heads were forced to become farmers in order to secure family subsistence, whereas their previous professional activity had had nothing to do with agriculture. Inappropriate use of water due to a misconception (“the more, the better”) caused salinisation and waterlogging, leading to reduced soil fertility and reduced agricultural productivity.

One adaptive reaction promoted by the most important international actors was the establishment of Water Users’ Associations (WUAs). This form of organisation among household farms was meant to enable better distribution of water resources at the plot level. In Kyrgyzstan, in 2000 WUAs already managed about one quarter of the total irrigated area, amounting to 232,800 ha. In 2003, 300 additional WUAs raised this figure to 450,000 ha, amounting to about 40% of the total irrigated area (Schaap et al 2004). The reasons for creating a WUA appear to be rather diverse, ranging from the expectation of obtaining infrastructural improvement and equipment to the hope of solving immediate irrigation needs; meanwhile, specific training is being provided by external actors (Johnson and Stoutjesdijk 2008). At the national level, governments also tried to respond (see section 14.3.1 below). The Kyrgyz Government has taken further action to address poverty, especially in rural areas, by starting to implement the second phase of the “Water and Land Reform” programme, which aims to stabilise the economy and increase living standards (Herrfahrdt et al 2006). Bilateral donors such as the Swiss Agency for Development and Cooperation (SDC) tried to respond to needs with a water strategy and development projects (“Integrated Water Resources Management in the Ferghana Valley”, see Krähenbühl et al 2002). However, not all of these reform efforts have yielded the expected results, as widespread corruption hampers effective support, especially for the poorest. Access to the most productive land and to sufficient water often remains a privilege for those who have good relationships with the responsible authorities as well as political influence.

14.2 State of research and methodological approach

14.2.1 Current status

At the country level, more recent research on water management in Central Asia has focused mainly on institutional aspects (e.g. Micklin 2000; Ul-Hasan et al 2004), while bio-physical baseline conditions and technical aspects are frequently neglected. A similar situation occurs in development, where bio-physical aspects are also often not taken into consideration, as in the World Bank's "On-Farm Irrigation" project. More efforts are being made to gain a better understanding of climate change and its possible impacts on water in Central Asia (IPCC 2007; Perelet 2007) and to address transboundary water management issues (Moerlins et al 2008). In general, issues related to water are receiving increased attention at the global level, e.g. in the Human Development Report 2006, which is devoted to the global water crisis (UNDP 2006), and the 5th World Water Forum in Istanbul (March 2009).

14.2.2 General set-up and 'one watershed approach'

Research on water management in Central Asia carried out within the framework of the Swiss National Centre of Competence in Research (NCCR) North-South programme addressed three main questions: How is water used and managed, and where are the technical, socio-economic, institutional and legal bottlenecks? How does climate change impact on river flow and agriculture? How do livelihood strategies impact on natural resource use and management? For strategic reasons, five PhD and nine MSc studies were concentrated in one watershed (Sokuluk River) in Kyrgyzstan, in order to take advantage of synergies and facilitate collective coaching and collaboration. The five PhD studies were conducted by Natalya Ershova on river flow and climate change; Bakyt Askaraliev on water use and management; Justus Gallati on participatory system dynamics; Jyldyz Shigaeva on livelihood strategies and the environment; and Asel Ibraimova on social mobilisation and the legal framework. These studies were complemented by additional PhD-level studies on governance and conflicts in water use in southern Kyrgyzstan, by Christine Bichsel; on land-use change and degradation in western Tajikistan, by Bettina Wolfgramm and Gulniso Nekushoeva; and on the role of knowledge generation in the Tajik Pamirs, by Thomas Breu (see also Breu et al 2005).⁷

14.3 Changes and the dynamics of change after independence

The studies elucidated the tremendous bio-physical, political and socio-economic changes that have taken place, as well as their implications for natural resource management in the region, especially with respect to water use and management. Analysis of coping strategies to mitigate changes at the local level revealed that ensuring minimal access to land and irrigation water for the poor is imperative in addressing rural poverty. Obviously, natural resources and people's livelihoods are not only threatened by socio-economic upheaval, but also affected by environmental dynamics such as climate change. Continued and increasing glacier melting in recent years has impacts on the amount and the timing of river flow. Evidence suggests that it is not the increased quantity of water, but rather the river flow peak shifting forward by one month that may cause problems for livelihoods. This shift will have particularly negative impacts on the entire irrigation system, possibly leading to a lack of water during the period of maximum water consumption, which coincides with the dry summer season.

14.3.1 Political, legal and socio-economic transformation

In order to better manage water following independence, a range of new legal documents were elaborated and approved. The most relevant in Kyrgyzstan are the Law on Water (1995), the Law on Water Users' Associations (2002), and the Water Code (2005). This should help to achieve the ADB goal of establishing 500 WUAs by 2010. Similar efforts were undertaken in Tajikistan, where a new Water Code was approved in 2003 as an outcome of the International Year of Water 2003.

The major economic change at the national level is related to the pricing of irrigation water for farmers. Even though prices per cubic metre are low, payments are not made regularly (Gallati 2008). At the regional level, the major challenge is to accommodate competing transboundary demands for water to be used for energy and agriculture. While Kyrgyzstan and Tajikistan as the 'water towers' of Central Asia depend heavily on revenues from hydro-power production in winter, Uzbekistan and Kazakhstan expect water to be released – free of charge – mainly during the growing season from spring to autumn.



Fig. 2
Self-made low-tech
waterwheel in the
Ferghana Valley
used to illegally
extract water from
a channel in order
to irrigate a home
garden. (Photo by
Daniel Maselli,
Batken Oblast,
5 May 2004)

Analysis of the rationale of three development projects aiming to transform inter-community water conflicts along the newly established borders in the Ferghana Valley between 1999 and 2005 showed that water scarcity and ethnic differences are historically, culturally and politically constructed, institutionally embedded, and shaped by power relations. Violence that develops locally is often characterised by multiple interdependencies reaching beyond the boundaries of communities, concealing wider political interests and power relations. Addressing such water conflicts as mere technical or relational issues, and proposing infrastructural solutions or more intensive exchange processes, will therefore fail (Figure 2). Successful mitigation of water conflicts must include multiple dimensions and acknowledge the parties' moral and reflective capacities. It requires critical reflection on the assumptions and choices that underlie both the changes proposed and the aims of conflict mitigation. Overly normative and value-laden models transposed from differing social contexts appear not only to be questionable in terms of their ethnocentrism but may ultimately fail to lead to the desired empowerment and change (Bichsel 2005, 2006, 2009).

14.3.2 Impacts on institutions

Existing legislation should recognise and guarantee collective rights to rural communities and help to implement the subsidiary principle. However, in practice, in Kyrgyzstan the legal and institutional framework does not pro-

vide favourable conditions due to lack of adequate financial and institutional support to local communities (Ibraimova 2009). At present, rural communities seldom exercise their collective rights, for three main reasons. First, the Kyrgyz state has Soviet-style top-down law-making processes without participatory mechanisms involving rural communities; hence the existing legal and institutional framework is 'empowering' only from a governmental perspective. Second, there are no effective state incentives to enforce the proposed institutions and organisations at the rural level; bodies prescribed by law exist only on paper unless financial and/or institutional support is provided, either by international donors or successful community members. Third, traditional practices for collective actions in rural areas are not taken into account by government, while new organisations for collective action remain ineffective. However, social mobilisation is an important prerequisite for 'Participatory Irrigation Management' in Central Asia (Ul Hassan et al 2004; Dukhovny and Sokolov 2005).

14.3.3 Climate change – the invisible curse of the future?

Temperature and precipitation data over the past 60 years show a general decreasing trend for precipitation, while the average temperature is increasing (Galkina 2005). Analysis of glacier wastage in the Sokuluk catchment over the last 40 years (Niederer et al 2008) shows a clear trend in glacier retreat between 1963 and 2000. Both the areal loss of 28% observed for the 1963–2000 period and a clear acceleration of wastage since the 1980s correlate with the results of studies in other regions of the Tien-Shan and the Alps (Paul et al 2004). In particular, glaciers smaller than 0.5 km² have exhibited this phenomenon most starkly. While they registered a medium decrease of only 9.1% for 1963–1986, they lost 41.5% of their surface area between 1986 and 2000.

Analysis of river flow data for the Sokuluk River indicates a clear increase in recent decades, particularly during the warm summer months. Discharge in July increased by about 4 m³/s between 1960 and 2000. Annual river flow increased on average by 1.3 m³/s, which corresponds to about 24% of the average annual discharge of 5.33 m³/s (Galkina 2005).

Considering the composition of river flow, this confirms the link between temperature increase and glacier melting, which results in temporarily higher river flow and water discharge. The water balance of the Sokuluk catchment shows that more than 33% of precipitation is lost to evapotranspiration,

while about 39% of total runoff is generated by snowmelt and 17% by ice melt. Annual precipitation has fluctuated considerably since 1915, making prognosis rather difficult. However, since average annual temperature and average runoff have increased, the sustainability of water discharge is highly unpredictable and becoming increasingly problematic.

River flow modelling further reveals a possible increase in peak flow, causing potential hazards such as mudflows, storm waters, and floods. Moreover, the expected forward shift in the peak flow from July to June – and thus earlier melting of water resources important for irrigation – may either be a blessing for early agricultural production or create a problem for late summer cultivation.

14.3.4 Infrastructural changes

De-collectivisation of state farms has led to a sharp increase in water users in the Sokuluk catchment since 1991. This proliferation complicates water allocation and distribution, a problem that is further aggravated by the fact that distribution channels are often dilapidated (Askaraliev and Ivanova 2006). In the Sokuluk Rayon – which has the largest irrigated agricultural surface (56,600 ha) – 60% of the 965.9 km of earth channels and 55% of the 422.9 km of concrete channels are in bad condition. Only 23% of the initially abstracted water currently reaches its final destination (Askaraliev 2006). Losses are also caused by the many earth channels where water infiltrates. In five villages located in the foothill zone of the Sokuluk catchment (Toshbulak, Saz, Asylbash, Krupski, and Sokuluk), less than 9 km of the 97.7 km of channels are made of concrete, i.e. less than 10%, whereas the national average is 25%.

In principle, while the amount of water available would be sufficient to cover local needs – provided water is appropriately managed through adapted small-scale technologies – at present only 65% of the land is being irrigated. So far most of the planning, monitoring and payment mechanisms elaborated during Soviet times are still being applied, although they are outdated and inadequate (Froebrieh et al 2007). This gives rise to tensions and conflicts between users and the authorities in charge. The willingness of farmers to pay for water depends on the quality of services provided, in particular the amount and timing of water delivery (Gallati et al 2006). The lack of a water discharge accounting system hinders more effective management. Therefore, a newly improved device for stabilising and measuring water discharge for different channel categories was developed by Bakyt Askaraliev and patented in 2008.

14.4 Implications, responses and outlook

14.4.1 Policies, institutions and economics

These research results emphasise the importance of institutions and policies in shaping future human–nature interfaces in order to address rapid change more effectively. They demonstrate how social, political and cultural institutions mediate the relations between humans and the environment, giving rise to conflicts as well as offering opportunities (Giese and Sehring 2007; Wegerich 2008). In future, more attention should be paid to gender aspects in integrated water resource management (GWP 2006) as well as to regional cooperation. This is a prerequisite to achieving sustainable management of the Amudarya and Syrdarya rivers, which constitute the two lifelines of the entire region (UNDP 2005).

The obvious economic damage due to inappropriate and ineffective water management, both in agriculture and in hydropower, need to be addressed too. The processes of climate change that are already tangible are likely to further aggravate the situation (IPCC 2007). There is thus an urgent need for effective laws and adaptive strategies, from livelihood to regional levels, to help share responsibility (UNESCO 2006). This will require participatory approaches to secure the ownership of farmers, who are the future key managers and custodians of water resources in Central Asia (Dukhovny and Sokolov 2005). Forgotten or neglected traditional soil and water conservation (SWC) technologies may play a crucial role here.

14.4.2 Livelihoods and ecology

Since independence, people have developed different strategies to cope with change (Shigaeva et al 2007). The ‘accumulation strategy’ applied by wealthy households, which rent or buy additional agricultural land, plays an important role in water management. Short-term profit orientation often hampers sustainable land and water management. This attitude needs to be addressed through appropriate and enforced regulations. Pricing water for agriculture based on consumption is a necessary measure to reduce water consumption and increase the effectiveness of irrigated agriculture. Special attention should be paid to both environmental and health risks related to irrigation, such as salinisation, waterlogging, or the spread of malaria in connection with climate and land-use change (Rebholz et al 2006).

14.4.3 Challenges for development and research

Already visible climate change – and, to an even greater extent, predicted climate change in Central Asia – calls for early reflection about possible mitigation strategies to avoid or reduce further negative effects. A major challenge will be to find ways of coping with predicted reductions in (annual) rainfall and increases in (summer) temperature. This may entail the construction of cheap but effective small-scale water retention devices using local construction materials and requiring little or no external technical support. Development actors are thus challenged to reflect more on how to support the required adaptation of smallholders rather than favour water-intensive large-scale agriculture. More support will be required to increase knowledge regarding appropriate irrigation – in particular, the amount and timing of water – to avoid wasting water or causing environmental damage. Here, innovative forms of information sharing are called for; a multi-level multi-stakeholder-based ‘water management information system’ could be helpful. At a meso-scale, support for participatory integrated water resource management at watershed level could be a promising future pathway. Here, development-oriented research should put greater emphasis on involving end-users as the real future managers of water in particular and natural resources in general.

Endnotes

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⁷The PhD dissertations referred to in this paragraph are not included in the list of references unless they are referred to elsewhere in this article. However, many of them are available at: <http://www.north-south.unibe.ch/content.php/filterpage/id/27>. Moreover, this article refers to other publications by these authors that are based on their PhD studies.

References

Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- * Askaraliev B. 2006. Analysis of the effectiveness of water use in the irrigation system of the Sokuluk River Basin, Chui Valley, Kyrgyzstan [in Russian]. *Kyrgyz Agricultural University Bulletin* 1(4):78–82.
- * Askaraliev B, Ivanova N. 2006. Analysis of the technical condition of irrigation systems of the Sokuluk River Basin [in Russian]. *Kyrgyz Agricultural University Bulletin* 1(7):112–114.
- * Bichsel C. 2005. In search of harmony: Repairing infrastructure and social relations in the Fergana valley. *Central Asian Survey* 24(1):53–66.
- * Bichsel C. 2006. *Dangerous Divisions: Irrigation Disputes and Conflict Transformation in the Fergana Valley* [PhD dissertation]. Bern, Switzerland: University of Bern.
- * Bichsel C. 2009. *Conflict Transformation in Central Asia: Irrigation Disputes in the Fergana Valley*. Central Asian Studies Series. London, UK: Routledge.
- Bilik OA. 1990. *Irrigation of Kyrgyzstan in Projects and Objects* [in Russian]. Bishkek, Kyrgyzstan: Kyrgyzstan.
- * Breu T, Maselli D, Hurni H. 2005. Knowledge for sustainable development in the Tajik Pamir Mountains. *Mountain Research and Development* 25(2):139–146.
- Bucknall J, Klytchnikova I, Lampietti J, Lundell M, Scatasta M, Thurman M. 2003. *Irrigation in Central Asia: Social, Economic and Environmental Considerations*. New York: The World Bank, Europe and Central Asia Region Environmentally and Socially Sustainable Development.
- Dukhovny VA, Sokolov VI. 2005. *Integrated Water Resources Management: Experience and Lessons Learned from Central Asia towards the Fourth World Water Forum* [in Russian]. Tashkent, Uzbekistan: Interstate Coordination Water Commission (ICWC) in Central Asia.
- Froeblich J, Bos MG, Wegerich K, editors. 2007. *Emerging Issues on Land and Water in Central Asia*. Special issue. *Irrigation and Drainage Systems* 21(3–4). Also available at: <http://www.springerlink.com/content/0168-6291>; accessed on 10 June 2009.
- * Galkina M. 2005. *The Impact of Glacier Dynamics on River Flow on the Northern Slope of the Kyrgyz Range (NSKR)* [MSc thesis]. Bishkek, Kyrgyzstan: Kyrgyz-Russian Slavic University.
- * Gallati J. 2008. *Towards an Improved Understanding of Collective Irrigation Management: A System Dynamics Approach* [PhD dissertation]. Bern, Switzerland: University of Bern.
- * Gallati J, Askaraliev B, Niederer P, Maselli D. 2006. Towards a system dynamics framework for understanding interactions of head- and tail-users in irrigation systems in Kyrgyzstan. In: *Proceedings of the 24th International Conference of the System Dynamics Society, Nijmegen, 23–27 July 2006*. Nijmegen, The Netherlands and Albany, NY: Methodology Department, Nijmegen School of Management, Radboud University Nijmegen, and The System Dynamics Society, University at Albany. Also available at: <http://www.systemdynamics.org/conferences/2006/proceed/index.htm>; accessed on 10 July 2009.
- Giese E, Sehring J. 2007. Konflikte ums Wasser – Nutzungskonkurrenz in Zentralasien. *Osteuropa* 57(8–9):483–495.
- GWP [Global Water Partnership]. 2006. *Gender Aspects of Integrated Water Resources Management. Report on Gender Surveys in Representative Households in Azerbaijan, Armenia, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan*. Tashkent, Uzbekistan: Global Water Partnership Secretariat for Central Asia and Caucasus.
- Herrfahrdt E, Kipping M, Pickardt T, Polak M, Rohrer C, Wolff CF. 2006. *Water Governance in the Kyrgyz Agricultural Sector: On Its Way to Integrated Water Resource Management?* DIE Studies No. 14. Bonn, Germany: German Development Institute (DIE).

- * Hoeck T, Droux R, Breu T, Hurni H, Maselli D. 2007. Rural energy consumption and land degradation in a post soviet setting: An example from the West Pamir Mountains in Tajikistan. *Energy for Sustainable Development* 11(1):48–57.
- * Ibraimova A. 2009. *Legal and Institutional Framework for Empowerment of Rural Communities in the Kyrgyz Republic*. Etudes et Colloques 53. Fribourg, Switzerland: Publications of the Institute of Federalism.
- IPCC [Intergovernmental Panel on Climate Change]. 2007. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, UK: Cambridge University Press.
- Johnson III SH, Stoutjesdijk J. 2008. WUA training and support in the Kyrgyz Republic. *Irrigation and Drainage* 57(3):311–321.
- Krähenbühl J, Gely J, Herren U. 2002. *Swiss Water Strategy for Central Asia 2002–2006*. Bern, Switzerland: Swiss Agency for Development and Cooperation (SDC) and Swiss State Secretariat for Economic Affairs (SECO).
- Mamatkanov DM. 2000. Water and energy problems in Kyrgyzstan [in Russian]. *Science and New Technologies* 4:75–76.
- Mamatkanov DM, Bazhanova LV, Romanovsky VV. 2006. *Present-day Water Resources of Kyrgyzstan* [in Russian]. Bishkek, Kyrgyzstan: Ilim.
- Martius C, Lamers JPA, Vlek PLG, Eshchanov R, Rudenko I, Salaev O. 2005. Water, salt, cotton and soums: Shedding new light on the Aral Sea problem. *Tropentag 2005. The Global Food and Product Chain: Dynamics, Innovations, Conflicts, Strategies*. University of Hohenheim, Stuttgart-Hohenheim, Germany, 11–13 October 2005. *Conference Proceedings*. <http://www.tropentag.de/2005/abstracts/full/172.pdf>; accessed on 14 July 2009.
- Micklin P. 2000. *Managing Water in Central Asia: Central Asian and Caucasian Prospects*. London, UK: The Royal Institute of International Affairs.
- Moerlins JE, Khankhasayev MK, Leitmann SF, Makhmudov EJ, editors. 2008. *Transboundary Water Resources: A Foundation for Regional Stability in Central Asia. Proceedings of the NATO Advanced Research Workshop on Facilitating Regional Security in Central Asia through Improved Management of Transboundary Water Basin Resources, Almaty, Kazakhstan, 20–22 June 2006*. Dordrecht, The Netherlands: Springer.
- Molden D, de Fraiture C. 2004. *Investing in Water for Food, Ecosystems and Livelihoods: Blue Paper, Stockholm 2004*. Discussion Draft for Comprehensive Assessment of Water Management in Agriculture. Colombo, Sri Lanka: Consultative Group on International Agricultural Research (CGIAR) and International Water Management Institute (IWMI). Also available at: <http://www.iwmi.cgiar.org/Assessment/files/pdf/BluePaper.pdf>; accessed on 10 June 2009.
- * Niederer P, Bilenko V, Ershova N, Hurni H, Yerokhin S, Maselli D. 2008. Tracing glacier wastage in the Northern Tien Shan (Kyrgyzstan/Central Asia) over the last 40 years. *Climatic Change* 86:227–234.
- Pala C. 2005. To save a vanishing sea. *Science* 307(5712):1032–1034.
- Paul F, Käab A, Maisch M, Kellenberger T, Haerberli W. 2004. Rapid disintegration of Alpine glaciers observed with satellite data. *Geophysical Research Letters* 31:L21402. doi:10.1029/2004GL020816.
- Perelet R. 2007. Central Asia: Background paper on climate change. *Human Development Report 2007/2008. Fighting Climate Change: Human Solidarity in a Divided World*. New York, NY: United Nations Development Programme (UNDP).
- Rabejanova M. 2008. The Tajik energy crisis. Special Report. *Peace and Conflict Monitor*. Ciudad Colón, Costa Rica: University for Peace. Also available at: http://www.monitor.ucepeace.org/archive.cfm?id_article=492; accessed on 11 November 2008.
- * Rebolz C, Michel A, Maselli D, Saipphudin K, Wyss K. 2006. Frequency of malaria and glucose-6-phosphate dehydrogenase deficiency in Tajikistan. *Malaria Journal* 5(1):51.
- Schaap O, Pavey J, Kirby A. 2004. *Privatization/Transfer of Irrigation Management in Central Asia*. Final Report. London, UK: Department for International Development (DFID). Also available at: <http://www.research4development.info/PDF/Outputs/R8025.pdf>; accessed on 10 June 2009.

- * Shigaeva J, Kollmair M, Niederer P, Maselli D. 2007. Livelihoods in transition: Changing land use strategies and ecological implications in a post-Soviet setting (Kyrgyzstan). *Central Asian Survey* 26(3):389–406.
- Sobolin GV. 1990. *Land and Water Resources: Conditions of Decreased Irrigated Land and Irrigating Systems* [in Russian]. Bishkek, Kyrgyzstan: Kyrgyz Economy Research Institute.
- Spoor M. 1995. Agrarian transition in former soviet Central Asia: A comparative study of Kyrgyzstan and Uzbekistan. *The Journal of Peasant Studies* 23(1):46–63.
- Ul Hassan M, Starkloff R, Nizamedinkhodjaeva N. 2004. *Inadequacies in the Water Reforms in the Kyrgyz Republic: An Institutional Analysis*. Research Report No. 81. Colombo, Sri Lanka: International Water Management Institute (IWMI).
- UNDP [United Nations Development Programme]. 2003. *Tapping the Potential: Improving Water Management in Tajikistan. National Human Development Report 2003*. Dushanbe, Tajikistan: UNDP.
- UNDP [United Nations Development Programme]. 2005. *Bringing Down Barriers: Regional Cooperation for Human Development and Human Security. Central Asia Human Development Report*. Bratislava, Slovakia: UNDP Regional Bureau for Europe and the Commonwealth of Independent States.
- UNDP [United Nations Development Programme]. 2006. *Beyond Scarcity: Power, Poverty and the Global Water Crisis. Human Development Report 2006*. New York: UNDP.
- UNEP/GRID [United Nations Environment Programme/Global Resource Information Database]. 2000. *State of the Environment in Tajikistan Report*. <http://enrin.grida.no/htmls/tadjik/soe2/eng/index.htm>; accessed on 10 June 2009.
- UNEP/GRID [United Nations Environment Programme/Global Resource Information Database]. 2002. Water Resources. *National Electronic Report. Environment State of Kyrgyz Republic*. <http://enrin.grida.no/htmls/kyrgyz/soe2/english/waterf.htm>; accessed on 26 May 2008.
- UNESCO [United Nations Educational, Scientific and Cultural Organization]. 2006. *Water: A Shared Responsibility. The United Nations World Water Development Report No. 2*. Paris, France: UN Water.
- Vinogradov S, Langford VPE. 2001. Managing transboundary water resources in the Aral Sea Basin: In search of a solution. *International Journal of Global Environmental Issues* 1(3–4):345–362.
- Wegerich K. 2000. *Water User Associations in Uzbekistan and Kyrgyzstan: Study on Conditions for Sustainable Development*. Occasional Paper No. 32. London, UK: University of London, School of Oriental and African Studies (SOAS).
- Wegerich K. 2008. Hydro-hegemony in the Amu Darya Basin. *Water Policy* 10(2):71–88.

15 Kyrgyz and Tajik Land Use in Transition: Challenges, Responses and Opportunities

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Abstract

Based on studies conducted in Kyrgyzstan and Tajikistan, land use in transition was assessed with regard to historical background, implications for livelihoods, the current state of natural resources, and opportunities for sustainable land management. The overall aim of this research was to improve the basis for decision-making in sustainable land management. Methodologically, a need for new approaches and methods well adapted to the changing agricultural sector in the Central Asian context was identified, and studies conducted were analysed for lessons to be learned. Thematically, it can be concluded that political and socio-economic transition created a highly challenging situation for farmers, initially forcing many of them into land-use practices that led to land degradation. However, studies in Tajikistan clearly revealed the existence of opportunities for improving land management, which include (i) fruit, cereal and fodder plots, (ii) large-area conservation systems implemented in Soviet times, and (iii) agronomic conservation measures on cropland. Finally, it was concluded that insufficient knowledge had been gathered so far, especially on pasture management.

Keywords: Land use; transition; land degradation; sustainable land management (SLM); SLM opportunities; impact assessment; Kyrgyzstan; Tajikistan.

15.1 Introduction

15.1.1 Challenges: triggers of land-use change

The transition period after the collapse of the Soviet Union in 1991 led to a deep economic and social crisis that called for immediate measures. One such measure was the land reform process initiated directly after the Central Asian states achieved independence. It was expected to improve the efficiency and productivity of agriculture (Nissen 2004). However, decisions on land reform often taken in an ad hoc manner led to unequal access to land (Dudwick et al 2003), leaving many rural households with small rainfed plots on steep slopes. Food insecurity caused an emergency situation, and subsequently such marginal areas were cultivated without application of conservation measures. Large areas of grazing land remain common property, but they lack management and are thus frequently overstocked (Ludi 2003). In Kyrgyzstan, pasture use is strictly regulated in theory. In practice, responsibilities at different administrative levels often overlap, creating management conflicts. Furthermore, breakdown of infrastructure has in particular limited farmers' possibilities and willingness to move to remote summer pastures, adding pressure on common pasture resources in the vicinity of villages. Overall, all these land-use changes have resulted in degradation of land resources (see section 15.3.1). In recent years, labour migration has often led to the abandonment of degraded cropland and agricultural activities as a whole.

Thus, the political and socio-economic transformation that took place after the breakdown of the Soviet Union triggered a series of sudden land-use changes in Central Asia (Jones 2004). Together with changes in land tenure, this has affected not only land resources, but also the livelihoods of people as well as their livestock (Dudwick et al 2003). Accordingly, a range of ecological, socio-economic, institutional, legal and political changes can be observed which can be considered as both opportunities and threats for the future development of the region. In particular, land management may help to prevent, mitigate and reverse the degradation of natural resources or, on the contrary, trigger or accelerate degradation (Liniger and Critchley 2007). Despite the ongoing transformations, information on the state of land resources has scarcely been updated since independence in 1991, and in most areas statistical data and maps are outdated or inappropriate for land-use planning in this new context.

15.1.2 General set-up, overall aim and research questions

This synthesis is based on the analysis of studies conducted in different regions of Central Asia, including studies on the Sokuluk and Naryn river basins in Kyrgyzstan, the Tajik Pamirs and the hills of central Tajikistan, within the framework of the Swiss National Centre of Competence in Research (NCCR) North-South programme. The overall aim of the research conducted was to improve the basis for decision-making and for more effective interventions to achieve sustainable land management (SLM) in Central Asia. Thematically, the research questions at hand were the following: (1) What triggered land-use changes, and what were the main implications for livelihoods? (2) How did land-use changes affect natural resources, and what is the present state of natural resources? (3) What opportunities exist for SLM? The implicit methodological goal of the studies was to introduce and integrate different new approaches to land resource assessment in Central Asia. These included efficient methods for spatially explicit analysis, such as soil spectrometry for digital soil mapping (Shepherd and Walsh 2002) and fuzzy logic-based risk modelling, as well as interdisciplinary and transdisciplinary approaches such as livelihood and multi-level stakeholder approaches (Hurni 2000) and the WOCAT⁸ methodology (Liniger and Critchley 2007).

15.2 Methods: assessing land degradation and conservation

In this section it is first argued that there is a need to apply new and more efficient methodologies for assessing land degradation and conservation in order to suit the context of the changing agricultural sector in Central Asia, including transformations in government institutions concerned with land management. This is followed by a brief presentation of the methodological approach using four examples of studies conducted at various spatial scales.

15.2.1 Adapting to new land management requirements

During the era of planned economy, central top-down management authorities prepared basic materials for land-use planning, decided on land use (Bloch 2002), and deployed specific conservation measures to state-farm managers. Since the breakdown of the Soviet Union most rural families have gone back to subsistence agriculture, and land is now privately used. How-

ever, rural households have limited physical, financial and human resources, while depending heavily on the output of their land. With the stakeholders, the land management units and the available physical and financial resources changing, there is a need to adapt research approaches to new land management requirements, particularly with a view to introducing new and more efficient methods. In addition, the overall research goal has changed, as well. While in Soviet times land surveying (e.g. geobotanical and soil surveying) was dominated by a focus on agricultural production, the focus has now shifted towards SLM since the Central Asian countries have signed international conventions. SLM requires balancing ecological, economic and socio-cultural sustainability, and thus calls for inter- and transdisciplinary research approaches. Joint efforts must be made by scientists and various stakeholder groups to adapt and develop more cost-effective monitoring systems, including indicators, measures, and procedures adjusted to the farmers' needs and means.

15.2.2 Four studies, four spatial scales and specific approaches

The first study presented here focused on the communal level in Kyrgyzstan (Figure 1) and was conducted by Shigaeva et al (2007). The aim was to analyse qualitative and quantitative changes over time in the ecology and productivity of pasture resources, and subsequently to analyse the links between the status of land resources and corresponding household strategies. Use of a standardised procedure from the Soviet era for detailed geobotanical pasture assessment (Kyrgyz Giprozem 1987) facilitated comparison of new with previous data. Household strategies were appraised using interviews based on the Sustainable Livelihood Framework (DFID 2000); this allowed for examination of how peasant farms emerging from the privatisation process reacted to the changes in their institutional and social environment.

Two studies were conducted in the loess hills of central Tajikistan (Figure 1); one was conducted at the plot level and used comparative case studies in order to assess in detail the impact of conservation measures on soil resources (Akhmadov and Nekushoeva 2007). Indicators included a set of commonly used soil chemical and physical properties developed in Soviet times (Zaslavski 1983). This information was then linked to the recent experiences of individual land users and systematically recorded by means of WOCAT questionnaires (Liniger and Critchley 2007), thus integrating quantitative and qualitative approaches.

The other study was conducted by Wolfgramm et al (2007) and focused on digital soil mapping to identify hot spots of soil degradation and bright spots of soil conservation at the district scale. It was conducted based on a large soil sample set collected using a systematic sampling design. A soil spectral library was established for efficient prediction of soil organic carbon (SOC) based on samples from soil reflectance measurements conducted in the laboratory. The large sample set allowed for subsequent calibration of SOC content to satellite imagery. SOC values were also regressed to the traditionally more widely used organic matter content values. Classification tree models proved efficient when linking ground-truth data and information from satellite imagery in the heterogeneous area (Wolfgramm et al 2007).

The fourth study focused on the provincial scale, on the Gorno Badakhshan Autonomous Oblast (GBAO), Tajikistan (Figure 1). The aim was to model the degradation risk for *teresken*, a shrubby vegetation which in the Pamirs is nowadays extensively used as a fuel substitute. A spatial fuzzy logic-based modelling approach applied to an expert-based classification tree was adopted. This approach has so far been applied mainly at a smaller scale (e.g. global resource assessments). In this study, the approach was further developed for application at the village level. The study was intended to investigate knowledge about land resources available at different stakeholder levels and to address its role in SLM (Breu 2006a).

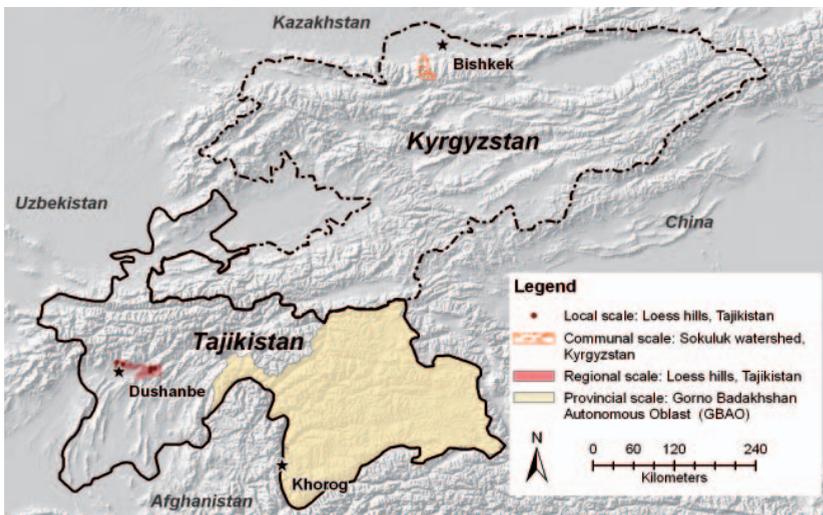


Fig. 1
Map of Central Asia and the four Swiss National Centre of Competence in Research (NCCR) North-South study sites. (Map by Bettina Wolfgramm)

15.3 Results: responses and opportunities for SLM

This section presents results related to responses to the challenges created in the transformation context and highlights opportunities for SLM in the same context. Additionally, a summary of the lessons learned from the different methodological approaches applied in the specific Central Asian context is provided in section 15.3.4.

15.3.1 Responses: the current state of land resources resulting from land-use changes

Today in Central Asia the situation generally reported is one of widespread and severe land degradation (Sadikov 1999). The results of the four studies presented here confirm ongoing land degradation in many places. However, this understanding must be refined, as spatial variability is high and various examples of well-conserved land resources do exist. This is demonstrated especially in the two studies from the Tajik loess hills (Akhmadov and Nekushoeva 2007; Wolfgramm et al 2007).

Newly collected empirical data on the state of land resources show that in the loess region of central Tajikistan large areas are affected by water erosion, with 45% of the study area classified as showing indications of erosion (Wolfgramm et al 2007). In the Sokuluk basin in Kyrgyzstan, forage productivity on pre-mountain and mountain pastures close to villages has generally decreased between 1% and 34% since 1978 (Shigaeva et al 2007). Based on the *teresken* degradation risk model it was calculated that *teresken* areas with a low, medium or high degradation risk cover a total of roughly 30% (or 19,000 km²) of the surface of GBAO (Breu 2006a; Figure 2). However, by contrast with this negative picture, classification of the loess areas in Tajikistan showed that 33% of the area classified was well conserved (Wolfgramm et al 2007).

All four studies showed that severe management problems and the related depletion of natural resources today seem to be linked to the fact that the financial, human and physical resources of farmers are very limited. Thus, the intensity of use of these natural resources today is closely linked to the accessibility of areas and their vicinity to villages. This effect was observed for different land-use types: (i) for pasture use in the Pamirs (Haslinger et al 2007) and in Kyrgyzstan (Shigaeva et al 2007), where use of remote high-mountain pastures was abandoned and where forage productivity has

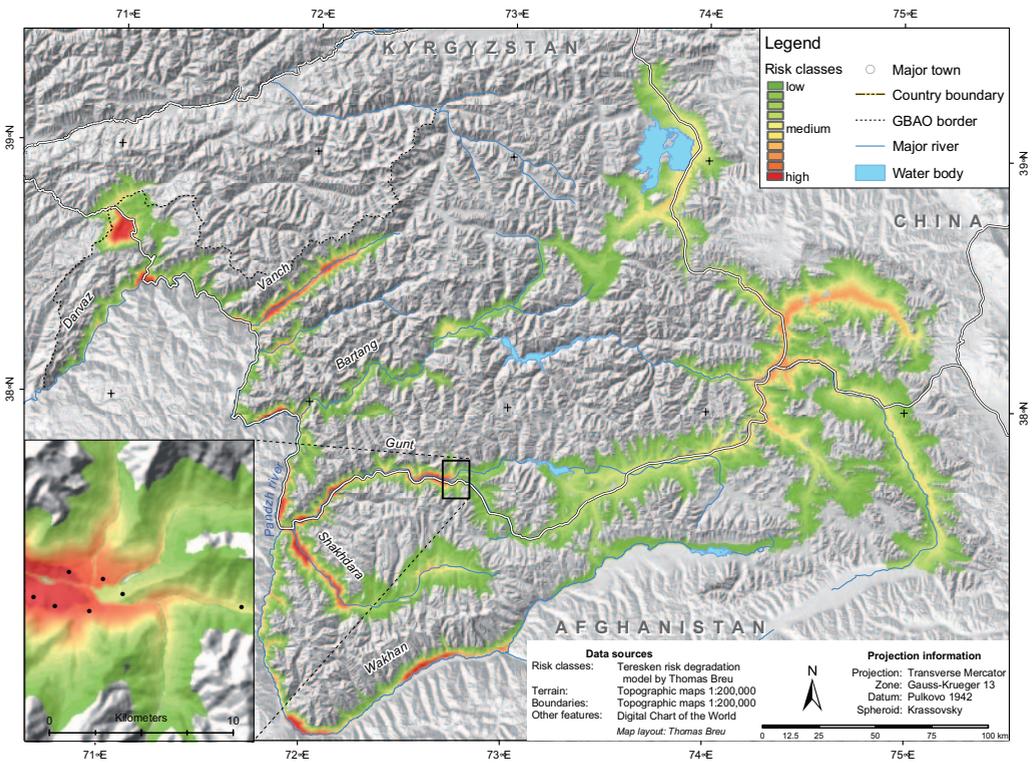


Fig. 2
Extract of the
teresken degrada-
tion risk map
(Source: Breu
2006a)

increased from 5% to 22% since 1978; (ii) for *teresken* use in the Pamirs (Breu 2007), where a steep gradient of *teresken* degradation risk over a short distance is expected at a walking distance of around 5 hours from villages; and (iii) for temporally cropped fields in the loess hills of central Tajikistan, where patterns of soil-degradation hot spots are observed in the vicinity of settlements (Wolfgramm et al 2007).

15.3.2 Responses: land-use change and implications for livelihoods

The Kyrgyz study revealed how the ongoing transformations called for the development of radically new livelihood strategies adapted to the emerging market-based economy in a changing political environment. Shigaeva et al (2007) identified three different livelihood strategies: (i) an accumulation strategy, applied by wealthy households, where renting and/or buying of land is a key element; (ii) a preserving strategy, applied mainly by inter-

mediate households, which are very often forced to return their land to the commune or sell it to wealthier households; (iii) a coping strategy, applied mainly by poor households consisting of elderly pensioners or headed by single mothers, whose agricultural production is very low and barely covers subsistence needs due to their limited labour and economic power; pensions and social allowances form the backbone of these households' income. The study showed that in the study areas the main avenues for rural families to increase their wealth are to be found in the agricultural sector and consist in controlling more and mainly irrigated land, as well as in increasing live-stock. Ensuring access to land for the poor is therefore imperative to combat rural poverty and socio-economic disparities in rural Kyrgyzstan.

15.3.3 Opportunities: examples of SLM

The Tajik study conducted at the regional level showed that various opportunities for SLM in the loess hills of Tajikistan exist and include specifically the following land-use systems: (i) fruit, cereal and fodder plots, either traditionally cultivated or newly established; (ii) large-area conservation systems implemented in Soviet times and diversified into agroforestry systems during the 1990s; and more recently, (iii) agronomic conservation measures on farm cropland, such as crop rotation and cultivation of perennial fodder (Wolfgang et al 2007).

Fig. 3
Degrading and well-conserved areas, Faizabad, Tajikistan.
(Photo by Gulniso Nekushoeva, 2006)

In the Tajik study conducted at the local level, a significant impact of conservation measures, especially on organic matter content in the topsoil, was detected in a case study in Varzob. In this area, slopes of around 30% are used communally and are heavily overgrazed, resulting in reduced vegeta-



tion cover and severe sheet and rill erosion. Already in 1982, an innovative land user began to set up a half-hectare vineyard/fruit plot with intensive grass/fodder production for cut-and-carry use (Liniger and Critchley 2007). Today this management practice has led to distinct differences in the content of soil organic matter, with an organic matter content of over 1.5% to over 2% in conserved areas, as opposed to less than 1.5% in degraded areas (Akhmadov and Nekushoeva 2007).

Nekushoeva also found that even degraded areas have a potential to be used for agricultural production when adequately managed – such as degraded pasture areas when fenced in and cultivated with alfa-alfa. While soil properties in such areas change slowly and inconsistently, productivity rapidly increases several times over (Akhmadov and Nekushoeva 2007).

15.3.4 Summarising methodological experiences

Analysis of the above studies led to three types of conclusions regarding the application of more efficient methods for assessing land degradation and conservation in Central Asia:

Research questions and required spatial scales: Comparison of the studies described above highlights differences in the availability of data and the feasibility of specific analyses for each scale. At the provincial scale (1:500,000), data are highly generalised and often remotely sensed; expert-knowledge-based classification models might be applied, but ground-truth information for verification is often scarce. Thus, such coarse information is mainly indicative and suitable for preliminary analysis of risks and/or opportunities. At the district scale (1:50,000), collection of representative field data is feasible and can be used to calibrate remotely sensed data. Resulting maps provide information on the state of resources and are also useful for monitoring. However, the level of generalisation of the data is high, allowing mainly for qualitative analysis with regard to the effect of land use on natural resources, e.g. soil. Case studies (1:5000) allow for sampling of well-defined, homogenous areas at a high density, and thus facilitate controlling of influencing factors. This allows for quantitative impact assessments.

Classification tree modelling – successful approaches for spatial assessments in heterogeneous areas: Today, spatial datasets are readily accessible, e.g. in the form of satellite images. However, highly heterogeneous areas are challenging with regard to satellite image classification. In the pre-

vious section, two studies were mentioned that included different types of tree models: (i) an expert-knowledge-based classification tree model combined with fuzzy logics (Breu 2006b) and (ii) a modelling approach based on statistical algorithms (Wolfgramm et al 2007). Classification tree models are non-parametric and thus provide a well-suited approach for heterogeneous areas. Further advantages are straightforward integration of various datasets and linking of rules observed in the field with models.

Collaboration between land users and scientists (transdisciplinary approaches): The results from the interviews conducted with farmers using the WOCAT questionnaires showed that farmers' knowledge is decisive for planning SLM. While researchers are better equipped to verify and quantify processes, land users provide crucial information regarding land management and degradation and conservation processes (Akhmadov and Nekushoeva 2007). Thus, there is great potential in concurrently applying transdisciplinary approaches and disciplinary scientific methods. Furthermore, the results of the study by Breu (2006a) show that on average, knowledge of SLM at different stakeholder levels differs little, while differences within a stakeholder level can be considerable. These experiences confirm the importance of exchange among stakeholders, also within the individual stakeholder levels, in order to share knowledge about SLM and to negotiate and coordinate actions.

15.4 Conclusions and implications

This section draws conclusions and provides recommendations for future research. Based on the synthesis at hand, the following three aspects were considered of crucial importance in creating opportunities for SLM in Kyrgyzstan and Tajikistan:

Information basis for land-use planning: Approaches were identified and applied to efficiently collect information on the state of land resources at different scales relevant to land-use planning. Today geographic information systems (GIS), remote sensing and efficient laboratory methods play an important role in mapping. Studies have shown that transdisciplinary approaches for identifying SLM options at the plot level are decisive. Thus, participatory (GIS) approaches should be used also for land-use planning and monitoring activities at the district and provincial levels.

Abandonment of agricultural plots: This phenomenon has been observed to be linked to widespread labour migration. While in some cases abandonment of cultivation can take pressure off the land, heavily degraded fallow land can also degrade further when abandoned. However, with rising food prices⁹ it is expected that crop production on marginal land will increase again. As labour migration is very important for both Tajikistan and Kyrgyzstan, it is recommended that research be conducted on the effect of migration and the availability of human resources, on abandonment of cultivation and its effect on land degradation and conservation, as well as on SLM options adapted to households with a limited workforce.

Pasture management: Results show that large areas are used as pastures and that increasing the number of livestock is one of the main options for rural families to increase their wealth. However, easily accessible pastures in particular are highly affected by degradation processes. At the same time, land regulations regarding pastures show distinct deficiencies, for example regarding clear administrative responsibilities. Although the studies presented here identify various entry points to SLM, they focus mainly on the management of small plots, whereas opportunities for improved pasture management are lacking. Thus, there are many implications for future research in the field of pasture management. For Kyrgyzstan, important new topics and research questions have already been identified. They include transhumance to summer pastures, improved pasture and livestock management (e.g. pasture information systems), and pasture law, including the role of different institutions in land management as well as human and animal health risks.

Endnotes

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⁸ WOCAT: World Overview of Conservation Approaches and Technologies

⁹ <http://enews.ferghana.ru/article.php?id=2124>

References

Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- * Akhmadov HM, Nekushoeva G. 2007. The main SLM methods in rainfed areas [in Russian]. *Agricultural Academy Reports Journal* 14(4):37–44.
- Bloch P. 2002. *Agrarian Reform in Uzbekistan and Other Central Asian Countries*. Working Paper No. 49. Madison, WI: University of Wisconsin, Madison, Land Tenure Center.
- * Breu T. 2006a. *Sustainable Land Management in the Tajik Pamirs: The Role of Knowledge for Sustainable Development* [PhD dissertation]. Bern, Switzerland: Swiss National Centre of Competence in Research (NCCR) North-South and Centre for Development and Environment (CDE), University of Bern. Also available at: http://www.nccr-north-south.unibe.ch/publications/Infosystem/On-line%20Dokumente/Upload/PhD%20Breu-SLM%20Pamirs_2006.pdf; accessed on 23 July 2009.
- * Breu T. 2006b. Spatial environmental risk modelling in the Pamir-Alai Mountains: Application of a fuzzy-logic based GIS approach. In: *Proceedings of the International Disaster Reduction Conference (IDRC), Davos, 27 August – 1 September, 2006*. Davos, Switzerland: Swiss Federal Research Institute, pp 705–708.
- DFID [Department for International Development]. 2000. *Sustainable Livelihoods Guidance Sheets*. London: Department for International Development.
- Dudwick N, Gomart E, Marc A. 2003. *When Things Fall Apart: Qualitative Studies of Poverty in the Former Soviet Union*. Washington, D.C.: World Bank.
- * Haslinger A, Breu T, Hurni H, Maselli D. 2007. Opportunities and risks in reconciling conservation and development in a post-Soviet setting: The example of the Tajik National Park. *International Journal of Biodiversity Science and Management* 3(3):157–169.
- Hurni H. 2000. Assessing sustainable land management (SLM). *Agriculture Ecosystems & Environment* 81:83–92.
- Jones KD. 2004. Land privatization and conflict in Central Asia: Is Kyrgyzstan a model? In: Burghart D, editor. *In the Tracks of Tamerlane: Central Asia's Path to the 21st Century*. Washington, D.C.: National Defense University, Center for Technology and National Security Policy (CTNSP), pp 258–272.
- Kyrgyz Giprozem [Kyrgyz State Institute for Land Management Planning]. 1987. *Methodological Guidelines to Conduct Geobotanical Research on Natural Fodder Lands of the Kyrgyz SSR* [in Russian]. Bishkek, Kyrgyzstan: Kyrgyz Giprozem.
- Liniger HP, Critchley W, editors. 2007. *Where the Land Is Greener: Case Studies and Analysis of Soil and Water Conservation Initiatives Worldwide*. Bern, Switzerland: World Overview of Conservation Approaches and Technologies (WOCAT), CTA, Food and Agriculture Organization of the United Nations (FAO), United Nations Environment Programme (UNEP), and Centre for Development and Environment (CDE).
- * Ludi E. 2003. Sustainable pasture management in Kyrgyzstan and Tajikistan: Development needs and recommendations. *Mountain Research and Development* 23(2):119–123.
- Nissen SW. 2004. Tajiks' promised land – A farm of one's own. *OSCE Magazine* 1(3):4–7.
- Sadikov KR, editor. 1999. *Mountain Regions of Central Asia – Sustainable Development Issues*. Dushanbe, Tajikistan: Tajik Technical University.
- Shepherd KD, Walsh MG. 2002. Development of reflectance spectral libraries for characterization of soil properties. *Soil Science Society of America Journal* 66:988–998.
- * Shigaeva J, Kollmair M, Niederer P, Maselli D. 2007. Livelihoods in transition: Changing land use strategies and ecological implications in a post-Soviet setting (Kyrgyzstan). *Central Asian Survey* 26(3):389–406.
- * Wolfram B, Seiler S, Kneubühler M, Liniger HP. 2007. Spatial assessment of erosion and its impact on soil fertility in the Tajik foothills. *EARSeL eProceedings* 6(1):12–25.
- Zaslavski MN. 1983. *Studying Soil Erosion* [in Russian]. Moscow, Russia: Mysl.

16 **Natural Resource Institutions in Transformation: The Tragedy and Glory of the Private**

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Abstract

The present article focuses on continuity and change in natural resource institutions in post-Soviet Kyrgyzstan. Two main trends have characterised the management of water, agricultural land and pastures since the country became independent in 1991. First, while natural resources were collective and state-owned during the Soviet period, they are now being gradually privatised and passed into individual or group ownership. Second, by contrast with central administration under the Soviet regime, after independence natural resource management has been and is increasingly being decentralised to the community level. We suggest that these processes have created a new concept of the 'private', defined as clearly assigned property rights as opposed to 'commons', and individual or group ownership as opposed to 'public' ownership. We attempt here to analyse how privatisation and decentralisation have created new property relations and new forms of natural resource governance. We conclude that these processes have yielded both favourable and unfavourable outcomes.

Keywords: Post-socialist transformation; natural resource institutions; privatisation; decentralisation; water; agricultural land; pastures; Kyrgyzstan.

16.1 Introduction

Privatisation and decentralisation in Kyrgyzstan have altered natural resource use and management. This article traces the emergence of the 'private' and discusses its 'glories' and 'tragedies' in terms of favourable and unfavourable outcomes. The term 'private' entails two dimensions. First, 'private' relates to the 'tragedy of the commons' proclaimed by Garrett Hardin (1968), who, in brief, posits a Malthusian relationship between unregulated access to natural resources and over-exploitation and degradation of these resources. He bases this relationship on the idea of self-interested individuals who strive for maximisation of benefits rather than protecting the common good. In this view, the 'private' as opposed to the 'commons' denotes clearly defined property rights that restrict access and regulate demand, thus avoiding Hardin's tragedy. The 'tragedy of the commons' remains an implicit assumption that shapes critique of excessive use and degradation of natural resources in the former Soviet Union (Mirovitskaya and Soroos 1995). Analysts, mainly of Western origin, understand Soviet public ownership as a 'property vacuum' that represents a form of Hardin's commons and in practice leads to an open access situation – hence the prescription of clearly assigned property rights.

Second, 'private' refers to a form of ownership not by the state, but by individuals or groups. Yet in this sense private property is more than a form of ownership. It is a concept that has ideological effects. In particular, individualised private exclusive ownership is posited as the basis of democratic politics and stable market economies (Hann 1998; Verdery 2004b). Moreover, the controversy regarding public and private property regimes had political symbolism and characterised the central ideological opposition of the state socialist and capitalist systems during the Cold War period. Therefore, transformation of property regimes – i.e. privatisation – throughout the post-socialist space needs to be understood in the context of this ideological opposition.

We argue that exploration of the two aspects of the 'private' outlined above constitutes an important contribution to understanding post-socialist transformation.⁷ Post-socialist transformation is defined first of all as the sum of social, economic and political changes that have occurred and continue to occur in Kyrgyzstan (and in varying forms in other countries) since the demise of state socialism. Second, it is defined as a process that links the past to the future (Burawoy and Verdery 1999). While we aim at a descriptive

rather than a prescriptive use of the term, we acknowledge that evaluation of processes attributed to it is hardly ever value-free. We mark the beginning of post-socialist transformation with the independence of Kyrgyzstan. However, we also take into account that the final years of the Soviet Union were constitutive in this process. Not only was this period formative in terms of present-day post-Soviet realities, but it also serves as a point of reference for people's subjective interpretations of transformation.

The present article draws on empirical research on land, water and pasture management conducted in Kyrgyzstan between 2002 and 2007 within the framework of the Swiss National Centre of Competence in Research (NCCR) North-South programme. The next section presents a descriptive account of privatisation and decentralisation of natural resources in independent Kyrgyzstan. This is followed by an exploration of how privatisation and decentralisation have altered social relations with respect to natural resources, and an examination of the new forms of natural resource governance. Finally, conclusions are drawn from our analysis of the 'private'.

16.2 Privatisation and decentralisation in independent Kyrgyzstan

Privatisation entails the transfer of property from state or collective entities to private actors. Privatisation programmes were introduced in Kyrgyzstan as early as December 1991. In the course of the following years, a vast array of state enterprises and state-owned utilities were transferred to private entities by means of vouchers and cash auctions.⁸ For this endeavour, the newly independent state received strong political backing and monetary support from international financial institutions (i.e. the International Monetary Fund and the World Bank) which assigned a high priority to privatisation (Pomfret 2004). In the case of natural resources, Kyrgyzstan largely privatised excludable goods such as agricultural land and cattle, but has so far retained state ownership of some common-pool and key natural resources such as forests, pastures and water.

Agricultural land has been successively transferred from state and collective farms to private ownership by peasant farms.⁹ In a first step, the government allocated land-use rights to peasant farms for 99 years in 1995. These rights, inscribed in land-use certificates, were converted to ownership documents in 1998. The Land Code¹⁰ adopted in 1999 initially foresaw a five-

year moratorium on agricultural land sales, which, however, was gradually eased and eventually lifted by 2002 (Bloch and Rasmussen 1998; Giovarelli 1998; Bloch 2002). While livestock was privatised by distribution to entitled individuals, pastures have remained state property as regulated in the Land Code. Individuals or economic entities may, however, conclude leasing agreements for grazing rights over a period of five to ten years (Farrington 2005). The Water Code¹¹ adopted in 2005 defines water as state property, but grants every person within the boundaries of Kyrgyzstan the right to use water for a finite list of purposes, including irrigation. An irrigation service fee was introduced in 1995 and finally implemented in 1999. While inter-farm irrigation infrastructure also remains state-owned, the ownership of on-farm (tertiary) infrastructure is transferred to formalised irrigation communities (Ul Hassan et al 2004; Herrfahrdt et al 2006; Sehring 2007).

Decentralisation transfers centralised state authority to lower political levels and delegates authority to governmental and non-governmental bodies. In Kyrgyzstan, the process of decentralising the political and economic system inherited from the Soviet period began soon after independence.¹² It centres on the concept of 'local self-governance'. The most relevant body in this respect is the village administration (*aiyl ökmötü*), which was introduced in 1996. It subsumes clusters of villages – most of which were part of the same state or collective farm – under the same executive and representative body. The law defines the village administration as independent from central government. The decentralisation process has received strong support from the United Nations Development Programme and other international aid organisations.¹³ It was implemented by the central government as a top-down process rather than being driven by the population (Ibraimova 2009).

In the case of agricultural land, the village administration was entitled to hold property in 2002 and is thus in charge of managing municipal infrastructure and the land in the Redistribution Fund. With regard to pastures, the village administration holds the right to conclude lease agreements and collect taxes for grazing areas in the vicinity of villages. With regard to irrigation water, Kyrgyzstan has transferred and is still transferring authority for irrigation management to Water User Associations (WUAs). WUAs are non-commercial voluntary associations of water users that finance themselves through members' payments for water service delivery. Usually established along the boundaries of the former state and collective farms, they are intended to operate, maintain and rehabilitate the irrigation system, deliver water to the end users, purchase water from the state, and collect water fees from users

(Ul Hassan et al 2004; Herrfahrdt et al 2006; Sehring 2007). The country received strong financial and logistic support from the Asian Development Bank and the World Bank for country-wide development of WUAs.¹⁴

16.3 New property relations concerning natural resources

Property relations are a specific form of social and cultural relations among humans with respect to natural resources (Hann 1998; Humphrey and Verdery 2004). Privatisation and decentralisation alter property relations in two ways: first, they transform the nature of people who engage in social relations with respect to natural resources, and second, they redefine the way the natural resources at stake are constituted (Table 1). In the case of Kyrgyzstan, these processes have created an unprecedented form of personhood: the ‘peasant farmer’. Far from being a naturally existing category, the peasant farmer emerges as both a means and an end of privatisation and decentralisation. The peasant farmer becomes the holder of property rights, but it is the very social concept translated into spatial boundaries that allows property to be reassigned in the first place. Equally, the peasant farmer becomes the basic social unit of rural livelihood production, engagement in the market economy, preservation of natural resources and the environment, and realisation of local self-governance. But transfer of political power and delegation of authority are only possible on the grounds of the peasant farmer’s conceptual existence.

In practice, a vast number of farmers clearly support and approve of private land ownership. They either produce for subsistence or participate in the evolving rural and urban agricultural and livestock markets in Kyrgyzstan. A smaller number of farmers engage in emerging profitable agricultural businesses beyond the national border.¹⁵ At the same time, farmers often perceive themselves as ‘unemployed’ or ‘without a job’ (Lindberg 2007, p 69; Rohner 2007). This may be the result of previous Soviet practices, whereby agricultural workers were provided with salaried jobs. Alternatively, it could be a strategy for dealing with the Ministry of Labour and Social Protection, which monitors income and submits those categorised as ‘poor’ to the Employment Centre for unemployment allowances (Ibraimova 2009). But in this context we suggest that a lack of ‘professionalisation’ also hints at a hitherto absent social identity and societal valuation. Becoming a peasant farmer is – at least initially – not an entrepreneurial option as neo-liberal

Table 1

Impacts of privatisation and decentralisation on property relations related to natural resources in Kyrgyzstan.	Changes in property relations	Processes
	Emergence of the 'peasant farmer'	<ul style="list-style-type: none"> - The concept of the 'peasant farmer' emerges as both the means and end of privatisation and decentralisation - Actual practice lacks social identity and valuation
	Monetarisisation and new values of natural resources	<ul style="list-style-type: none"> - Renders people 'responsible' and 'self-governing' in a neo-liberal framework - Attributes higher value to some natural resources and makes others lose value
	Natural resources become an asset and obligation	<ul style="list-style-type: none"> - Empowerment and freedom of choice through ownership - Private ownership leads to new risks, liabilities and burden
	Reconfiguration of wealth and social status	<ul style="list-style-type: none"> - Privatisation processes lead to unequal benefits - Private ownership results in new social stratification

reasoning constructs it, but is often the last resort in comparison with other socially and economically more beneficial opportunities, such as migrating for low-skilled but better-paid work to the capital of Bishkek or to Kazakhstan or Russia (Thieme 2007).

The constitution of natural resources has been altered by monetarisisation, through the process of assigning prices to the potential benefits derived from resources (e.g. irrigation service fee). This is not to say that natural resources were completely outside the realm of economic relations during the Soviet period.¹⁶ But with the form of capitalism that followed independence, monetarisisation – and the market in particular – became imperative (Wood 1994). Assigning a price to property and services was guided by ideas of economic efficiency, but also by the attempt to render people responsible and self-governing within a neo-liberal framework. By this reasoning, the monetarised natural resource was to appear as a scarce good of (monetary) value with which people could engage in a specific form: environmental stewardship, political agency, and efficient economic transactions.¹⁷

With ownership, it is expected that people will bestow new values on natural resources and therefore help protect them from degradation. At the same

time, ownership implies new obligations. When privatised land carries liabilities (Verdery 2004a), repair and maintenance of transferred irrigation infrastructure turn into a financial burden (Bichsel 2009), and livestock ownership devolved to individual herders becomes a risk (Farrington 2005). Moreover, newly owned objects have gone from being valuable to being valueless or vice-versa, simply because the surrounding conditions changed.¹⁸ This is illustrated by the greater value attributed to pastures near villages and the diminished importance of more distant high-altitude villages after the collapse of the Soviet supply and transportation network (Ludi 2003; Shigaeva et al 2007; Liechti, submitted). Similarly, users at present greatly prefer gravity-operated to pump-fed systems for irrigation. The latter were designed for the Soviet socio-economic system, with heavily subsidised electricity and state infrastructure maintenance. When this network fell apart, pumps transferred to communities became a burden to users and a liability with respect to ensuring water supply (Bichsel 2009).

Changed values brought about winners and losers, most succinctly summarised in a colloquial expression: *prikhvatisatsiia*. The collated words *privatisatsiia* (Russian for ‘privatisation’) and *khvatat’* (‘to grab’) denote the illicit appropriation of former or present state property for private use.¹⁹ The expression entails both ridicule of the actual process of privatisation and a social critique of its sometimes grossly unequal and unjust outcomes. Not only did privatisation processes allow for inequalities; private ownership itself resulted in new social stratification. Shigaeva et al (2007) argue that the social dynamics in two northern Kyrgyz villages reflect reassignment of agricultural production assets to wealthier households. While post-socialist distribution of wealth appears to reflect former disparities – and thus to counter the ideological picture of a ‘levelled’ Soviet society – the influx of new financial resources such as remittances reconfigures and possibly also amplifies these disparities (Rohner 2007). Unequal accumulation and consumption of wealth alter moral perceptions and remake familial and social networks (Wanner 2005), as indicated by the low prestige of agricultural work on fields now done by the poor for the wealthier (Lindberg 2007).²⁰

16.4 Altered governance of natural resources

Natural resource governance is understood as the arrangements of power and forms of authority that regularise the appropriation, distribution and value of natural resources in society (Hann 1998; Humphrey and Verdery 2004).

Altered governance thus raises the question of the legislative framework, as well as of other norms and relationships that shape current social practices related to natural resources (Table 2). Formal state law in independent Kyrgyzstan draws on a number of sources. The present legislative system succeeds Soviet law, but is also inspired by post-socialist Russia's legal science and law-making (Ibraimova 2009). At the same time, Western legal concepts entered legislation in Kyrgyzstan following independence and continue to shape the law. As discussed above, the country welcomed standards and practices recommended by international organisations for governance of natural resources. Finally, invoking its historical heritage, Kyrgyzstan has introduced institutions referred to as 'traditional' which presumably or actually existed prior to the Soviet period. This 're-traditionalisation' of law is reflected in the formalisation of elders' courts with the authority to adjudicate minor disputes over water and land at village level (Beyer 2006).

Evidence shows that social practices related to natural resources do not fully mirror the legislative framework (see, for example, Steimann 2008). Depending on their normative position, observers speak of a 'lack of rule of law' (Kangas 2004) or 'hybrid institutions' (Koehler and Zürcher 2004). Discrepancies between the legal and the empirical appear to have existed as a key element in Soviet institutional patterns and thus suggest a certain continuity. We propose that current social practices are governed by four main frameworks: first, the legal framework and respective policies already discussed; second, pre-independence structures and imaginaries, such as

Table 2

Governance of natural resources in Kyrgyzstan.	Frameworks	Informed by...
	1. Formal law and policies	<ul style="list-style-type: none"> – Soviet law – Russian legal thought – Western legal concepts – Introduction of 'traditional' law
	2. Pre-independence structures and imaginaries	<ul style="list-style-type: none"> – Soviet administrative divisions – Existing infrastructure – Past experiences and value systems
	3. Local moralities and norms	<ul style="list-style-type: none"> – Boundaries of collectivities – Rules of reciprocity and trust – Customary law (<i>adat</i>)
	4. On-site power relations	<ul style="list-style-type: none"> – Social and political configurations – Wealth, status and connections

ethno-territorial administrative divisions (Haugen 2003), infrastructural politics (Obertreis 2007), and previous experiences and value systems (Liechti, submitted); third, local moralities and norms that regulate the formation of collectivities, reciprocity and trust (Rohner 2007; Ibraimova 2009); and fourth, on-site power relations such as upstream–downstream constellations in irrigation systems (Bichsel 2009) or the advantageous position that ‘status’ bestows for access to irrigation water (Lindberg 2007).

The discrepancy between the legal framework and social practices entails inherent tension. Law is a normative prescription for behaviour, and the gap between the ‘ought’ and the ‘is’ raises questions about forms of authority and power that regulate actual social practices, and about their basis for legitimacy. The extended room for manoeuvre to bend formal rules is attributed to wealth, ‘status’ and social connections (Lindberg 2007; Rohner 2007; Shigaeva et al 2007). While the importance of connections may constitute a continuation of Soviet practices (Kuehnast and Dudwick 2002), it appears that status and wealth are now becoming more closely interlinked and morally reconfigured. Monetary means create a form of influence that incites both respect and fear among people for its potential to promote one’s own interests and ‘achieve things’. Possession or promise of money bestows authority on semi-criminal actors and buys popular support for political candidates to ascend to power, but also accounts for the wide room for manoeuvre of development projects to pursue their objectives. Conversely, this also explains the lack of trust and the low status that state institutions with limited funds enjoy among the population when pitted against financially potent international organisations.

Yet legal reform and development policy assign importance to a different form of power: associational power that emerges from joint integrative action for a common purpose, usually expressed as ‘collective action’. Decentralisation is driven by the idea that collective action needs to replace the centrally assumed responsibilities of previous state socialism. For example, the transition to farmer-managed systems now requires new forms of collective action for sustained operation and maintenance (Gallati 2008). Moreover, through forms of public sociality and mobilisation, collective action should fill the presumed ‘public void’ (Fairbanks 1997) of the Soviet Union and mould a democratic society.²¹ The main responsibility for people’s ability to recognise and exert their agency, Ibraimova (2009) argues, lies in the legislative and institutional framework the government provides. This framework has been significantly altered to enable collective action at

the community level. At the same time, Ibraimova contends that Kyrgyzstan has so far failed to successfully empower people for collective action due to its excessive focus on executive power and lack of the conditions required to secure public interests (*ibid.*).

Aid projects engage in institutional engineering for collective action through ‘community mobilisation’ and ‘initiative groups’. Here, their aims of political and societal reform account for specific ‘design principles’ to build collective action and related institutions. Such institutions are either built from scratch following the idealised image of Western democracy, or, alternatively, aid projects build on so-called ‘local traditions’ but include only selective aspects of these traditions that are of interest,²² while at the same time attempting to transform their underlying societal model (Bichsel 2009). Since independence, aid projects have set up or supported a vast number of community-based organisations for collective action. Numerous persons have participated in such organisations, and have been able to voice their needs and join forces to address the challenges they face. At the same time, many of these organisations are highly dependent on financial and technical aid that often determines their terms and their very existence. Moreover, the resulting contradictory and parallel structures often create confusion and thus threaten rather than enable collective action (Ibraimova 2009). In summary, the public space no longer appears in its retrospective void, but appears overcrowded in the sense of a Hardinian tragedy.

16.5 Conclusion

Privatisation and decentralisation rely heavily on the administrative and conceptual boundaries of the socialist property regime. For example, Kyrgyzstan adopted the principle of re-distribution rather than restitution, as it did not aim to restore pre-Soviet individual or group rights to natural resources which had to be relinquished in the socialist collectivisation process. Rather, it took residential and professional affiliation during the last Soviet period as a baseline. Similarly, the concept and term of ‘local self-governance’ has its origins in Soviet law. After the rapid social development and deeply conservative politics of the Brezhnev period, Gorbachev separated spheres of authority for the different levels of government, if only administratively (Ibraimova 2009). Therefore, despite the ideological politics which surround privatisation and decentralisation in post-Soviet Kyrgyzstan, the ‘private’ is inevitably conditioned by its preceding property

regime. We therefore suggest that accounts of post-socialist transformation must acknowledge this past outside its ideological framework.

Legal and social engineering has achieved de facto private property and decentralised governance in Kyrgyzstan. Yet it appears that social imaginaries that attribute meaning to the facts do not necessarily correspond. The peasant farmer as the newly emerging basic social unit of privatisation and decentralisation is a discursive reality and a social fact. However, on closer examination, the integrity of this image breaks down. Similarly, devolution of power and decentralisation of authority to the newly created political level of 'local self-governance' has to a considerable extent been successful. Yet many people perceive local self-governance authorities and even the re-invented elders' courts – per definition not part of the state – as an element of the central state. We suggest that this may be both a stage of ongoing transformation as well as a particular manifestation of the 'private' in Kyrgyzstan's post-Soviet context.

At present, our research suggests that the 'private' has both its glories and its tragedies in terms of outcomes. In terms of the 'private' as opposed to Hardin's tragedy of the commons, evidence suggests that clearly assigned property rights have indeed altered people's relationships to natural resources in terms of responsibility for protecting their condition. On the other hand, concomitant processes such as reconfiguration of value, slowly emerging markets and growing inequalities have led to greater exploitation and degradation of natural resources. With regard to private property, people's appreciation of individual or group ownership, their empowerment through such ownership, and their freedom of choice clearly rank as a glory. Yet private property has so far not delivered the 'bright future' promised by market capitalism and liberal theory in terms of democratic politics and stable market economies.

Endnotes

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⁷ In this article, we use the term ‘transformation’ rather than ‘transition’, which is more common in English literature. By doing so, we emphasise the all-encompassing changes of the political, social and economic system with the advent of the post-socialist period rather than the transition from an authoritarian to a democratic system only (Herbers 2006, pp 3–9).

⁸ For a detailed account of progress and problems relating to privatisation in the 1990s, see Abazov (1999).

- ⁹ According to the 1999 Land Code, 25% of agricultural land remains in the Agricultural Land Redistribution Fund for lease to rural and urban citizens.
- ¹⁰ *Land Code of the Kyrgyz Republic*, 30 April 1999, with several amendments, most importantly the 2001 *Law on Agricultural Land Regulation*.
- ¹¹ *Water Code of the Kyrgyz Republic*, 12 January 2005.
- ¹² For a detailed overview of the different stages of decentralisation see Ibraimova (2009).
- ¹³ Compare Ackermann (2007) for an overview of the involvement of foreign donor organisations in decentralisation in Kyrgyzstan.
- ¹⁴ The establishment of a WUA has been a condition for international aid projects in the irrigation sector (Sehring 2007).
- ¹⁵ Examples include farmers in southern Kyrgyzstan catering to the demand for cherries in Russia, or livestock herders from Naryn province profitably selling white wool to traders from Kazakhstan and China.
- ¹⁶ For example, land and water played a pivotal role in the political economy of cotton production in Central Asia during the Tsarist and Soviet periods (Kandiyoti 2007). Moreover, historical studies show that economic transactions for natural resources were also frequent at the micro-economic level (see, for example, Thurman 1999).
- ¹⁷ At present, poplar trees are increasingly planted on private land plots as they fetch a good price on the timber market, and at the same time have a positive effect on the environment.
- ¹⁸ Values are a quality not of single objects or conditions of property, but of networks of things and institutions (Alexander 2004).
- ¹⁹ It is, however, rarely used for the case of natural resources and refers more to assets such as machinery or whole enterprises.
- ²⁰ Such low prestige is, however, not observed in animal husbandry. In Naryn province, more and more households offer their herding skills as professional herders to livestock owners in order to generate income. The higher esteem attributed to such work may be related to the fact that herding, livestock and life on the pasture enjoy prestige among large segments of Kyrgyz society.
- ²¹ Whether or not Soviet public space was actually void is disputed. See, for example, Sievers (2002).
- ²² For example, aid projects are often interested in the capacity of elders to mobilise villagers for a collective task, or their presumed accountability to the public.

References

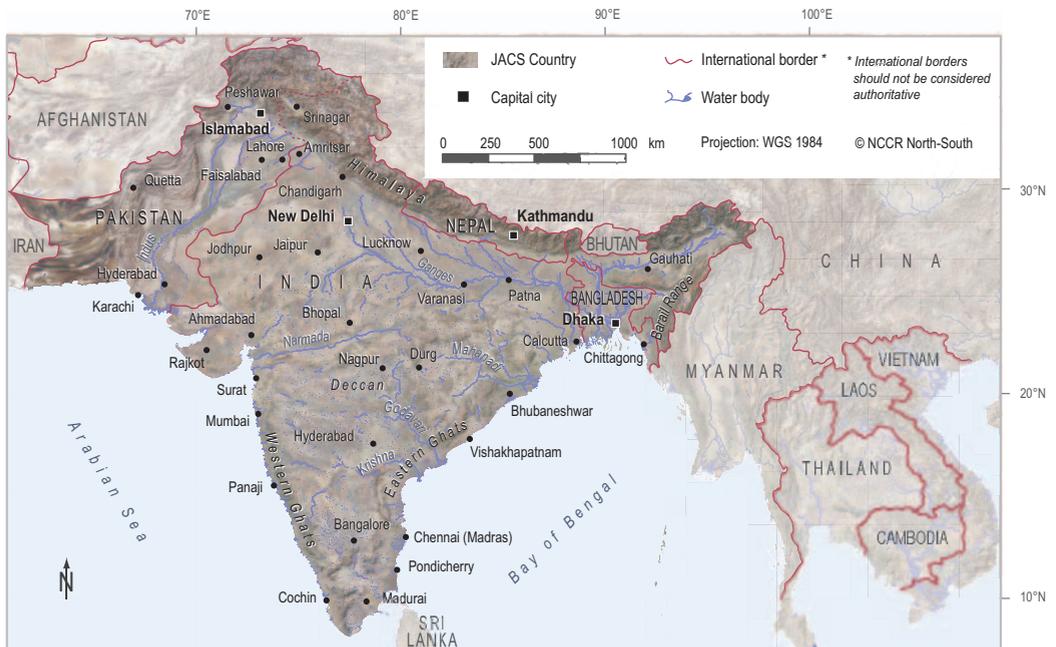
Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- Abazov R. 1999. Policy of economic transition in Kyrgyzstan. *Central Asian Survey* 18(2):197–223.
- Ackermann M. 2007. *Die lokale Selbstverwaltung in Kirgisistan* [MSc thesis]. Tübingen, Germany: Institute of Geography, University of Tübingen.
- Alexander C. 2004. Value, relations, and changing bodies: Privatisation and property rights in Kazakhstan. In: Verdery K, Humphrey C, editors. *Property in Question: Value Transformation in the Global Economy*. Oxford, UK: Berg, pp 251–273.
- Beyer J. 2006. Revitalization, invention and continued existence of the Kyrgyz *aksakal* courts: Listening to pluralistic accounts of history. *Journal of Legal Pluralism and Unofficial Law* 53/54:141–176.
- * Bichsel C. 2009. *Conflict Transformation in Central Asia: Irrigation Disputes in the Fergana Valley*. Central Asian Studies Series. London, UK: Routledge.
- Bloch PC. 2002. Land reform and farm restructuring in Kyrgyzstan: Almost done, what next? *Problems of Post-Communism* 49(1):53–62.
- Bloch PC, Rasmussen K. 1998. Land reform in Kyrgyzstan. In: Stephen WK, editor. *Land Reform in the Former Soviet Union and Eastern Europe*. London, UK: Routledge, pp 111–125.
- Burawoy M, Verdery K, editors. 1999. *Uncertain Transition: Ethnographies of Change in the Postsocialist World*. Lanham, MD: Rowman and Littlefield.
- Fairbanks CH. 1997. The public void: Antipolitics in the former Soviet Union. In: Schedler A, editor. *End of Politics? Explorations into Modern Antipolitics*. London, UK: Macmillan Press, pp 91–114.
- Farrington JD. 2005. De-development in Eastern Kyrgyzstan and persistence of semi-nomadic livestock herding. *Nomadic Peoples* 9(1/2):171–197.
- * Gallati J. 2008. *Towards an Improved Understanding of Collective Irrigation Management: A System Dynamics Approach* [PhD dissertation]. Bern, Switzerland: University of Bern.
- Giovarelli R. 1998. *Land Reform and Farm Reorganization in the Kyrgyz Republic*. RDI Reports on Foreign Aid and Development No. 96. Seattle, WA: Rural Development Institute (RDI).
- Hann CM. 1998. Introduction: The embeddedness of property. In: Hann CM, editor. *Property Relations: Renewing the Anthropological Tradition*. Cambridge, UK: Cambridge University Press, pp 1–47.
- Hardin G. 1968. The tragedy of the commons. *Science* 162(3859):1243–1248.
- Haugen A. 2003. *The Establishment of National Republics in Soviet Central Asia*. Basingstoke, UK: Palgrave Macmillan.
- Herbers H. 2006. *Landreform und Existenzsicherung in Tadschikistan. Die Handlungsmacht der Akteure im Kontext der postsowjetischen Transformation*. Sonderband Nr. 33. Erlangen, Germany: Erlanger Geographische Arbeiten.
- Herrfahrdt E, Kipping M, Pickardt T, Polak M, Rohrer C, Wolff CF. 2006. *Water Governance in the Kyrgyz Agricultural Sector: On Its Way to Integrated Water Resource Management?* DIE Studies No. 14. Bonn, Germany: German Development Institute (DIE).
- Humphrey C, Verdery K. 2004. Introduction: Raising questions about property. In: Verdery K, Humphrey C, editors. *Property in Question: Value Transformation in the Global Economy*. Oxford, UK: Berg, pp 1–25.
- * Ibraimova A. 2009. *Legal and Institutional Framework for Empowerment of Rural Communities in the Kyrgyz Republic*. Etudes et colloques 53. Fribourg, Switzerland: Publications of the Institute of Federalism.
- Kandiyoti D, editor. 2007. *The Cotton Sector in Central Asia: Economic Policy and Development Challenges*. London, UK: School of Oriental and African Studies (SOAS).

- Kangas RD. 2004. Legal reform in Central Asia: Battling the influence of history. In: Burghart DL, Sabonis-Helf T, editors. *In the Tracks of Tamerlane: Central Asia's Path to the 21st Century*. Washington, D.C.: Center for Technology and National Security Policy, pp 65–91.
- Koehler J, Zürcher C. 2004. Conflict and the state in the Caucasus and Central Asia: An empirical research challenge. *Berliner Osteuropa Info* 21:57–67.
- Kuehnast K, Dudwick N. 2002. Better a hundred friends than a hundred rubles? Social networks in transition—The Kyrgyz Republic. *World Bank Economists' Forum* 2:51–88.
- * Liechti K. Submitted. The meanings of pasture and their relevance to negotiations regarding resource degradation: Evidence from post-Soviet rural Kyrgyzstan. Available from Karina Liechti (see Endnote 1 in Chapter 35 by Liechti and Müller on p 559 of the present volume).
- * Lindberg EE. 2007. *Access to Water for Irrigation in Post-Soviet Agriculture* [MSc thesis]. Zurich, Switzerland: Department of Geography, University of Zurich.
- * Ludi E. 2003. Sustainable pasture management in Kyrgyzstan and Tajikistan: Development needs and recommendations. *Mountain Research and Development* 23(2):119–123.
- Mirovitskaya N, Soroos MS. 1995. Socialism and the tragedy of the commons: Reflections on environmental practice in the Soviet Union and Russia. *Journal of Environment and Development* 4(1):77–110.
- Obertreis J. 2007. Infrastrukturen im Sozialismus. Das Beispiel der Bewässerungssysteme im sowjetischen Zentralasien. *Saeculum. Jahrbuch für Universalgeschichte* 58:151–182.
- Pomfret R. 2004. Aid and ideas: The impact of western economic support on the Muslim successor states. In: Ro'i Y, editor. *Democracy and Pluralism in Muslim Eurasia*. London, UK: Frank Cass, pp 77–99.
- * Rohner I. 2007. *National and International Labour Migration: A Case Study in the Province of Batken, Kyrgyzstan*. IP6 Working Paper No. 8. NCCR North-South Dialogue Series. Bern, Switzerland: Swiss National Centre of Competence in Research (NCCR) North-South. Also available at: http://www.nccr-north-south.unibe.ch//publications/Infosystem/On-line%20Dokumente/Upload/WP_finale_Irene1.pdf; accessed on 6 January 2010.
- Sehring J. 2007. Irrigation reform in Kyrgyzstan and Tajikistan. *Irrigation and Drainage Systems* 21(8–9):497–510.
- * Shigaeva J, Kollmair M, Niederer P, Maselli D. 2007. Livelihoods in transition: Changing land use strategies and ecological implications in a post-Soviet setting (Kyrgyzstan). *Central Asian Survey* 26(3):389–406.
- Sievers EW. 2002. Uzbekistan's Mahalla: From Soviet to absolutist residential community associations. *Chicago-Kent Journal of International and Comparative Law* 2:91–158.
- * Steimann B. 2008. 'Niemand hier respektiert meine Grenzen' – Konflikte zwischen Hirten und Goldsuchern auf Kirgistans Weiden. *Neue Zürcher Zeitung*, 16–17 February 2008, p 9.
- * Thieme S. 2007. Osh–Bishkek–Almaty–Moscow and return? How different generations sustain their livelihoods in multilocal settings. *International Migration, Multi-local Livelihoods and Human Security: Perspectives from Europe, Asia and Africa*. The Hague, The Netherlands: Institute of Social Studies (ISS). Also available at: http://www.iss.nl/content/download/8279/80795/file/Panel%203_Thieme.pdf; accessed on 27 July 2009.
- Thurman JM. 1999. *Modes of Organization in Central Asian Irrigation: The Fergana Valley, 1876 to Present* [PhD dissertation]. Bloomington, IN: University of Indiana.
- Ul Hassan M, Starkloff R, Nizamedinkhodjaeva N. 2004. *Inadequacies in the Water Reforms in the Kyrgyz Republic: An Institutional Analysis*. Research Report No. 81. Colombo, Sri Lanka: International Water Management Institute (IWMI).
- Verdery K. 2004a. The obligations of ownership: Restoring rights to land in postsocialist Transylvania. In: Verdery K, Humphrey B, editors. *Property in Question: Value Transformation in the Global Economy*. Oxford, UK: Berg, pp 139–159.
- Verdery K. 2004b. The property regime of socialism. *Conservation and Society* 2(1):189–198.
- Wanner C. 2005. Money, morality and new forms of exchange in postsocialist Ukraine. *Ethnos* 70(4):515–537.
- Wood EM. 1994. From opportunity to imperative: The history of the market. *Monthly Review* 46:14–40.

Part V

Addressing Livelihood Challenges Through Research: Insights from South Asia





17 Livelihoods, Institutions and Migration in South Asia

Bishnu Raj Upreti¹

17.1 The context

South Asia is one of the most populated regions of the world and is characterised by a diverse livelihood situation. The region is facing the problems of a skewed power structure, a diminution of the state's role, lack of capacity for implementation, unequal participation in decision-making, erosion of indigenous knowledge and institutions, intolerance towards ethnic and cultural diversities, growing inequalities and imbalances, widening gender disparity, migration, livelihood insecurity, land degradation, unequal distribution of resources, armed conflicts, and lack of adequate infrastructure and access to information and technologies (Müller-Böker et al 2004). However, at the same time these challenges are increasingly acknowledged, and interest in addressing them is growing. The region's problems and opportunities were identified accordingly during a multi-stakeholder workshop in Kathmandu at the outset of the Swiss National Centre of Competence in Research (NCCR) North-South programme, in 2001. Since then, NCCR North-South research activities in South Asia have been based mainly on these problems and opportunities.

Table 1 gives an impression of the region's complexity. All eight countries would have represented too broad an area to apply the concepts, approaches and methodologies of the partnership arrangements in which the NCCR North-South collaborates. Therefore, research activities were concentrated in parts of India, Nepal, the North-West Frontier Province (NWFP) of Pakistan, and Bangladesh (the latter only with regard to migration issues).

NCCR North-South research carried out in the Joint Area of Case Studies (JACS)² South Asia (SAS) over the past eight years has demonstrated that global change has had a negative impact on marginalised people, especially with respect to institutions, policies and practices at various levels. Research has addressed questions of access and power in relation to migration, conflict, livelihood insecurity, and degradation of natural resources. The

Table 1

South Asian countries	Area (km ²)	Population in mid-2008 (millions)	Projected population in 2050 (millions)	Infant mortality rate (per 1000)	Life expectancy at birth (years)			% of undernourished population (2002–2004)
					Total	Male	Female	
Afghanistan	65,209	32.7	81.9	163	43	43	43	–
Bangladesh	144,000	147.3	215.1	52	63	62	64	30
Bhutan	47,000	0.7	1.0	40	66	66	67	–
India	328,726	1149.3	1755.2	57	65	65	66	20
Maldives	300	0.3	0.5	16	73	72	73	10
Nepal	147,180	27.0	48.7	48	64	63	64	17
Pakistan	796,100	172.8	295.2	75	63	62	64	24
Sri Lanka	65,610	20.3	25.4	15	71	67	75	22
Total	513,954	1550.4	2423.0	–	–	–	–	–
Average	–	–	–	58.25	63.5	64.5	62.5	–

Overview of demographic features of South Asia.

Source: Compiled from Population Reference Bureau 2008.

findings have been synthesised focusing on the following three themes: 1) *The Functioning of Institutions in Relation to Access to Livelihood Assets*; 2) *State Performance in Resource Governance and Associated Conflict*; and 3) *Migration*. JACS SAS researchers pursued disciplinary, as well as multi-, inter- and transdisciplinary research approaches to address problems of sustainable development. The synthesis work done in the JACS SAS also focuses on concretisation, specialisation, application and generalisation.

17.2 Research achievements

The three syntheses provide a better understanding of rural livelihood strategies in South Asia and the role of institutions and their effects on state governance practices. The first synthesis is concerned with analyses of access to livelihood assets and the functioning of institutions (Chapter 18 in the present volume). It identifies the conditions that impede access of marginalised people to sources of livelihood, and hamper the functioning of state

regulations, customary norms, and institutions. It reveals that despite the efforts made in development interventions to create livelihood assets for poor people, their access to these assets is still shaped by local power relations and institutional performance. Customary rules remain influential in determining access to basic services such as health, education and livelihood assets (Figure 1). For example, women's mobility and access to resources in Pakistan's NWFP was very much shaped by the *purdah* (a customary law that confines women within a certain spatial boundary). Similarly, in Kerala's Adivasi (tribal) community, Paniyan and Kattunayakan were not allowed to milk cows owing to caste-based discrimination, which thus limits dairy farming as an alternative means of livelihood. Customary norms and power status are interrelated in the shaping of access and entitlement issues. Interactions between customary practices and socio-economic systems often influence access (see Chapters 18–20 in the present volume). Therefore, it is essential to have a better understanding of local dynamics in order to formulate development interventions. As argued by Scoones (2009), rural livelihood strategies are very much affected by local power relations.



Fig. 1
Alpine pasture as a
livelihood base in
northwest Paki-
stan. Access to
these pastures is
strictly regulated
through informal
customary institu-
tions. (Photo by
Urs Geiser)

The second regional synthesis is related to state performance in resource governance and associated conflicts (Chapter 19 in the present volume). A comparative analysis shows that the governing practices of the state are one of the main causes of conflict over natural resources. State legitimacy and interaction with people determine the degree and intensity of conflict and collaboration with respect to natural resources. Once state legitimacy is weak and a top-down, controlling approach is adopted, conflict is inevitable. Analysis of forest management in the NWFP and Kerala, and of conservation management in Nepal, shows that the high vertical and horizontal legitimacy of the state promotes collaboration in managing natural resources. Once the state uses its vertical authority over management and utilisation of natural resources without considering the traditional rights of indigenous people, conflict and tension are inevitable. Centralised resource governance systems have created conflict and tension in all three countries. This synthesis chapter confirms the findings of Bergh (2004) and Ribot (2002) on the importance of democratic decentralisation and people's involvement in resource management. Moreover, this analysis has added a new 'legitimacy' discourse on managing natural resources and addressing related conflict (see Chapter 19 in the present volume).

Migration is the theme of the third regional synthesis. With changes in conventional livelihood bases for political and economic reasons, migration is becoming an important livelihood strategy (Figure 2). Chapter 20 in the present volume reveals that migration is a complex process which is not only due to push and pull factors. Migrants' lifeworlds are caught up between the 'source society' and the 'recipient society' with their differing rules and regulations, cultures and social norms, job markets and social networks. Hence, migrants operate in transnational social space. At the same time, the economy in South Asia is very much shaped by remittances.

Migration has also changed domestic labour dynamics. Changes in the dynamics of the labour market observed in Kerala are an example of how large numbers of migrant workers going to Gulf countries created labour shortages and increased wages; as a consequence, large numbers of migrant workers came to Kerala from other parts of India. Gender-biased policies pursued until recently by South Asian countries (restrictions on the mobility of female migrants) also created inequities and discrimination felt by female migrants. Control of trafficking in women is often linked with female migration, without exploring better options for the safe migration of women. When males migrate, household roles change; female members have to assume the responsibilities of male household members in their absence.



Fig. 2
Young men on their way to urban areas on an early morning in northwest Pakistan. Very few of them find employment in their villages; thus, searching off-farm income has become an important livelihood strategy.
(Photo by Urs Geiser)

Research on these three themes has produced complementary findings. The first analysis examines the role of formal and informal institutions in poor people's access to livelihood assets. Socio-economic and cultural diversity must be respected by the state to minimise potential tensions in local communities. Similarly, the second theme also addresses the notion of 'state legitimacy' to manage resources and resolve associated conflicts. Research on the third theme reveals that customary practices in a particular local socio-cultural setting define the mobility of females and determine access to basic services such as health and education. Hence, examining customary practices and their relations to the livelihood of local people is an important integrated issue in research carried out in the JACS SAS.

One of the most important outcomes of this research is its theoretical contribution to the livelihood approach. In conceptualising and theorising on livelihood realities, for example, researchers from the JACS SAS analysed 'livelihood arenas', 'governance', and 'the changing role of the state'. These concepts require clear and transparent reflection on their meanings and their roots in scientific debates. The Sustainable Livelihood Approach, widely used in livelihood research, appeared to lack theoretical underpinning. Realising this deficiency, JACS SAS researchers began to address the enabling

Table 2

Title	Location	Duration (months)	Main outcomes
Literacy, Labour Rights and Health Courses	Nepal/India	12	Migrants were trained in labour rights
Courses for Unemployed Youths	Nepal	13	Youths applied livestock farming skills from training
From Mutual Learning to Collective Action: Self-reliant Local Development	India	14	Rights-based development was promoted
Radio Programme for Migrants from Rural Areas of Nepal	Nepal	13	Living conditions of Nepali migrants in Delhi were improved
IT-supported and Farmer-led Vanilla Marketing System	Kerala	10	Farmers found market for vanilla
GIS-based Slum Monitoring for Mitigating Poverty, Vulnerability and Disease in Urban Slums	Ahmada-bad, India	19	Slum dwellers were given a voice
Programme for Organising Labour Migrants from Far-western Nepal and Giving Courses in Literacy, Labour Rights and Health	Nepal/Delhi	13	Migrants were empowered to assert their rights; exploitation was reduced
Improving Livestock Output of Smallholder Mountain Communities in the Hindukush	Pakistan	24	Animal health-care practices were improved
Community Managed Livestock Insurance Scheme for Cost/Benefit Sharing in Kangchen-junga Conservation Area	Nepal	13	Human-wildlife conflict was reduced
Information for Migrants: A Radio Programme for Nepali Youths Working Outside the Village as Rural Livelihood Strategy	Nepal	12	Most important information was made available to Nepali migrants
Facilitating Access of Dalit People to Land Resources in Nepal	Nepal	16	Dalits' rights were recognised by state; Consortium for Land Research and Policy Dialogue (COLARP) emerged
Strengthening Communication and Trust Between Actors for Sustainable Forest Governance in the North-West Frontier Province of Pakistan	NWFP	18	Forged a link between local and policy actors in forestry
Strengthening Migrants' Wives in Rural North-west Pakistan	Pakistan	Ongoing	
Developing a Community-based Tourism Model in Kaski District in Western Nepal	Nepal	Ongoing	
Bridging the Gap between Research, Policy and Practice on Land Issues	Nepal	Ongoing	

Overview of Partnership Actions for Mitigating Syndromes (PAMS) implemented in South Asia during Phases 1 and 2 of the Swiss National Centre of Competence in Research (NCCR) North-South programme, and their main outcomes.

or restricting institutional context within which people construct their livelihoods, for example by referring to various structuration theories (e.g. Giddens's agency-based approach and Bourdieu's notions of habitus and social capital) and working with the concept of political economy.

Among the unexpected innovations was spontaneous creation of new platforms to foster policy dialogue among different stakeholders (Figure 3). Examples include the Consortium for Land Research and Policy Dialogue (COLARP) and Radio Paurakhi in Nepal, as well as the Forestry Forum in Pakistan. Partnership Actions for Mitigating Syndromes (PAMS)³ have proven to be one of the most effective tools to link research policy and practice in the region. The PAMS carried out in the JACS SAS related to migration, livelihood security of the poor, marketing support for farmers, and communication between policy-makers and resource users have become useful instruments for facilitating dialogue between researchers, policy-makers and practitioners (see Table 2 for details on the various PAMS, including outcomes).

17.3 Future directions

Research collaboration in the JACS SAS over the last eight years has offered a number of important experiences and lessons. One important lesson is that dealing with new concepts and perspectives and implementing collaborative research initiatives is a slow and evolutionary process that requires constant engagement and backstopping. Partnerships that evolve as a result of this process are stable, mutually beneficial, and a crucial basis for developing capacity both in the South and in the North as well as for building trust.

Research activities in the third phase of the NCCR North-South programme will be guided by three specific themes: 1) livelihood realities in the context of globalisation; 2) development, environment and resource management; and 3) institutions, governance and conflict transformation. These themes were identified on the basis of past experience, relevance in the region, and available competencies. In the past eight years, JACS SAS researchers have gained considerable experience with and competence in these themes and their great societal relevance in the region. Moreover, migration, peace and livelihood security are globally recognised as important issues. All individual JACS SAS research projects as well as research activities by the NCCR North-South Regional Coordination Office (RCO) in South Asia will fall



Fig. 3
Local people discussing the resolution of a resource use conflict in Baitadi district of far-western Nepal. (Photo by Siddhi Mamandhar)

within one or more of these themes. Main research activities will be related to livelihood options and social exclusion, migration and rural development, conflict transformation and peace building in order to consolidate past achievements, contribute to ongoing policy debate, and address the new challenges faced by the region. Expected innovations emerging from research will be interwoven with generalisations and applications through social learning. There will also be emphasis on publications and dissemination of the synthesis by bringing together all research findings.

The JACS SAS faces great opportunities and huge challenges in implementing the NCCR North-South model of research partnership, owing to the diversity and complexity of the region. Existing networks must be further expanded, along with communications and public relations strategies and joint efforts to enhance effectiveness. Concrete collaboration with regional and international networks and agencies must be developed, and the JACS SAS must participate in addressing challenges faced by the region. The major challenge for the JACS SAS is to position its RCO in the region and gain recognition within the region as a credible, capable and viable research network for addressing the challenges of regional sustainable development.

Endnotes

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² The NCCR North-South is based on research partnerships with researchers and research institutions in the South and East. These partnership regions are called JACS (Joint Areas of Case Studies). Regional Coordination Offices (RCOs) were established in each of these JACS at the outset of the programme. The original function of the RCOs was to coordinate research; with the third and final phase of the programme, RCOs will also become independent hubs for generating new research projects and partnerships.

³ Partnership Actions for Mitigating Syndromes (PAMS) are projects implemented by local actors together with scientific and non-scientific stakeholders. As a component of the NCCR North-South programme they are designed to implement and validate approaches, methods and tools developed in research, with a view to finding promising strategies and potentials for sustainable development. Moreover, they are intended to promote mutual learning and knowledge-sharing between academic and non-academic partners in sustainable development.

References

Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- Bergh S. 2004. Democratic decentralization and local participation: A review of recent research. *Development in Practice* 14(6):780–790.
- * Müller-Böker U, Geiger D, Geiser U, Kansakar V, Kollmair M, Molesworth K, Suleri A. 2004. JACS South Asia: Sustainable development in marginal regions of South Asia. In: Hurni H, Wiesmann U, Schertenleib R, editors. *Research for Mitigating Syndromes of Global Change: A Transdisciplinary Appraisal of Selected Regions of the World to Prepare Development-oriented Research Partnerships*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 1. Bern, Switzerland: Geographica Bernensia, pp 225–261.
- Population Reference Bureau. 2008. *World Population Data Sheet 2008*. Washington, D.C.: Population Reference Bureau.
- Ribot JC. 2002. *Democratic Decentralization of Natural Resources: Institutionalizing Popular Participation*. Washington, D.C.: World Resources Institute. Also available at: http://pdf.wri.org/ddnr_full_revised.pdf; accessed on 29 July 2009.
- Scoones I. 2009. Livelihood perspectives and rural development. *Journal of Peasant Studies* 36(1):171–196. doi:10.1080/03066150902820503.

18 Access to Livelihood Assets: Insights from South Asia on How Institutions Work

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Abstract

The present contribution is an attempt to understand the conditions that impede some households and social groups in securing a decent livelihood by drawing on 'purported' facilitating institutions. It is generally agreed that access to livelihood assets is negotiated through institutions. However, the way in which these institutions operate in everyday practice and in specific contexts is less well understood. The four case studies presented here therefore analyse how customary norms and state regulations work. The article argues that a deeper understanding of the working of institutions, which in turn influence who is excluded from and who is entitled to access a particular livelihood asset, also provides a bridge to evidence-based development support.

Keywords: Sustainable livelihoods; institutions; customary norms; gender disparities; poverty; South Asia.

18.1 Introduction

Meager assets, inaccessible markets, and scarce job opportunities lock people in material poverty. That is why promoting opportunity – by stimulating economic growth, making markets work better for poor people, and building up their assets – is key to reducing poverty. (World Bank 2000)

Lack of assets has become a key factor in explaining poverty, and thus the *building up of assets* of poor people has become a central theme in development interventions by states, NGOs and international donors. In terms of research, this emphasis has received special support through wide use of the “Sustainable Livelihoods Framework” developed by the United Kingdom’s Department for International Development (DFID 2001), which focuses heavily on assets or capitals. Asset-oriented interventions in the South Asian context include, for example, joint forest management programmes in Pakistan, infrastructural programmes focusing on health and education in Pakistan and Nepal, land reform programmes in Nepal, and agricultural extension schemes in India. However, many of these programmes face considerable implementation difficulties. Indeed, experience as well as research (see, for example, Sen 1981) indicate that many social groups find it extremely difficult to gain *access* to assets required for a decent livelihood:

[Creating assets] is only part of the story. In a world where political power is unequally distributed and often mimics the distribution of economic power, the way state institutions operate may be particularly unfavourable to poor people. [...] Poverty outcomes are also greatly affected by social norms, values, and customary practices that, within the family, the community, or the market, lead to exclusion of women, ethnic and racial groups, or the socially disadvantaged. That is why facilitating the empowerment of poor people – by making state and social institutions more responsive to them – is also key to reducing poverty. (World Bank 2000)

Although the difficulties of implementing asset-oriented approaches are acknowledged in principle (as the above quote from the World Bank indicates), the *actual working of* institutions, social norms or customary practices, and the concrete ways in which institutions tend to sustain access to livelihood assets for the already privileged and restrict them for the marginalised and poor, are less well understood. The present article aims to explore

this gap and add insights. It brings together the findings of four empirical case studies,⁷ illustrating that poverty and insecurity are the result of a lack not (only) of “endowments” but (also) of “entitlements” (Leach et al 1999). The four case studies show which intra- and inter-community dynamics shape the rules of who has access to assets and who does not, whether in relation to health and education, forest resources, or new income-generating strategies and development programmes. We argue that an understanding of the actual working of institutions – which in turn support or obstruct different people’s endowments and entitlements – facilitates “strategic specificity in interventions” (Leach et al 1999).

The case studies reviewed here applied a livelihood perspective as well. However, they attempted to go beyond an assessment of *capitals* that (mainly poor) people in rural contexts have at their disposal, in order to grasp specifically the “social and institutional context within which rural individuals and families construct and adapt their livelihoods” (Ellis 2000). The studies focused on: 1) Access of women in northwest Pakistan to health and education services; 2) access of poor households to schooling in Nepal; 3) access of tribal groups in Kerala, India, to agricultural extension schemes; and 4) access of various social groups to forest resources in Pakistan.

18.2 The case studies

The methods used in the individual studies generally included case study research by means of exploratory triangulations and subsequent interviews and selected questionnaire surveys. Conceptually, the studies applied a broad definition of institutions along the lines of North (1990), i.e. as “rules of the game” in the sense of norms, rules and regulations that structure everyday life, as well as the organisations linked with these. Each of the four studies is briefly summarised below, followed by a discussion of its implications.

18.2.1 Gender norms and access to health in Pakistan

This study by Sadaf and Siegmann (Sadaf 2006; Siegmann and Sadaf 2006) investigated household power relations and gender norms in northwest Pakistan in order to understand why women have less access to education and health facilities even though educational and health institutions are present in the villages. Women’s literacy rate is lower than that of males (national average for males: 64%; for females: 39%; Government of Pakistan 2005).

In terms of health indicators for women, the country ranks among the lowest in the world. In the rural North-West Frontier Province (NWFP) of Pakistan, gender gaps in access to health and education services are even wider than in urban areas of the province and the country as a whole.

Although there is general criticism of the functioning of educational and health infrastructure, educational and health services are in principle available throughout the province. Reasons for low female access, therefore, need to be sought elsewhere. Given this context, the researchers hypothesised that *social gender norms* are crucial. To study the impact of these norms on access, the case study localities were selected on the basis of different levels of remoteness, as well as distinct 'cultural spaces': One village was located in a relatively poorly accessible highland region (Kanshian), the second in a foothill region (Gali Badral), and the third in the lowlands (Chamtтар). Whereas Kanshian and Gali Badral are located in the Hazara region, Chamttar is a Pathan village.

The Pathan, or Pakhtun, are the largest ethno-linguistic group living in the NWFP, and are characterised by rigid gender norms of female seclusion, restricted mobility, gendered division of labour, and *pardah*. *Pardah* refers to women's confinement within the spatial boundary of a house and covering themselves with a veil whenever they go outside the home; it also relates to male honour. This code of behaviour, deemed to be ideal amongst the Pakhtun, is known as *Pakhtunwali*, and attaches great importance to family prestige, where men are dominant in decision-making and women represent their *ghairat* (honour). This is reflected in the following statement made during a male focus group discussion in Chamttar:

Actually we are Muhmand [a Pathan tribe], we are very strict, and we don't allow women to be educated. It is a sense of shame for us. If someone does this, other villagers consider it bad; they consider him as shameless. We can't allow our girls to participate in co-education.

As mobility is a meaningful and operational indicator within this context, a female mobility index was formulated on the basis of the frequency of female visits to local shops, need for permission from males, and the type of company required for their visits. The Likert scale's lowest value was 2, the highest 20. Overall, the survey revealed that the majority of the respond-

ents (38%) perceived restricted female mobility (index value 5), while 37% of the respondents were assigned an index value of 10. However, mobility was more restricted in the Pathan village (Chamttar) than in Gali Badral and Kanshian (index values were 7, 8 and 15, respectively) – even though female educational institutions were available in all of the study villages. Qualitative data indicated that in Chamttar, female education, particularly learning with and/or from males, was discouraged due to *ghairat* (honour). *Purdah* is considered necessary for female adolescents who attend school. Another impeding factor was that after marriage, demand on females for household work is likely to increase, and parents consider it a liability to educate them. They prefer to send boys to school, as in their perception a boy's education will later contribute to improving the family's financial assets.

Health was also selected as an indicator of human capital. The data revealed that 55% of all women had reported to have suffered from diseases during the past six months, whereas this figure was only 25% for males. Females suffered from chronic diseases, infection and respiratory illnesses more than males. The gender difference was found to be more striking in the Pathan village of Chamttar (44%) when compared with Kanshian and Gali Badral (32% and 20%, respectively). The qualitative survey revealed that men were preferred to women for medical treatment. Childbearing and continuous work during illness and pregnancy makes women victims of additional diseases. Medical facilities were easily available in the city near Chamttar, but *Pakhtunwali* culture was the main reason why female mobility to hospitals was restricted. In Chamttar 99% of all (female) respondents related that they had to seek permission to leave home, as compared to 82% in Kanshian and 92% in Gali Badral (Siegmann and Sadaf 2006). The following statement made during a female focus group discussion in Gali Badral describes this situation from a female point of view: “[...] she feels unprotected when she moves outside. Home is considered a safer place for women; [...] men's *ghairat* does not allow females to work outside.”

Thus, apart from lower investments in female education, gender norms – particularly those related to female mobility and traditional ascription of feminine and masculine standards of behaviour – play a central role in poor female education and health.

18.2.2 Livelihoods, social position, and access to education in Nepal

This case study examined the patterns and causes of gender inequality in primary school attendance in the area of Lumbini, Rupandehi District, Nepal (Schärer 2005). The study sample focused on Hindu and Muslim households, and on both government schools and *madrassas* (Islamic schools). It highlights that access is influenced by a blend of 1) livelihood realities of households (incomes, asset base, etc.); 2) images and norms regarding gender; and 3) the social position households have in the local social fabric.

Livelihood strategies are decisive, as they determine the labour contribution required of a given child, as well as the amount and regularity of available financial capital. Hence, a household's livelihood strategies influence parents' perceptions of both direct and opportunity costs associated with children's schooling. Furthermore, the household's composition influences its capacity to pursue different livelihood strategies. The number, age and sex of the household members are crucial factors relating to children's and particularly girls' educational opportunities. A higher number of productive members is likely to reduce opportunity costs for children who come later in the order of birth.

The study showed why girls' education is particularly vulnerable in the poor rural study communities. Gendered division of labour also places a heavy burden of work on girls. The patrilocal marriage system does not lead parents to regard investment in girls' education as beneficial, since girls marry out of their natal family; boys, as future household income earners, are given preference. One Hindu parent even stated: "She is a girl so why should she study? [...] She has to be married. After all she has to do household work and handle the family [...] what's the use of education?" (Schärer 2005, p 89).

Finally, the practice of early marriage is a key reason for girls' disadvantage in educational opportunities. Poverty, the dowry system, and girls' exclusion from the labour market further constrain parents from giving their daughters the same schooling opportunities as their sons. As a result, girls are 'at risk' of not being enrolled, or of being temporarily and permanently withdrawn from school.

Data from this study suggest that caste status and religion are influential factors in parents' choice of the type of school for their children. The majority

of Muslim parents regarded the culturally and religiously oriented education in the Urdu and Arabic languages at the *madrassa* to be essential for their children's needs. As a religious minority in Nepal, some Muslim parents consider the maintenance of religious and cultural identity to be in jeopardy if children are sent to government schools instead of a *madrassa*. None of the Muslim households in the study sample sent girls to government schools, as the practice of *purdah* prohibits Muslim girls from attending co-educational schools. Although both *madrassas* participating in this study included English and Nepali in the school curricula, most Muslim parents nonetheless considered that government education would give their sons access to better jobs, such as government posts. However, young Muslim males have become disillusioned due to limited prospects of finding a government job despite their educational qualifications, and focus instead on vocational training in practical skills or seek labour migration. The majority of Hindu parents send their children to government schools. Parents who can afford to send their children to private schools send only boys for the most part. Quality private schooling is beyond the reach of most low-caste children, and girls in particular.

The exclusion of females from the labour market and from co-education in government schools is a factor that discourages Muslim parents from sending girls to government schools, as well as better-off Hindu parents from sending girls to private schools. In addition to differences in gender and livelihood strategies, the specific situation (e.g. distance from the school) of each study village also influenced parents' motivations and schooling choices. Furthermore, different households in both the Hindu and the Muslim communities under study pursued individual educational strategies. This indicates that motivations and schooling choices are not necessarily primarily determined by culture and religion, but are also influenced by a household's individual financial and social situation.

18.2.3 'Tribals' and access to dairying in Wayanad District of Kerala, India

Wayanad is one of the very few districts in the Indian state of Kerala where agriculture is the primary source of livelihood (SPB 2001). It also has the largest indigenous Adivasi population in the state. According to the census of 2001, 36% of the total Adivasi population in the state live in Wayanad District. The Adivasi are heterogeneous in terms of their traditional livelihoods. At village level, they are divided into the following groups: Kuru-

man, traditionally cultivators and agricultural workers; Paniyan, formerly bonded labourers; and Kattunayakan, traditionally forest gatherers.

Following a distressful situation induced by volatile price fluctuations for cash crops such as coffee and pepper in the context of import liberalisation and the opening up of the country's economy, dairying has become an important livelihood strategy for many poor households. But hardly any of the marginalised Adivasi households have opted for dairying. Why are these Adivasi households not able to adopt dairying as an alternative livelihood strategy although enabling institutions exist and can help to create a favourable environment for them?

This study selected one administrative ward in the village of Pulpalli, where households across various socio-economic groups have adopted dairying as an income-generating strategy. There are many institutions in the village that should enable households to practise dairying. Formal institutions generally include welfare agencies, state policies, societies, and credit organisations in the cooperative sector. For example, the functions of the local 'milk society' include collection and marketing of milk, extension services, and organisation of farmers in self-help groups. Informal institutions include traditional local arrangements, such as *pottanvangal* (adoption of a calf). In this system of exchange a poor household adopts a calf from a household that has several calves, and later, after the first delivery by the adopted calf, the new-born animal is given to the recipient household. *Valam kotukkal* (exchange of manure) is another type of informal institution through which a poor household exchanges cow dung for green fodder from larger holders.

In his ongoing study, the researcher (C.P. Vinod) identified two issues limiting the Adivasi's access to dairying. One is their historical position in the division of labour. Although livestock was part of the farming systems practised by other groups in the area, the Adivasi communities of Paniyan and Kattunayakan were employed only as grazers and were not allowed to milk the cows due to the practice of caste-based untouchability. The second, more important reason refers directly to images of caste. This can be illustrated by the case of Mr. Chamayan, one of the very few Adivasi involved in dairying.

Mr. Chamayan, a member of the landless Paniyan community, was doing exceptionally well. He owned a cow and a calf, which he had received through a development scheme implemented by the local *panchayat* (*panchayat* is a locally elected government with considerable financial and

administrative powers, especially after implementation of the decentralisation programme in 1997). Mr. Chamayan also owned a small piece of land attached to his house, which enabled him to construct a cattle shed. The proximity of the forest and access to it helped him to rear a cow. But the problem he faced was selling the milk. Initially, he was able to deliver his milk to the local cooperative society, but later on they refused to accept the milk on 'scientific' grounds: at some point he failed a quality test because traces of dung were found in the milk. Another option for him was to approach the local tea shops or neighbouring households. But usually local shops do not accept milk produced by the marginalised Adivasi because they believe that milk collected by Adivasi is not pure and hygienic enough. Under these circumstances, dairying as a livelihood option was a daily struggle for Mr. Chamayan.

Thus, a cultural bias against the Adivasi community on the basis of hygiene restricts them from adopting a livelihood option such as dairying. Most of the non-Adivasi in the village believed that the living conditions of marginalised communities are extremely unhygienic. This perception is closely related with the concept of purity and pollution within the Hindu caste system, and also the untouchability practised in earlier times. Even though untouchability based on 'purity and pollution' is a matter of the past, people today 'construct' hygiene by transferring the elements of untouchability into the modern public concept of health.

18.2.4 Communities and access to forest resources in northwest Pakistan

The North-West Frontier Province of Pakistan is rich in forests, as about 40% of the country's forest area is situated in this province. However, the forest depletion rate is very high in Pakistan in general (FAO 2005) and in the NWFP in particular. To stop this trend, the provincial Forest Department, with the support of several donors, introduced the system of Joint Forest Management (JFM) in selected villages. Here, village development committees (VDCs) and women's organisations (WOs) were established to manage the natural resources of the village and to initiate village infrastructure improvement projects under the coordination of the Forest Department.

Research findings (Shahbaz 2007) indicate that poor villagers in particular have less access to these new institutional arrangements, even though these are expected to improve poor people's access to forest resources. In

order to understand the reasons behind this situation, case study analyses were combined with a quantitative survey based on stratified sampling. The research findings hint at two main reasons: one is the considerable differences in expectations regarding the new institutions among the various groups involved; the second refers to a misconception of the notion of community.

Most of the households were using forests and forestland predominantly for subsistence needs (e.g. firewood, timber for house construction). Financial livelihood needs are not met by forests, but through remittances in the context of migration (see also Steimann 2005). Therefore, livelihoods were based in areas far from where the family in question was living. In turn, forest conservation was a lower priority for these people as compared to financial security. This implies that the households' expectations from the VDCs (established in the context of JFM) related to fulfilling their subsistence needs – whereas the project documents and actual practices indicate a commitment of the Forest Department mainly to forest protection, with little attention paid to income concerns.

Research showed that access to forest resources for poor households was more difficult than for wealthier people, as expressed in comments such as the following:

[...] we are poor people and we cannot survive without wood, but the Forest Department imposes restrictions on us while for the wealthy people there is no problem at all.

[...] we have to use firewood during winter otherwise our children will die of cold. We also have to use wood to repair our roofs because during the winter heavy snowfall badly damages our houses. But these governmental employees consider the forests as their property and not only demand money from us but also allow the rich people and outsiders to cut trees just for a few hundred rupees.

[...] the timber smugglers are influential and they can give money to the Forest Department but I don't have enough money even to buy food for my family therefore I cannot bribe them to take wood from the forest.

Access to forests is first of all negotiated through the intermediary agents of the Forest Department staff – and this everyday reality is reproduced in the

new institutional arrangements as well. As a matter of fact, poor households have the least participation and representation in new JFM institutions such as VDCs and WOs. The study specifically probed whether the forest reform process has taken care to include marginalised (low-income) segments of the population.

The correlation of income (per capita) and the participation rate (and related trust in these new institutions) were calculated. Significant positive correlation was found between income as well as relationship and trust of the respondents in the VDCs and the Union Council⁸ (UC). Similarly, significant positive correlation was found between income and extent of participation (in the activities of VDCs, WOs, and the UC). These positive correlations indicate that people with less income had less trust and participated less in these institutions, whereas comparatively wealthy people (with more income) had a higher degree of trust in the institutions. This was confirmed by qualitative interviews, in which respondents mentioned the dominance of elites and influential households in these institutions, as well as the uncooperative attitude of the Forest Department. For example, one respondent stated: “[...] what are you talking about? Nobody listens to us. I don’t know much about the committee (VDC), whose president is a Sayyed and most members are Khans and Sayyeds [the influential tribes].”

18.3 Conclusions and outlook

The case studies summarised in this article address the issue of how institutions actually work. They examine educational and medical institutions, institutions created for the management of natural resources (forests), and traditional ‘rules and regulations’. These studies go beyond the conventional approach of assessing livelihood capital as advocated by DFID in its Sustainable Livelihoods Framework. The DFID approach – if used as a blueprint recipe – has its shortcomings, as has been stated by a number of critics (De Haan and Zoomers 2005), most notably because it emphasises poor people’s assets and their potential improvement, but gives no explanation of the causes of unequal access. The studies presented here embarked on an explanation of the reasons behind unequal access and showed why an ‘enabling’ institutional support system – which should help poor households in the case study villages to enhance their asset base and adopt viable livelihood options – was inaccessible for some social groups.

The insights gained in three South Asian countries show how, for example, customary norms (gender norms, ethnic affiliations, cultural bias, etc.) determine who is excluded from and who is entitled to access particular assets. Socio-cultural contexts and power relations influence access to certain assets. In practice, ‘marginalised households’ are quite heterogeneous in terms of socio-cultural norms and traditional livelihood strategies. Therefore, the “room for manoeuvre” (Long and Long 1992) they have depends on their position within the Adivasi group in the Kerala case, their ethnic and gender affiliation in the Pakistan case, and their religious affiliation in the Nepal case. This means that the socio-economic and cultural specificities of an area, and the ways in which they work in everyday reality, need to be taken into account in development projects, and that policies and interventions should be tailored to specific local contexts.

Endnotes

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⁸The Union Council is at the lowest tier of the local government system and usually comprises 6–8 villages.

References

Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- De Haan L, Zoomers A. 2005. Exploring the frontiers of livelihoods research. *Development and Change* 36(1):27–47.
- DFID [United Kingdom Department for International Development]. 2001. *Sustainable Livelihoods Guidance Sheet*. London, UK: DFID.
- Ellis F. 2000. *Rural Livelihoods and Diversity in Developing Countries*. Oxford, UK: Oxford University Press.
- FAO [Food and Agriculture Organization of the United Nations]. 2005. *State of the World's Forests*. Rome, Italy: Forestry Department, FAO.
- Government of Pakistan. 2005. *Pakistan Economic Survey 2004–2005*. Islamabad, Pakistan: Finance Division, Economic Advisers' Wing.
- Leach M, Mearns R, Scoones I. 1999. Environmental entitlements: Dynamics and institutions in community-based natural resource management. *World Development* 27(2):225–247.
- Long N, Long A, editors. 1992. *Battlefields of Knowledge: The Interlocking of Theory and Practice in Social Research and Development*. London, UK: Routledge.
- North DC. 1990. *Institutions, Institutional Change and Economic Performance*. Cambridge, UK: Cambridge University Press.
- * Sadaf T. 2006. *Gendered Livelihood Strategies in Mansehra and Mardan Districts of NWFP, Pakistan: The Role of Gender Norms* [MSc thesis]. Peshawar, Pakistan: Department of Economics, University of Peshawar.
- * Schärer L. 2005. *Factors Influencing the Gender Disparity in Primary School Participation: A Case Study in Rupandehi District, Nepal* [MSc thesis]. Zurich, Switzerland: University of Zurich.
- Sen A. 1981. *Poverty and Famines: An Essay on Entitlement and Deprivation*. Oxford, UK: Oxford University Press.
- * Shahbaz B. 2007. *Analysis of Institutional Changes in Forest Management and Their Impact on Rural Livelihood Strategies in NWFP, Pakistan* [PhD dissertation]. Faisalabad, Pakistan: Faisalabad University of Agriculture.
- * Siegmann KA, Sadaf T. 2006. Gendered livelihoods, assets and workloads in the NWFP. In: SDPI [Sustainable Development Policy Institute], editors. *Troubled Times: Sustainable Development and Governance in the Age of Extremes*. Islamabad, Pakistan: SDPI, pp 25–30.
- SPB [State Planning Board]. 2001. *Economic Review 2001*. Thiruvananthapuram, India: Government of Kerala.
- * Steimann B. 2005. *Livelihood Strategies in North-West Pakistan: Results from the Sustainable Livelihoods Survey 2004, North-West Frontier Province (Pakistan)*. IP6 Working Paper No. 5. NCCR North-South Dialogue Series. Zurich and Bern, Switzerland: Department of Geography, University of Zurich, and Swiss National Centre of Competence in Research (NCCR) North-South. Also available at: http://www.nccr-north-south.unibe.ch/publications/Infosystem/On-line%20Dokumente/Upload/IP6_WP5.pdf; accessed on 11 May 2010.
- World Bank. 2000. *World Development Report 2000/2001: Attacking Poverty*. Oxford, UK: Oxford University Press and World Bank.

19 **The State, Resource Governance, and Conflict: Reflections from South Asia**

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Abstract

The role of the state in modes of resource governance is increasingly becoming a source of conflict over natural resources. Based on studies of resource governance practices in South Asia, this contribution argues that conflict or collaboration in natural resource management depends upon the legitimacy of the state and its interaction and cooperation with resource users. When the state shows a controlling attitude towards managing natural resources, conflict and tension are unavoidable. On the other hand, challenges arise in resource management if the state is too weak to provide a conducive policy framework, institutional arrangements, and a facilitating environment. This article concludes that expanding the horizontal and vertical legitimacy of the state is essential to promote sustainable governance of natural resources and to resolve associated conflicts.

Keywords: Conflict; governance; institution; legitimacy; natural resource; power; state.

19.1 The state, participation, and natural resource use

Poor governance of natural resources (NR) in different parts of the world is resulting in communal disharmony, social tension, and even armed conflict. Consequently, it causes extensive loss of life, damage to property, and harm to the environment. In many instances, mismanagement and poor governance of NR are caused by non-participatory, centralised and exclusionary resource-management policies and practices. 'Controlled' forms of resource governance have had adverse effects on sustainable management of natural resources and have made already precarious social, economic and environmental conditions worse, particularly in local communities.

The issue of proper management of NR has long been debated among practitioners and scholars. In the present article, we understand governance as a tool to achieve proper management of natural resources.⁵ Decentralised resource governance is expected to enhance management efficiency and result in greater equity for local people. But this is not easy to attain, and conflict has resulted in some cases where decentralised resource governance was not effectively practised. There are several reasons for this. One of the major reasons is said to be the lack of democratic decentralisation. It has been observed that decentralisation accompanied by the participation of local communities is not enough; the quality of decentralisation in terms of institutional arrangements, monitoring mechanisms, ownership and accountability is of fundamental importance. Ribot (2004) and Agrawal and Ribot (1999) have documented that most ongoing decentralisation efforts are characterised by insufficient transfer of power to local institutions, taking place under tight central government oversight, with local institutions often being neither representative of nor accountable to local communities. They further argue that transferring power without accountable representation is dangerous, while establishing accountable representation without power is an empty gesture.

Thus conflict and/or cooperation in natural resource management are related to the characteristics of the governing policy and practices of the state, as well as the public legitimacy of the state. Table 1 illustrates the relationship between a state and its population, and the impacts of this relationship on governance of NR.

Table 1

Vertical public legitimacy (state structures, laws, etc.) ↑	Controlling state (high vertical but low horizontal public legitimacy) <ul style="list-style-type: none"> – Centrally controlled power – Lesser sense of belonging and trust – Low level of ownership and accountability – Poor participation by people – Rigid legal control and legal domination – Assumption that state controls and people obey as passive recipients 	Facilitating state (high vertical and horizontal public legitimacy) <ul style="list-style-type: none"> – High degree of interaction between state and people and high level of trust in state – High level of participation and representation leading to greater ownership and accountability – Effective legal performance – Fewer conflicts; win-win settlements – Conducive policy, responsive institutions 	The state and its public legitimacy in governing natural resources.
	Dysfunctional state (low vertical and horizontal public legitimacy) <ul style="list-style-type: none"> – Non-functioning state institutions and regulations; massive corruption, nepotism and bureaucracy – Law and order not respected (might is right) – Impunity and lack of accountability – Irrational exploitation of NR – Erosion of people’s trust in state; anarchy – Smugglers, mafia and elite groups control NR – Increased conflict and tension in society 	Weak state (low vertical but high horizontal public legitimacy) <ul style="list-style-type: none"> – Unbalanced legal and social interactions leading to weak enforcement of state policies and regulations related to NR – Weak state and very strong non-state actors, creating imbalance in decision-making and policy and regulation enforcement – Poor decision-making and poor management of NR – Uncoordinated planning, implementation and duplication – Demoralised state administrative apparatus 	
Horizontal public legitimacy →			

A state with high vertical and horizontal public legitimacy provides a strong basis for sustainable management and governance of NR, as it incorporates democratic decentralisation, distribution of power, local accountability, and ownership.

In a ‘controlling state’, capture of management processes and resources by elites at the local level strengthens or maintains unequal power relations. By contrast, a ‘facilitating state’ promotes better distribution of power, applies principles of subsidiarity, fosters accountable and representative institutions, and accommodates the collective concerns of all actors who depend on NR (Castro and Nielsen 2001).

19.2 Reading empirical evidence

The present contribution addresses these concerns about the respective roles of the state and local bodies. It analyses whether conflicts over resource use in selected localities of South Asia can be explained by variations in horizontal and/or vertical governance relations. It is based on three case studies (Figure 1):

- Forest management in Pakistan
- Conservation area management in Nepal
- Joint forest management in India.

More specifically, the following questions were asked in reviewing these cases:

- To what extent do the characteristics of the state and its legitimacy affect resource governance and resolution of associated conflicts?
- What role should the state play in governing NR and addressing related conflicts?
- What is the relationship between democratic decentralisation of resource governance and the legitimacy of the state?
- What factors determine the state's ability to mediate?
- What are the prerequisites for successful decentralised governance of resources?

Methodologically, the case studies followed a livelihood approach, with reviews and analyses of different studies conducted in South Asia.



Fig. 1
Overview map
of South Asia.
(Map by Andreas
Brodbeck)

19.3 Empirical results and findings

19.3.1 Forest governance in North-West Frontier Province, Pakistan

Prior to British colonial rule, forests in the North-West Frontier Province (NWFP) of Pakistan were managed by customarily defined by-laws and traditional institutions. Forests were traditionally owned by landlords, while the landless enjoyed certain privileges in the use of forests (Sultan-i-Rome 2005). There were fewer conflicts and minimal pressure on forests due to a low population and a subsistence economy. After 1850, when most parts of the province came under British rule, forest management was assumed by the state, and existing local rights to forest resources were restricted. Following the independence of Pakistan in 1947, the state perpetuated its controlling role through various forest policies promulgated from time to time.

Several studies (e.g. Geiser 2005; Sultan-i-Rome 2005) have shown that local people who once had access to forest resources through traditional institutions and regulations have always resisted state authority over forest resources. In fact, non-participatory approaches failed to stop forest depletion, and the deforestation rate in Pakistan became one of the highest in the world. At the same time, conflict and confrontation between the state (represented by the Forest Department) and local people increased (Geiser 2005). The state was perceived to be playing a controlling role and to be in competition with the interests of local people.

In response, a system of participatory forest management was introduced in some parts of the province around 1996, through donor-funded projects. Under this system, the state was to perform a facilitating role. Village-level committees were instituted and authorised to join Forest Department officials in the preparation and implementation of local resource use plans, the execution of development activities, and other tasks.

However, studies by Steimann (2003) and Shahbaz (2007) indicate a significant lack of trust and interaction between local people and the state Forest Department, even after the implementation of joint forest management systems in some areas. Historically rooted mistrust between local people and the state, on the one hand, and the unwillingness of actors with great bargaining power – such as officers from the Forest Department – to devolve power, on the other hand, contributed to the failure of the participatory approach.

State-initiated decentralisation of forest management has not overcome these tensions. For one thing, it does not take account of traditional forest use practices (*rivaj*) but maintains state authority. Moreover, it has not overcome traditional access discrimination among local people. One of the main reasons for the failure of participatory forest management projects, therefore, is the Forest Department's lack of sensitivity to customary local practices.

Political will is indispensable for successful decentralised forest governance (Agrawal and Ribot 1999; Ribot 2002, 2004); without it, state control over resources will simply be strengthened. In the case of the NWFP, basic reality suggests that the state, represented by the provincial Forest Department, is reluctant to change its top-down form of governance and attitude, and is thus unwilling to give local people more say in forestry-related issues. Trust between the state and local actors can only be strengthened if a genuine participatory approach is taken in such a way that local institutions are given the right to manage the forests through locally defined by-laws and customary regulations. The state needs to change its role from controller to facilitator.

19.3.2 Governance of conservation areas in Nepal

Governance of conservation areas in Nepal is a vivid example of interaction between horizontal and vertical public legitimacy. Empirical studies by Upreti (2004, 2009) on the management of the Koshi Tappu Wildlife Reserve (KTWR), situated on the eastern terai plains near the border with India, and the findings of Gurung (2006) on the Kangchenjunga Conservation Area Project (KCAP)⁶ in Taplejung District illustrate the distinct character of the controlling state and the facilitating state, respectively.

In the KTWR, the reserve authority took an authoritarian approach characterised by force and rigid legal control. The role played by the state exacerbated livelihood insecurity and vulnerability among poor people residing in or around the protected areas. Local people had earned livelihoods from fishing, driftwood collection, harvesting of thatch grasses, hunting, and other forms of use in the KTWR area prior to the establishment of the KTWR. After the establishment of the KTWR, the National Parks and Wildlife Conservation Act prohibited the following activities: poaching of wildlife; construction of houses, huts, shelters or any other structure from any material; occupying any part of the land; uprooting plants; cultivating or planting and cutting of plantations; access to drinking water or grazing for domestic animals or birds; chopping, lopping, dismantling and blocking trees, plants and

bushes; arson or damage of any kind to forest products; mining, stone excavation, or displacement of mining resources, stones, boulders, soil or other similar resources; carrying or using arms, ammunition or poison; transporting domestic animals and dead or live wildlife or wildlife body parts, except by regular wayfarers or government officers; and blocking, diverting, or placing hazardous or explosive materials in rivers, streams or water fountains. Section 4 of the Act prohibits entry into the national parks and reserves without prior approval in writing from the authorities concerned. Similarly, the Act empowers the authorities concerned to inspect, search and arrest violators of the Act even without a warrant. The reserve authority used a heavily top-down and coercive approach in executing these provisions. This has not only caused severe livelihood insecurity but has also become a perennial source of conflict between the reserve authority and local people.

Many people in Nepal live within the boundaries of protected areas. In light of the increasing number and size of protected areas and changing societal needs, Gurung (2006), in the case of the Kangchenjunga Conservation Area Project, examined how the livelihoods of local people could be enhanced without compromising protection of biological diversity. The results of his study show that people-orientated participatory conservation projects can successfully reconcile conservation with the livelihood needs of local people, through long-term interventions that carefully integrate development issues into conservation strategies and can be implemented in a transparent manner and facilitated skilfully through local institutions.

The participatory management approach adopted in the Kangchenjunga Conservation Area, integrating the livelihood needs of local people, was successful (Gurung 2006) mainly because it made special provisions to include people in project planning, implementation, monitoring, and benefit sharing. By contrast, the KTWR, managed by the government through controlling mechanisms (laws, use of force), led to long-term conflict between the park and the people (Upreti 2009).

It is apparent from the above discussion that the approaches used by representatives of the state (conservation management authorities) largely determine whether there is conflict or cooperation between local people and the state. If state representatives have an open attitude and promote both vertical and horizontal engagement in managing natural resources, there is less conflict and problems are solved through dialogue, collaboration and cooperation, as in the case of the KCAP. Tension, conflict and mistrust are high when

state representatives use coercive, top-down and exclusionary approaches, as in the case of the KTWR.

19.3.3 Indigenous people and their relations with the state and forest resources in Kerala, India

The Paniyan are the largest community among the marginalised Adivasi (tribal) segment of the population of Kerala. They reside in and around the Wayanad region, a place known historically for coexistence of Adivasi populations and the forest. All Adivasi groups in the region used to be traditional forest users. They enjoyed open access to forests until the onset of the colonial regime, which brought the forest under the ownership of the state and local elite families, thus initiating 'systematic' control and use of forest resources (Logan 1992; Nair 2000).

Tribal populations and their subsistence-based relationship with the forest were not given priority in successive laws, even after the formation of the State of Kerala in 1956. The state's conservative policy regime perpetuated control through a hierarchically ordered departmental structure. Furthermore, large-scale migration of small-scale farmers from the Kerala plains to the Wayanad region in the 1950s and their clearing large tracts of forestland to cultivate commercial crops severely constrained relations between the Adivasi and the forest. A strong nexus was developed between the migrants, the dominant political and religious forces, and government officials, who disregarded the interests of the marginalised Adivasi.

In 1990 the central government initiated the policy of Joint Forest Management (JFM), which was implemented by the government of Kerala in 1998, coinciding with the People's Plan Campaign launched by the leftist democratic front government (Issac and Franke 2002). The primary unit of local level participation in JFM was the *Vanasamrakshana Samithi* (Forest Protection Committee), an association of people dependent on forests, NGOs, individuals interested in the conservation of forests, a forester or guard from the Forest Department, and a member of the local *Panchayat* (local unit of self-government). The expansion of modern governance and a market economy based on commercialisation of the forests and cultivation of plantation crops have forced further changes in the livelihoods of many forest-dependent Adivasi (Nair et al 2007).

Our research looked into local practices of decentralised resource governance and management in relation to the livelihood experiences of Adivasi, mainly forest-dependent members of the Paniyan community. We found that local governance practices do not include the Adivasi in natural resource management and decision-making processes. Present failures in decentralised resource management can be explained in terms of poor representation and participation of Paniyan in democratic bodies, along with a low level of accountability in governance. Participation by Paniyan in public decision-making is virtually nil.

Lack of trust in public administration and alienation from forest resources has resulted in conflict among the Paniyan. A Paniyan explained, “Government has no land when we demand [...] why don’t they see this forest? [...] they had given it to *nattukar* [settlers]. Why don’t they give it to us? If they give us this forest land, we will also clear it and do cultivation as they have done [...] we can cultivate coffee, pepper and all [...]” At present, the Paniyan are seeking greater access to forest resources and participation in governance processes.

19.4 Analysis and discussion of empirical results

The three cases discussed above raise several issues related to resource governance and associated conflict that are summarised in the following sections.

Effects of state characteristics and legitimacy on resource governance and conflict resolution: The cases of the KTWR (Nepal), Kerala (India) and the NWFP (Pakistan) demonstrate that social tensions and conflicts are inevitable when states opt for centrally controlled governance of NR and treat local people merely as resource users rather than as managers and owners. Governance of natural resources is largely shaped by the degree and intensity of interactions between resource users and the state. Examination of the two cases of protected-area management (KTWR and KCAP) shows that when the state opts for a controlling approach to resource governance through imposition of law and the use of force, the vertical legitimacy of the state diminishes and conflict escalates (in the case of KTWR). But when the state interacts with resource users and serves as a facilitator, it promotes both horizontal and vertical legitimacy, thereby making resource governance effective. Hence it was concluded in all three cases that the characteristics of

the state have a direct relation to effective governance of NR and resolution of associated conflicts.

Role of the state in managing NR and addressing related conflicts: The cases of the NWFP, Kerala and the KTWR show that high vertical and low horizontal public legitimacy result in deep-seated conflict and tension, whereas the case of the KCAP (Nepal) illustrates that balancing horizontal and vertical public legitimacy in governing protected areas minimises conflict and supports the livelihoods of users. Hence it can be generalised that the state has a fundamentally important role in achieving sustainable management of NR and resolving associated conflicts. The study by Matthew and Upreti (2005) also demonstrates that environmental stresses created by poor environmental governance on the part of the state were one of the fundamental causes of the armed insurgency in Nepal.

Relationship between legitimacy of the state and decentralised democratic resource governance: The case of the KCAP in Nepal demonstrates that decentralised democratic resource governance is directly related to the legitimacy of the state. If the state plays the role of a facilitator rather than a controller, resource governance is more democratic and decentralised. In contrast, the cases of the NWFP and Kerala show that if people do not trust the state, decentralisation does not work. Protected-area management in the KCAP illustrates that decentralisation, democratic governance practices and democratic processes function well together and are closely interrelated.

Factors determining the ability of the state to mediate: People's sense of belonging to the state, and trust in the state on the part of resource users, are crucial factors that enhance the state's ability to mediate. The other factors are the willingness of the state to empower resource users by providing a decentralised legal framework, conducive policies, and responsive institutional arrangements. State engagement with resource users in terms of interaction and collaboration are important factors that determine the state's ability to mediate. In examining the relationships between resource governance and resource conflict in Nepal, Upreti (2004) found that strengthening people's access to decision-making processes also strengthens the state's ability to mediate and vice-versa.

19.5 Conclusions

Our research illustrates that the state has an important role to play in effective community participation in natural resource management. In this context, the concept of vertical and horizontal public legitimacy is a powerful approach for analysing livelihood-based resource governance and resolving associated conflicts. The strengths of this approach are that it closely represents people’s perspectives on resource governance and also provides a conceptual framework for examining state characteristics (controlling or facilitating) and performance (functioning of state institutions, use of laws and regulations, erosion of people’s trust in the state, etc.). However, this approach also has some weaknesses. One is its silence about the technical aspects of resource governance. Forest management and protection are highly technical processes, and sustainable governance of NR depends upon combining social and technical aspects.

From a comparison of cases of resource governance in Nepal, Pakistan and India, we conclude that decentralisation of resource governance should be democratic, and that decentralisation alone is not enough. Conducive policies, responsive institutions and appropriate operational mechanisms are equally important to make decentralised resource governance successful (Figure 2).

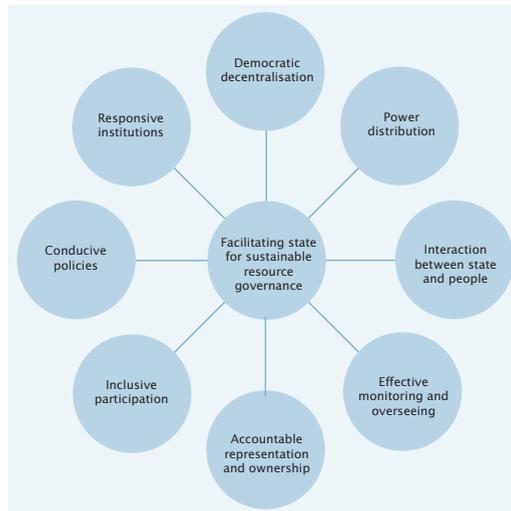


Fig. 2
Elements of a facilitating state that promote sustainable resource governance and minimise conflict. (Developed by Bishnu Raj Upreti based on research experience in the natural resources sector)

When analysing cases in South Asian countries, it is not appropriate to generalise with regard to the standard characteristics of a state. The same nation-state can be found to have controlling and facilitating governing characteristics. For example, the government of Nepal demonstrated a facilitating quality in managing the KCAP, whereas it took a very controlling approach to managing the KTWR. Therefore, the notion of characterising a country as a failed, fragile or transitional state is too simplistic.

In the NWFP, local social realities were not taken account of in the decentralisation of forest management. Trust and confidence can only be built between state actors and local communities if real decentralisation takes place and the state plays a facilitating rather than a controlling role. In such cases, local, clearly defined social entities are given the right to manage forests according to locally defined by-laws. This has not yet been observed in the NWFP.

The interrelationships between resource governance and state legitimacy in resolving or creating conflicts over NR are complex and require further research and analysis. Some of the questions that merit further examination are: a) Why do some state structures collaborate with local people in managing NR and in resolving associated conflicts while others ignore, refuse or resist such collaboration? b) What power relations, negotiating processes and decision-making processes exist among involved stakeholders at different levels (intra-household, regional, national, and global) in the context of natural resource management?

Endnotes

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⁵ “[...] a general conceptual framework for addressing the evolution and organising principles of governing processes in a society. It refers to the ways decisions are taken and implemented, and takes into account formal as well as informal arrangements and actors” (Hurni et al 2004).

⁶ See http://nepal.panda.org/our_solutions/conservation_nepal/kangchenjunga/

References

Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- Agrawal A, Ribot JC. 1999. Accountability in decentralisation: A framework with South Asian and West African cases. *The Journal of Developing Areas* (33):473–502.
- Baechler G, editor. 2002. *Promoting Peace: The Role of Civilian Conflict Resolution*. Bern, Switzerland: Stämpfli.
- Castro AP, Nielsen E. 2001. Indigenous people and co-management: Implications for conflict management. *Environmental Science and Policy* (4):229–239.
- Geiser U. 2005. *Contested Forests in North-West Pakistan: Present-day Struggles and the Role of the "Colonial"*. Paper presented at Panel 38 of the 17th European Conference of Modern South Asian Studies, Heidelberg, Germany, 9–14 September 2005. Available from Bishnu Raj Upreti.
- * Gurung GS. 2006. *Reconciling Biodiversity Conservation Priorities with Livelihood Needs in Kangchenjunga Conservation Area, Nepal* [PhD dissertation]. Zurich, Switzerland: University of Zurich.
- * Hurni H, Wiesmann U, Schertenleib R, editors. 2004. *Research for Mitigating Syndromes of Global Change: A Transdisciplinary Appraisal of Selected Regions of the World to Prepare Development-oriented Research Partnerships*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 1. Bern, Switzerland: Geographica Bernensia.
- Issac TMT, Franke RW. 2002. *Local Democracy and Development: The Kerala People's Campaign for Decentralised Planning*. Oxford, UK: Rowman and Littlefield.
- Logan W. 1992. *Malabar* [1887¹]. New Delhi, India: Asian Education Services.
- Matthew R, Upreti BR. 2005. Environmental stress and demographic change in Nepal: Underlying conditions contributing to a decade of insurgency. *Environmental Change and Security Program Report* (11):29–39.
- Nair G. 2000. *Wynad: It's People and Traditions* [1911¹]. New Delhi, India: Asian Education Services.
- * Nair KN, Vinod CP, Menon V. 2007. *Agrarian Distress and Livelihood Strategies: A Study in Pulppalli Panchayat, Wayanad District, Kerala, India*: Centre for Development Studies.
- Ribot JC. 2002. *Democratic Decentralization of Natural Resources: Institutionalizing Popular Participation*. Washington, D.C.: World Resources Institute. Also available at: http://pdf.wri.org/ddnr_full_revised.pdf; accessed on 29 July 2009.
- Ribot JC. 2004. *Waiting for Democracy: The Politics of Choice in Natural Resource Decentralization*. Washington, D.C.: World Resources Institute.
- * Shahbaz B. 2007. *Analysis of Institutional Changes in Forest Management and Their Impact on Rural Livelihood Strategies in NWFP, Pakistan* [PhD dissertation]. Faisalabad, Pakistan: Faisalabad University of Agriculture.
- * Steimann B. 2003. *Decentralization and Participation in the Forestry Sector in NWFP, Pakistan: The Role of the State* [MSc thesis]. Zurich, Switzerland: University of Zurich. Also available at: http://www.nccr-north-south.unibe.ch/publications/Infosystem/On-line%20Dokumente/Upload/Abstract_Bernd.pdf; accessed on 9 January 2010.
- * Sultan-i-Rome. 2005. *Forestry in the Princely State of Swat and Kalam (North-West Pakistan): A Historical Perspective on Norms and Practices*. Zurich, Switzerland: Swiss National Centre of Competence in Research (NCCR) North-South.
- Upreti BR. 2004. Relationships between resource governance and resource conflict: Nepalese experience. *Journal of Legal Pluralism* (50):71–100.
- Upreti BR. 2009. Resource governance and livelihood concerns: Park–people conflict in the Eastern Terai of Nepal. In: Geiser U, Rist S, editors. *Decentralisation Meets Local Complexity: Local Struggles, State Decentralisation and Access to Natural Resources in South Asia and Latin America*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 4. Bern: Geographica Bernensia, pp 217–248.

20 **Patterns and Politics of Migration in South Asia**

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Abstract

Migration is an important social and historical reality in South Asia. In the past decade, migration from one country to another and internal migration (i.e. migration within a particular country) have assumed different dimensions for people in the region. Contemporary research on migration is placed in a spectrum that ranges from exponents of economic benefits at one end, to those who see migration as a security threat, at the other. This paper combines the work of three researchers and looks at the different political locations from which the South Asian subject is induced to move. It also discusses the economic and political implications that arise from these migration trajectories. Drawing on their research, the authors emphasise the need for understanding how migration is linked to a complex set of processes that reflect power relations in unequal societies.

Keywords: South Asia; multi-locality; migration; remittances; livelihood; citizenship; frontiers.

20.1 Introduction

Today, South Asia is the locus of extensive migrations that link cities and villages in the region to diverse places and that cut across the concerns of governments, policy-makers, migrants themselves and their families. Large migration streams already occurred at the outset of South Asia's post-colonial history, when millions fled communal violence on both sides of the Indian-Pakistani border. The significance of migration is likely to increase in future as a result of the global economic and climate crises. The patterns of migrations and their meanings vary, with motivations ranging from migrant workers' aspirations for upward mobility to the desire to escape from socio-economic or political distress.⁴

The present article⁵ is based on migration research carried out mainly in Nepal and northeast India, complemented by case studies in Pakistan, within the framework of the Swiss National Centre of Competence in Research (NCCR) North-South programme, and also on secondary literature. It highlights important commonalities and differences in the patterns and politics of mobility in South Asia. We first cover recent trends in labour migration and remittance flows, as well as the ambiguous impact of labour migration on the macro-economy, on migrants, and on the families they leave behind. Second, we examine the political economy of mobility. Besides an outline of institutional frameworks, especially those constructed for channelling labour migration, we provide a historical perspective on the demarcation of borders, which has often induced conflict and led to forced internal and international migration. Finally, we look at conceptual issues and question some common notions in mainstream discourses on migration. We emphasise migrants' multi-locality, the ambiguous role of social networks in enabling migration, and the political economy of colonial frontiers.

20.2 Migration patterns

20.2.1 Recent trends in migration flows

Migration is common throughout South Asia and its patterns are diverse. Today, the majority of South Asian migrants are workers who make significant contributions to the economies of both migrant-receiving and migrant-sending countries. Regional migration, such as between the neighbouring countries of India, Nepal, Pakistan and Afghanistan, has a long history that

remained largely undocumented for a long time (Schrader 1988; Gazdar 2003; Nichols 2008). East Asia and the Persian Gulf region have become other important destinations since the 1970s, for two major reasons. First, the oil-driven construction boom in the Gulf region created a demand for skilled and unskilled labour that the booming countries could not meet with their domestic labour force (Gazdar 2003). Second, the rapid expansion of mobile telecommunication and the Internet since the 1990s have accelerated the speed and volume of information on foreign employment opportunities. In Nepal, the private sector took the initiative to connect thousands of unemployed people – mainly youths – officially to labour markets overseas, whereas in Pakistan it was public institutions that promoted and facilitated the initial waves of contract labour migration to the Gulf region (Gazdar 2003; NIDS 2008). Increasingly restrictive immigration policies in host countries in the Gulf region have led to a rise in undocumented migration (Gazdar 2003; Shah 2006). For many people, both migration and living and working on a temporary contract basis have become a permanent feature of their lives. It has also become common for family members to live apart from each other and be organised in multiple locations throughout South Asia. Consequently, people's livelihoods have assumed multi-local dimensions (Thieme 2008).

Linkages between international and internal migrations are manifested throughout the region. For example, in the Indian state of Kerala, massive emigration of workers, mostly to the Gulf, has triggered a large inflow of migrant labour from other parts of India. This response to the labour shortage that arose in Kerala was motivated by higher agricultural and non-agricultural wages in Kerala.

A crucial aspect throughout the whole South Asian region is distress-induced migration, mostly to destinations that do not require official paper work and where there are no bureaucratic hurdles to be overcome, or where there is not much of a waiting period and where not many skills and capabilities or much initial investment are required. Migration between Nepal and India is facilitated by the open border between the two countries (Thieme 2006), whereas ethnic networks that transcend the Afghan-Pakistani border have eased the absorption of Afghani refugees in Pakistan (Gazdar 2003). Massive internal migration from the highlands of Pakistan's North-West Frontier Province (NWFP) to the urban centres of Punjab and Sindh has been induced by low agricultural productivity under conditions of harsh climate, poor infrastructure, and few non-agricultural employment opportunities (Gazdar 2003; Steimann 2005).

20.2.2 The role of remittances

Common patterns identified in South Asia's experience with migration include the appreciation of remittances at various levels. With remittances of US\$ 27 billion in 2007, India is ahead of all other countries that also receive huge financial transfers from international migrants (Zachariah and Rajan 2006; World Bank 2008). According to World Bank estimates, remittances have grown exponentially for the past 35 years (World Bank 2006).

Labour migration is also an economic mainstay of Nepal's economy. However, there is still insufficient documentation on the scale and significance of this process. Kollmair et al (2006) compared the latest national statistics with nine case studies carried out within the NCCR North-South. Whereas the authors' estimate of 1.15 million migrants corresponds closely with the National Living Standard Survey (CBS 2004) and challenges estimates of up to 2 to 3 million Nepalese migrants working in foreign countries (Seddon et al 2001; estimates by Nepalese immigrant associations in India in Thieme 2006), the amount of remittances indeed seems to be higher than the official volume of US\$ 150 million. The estimated total of US\$ 604 million in 2003 is close to estimates by Graner and Seddon (2004). The amount of money remitted varies considerably from country to country. Although the majority of migrants (77%) go to India, they send the lowest share of remittances (less than 20%). Remittances from Western and Gulf countries represent 75% of workers' transfers to Nepal.

Within states, regional economies display different degrees of dependence on overseas workers' transfers. The highlands of Pakistan's NWFP, as well as the part of Jammu and Kashmir under Pakistani administration, can plausibly be called remittance economies. Of all Pakistani provinces, rural NWFP is most dependent on foreign remittances. About one-tenth of average monthly income consists of remittance flows (Government of Pakistan 2007). Similarly, the state of Kerala in India is heavily dependent on worker remittances from the Gulf countries. Foreign remittances were seven times what Kerala received from the Government of India for the state budget and 1.6 times the state's annual governmental expenditures in 2004 (Zachariah and Rajan 2006).

Whereas migrant remittances help to fill the national exchequer with foreign exchange, the economic role of migration at the household and individual levels is ambiguous. The role of remittances in poverty reduction has been

emphasised across the region (Gazdar 1999; Bhattacharya and Deb 2006; Thieme 2006). There is evidence that migration from Nepal to India contributes to secure livelihoods (Thieme 2006). In rural communities with little cash income, even small transfers of cash may be of great value in reducing the risks of seasonality, harvest failure and food shortage (Ellis 2003). Moreover, aspects other than financial returns, such as sending goods, must also be taken into account. In addition, each person less in the household reduces total food consumption. Having family members in India assures access to medical treatment and schooling in India, and migrants cover these expenditures rather than sending money to Nepal (Thieme 2006). For Pakistan, Suleri and Savage (2006) highlight the fact that households receiving remittances were less vulnerable to the effects of the earthquake catastrophe that hit NWFP as well as Kashmir, on both sides of the Indian-Pakistani border, in 2005. Individuals had used the cash remitted by household members to reinforce their houses. While their neighbours' houses constructed with mud and stone were reduced to rubble, many of the cement mortar houses of families with migrant members withstood the quake.

On the other hand, regions where land and employment are scarce and poverty is widespread often become major migrant-sending regions. The mountainous districts of Pakistan's NWFP are examples. In the highland locations of a NCCR North-South study on sustainable livelihoods, a typical household had one or two (male) migrants. In the two villages studied, one out of four adult men was a migrant (Steimann 2005). The mountainous Dir and Swat districts bordering Afghanistan have displayed the highest absolute emigration of all rural districts in Pakistan in the past 25 years (BEOE 2007). At the same time, they are located at the bottom of the district-wise Human Development Index (Hussain 2003). The remittance economy of rural NWFP has created vulnerabilities of its own. Siegmann and Steimann (2005) found that irregular remittances are a source of major financial crisis for households in the region. A flow of cash transfers interrupted, for instance, by the illness or unemployment of a migrant, could disturb the delicate balance of indebtedness and repayment for households that hardly have access to other sources of cash income.

Overall, recent evidence of the poverty-reducing impact of migrant remittances has been scarce in the case of Pakistan. On the contrary, Ballard (2005) shows that in the absence of reasonable infrastructure and manufacturing activity in the international migrant-sending communities of Mirpur district, local banks redistribute surplus capital to the urban elite. They hence

fuel a cycle of ‘capital-rich underdevelopment’, which is likely to reinforce the local propensity to migrate. There is evidence that it is not the poorest income group for which foreign remittances represent the largest share of household income (Gazdar 2003; Azam 2005; Government of Pakistan 2007). This raises questions about the poverty-reducing effects of international migration. Similarly, in Nepal it is the better-off people, with more financial resources, education and access to information, who are more likely to go to the Gulf States, the East Asian ‘Tiger States’, or even Europe and the USA. Migrants with a more modest socio-economic background opt for neighbouring India, which is a more affordable journey.

20.2.3 Migration and social change

The meaning of migration goes beyond remittance transfers, however. It has consequences that encompass radical changes in the lives of migrants as well as the communities to which they are connected back home.

In many parts of South Asia, migration changes the social spaces available to the individual. In deeply stratified caste communities, many see migration as a means to move away from constraining traditional occupations. In South India, migrants from the washer people’s castes in Tamil Nadu have occupied a highly organised niche in Kerala. They have not inserted themselves into caste-stratified social space, but have moved into urban residential localities as ‘mobile ironers’ who visit homes or offer their services on street corners, bringing along their coal and iron in push carts. These kin groups iron clothes for the households in the localities demarcated for them by municipal bodies, escaping day-to-day caste expectations in their original habitats in Tamil Nadu.⁶

Migration may also redefine the division of labour and responsibilities within a family. Different environments within South Asia display diverse dynamics, however. In the case of migrants’ wives in parts of Nepal, NCCR North-South researchers have found an increased workload but also greater participation in decision-making (Kaspar 2005). During the Maoist conflict in Nepal, women were left to negotiate with the conflicting parties, which was new in the Nepali societal context. In Pakistan, a feminisation of agricultural work (Kazi 1999) going hand in hand with a strengthened position for women in the household (Naveed-i-Rahat 1986; Alavi 1991) was associated with domestic and international emigration in some earlier studies. Others perceived greater vulnerability among migrants’ wives to exploitation

by their in-laws once their husbands moved abroad (Burki 1984). Lefebvre (1999), on the other hand, found stability in the gender division of labour and decision-making. He interprets this as evidence that economic improvement through foreign remittances must not be accompanied by a loss of prestige, as will inevitably be the case if the role and authority of women in a Pakistani village are radically transformed. Recent NCCR North-South related research has tended to support the latter conclusions. For mountainous districts in Pakistan's NWFP, women's workloads partially buffer the loss of male workers due to outmigration. At the same time, they do not gain higher status in the household. Considerations of family honour even increase the vulnerability of migrants' wives in the absence of their husbands (Siegmann 2007).

Children are also affected when remittances alone cannot replace the overall contribution of a family member to family care. The study quoted above indicates that socialisation of boys especially suffers when they lose a male authority figure to labour migration. In an environment where female mobility outside the home is severely constrained in the name of family honour, supervision of school attendance by boys, for instance, becomes a major challenge (Siegmann 2007).

Obviously, separation from their homes implies a burden on migrants themselves as well. In the host countries, migrants' movements are often restricted, their livelihoods unprotected, and they themselves discriminated against by their employers and the authorities (Thieme 2006; SDPI 2007a). Generally, Nepali migrants going to India possess limited financial means and are not well educated. On the segmented job markets in India, they do not learn new skills, incur even greater debts due to poorly run financial self-help groups and gambling, and face poor working conditions. Consequently, many migrants live from hand to mouth (Thieme and Müller-Böker 2004; Thieme 2006). Migrants' value systems are shaken by confrontation with a different culture (SDPI 2007b). In the 1980s, *Dubai chalo* ("Let's go to Dubai") became the label for a socio-psychological stress syndrome common amongst Pakistani international migrants to the Gulf States. It consists of a sense of disorientation resulting from harsh working conditions, social isolation, culture shock, and the sudden acquisition of relative wealth (Ahmed 1984). Many women migrants who move outside their home territories to perform domestic labour, home nursing or agricultural or non-agricultural labour, have insecure working and living arrangements that threaten their personal safety. International human rights organisations, for instance,

report a heightened risk of sexual abuse of female domestic workers from South and Southeast Asian countries employed in the Gulf States (Amnesty International 2005).

20.3 The politics of mobility

20.3.1 Institutional frames and governmental responses

In order to address the risks that labour migrants face, but also to regulate their movements and manage the associated financial flows, countries such as Bangladesh have constituted separate ministries for the welfare of their migrant communities overseas. The Ministry of Expatriate Welfare and Overseas Employment is entrusted with protecting the rights and interests of Bangladeshi migrants in the host countries; ensuring the welfare of remittance senders; facilitating overseas employment for prospective Bangladeshi migrants and increasing their resource capabilities; and increasing the skills of the labour force (IOM 2006, p 219). In Pakistan, in the context of the ongoing re-shaping of the country's emigration policy, it has been suggested that research on migrant labour demand and supply as well as migrants' skill development be strengthened in the Bureau of Emigration and Overseas Employment, which is currently in charge of regulation, facilitation and monitoring of the process of emigration from Pakistan (BEOE 2007). In Nepal, structural changes at the government level were still under discussion at the time of writing of this article. It has been suggested that instead of having a separate government department, a foreign employment bureau under a public-private partnership would be better suited to address key issues affecting foreign employment and combine what is at stake in the private sector – such as recruiting agencies and banks – with concerns about public goods in the public sector (NIDS 2008).

South Asian national migration policies are often gendered, limiting the international migration of women. Nepal, Pakistan, Sri Lanka and, until recently, Bangladesh have placed various types of restrictions on legal migration by their female citizens (IOM 2005; Piper 2005; Migrant Forum in Asia 2007). In Nepal, for example, women were not allowed to migrate to specific countries such as the Gulf States. This was to protect them from potential exploitation and harassment in domestic work. However, women continued to migrate in many other, often illegal and riskier ways, increasing their vulnerability (Thieme 2006; NIDS 2008). In Pakistan, a ban was

imposed on the recruitment of young females for overseas employment, after reports of sexual abuse of women in some Middle East countries had been received (Jolly and Reeves 2005). For the first time, the Draft Emigration Policy currently under preparation is intended to promote selective female labour migration (Ghayur 2008).

20.3.2 Political economy of frontiers

Public efforts to manage migration not only mirror the gender norms of the subcontinent, but also reflect the post-colonial history of border-making in South Asia. The 20th century witnessed bold cartographic exercises that resulted in demarcation of national territories and spaces. However, these were carried out on a terrain that was for the most part not easy to map, such as the Bengal and Assam borderlands and the eastern Himalayan region, or the mountainous border regions that separate Pakistan from India and Afghanistan. This resulted in the transformation of ambiguous frontiers into national boundaries within which populations were subjected to different policies regulating identity, livelihood and mobility (Hutt 2003; van Schendel 2005). Cartographic solutions for post-colonial countries have also transformed the language of citizenship (Baruah 2005). States in the South Asian region must regulate the movement of people from territories that are contiguous and porous. Migration thus forces reconsideration of given categories of space and identity. It is a crucial element in what Rouse calls “a world of crisscrossed economies, intersected systems of meaning and fragmented identities” that challenge the notions of centre and periphery, of citizenship and nationality (Rouse 1991, pp 8–9).

Barbora (2007) looks at how this historical process has created modern problems of forced migration, the complexity of which South Asian governments are ill-equipped to handle. Forced migration is a very pertinent issue in South Asia. The movement of refugees fleeing from conflicts in Sri Lanka (to India) and Afghanistan (to Pakistan); forced eviction of Nepali-speaking citizens from Bhutan (to Nepal); forced migration of Muslim Rohingya from Burma (to Bangladesh); and periodic migrations of ethnic minorities such as the Nagas and the Chins from Burma (to northeast India) owing to conflict are part of the international dynamic of conflict-induced migration in South Asia. Insistence on a unitary citizenship regime has exacerbated this problem in places such as northeast India.

However, population flows between and within states are as much a result of a lack of human security arising from armed conflicts and natural disasters as they are a concern for states that see population movements as a reason for security legislation and regulation. This securitisation of migration has been seen in northeast India as well. Since the 1960s, ethnic conflicts and political confrontation have broken out over the issue of migration. As a result, the Indian state and significant portions of civil society have begun to view migration as a threat to social order (Bhattacharyya 2001; De 2005).⁷ The response to such concerns has been to bar entry to anyone suspected of being a migrant, with the adjective ‘illegal’ prefixed to the already vulnerable migrant. This notion of illegality is something that makes social space very contentious for ethnic minorities in regions like northeast India.

The phenomenon of internal forced migration has also been subjected to critical inquiry within the South Asian context. Some of this migration is linked to conflict, although much of it is linked to developmental strategies pursued by South Asian states (Banerjee et al 2005, pp 13–29). Conflict-induced internal forced migration has to do with the manner in which ethnic communities have been forced to negotiate territorial arrangements in different states. In India’s northeast, ethnic groups often contend with one another over territorial reorganisation of existing federal units. Claims to exclusive homelands have resulted in large-scale conflict and displacement (Kumar Das 2005, pp 113–143). The areas where such processes take place are also highly militarised. The sustained deployment of government forces, violent activities carried out by armed ethnic militia, and lack of constitutional safeguards for indigenous communities have made India’s northeast a hub for conflict-induced forced migration within the territorial borders of India (Barbora 2009).

20.4 Summary and conceptual reflections

The dignity of migrants must be respected and their contributions to the economy appreciated by societies and national governments in South Asia. However, this is easier said than done. Insights resulting from migration-related research conducted by the NCCR North-South have highlighted that efforts to show such respect and appreciation are still fragmentary and need to be calibrated by a nuanced grasp of what constitutes the life of a migrant and where migrants look for support.

There must be a shift of focus from financial flows to the well-being of migrants and their families and communities in order to produce more nuanced analyses of the patterns and politics of migration in South Asia. In order to understand the multi-locality of migrants' livelihoods, for instance, the relations of migrants to their places of origin as well as linkages to their other places of residence and work must be considered. These places are distinctive in terms not only of their spatial context but also of their social context, whereas work, household formation and day-to-day activities differ in their nature and consequences. The way migrants live is influenced by social identities and structures from 'home' (i.e. their place of origin) as much as by the structures of new places of residence (Thieme 2008). For example, social networks formed by family members or friends are essential for low-skilled migrants to find a job in new destinations. While this social capital is appreciated in some parts of the labour market, it carries no value in other sub-fields of the labour market – for example, when migrants look for better-paid or higher-skilled jobs. In addition, the same social capital that can help some colleagues to find a job may exclude others if they cannot satisfy certain preconditions laid down by their fellow villagers in order to obtain a job.

The role of social networks in enabling migration has been emphasised in mainstream discourses. Using evidence of exclusion through networks as a springboard, researchers associated with the NCCR North-South have questioned their purely positive role as 'social capital'. They have opened the black box of the household to capture power relations linked to the stratifiers of gender and generation. Siegmann and Thieme (2007) suggest that relations of domination and subordination within networks of family and kin determine whether household members experience a greater degree of vulnerability or of resilience as a result of migration.

Attention to the embeddedness of migration in a political economy of border-making is also necessary. The post-colonial history of the sub-continent has shown that frontiers are not given, but are drawn and guarded with intent. This sheds light on discourses on globalisation, transnationalism and time and space compression that undermine the nation-state as a unit of regulation or analysis. It has also become apparent that transnational ties are circumscribed in important ways – by the regulatory authorities of migrant-receiving states in the form of immigration criteria and procedures, and in the policies that migrant-sending states apply to their overseas citizens or co-ethnics (e.g. Kelly 2003). These increasing restrictions on migra-

tion have contributed to an increase in activities in the informal and illegal sectors that block the social mobility of migrants.

Challenges in further migration research in South Asia are associated with power relations from the intra-household to the national and international levels. These need to be conceptualised not as fixed resources but as fluid and changing conditions. There is also a need for multi-local research. A complete record of migration patterns and circuits will reveal the possible linkages between internal and international migration, the linkages between different sources of income, and how power relations between people change. In addition, research should take account not only of 'the migrant' and his or her household members but also of non-migrating people affected by migration owing to the fact that they live in the receiving place (e.g. Thieme 2008).

Migration and the resulting multi-locality of livelihoods can be driving forces that challenge power imbalances. However, migration and multi-locality do not always generate greater equality; they can also produce inequality and exclusion, and do not therefore necessarily provide human security.

Endnotes

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⁴ We do not address marital migration here, although it is probably the most common type of migration in South Asia.

⁵ This article is based on Barbora et al (2008).

⁶ The authors wish to thank Vineetha Menon for sharing this information (personal communication, December 2006).

⁷ This concern is widespread among non-state actors in South Asia. We wish to cite two examples of such concerns in the region. The National Human Rights Commission in Nepal mentions in its report of 2005 (NHRC Nepal 2005) that trafficking of women and children along its long and porous border with India is a cause for concern. It also states that non-governmental organisations have been asked to help with detection and interception of supposed victims of trafficking along selected border points. Migration rights activists argue that such measures go against notions of agency and restrict the livelihood options of mobile populations. In another example, the All Assam Students Union has been at the forefront of the demand to seal the border between India and Bangladesh, as it claims that there are daily incursions of illegal immigrants from Bangladesh into northeastern Indian states such as Assam. In response to such demands, the government of India has often rounded up "suspected" Bangladeshi migrants and, in violation of domestic and international law, forced them into the no-man's-land between the two countries.

References

Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

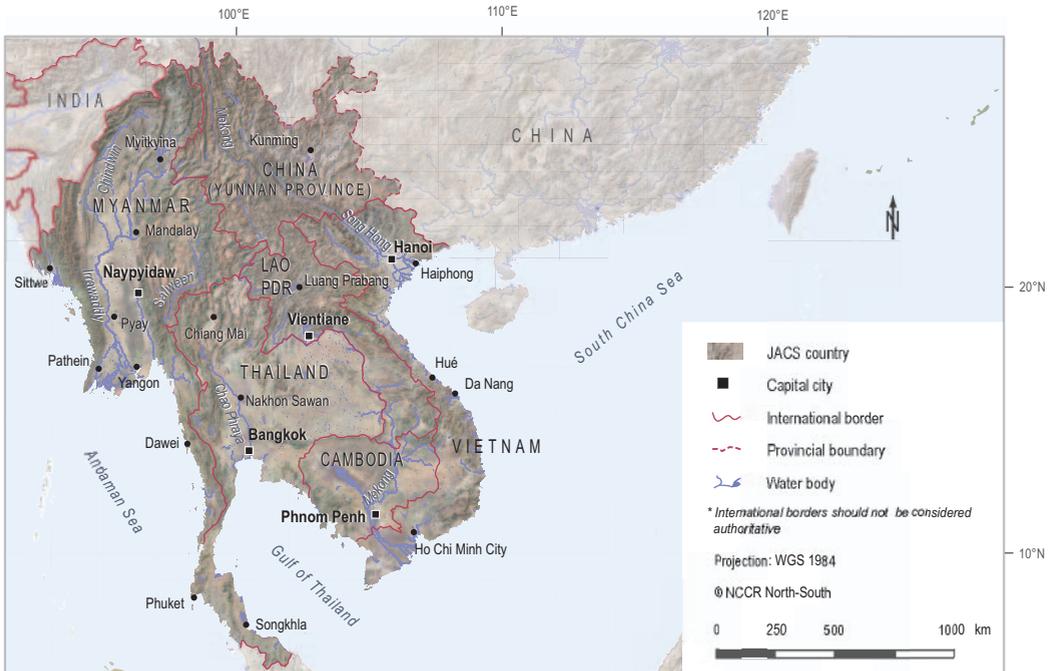
- Ahmed AS. 1984. *Dubai Chalo*: Problems in the ethnic encounter between Middle Eastern and South Asian Muslim societies. *Asian Affairs* 15:262–276.
- Alavi H. 1991. Pakistani women in a changing society. In: Donnan H, Werbner P, editors. *Economy and Culture in Pakistan: Migrants and Cities in a Muslim Society*. London, UK: Macmillan, pp 124–142.
- Amnesty International. 2005. *Gulf Cooperation Council (GCC) Countries: Women Deserve Dignity and Respect*. London, UK: Amnesty International.
- Azam F. 2005. *Public Policies to Support International Migration in Pakistan and the Philippines*. Conference paper presented at the World Bank New Frontiers of Social Policy Conference in Arusha, Tanzania, 12–15 December 2005. Available from Sanjay Barbora.
- Ballard R. 2005. Remittances and economic development in India and Pakistan. In: Maimbo SM, Ratha D, editors. *Remittances: Development Impact and Future Prospects*. Washington, D.C.: World Bank, pp 103–118.
- Banerjee P, Basu Ray Chaudhury S, Kumar Das S. 2005. Introduction. In: Banerjee P, Basu Ray Chaudhury S, Kumar Das S, editors. *Internal Displacement in South Asia: The Relevance of the UN's Guiding Principles*. New Delhi, India: Sage Publications, pp 13–29.
- * Barbora S. 2007. *Land, Class and Ethnicity: Permutations of Environmental Conflicts in Two Districts of Assam* [PhD dissertation]. Shillong, India: North Eastern Hill University, Department of Sociology.
- * Barbora S. 2009. Natural resources contested in autonomous councils: Assessing the causes of ethnic conflict in North-East India. In: Geiser U, Rist S, editors. *Decentralisation Meets Local Complexity: Local Struggles, State Decentralisation and Access to Natural Resources in South Asia and Latin America*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 4. Bern, Switzerland: Geographica Bernensia, pp 191–215.
- * Barbora S, Thieme S, Siegmann KA, Menon V, Gurung G. 2008. Migration matters in South Asia: Commonalities and critiques. *Economic and Political Weekly* 43(24):57–65.
- Baruah S. 2005. *Durable Disorder: Understanding the Politics of Northeast India*. New Delhi, India: Oxford University Press.
- Bhattacharya D, Deb UK. 2006. *Bangladesh 2020: An Analysis of Growth Prospects and External Sector Behaviour*. Paper No. 56. Dhaka, Bangladesh: Centre for Policy Dialogue.
- Bhattacharyya HK. 2001. *The Silent Invasion (Assam versus Infiltration)*. New Delhi and Guwahati, India: Spectrum Publications.
- BEOE [Bureau of Emigration and Overseas Employment]. 2007. *District-wise Data 1981–2006*. Available at: <http://www.beoe.gov.pk/Downloads.asp>; accessed on 10 June 2007.
- Burki SJ. 1984. International migration: Implications for labor exporting countries. *Middle East Journal* 38(4):668–684.
- CBS [Central Bureau of Statistics, National Planning Commission Secretariat, His Majesty's Government of Nepal]. 2004. *Nepal Living Standards Survey 2003/04: Statistical Report*. Vol. 1 and 2. Thapathali, Kathmandu, Nepal: CBS. Also available at: <http://www.cbs.gov.np/Surveys/NLSSII/NLSS%20II%20Report%20Vol%201.pdf> and <http://www.cbs.gov.np/Surveys/NLSSII/NLSS%20II%20Report%20Vol%202.pdf>; accessed on 12 May 2009.
- De S. 2005. *Illegal Migrations and the North-East: A Study of Migrants from Bangladesh*. Calcutta, India: Maulana Abul Kalam Azad Institute for Asian Studies.
- Ellis F. 2003. *A Livelihoods Approach to Migration and Poverty Reduction*. Norwich, UK: Department for International Development (DFID).

- Gazdar H. 2003. *A Review on Migration Issues in Pakistan*. Paper presented at the Regional Conference on Migration, Development and Pro-poor Policy Choices in Asia jointly organised by the Refugee and Migratory Movements Research Unit, Bangladesh and the Department for International Development, UK, in Dhaka, Bangladesh, 22–24 June 2003. Available from Sanjay Barбора.
- Gazdar H. 1999. Poverty in Pakistan: A review. In: Khan SR, editor. *50 Years of Pakistan's Economy: Traditional Topics and Contemporary Concerns*. Karachi, Pakistan: Oxford University Press, pp 241–326.
- Ghayur S. 2008. *Promoting Migration and Protecting Migrants*. Presentation at the Provincial consultative meetings on Draft Migration Policy. Karachi, Pakistan: Policy Planning Cell, Government of Pakistan/International Labour Organisation. Available from Karin Siegmann.
- Government of Pakistan. 2007. *Household Integrated Economic Survey (HIES) 2005–2006*. Islamabad, Pakistan: Federal Bureau of Statistics.
- Graner E, Seddon D. 2004. Nepal's remittances economy: A decade of change (1996–1997 to 2003–2004). In: Dahal MK, editor. *Nepalese Economy: Towards Building a Strong Economic Nation State*. Kirtipur, Nepal: Central Department of Economics (CEDEC), Tribhuvan University, and New Hira Books Enterprises, pp 29–52.
- Hussain A. 2003. *Pakistan National Human Development Report 2003: Poverty, Growth and Governance*. Karachi, Pakistan: United Nations Development Programme.
- Hutt M. 2003. *Unbecoming Citizens: Culture, Nationhood and the Flight of Refugees from Bhutan*. New Delhi, India: Oxford University Press.
- IOM [International Organisation for Migration]. 2005. *Labour Migration in Asia: Protection of Migrant Workers, Support Services and Enhancing Development Benefits*. Geneva, Switzerland: IOM. Also available at: http://www.iom.int/jahia/webdav/site/myjahiasite/shared/shared/mainsite/published_docs/books/labour_migration_asia.pdf; accessed on 7 April 2009.
- IOM [International Organisation for Migration]. 2006. *Migration for Development: Within and Beyond Frontiers*. Geneva, Switzerland: IOM.
- Jolly S, Reeves H. 2005. *Gender and Migration: Overview Report*. BRIDGE Cutting Edge Packs. Brighton, UK: Institute of Development Studies, University of Sussex.
- * Kaspar H. 2005. *"I am the Head of the Household Now": Gender Aspects of Out-migration for Labour in Nepal*. Kathmandu, Nepal: Swiss National Centre of Competence in Research (NCCR) North-South and Nepal Institute of Development Studies (NIDS).
- Kazi S. 1999. Gender inequalities and development in Pakistan. In: Khan SR, editor. *50 Years of Pakistan's Economy: Traditional Topics and Contemporary Concerns*. Karachi, Pakistan: Oxford University Press, pp 376–414.
- Kelly P. 2003. Canadian–Asian transnationalism. *Canadian Geographer* 47(3):209–218.
- * Kollmair M, Manandhar S, Subedi B, Thieme S. 2006. New figures for old stories? Migration and remittances in Nepal. *Migration Letters* 3(2):151–160.
- Kumar Das S. 2005. India: Homelessness at home. In: Banerjee P, Basu Ray Chaudhury S, Kumar Das S, editors. *Internal Displacement in South Asia: The Relevance of the UN's Guiding Principles*. New Delhi, India: Sage Publications, pp 113–143.
- Lefebvre A. 1999. *Kinship, Honour and Money in Rural Pakistan: Subsistence Economy and the Effects of International Migration*. Nordic Institute of Asian Studies Monograph Series. Richmond, UK: Curzon.
- Migrant Forum in Asia (MFA). 2007. *Uphold Women's Rights to Development and Fundamental Freedom! MFA Statement on New Sri Lanka Legislation*. Available at: <http://www.mfasia.org/mfaStatements/Statement68-SriLankaMarch2007.html>; accessed on 7 April 2009.
- Naveed-i-Rahat. 1986. Meharabad, a Punjabi village: Male outmigration and women's changing role. In: Selier F, Karim MS, editors. *Migration in Pakistan: Theories and Facts*. Lahore, Pakistan: Vanguard, pp 139–160.
- NHRC Nepal [National Human Rights Commission Nepal]. 2005. *Trafficking in Persons, Especially in Women and Children, in Nepal*. National Report 2005. Lalitpur, Nepal: NHRC Nepal.
- NIDS [Nepal Institute of Development Studies]. 2008. *Migration Year Book 2007*. Kathmandu, Nepal: NIDS and Swiss National Centre of Competence in Research (NCCR) North-South.

- Nichols R. 2008. *A History of Pashtun Migration, 1775–2006*. Karachi, Pakistan: Oxford University Press.
- Piper N. 2005. *Gender and Migration*. Paper prepared for the Policy Analysis and Research Programme of the Global Commission on International Migration (GCIM). Geneva, Switzerland: GCIM. Also available at: <http://www.gcim.org/attachements/TP10.pdf>; accessed on 7 April 2009.
- Rouse R. 1991. Mexican migration and the social space of postmodernism. *Diaspora* 1(1):7–13.
- Schrader H. 1988. *Trading Patterns in the Nepal Himalaya*. Saarbrücken, Germany: Breitenbach.
- * SDPI [Sustainable Development Policy Institute]. 2007a. *Making Their Voices Audible*. Report of celebration of International Migration Day in Islamabad, Pakistan, 18 December 2007. http://www.sdpi.org/research_Programme/human_development/MigrationDay_report.pdf; accessed on 11 May 2009.
- * SDPI [Sustainable Development Policy Institute]. 2007b. *Migration: Reducing or Inducing Risk?* Report of SDPI Seminar in Islamabad, Pakistan, 10 September 2007. http://www.sdpi.org/research_Programme/human_development/MigrationSeminarReport.pdf; accessed on 11 May 2009.
- Seddon D, Adhikari J, Gurung G. 2001. *The New Lahures: Foreign Employment and Remittance Economy of Nepal*. Kathmandu, Nepal: Nepal Institute of Development Studies.
- Shah NM. 2006. *Restrictive Labour Immigration Policies in the Oil Rich Gulf: Effectiveness and Implications for Sending Asian Countries*. Mexico City, Mexico: United Nations Secretariat.
- * Siegmann KA. 2007. *Strengthening Whom? The Role of Transnational Migration for Women and Men in North-West Pakistan*. Paper presented at the Sustainable Development Policy Institute (SDPI) 10th Sustainable Development Conference on *Sustainable Solutions: A Spotlight on South Asian Research*, Islamabad, Pakistan, 10–12 December 2007. Available from Karin Astrid Siegmann.
- * Siegmann KA, Steimann B. 2005. *Vulnerability and Resilience in Rural North-West Pakistan*. Unpublished draft. Also available at: http://www.nccr-pakistan.org/publications_pdf/Gender/VulnerabilityPaper_Draft.pdf; accessed on 7 April 2009.
- * Siegmann KA, Thieme S. 2007. Coping on women's back: Social capital–vulnerability links through a gender lens. *International Migration, Multi-local Livelihoods and Human Security: Perspectives from Europe, Asia and Africa*. The Hague, The Netherlands: Institute of Social Studies (ISS). Also available at: http://www.iss.nl/content/download/8387/81639/file/Panel%203_Siegmann,%20Thieme.pdf; accessed on 11 May 2009.
- * Steimann B. 2005. *Livelihood Strategies in North-West Pakistan: Results from the Sustainable Livelihoods Survey 2004, North-West Frontier Province (Pakistan)*. IP6 Working Paper No. 5. NCCR North-South Dialogue Series. Zurich and Bern, Switzerland: Department of Geography, University of Zurich, and Swiss National Centre of Competence in Research (NCCR) North-South. Also available at: http://www.nccr-north-south.unibe.ch/publications/Infosystem/On-line%20Dokumente/Upload/IP6_WP5.pdf; accessed on 11 May 2010.
- Suleri AQ, Savage K. 2006. *Remittances in Crisis: A Case Study from Pakistan*. London, UK: Overseas Development Institute. Also available at: http://www.sdpi.org/whats_new/recent_publications/BGPaper_Remittances_Pakistan.pdf; accessed on 7 April 2009.
- * Thieme S. 2006. *Social Networks and Migration: Far West Nepalese Labour Migrants in Delhi*. Münster, Germany: LIT.
- * Thieme S. 2008. Sustaining livelihoods in multilocal settings: Possible theoretical linkages between livelihoods and transnational migration research. *Mobilities* 3(1):51–71.
- * Thieme S, Müller-Böker U. 2004. Financial self-help associations among far west Nepalese labor migrants in Delhi, India. *Asian and Pacific Migration Journal* 13(3):339–361.
- van Schendel W. 2005. *The Bengal Borderlands: Beyond State and Nation in South Asia*. London, UK: Anthem Press.
- World Bank. 2006. *Global Economic Prospects: Economic Implications of Remittances and Migration 2006*. Washington, D.C.: The World Bank.
- World Bank. 2008. *Migration and Remittances: Factbook 2008*. Washington, D.C.: World Bank.
- Zachariah KC, Rajan IS. 2006. *Gulf Revisited*. Thiruvananthapuram, India: Centre for Development Studies.

Part VI

Integrated Approaches to Environmental Management in Southeast Asia





21 Dealing with Sanitation, Environmental Dynamics and Disparities: Research Partnerships in Southeast Asia

Thammarat Koottatep¹

21.1 Background

Among the world's fast-growing regions, the so-called Greater Mekong Sub-region (GMS) in Southeast Asia is one of the richest in terms of variety and quality of natural and environmental resources (Figure 1). The GMS includes Cambodia, Lao PDR, Myanmar, Thailand, Vietnam, and Yunnan Province in China. It has a total population of 240 million people and covers some 2.3 million km². In recent decades, the rapid economic growth of the GMS countries has increased disparities in terms of wealth and access to natural resources among their rapidly growing populations. Economic growth has also placed tremendous pressure on the region's natural resources and the environment. Problems such as deforestation, soil degradation, inadequate environmental sanitation services and pollution of water resources have become more serious and have been recognised by national and local authorities as an important area for action.

The countries in the GMS, with the support of international development cooperation, have put tremendous efforts into sustainable development, poverty alleviation, minimisation of disparities in resource distribution, managing natural resources, and protecting the natural environment. A number of national and international institutions involved in minimising environmental problems and building a well-managed society have, nonetheless, been constricted and impeded by numerous obstacles (Hurni et al 2004), among which the most critical are:

- Policy and regulatory frameworks that do not enable or support integration of environmental and economic planning;
- Centralised decision-making related to public services, infrastructure and the natural environment;

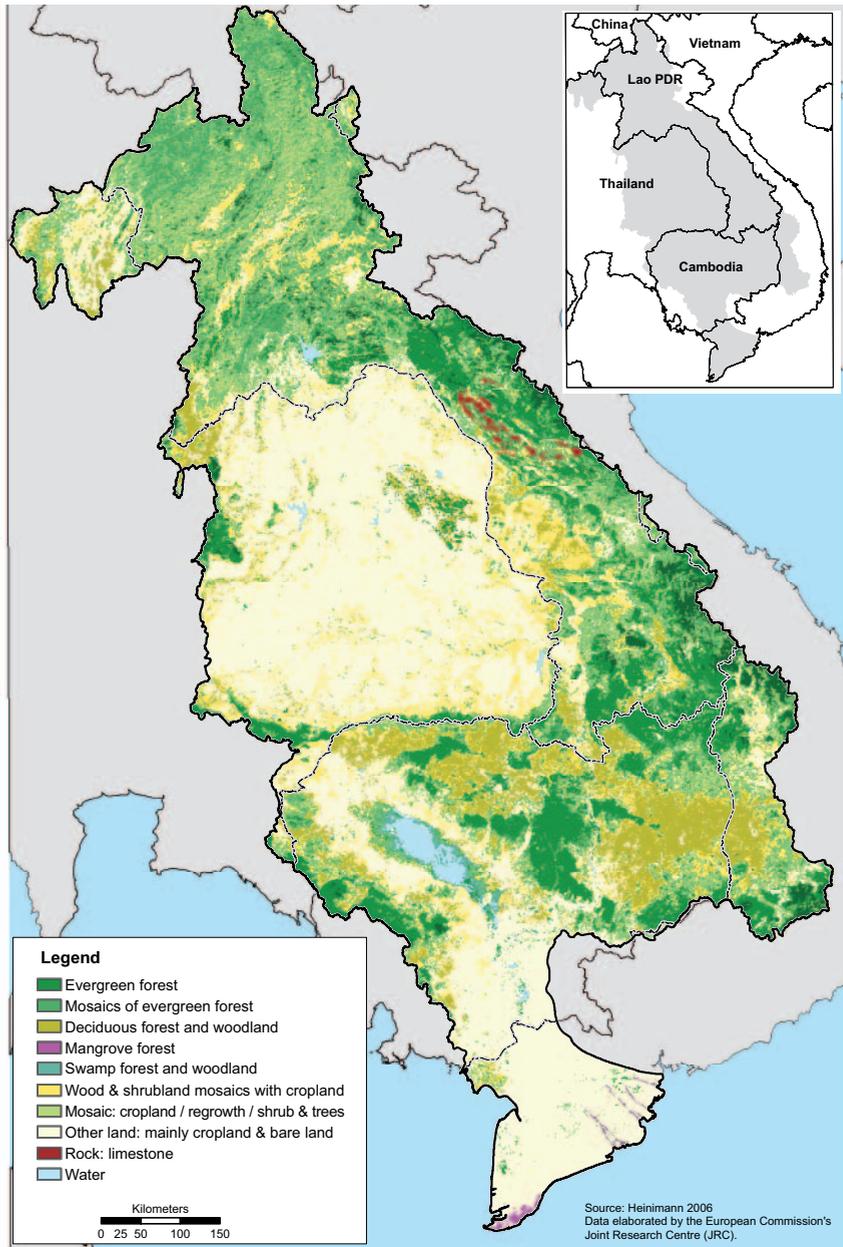


Fig. 1
Major land-cover
categories in the
lower Greater
Mekong Sub-
region (GMS)
countries. (Source:
Heinimann 2006)



Fig. 2
Hanoi and other
Southeast Asian
cities have rapidly
grown in an
uncontrolled man-
ner, leading to
major environ-
mental problems.
(Photo by Antoine
Morel, 2008)

- Inadequate databases and funding to support participatory decision-making;
and
- Ineffective design, enforcement and monitoring of policy implementation.

For instance, access to adequate environmental sanitation services is recognised as a priority issue for socio-economic development in most developing countries (Millennium Development Goal 10). While many sanitation programmes have been implemented in recent years, interventions in this sector often focused on strategically important areas, including high-income areas, rapidly growing urban centres, or touristic zones. Fast-growing city centres such as Luangprabang and Vientiane (Lao PDR), Bangkok (Thailand), Hanoi (Vietnam) and Kunming (China) applied a conventional approach to provision of environmental sanitation services (i.e. ‘flush and forget’; Figure 2); however, the problems are often redirected downstream to more vulnerable areas of less economic importance, resulting in increased environmental degradation and health threats (Kamal et al 2008). These typical practices have led to increased socio-economic and environmental disparities within urban communities, especially in Southeast Asia, where urbanisation rates are among the highest in the world.

Core problems of unsustainable development in Southeast Asia are not limited to the urban and peri-urban context. One other core issue is the poor management of natural resources in high- and lowland rural areas where the great majority of people rely on subsistence or semi-subsistence agriculture. Even in Vietnam, with average GDP growth rates of 10% per annum over the last decade, economic development still depends heavily on agricultural production. Such rapid development means that countries have to deal with enormous changes; emerging markets and new business opportunities typically increase the risk of spatially overlapping and conflicting interests in natural resources (Thanh Be et al 2007). While traditional subsistence agriculture depends on various forest products for domestic and local consumption, intensively cultivated farmlands likely utilise the same productive areas for larger-scale resource use.

Focusing on the above-mentioned regional problems, researchers of the Swiss National Centre of Competence in Research (NCCR) North-South in Southeast Asia have jointly undertaken field research with the ultimate aim of determining integrated management approaches to deal with environmental dynamics and disparities in both urban and peri-urban as well as highland–lowland contexts. These integrated approaches should enable key actors or stakeholders to effectively employ interventions that are appropriate for handling sustainable management and utilisation of natural and environmental resources with minimal adverse impacts on people’s livelihoods. NCCR North-South research activities in Southeast Asia have thus emphasised three overarching research themes: (1) equity-effective and environmentally sustainable sanitation for reducing disease burden (health risks); (2) multi-level stakeholder processes for development of interventions and coping strategies; and (3) livelihood and environment in trans-contextual perspectives.

Eight years into the NCCR North-South research and capacity development programme, it is crucial to assess the achievements of activities in the region by synthesising the research outputs relating to the aforementioned research themes. Three relevant synthesis themes have been consolidated and highlighted: 1) *Potential and Limitations of Decentralised Wastewater Management*; 2) *Innovative Tools for Environmental Sanitation Planning and River Basin Management*; 3) *Accessibility as a Determinant of Environmental Dynamics and Socio-economic Disparities*.

21.2 Attempts to develop integrated management approaches

Since 2002, field research activities in the NCCR North-South's Joint Area of Case Studies (JACS)² Southeast Asia (SEA) have been jointly developed and undertaken by researchers from both the North (Switzerland)³ and the South (Thailand, Vietnam, Lao PDR and China), with their respective local and regional partner institutions (Table 1). A research partnership network was established, involving around 40 researchers – 2 post-doctoral researchers, 10 PhD candidates, 7 senior researchers, 6 research associates, and 15 Master's students. This partnership network was able to conduct high-quality

Table 1

Country	Partner institutions	
Thailand	School of Environment, Resources and Development (SERD), Asian Institute of Technology (AIT)	Partner institutions of the Swiss National Centre of Competence in Research (NCCR) North-South's Joint Area of Case Studies (JACS) Southeast Asia (SEA).
	Pollution Control Department (PCD), Ministry of Science, Technology and Environment	
	Mahidol University (MU)	
	Faculty of Environment and Resource Studies, Thammasat University	
	Southeast Asian Ministers of Education Organisation–Regional Centre for Archaeology and Fine Arts (SPAFA)	
Vietnam	Hanoi University of Civil Engineering (HUCE)	
	National Institute of Soil and Fertiliser (NISF)	
	National Institute of Hygiene and Epidemiology (NIHE)	
	Urban Rural Solutions (URS)	
	AIT Centre Vietnam (AIT CV)	
Lao PDR	Lao National Mekong Commission Secretariat (LNMCS)	
	Urban Research Institute (URI)	
	Swiss Agency for Development and Cooperation (SDC) Lao PDR	
Cambodia	Royal University of Phnom Penh (RUPP)	
China	Kunming Institute of Environmental Science (KIES)	
	Yunnan Academy of Social Science (YASS)	
	City Government of Kunming, Kunming, People's Republic of China	
	Department for Environmental Science and Engineering, Kunming University of Technology	

ity research, as evidenced by the number of scientific publications and other research outputs, some of which have been transferred into practice by local partner institutions or integrated into national policies.

Field research related to the first two themes, *Potential and Limitations of Decentralised Wastewater Management* and *Innovative Tools for Environmental Sanitation Planning and River Basin Management*, was conducted within the framework of the Household-Centred Environmental Sanitation (HCES) approach. The HCES approach is a demand-responsive, participatory and community-focused approach for improving environmental sanitation services, and relies on the availability of appropriate sanitation technologies as well as supporting tools for informed decision-making. Research therefore first focused on the development of appropriate environmental sanitation systems, with an emphasis on decentralised wastewater management. In laboratory and pilot-scale experiments, wastewater treatment systems were investigated in terms of treatment efficiency, operation and maintenance requirements, compliance with national discharge standards, and costs. The Anaerobic Baffled Reactor (ABR) and Constructed Wetland (CW) systems were experimentally tested because of their high treatment performance, their minimal energy consumption, and their financial competitiveness – all important preconditions for decentralised wastewater management schemes. As a result of the field testing, design and operational criteria for the ABR and CW systems were defined and published in technical manuals. These were then adopted by the environmental authorities in the region (e.g. the Pollution Control Department of Thailand and the Ministry of Construction in Vietnam), which consequently implemented the recommendations and results in several peri-urban communities. Research also focused on the limitations of wider-scale application of such systems. Lack of public acceptance of such innovative technologies, lack of capacity to plan and implement these systems, and hindering policies and regulations were identified as the main limiting factors, as elaborated in Chapter 22 of the present volume.

In addition to the field testing of decentralised wastewater treatment systems, NCCR North-South research included applications of Material Flow Analysis (MFA) to depict obvious environmental pollution and scenarios for its management. Field research activities concerned with MFA were pursued at various scales, from the university campus to the small-scale community and the large-scale municipality, up to the river basin in Thailand, Vietnam and China (Yunnan Province). Recognising the public health threats caused



Fig. 3
A typical hanging latrine over a fish pond in a peri-urban community in Cantho city, Vietnam. (Photo by Thammarat Koottatep)

by poor environmental sanitation services (Figure 3), field research encompassed the study of health risk assessment using the Quantitative Microbial Risk Assessment (QMRA) technique. Though MFA and QMRA provided sufficient analytical information for environmental sanitation planning with respect to environmental pollution and public health threats, an understanding of stakeholders and their vital roles in decision-making and/or implementation processes was also required. Researchers thus developed and tested a set of systematic tools for stakeholder analysis that enables and enhances stakeholder involvement in effective participatory planning. Applications of these tools are well documented and explained by selected case studies in Chapter 23 of the present volume.

Research on the third theme, *Accessibility as a Determinant of Environmental Dynamics and Socio-economic Disparities*, addressed environmental dynamics in the highland–lowland context and was designed to provide spatially explicit meso-scale information on development disparities and the status and dynamics of natural resources. Research on the geography of welfare in Vietnam demonstrated that poverty and inequality maps may be misinterpreted if spatial patterns specific to important sub-populations remain unclear. In the environmental realm, land-cover research in the lower

Mekong basin showed the distinct scars that various long-term land-cover change processes – related to the level of market integration and depending on the political context – left on the landscape in the riparian countries of the lower Mekong basin. Based on insights of great interest from these studies that showed clear patterns of poverty and environmental characteristics (see Chapter 24 in the present volume), very recent research has been oriented towards integrated analysis of the poverty–environment nexus in Laos, with the aim of detecting typical patterns of environmental degradation and related welfare or poverty, and vice versa.

In addition to the aforementioned research activities, NCCR North-South researchers and their local partners jointly implemented Partnership Actions for Mitigating Syndromes (PAMS), a programme component designed to transfer the knowledge gained from research but also to test the applicability of research results.⁴ Altogether, six PAMS projects were implemented in the Joint Area of Case Studies (JACS) Southeast Asia (SEA) (Table 2),

Table 2

PAMS	Duration	Location	Main outcomes
Woman negotiating the borders: Marketing route and cross-border trade of inland fish between Thailand and Cambodia	2003–2004	Cambodia and Thailand	Implementation of gender-sensitive policy for border trade
Implementation, monitoring and promotion of urine-separating dry toilets in a village in China	2003–2004	Kunming, China	Acceptance of urine-separating toilets in peri-urban communities
Developing a socio-economic atlas of Vietnam	2004–2005	Vietnam	Adoption of socio-economic atlas for development planning
Development of technical guidelines on constructed wetlands for septage treatment and management	2004–2005	Thailand	Application of technical guidance as a national code of conduct
Effective sanitation systems through stakeholder involvement: A case study of faecal sludge management in Thailand	2007–2008	Thailand	Adoption of some developed strategies into the national master plan for environmental health and sanitation
Participatory improvement of urban environmental sanitation services in Hatsady Tai, Vientiane, Lao PDR	2008–2009	Lao PDR	Increased awareness and capacity on participatory planning of sanitation improvement facilities

Partnership Actions for Mitigating Syndromes (PAMS) carried out in the Joint Area of Case Studies (JACS) Southeast Asia (SEA) during 2002–2009, and their main outcomes.

all of them dealing with integrated approaches to environmental management. One promising outcome of these PAMS was that the management interventions developed during the PAMS were then translated into policy. For instance, the Department of Health of the Thai Ministry of Public Health adopted the technical guidance and recommended strategies for septage management from two PAMS (SEA-4 and SEA-5) in a national master plan for environmental health and sanitation in 2008 and an updated ministerial decree on faecal sludge management in 2009.

21.3 Outlook and ways forward

Integrated management has proved to be a promising approach for coping with unsustainable patterns of development in fast-growing regions of GMS countries. However, long-term evidence based on transdisciplinary research, and its transfer into actions or policy implications, is still required. In future, NCCR North-South research in Southeast Asia will focus further on the adopted research themes, with several slight adjustments: 1) Multi-level stakeholder processes for development; 2) Sustainable sanitation and health interventions; and 3) Livelihood and environment in trans-contextual perspectives. Integration of sanitation and health risk assessments within the framework of participatory planning, for instance, will be a key area of research. In addition, analysis of the contribution of environmental sanitation interventions to climate change mitigation and to emerging health issues will be included.

Given the existing competences and expertise of the NCCR North-South team in the region, it appears necessary to explore new research partnerships with other institutions when it comes to transdisciplinary research for sustainable development. We anticipate linking NCCR North-South research activities with the Association of Southeast Asian Nations (ASEAN) Regional Center of Excellence on MDGs at the Asian Institute of Technology (AIT), which provides a broad networking platform for research and academic institutions in the region and beyond.

Endnotes

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² The NCCR North-South is based on research partnerships with researchers and research institutions in the South and East. These partnership regions are called JACS (Joint Areas of Case Studies). Regional Coordination Offices (RCOs) were established in each of these JACS at the outset of the programme. The original function of the RCOs was to coordinate research; in the third phase of the programme, RCOs will consolidate the existing research network in the South and will become hubs for generating new research projects and partnerships.

³ Mainly from the Department of Water and Sanitation in Developing Countries of the Swiss Federal Institute of Aquatic Science and Technology (Eawag/Sandec), the Swiss Tropical and Public Health Institute (Swiss TPH), and the Centre for Development and Environment (CDE).

⁴ Partnership Actions for Mitigating Syndromes (PAMS) are projects implemented by local actors together with scientific and non-scientific stakeholders. As a component of the NCCR North-South programme they are designed to implement and validate approaches, methods and tools developed in research, with a view to finding promising strategies and potentials for sustainable development. Moreover, they are intended to promote mutual learning and knowledge-sharing between academic and non-academic partners in sustainable development.

References

Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- * Heinimann A. 2006. *Patterns of Land Cover Change in the Lower Mekong Basin: The Relevance of Mesoscale Approaches* [PhD dissertation]. Bern, Switzerland: Faculty of Natural Sciences, University of Bern, Swiss National Centre of Competence in Research (NCCR) North-South and Centre for Development and Environment (CDE).
- * Hurni H, Wiesmann U, Schertenleib R, editors. 2004. *Research for Mitigating Syndromes of Global Change: A Transdisciplinary Appraisal of Selected Regions of the World to Prepare Development-oriented Research Partnerships*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 1. Bern, Switzerland: Geographica Bernensia.
- Kamal ASM, Goyer K, Koottatep T, Amin ATMN. 2008. Domestic wastewater management in South and Southeast Asia: The potential benefits of a decentralised approach. *Urban Water Journal* 5(4):345–354.
- Thanh Be T, Tan Sinh B, Miller F, editors. 2007. *Challenges to Sustainable Development in the Mekong Delta: Regional and National Policy Issues and Research Needs*. Bangkok, Thailand: The Sustainable Mekong Research Network (Sumernet), Chulalongkorn University.

22 Potential and Limitations of Decentralised Wastewater Management in Southeast Asia

Antoine Morel¹, Yuttachai Sarathai², Viet-Anh Nguyen³, and Thammarat Koottatep⁴

Abstract

In rapidly growing cities of Southeast Asia, decentralised technologies for wastewater treatment have a great potential for mitigating the problems of water pollution and water scarcity. This article synthesises research conducted in Thailand, Vietnam and China with the aim of identifying the potential and limitations of introducing decentralised approaches into domestic wastewater management in the region. Laboratory and pilot-scale research on anaerobic baffled reactors (ABRs) and constructed wetlands (CWs) in Thailand and Vietnam revealed that decentralised wastewater treatment technologies can treat domestic wastewater to satisfactory levels at reasonable costs. While the benefits of a decentralised approach are widely recognised within the international scientific community, very few systems are actually implemented in Southeast Asia. Barriers to wide-scale recognition and application of decentralised systems are manifold. Many policy- and decision-makers do not yet perceive decentralised wastewater management as state-of-the-art, indicating technical limitations and a lack of public acceptance as the main obstacles. This lack of political commitment hinders the creation of enabling institutional and legislative frameworks. A basic lack of capacity to plan, implement and operate systems was also identified as an important barrier to wide-scale application and sustainable management of at-source pollution control measures in Southeast Asia. While the limitations are known, measures to overcome these barriers are far more complex. An enabling environment must be created by raising awareness of the importance of wastewater management and of opportunities such as decentralised approaches, creating supporting policies and regulations, identifying suitable financing mechanisms and incentives, and building capacity to plan, implement, operate and maintain such systems.

Keywords: Pollution control at the source; decentralised wastewater management; anaerobic baffled reactor; constructed wetland; enabling environment; Southeast Asia.

22.1 Introduction

The provision of adequate water and sanitation services is one of the oldest and most fundamental challenges in the urbanising world. Historically, most Western countries have relied on sewer systems with centralised wastewater treatment plants optimised for water pollution control. For a long time, it was generally accepted that this model could be exported to any part of the world. While the conventional approach to urban environmental sanitation has contributed greatly to the improvement of hygienic conditions in industrialised countries that could afford to install and operate these systems, it is now generally recognised that under certain circumstances, this 'end-of-pipe' strategy leads to failure (Larsen and Gujer 2001; Zurbrügg et al 2004). In most cities in Southeast Asia, only a small part of the wastewater collected in sewer lines is treated. In Kunming, China, for example, despite large investments in centralised treatment plants in the last decade, only 25% of wastewater collected in the city sewer system is treated, with most of the untreated remainder entering Dianchi Lake – the main drinking water source of the city – via overflows (Huang et al 2006). It was further simulated that even the application of the best available technology – upgrading of the city's urban wastewater collection and treatment system to up-to-date standards – could not prevent lake eutrophication. Indeed, simulations showed that only a combination of innovative measures could solve this problem.

There is a growing tendency to argue that decentralisation of wastewater management would be more effective than centralised systems. In general terms, decentralisation may be defined as a transfer of the authority, functions, resources and responsibilities of government, management or administration from the national (central) level to 'sub-national levels', including lower levels of government, administrative field offices, the private sector, NGOs representing the community, and the community itself. Decentralisation of wastewater management relates to planning and decision-making, design of physical infrastructure, and management arrangements for operations and maintenance (Parkinson and Tayler 2003). The decentralised approach offers important benefits, namely the possibility of dealing with wastewater locally and applying pollution control measures at the source. By tackling pollution problems close to their source, the large capital investment required for trunk sewers associated with centralised systems can be reduced, thus increasing the affordability of wastewater management systems. In terms of planning, decision-making and management, a decentralised approach makes it possible to devolve responsibility from centralised

institutions to lower operational levels, promoting partnerships between community groups, private sector organisations and government agencies. These partnerships increase local accountability, provide greater opportunities for community participation, and can result in a service that is more affordable and responsive to the needs and demands of local stakeholders (Strauss and Montangero 2003).

Despite the above-mentioned opportunities, pollution control measures at the source are not yet fully recognised as an alternative to the conventional centralised wastewater management approach. The present article synthesises the outcomes of a series of research projects conducted within the framework of the Swiss National Centre of Competence in Research (NCCR) North-South programme that aimed to determine the technical potential of promising decentralised wastewater treatment systems and identify the main barriers to their wider implementation in Southeast Asia.

22.2 Methods and approaches

The treatment potential of technologies for domestic wastewater treatment was assessed based on a review of different NCCR North-South related projects. The review focused on the anaerobic baffled reactor (ABR) and constructed wetlands (CWs) for the pre- and post-treatment of domestic wastewater, respectively.

The ABR is a technically modified septic tank, which is the most commonly applied method for on-site treatment of domestic wastewater in Southeast Asia (Nguyen et al 2007). The ABR differs from the conventional septic tank system in that it is operated in an up-flow mode, resulting in both improved physical removal of suspended solids and improved biological conversion of dissolved components (Figure 1). While the ABR was suggested by several researchers as a promising system for the treatment of high-strength industrial wastewater (see Barber and Stuckey 1999 for a comprehensive review), its applicability for the treatment of low-strength domestic wastewater in tropical conditions is not well documented.

The CW is a natural wastewater treatment system that combines multiple treatment modules, including biological, chemical and physical processes (Babatunde et al 2008). The technology has been successfully used for the treatment of a wide variety of wastewaters, including domestic wastewater,

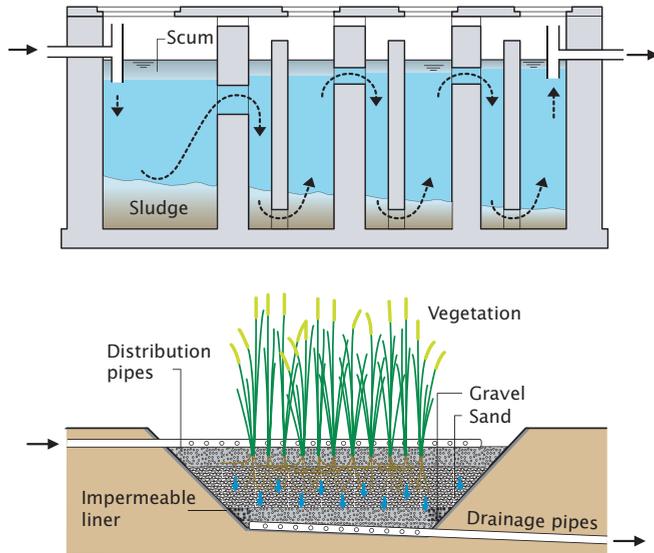


Fig. 1
The two waste-
water treatment
technologies
investigated:
Anaerobic baffled
reactor (ABR, top)
and vertical-flow
constructed wet-
land (CW, bottom).
(Source: Morel and
Diener 2006)

industrial effluents, urban and agricultural storm water runoff, animal wastewater, and faecal sludge (Kadlec et al 2000; Mbuligwe 2004; Koottatep et al 2005). Until recently, however, knowledge about how wetlands work in Southeast Asia was not sufficiently advanced to provide engineers with detailed guidance. Our review focused on the treatment efficiency of these systems in terms of organic load (expressed as chemical oxygen demand [COD] and biochemical oxygen demand [BOD]) and nutrient removal (phosphorus, nitrogen). The exact methodology of the various experiments is described elsewhere (Khumkhom 2004; Koottatep et al 2006; Nguyen et al 2007; Sarathai 2007) and not further discussed here. Table 1 provides an overview of the projects reviewed for the present synthesis.

Institutional, legislative and socio-economic barriers to the wide-scale application of innovative technologies for pollution control at the source were analysed based on one case study in Kunming, China, and on interviews with governmental agencies and sector specialists in Thailand, Lao PDR and Vietnam. Medilanski et al (2006) relied on expert interviews adapted from Meuser and Nagel (1991) and Witzel (1982) to identify the attitudes of the most important stakeholders in Kunming towards different measures at the source for more effective wastewater management. Thirty-four interviews were conducted with stakeholders from political, administrative, scientific and business circles. The priority and feasibility of different measures at the

source were evaluated based on structured interviews. The exact methodology of this study was presented elsewhere (Medilanski et al 2006) and is not discussed any further at this point.

22.3 Results

22.3.1 Anaerobic baffled reactor (ABR) and constructed wetland (CW) technologies

The projects on ABR and CW reviewed in this article (Table 1) provided scientific evidence for treatment performance and critical design parameters of these two wastewater treatment technologies, as well as valuable knowledge about their costs and the operation and maintenance requirements of the systems.

The anaerobic baffled reactor – an efficient, robust and cost-effective technology for the pre-treatment of heavily polluted domestic wastewater: The ABR has several advantages over well-established systems such

Table 1

Project	References	Projects on decentralised wastewater treatment technologies reviewed in this synthesis article.
Laboratory- and pilot-scale research on anaerobic baffled reactor (ABR) and constructed wetland (CW) in Hanoi; conducted by the Centre for Environmental Engineering of Towns and Industrial Areas of the Hanoi University of Civil Engineering (CEETIA/HUCE) and the Swiss Federal Institute of Aquatic Science and Technology (Eawag) in collaboration with Linköping University, Sweden, and the Vietnamese Ministry of Natural Resources and Environment (MONRE), 2003–2007	Beauséjour and Nguyen 2007; Nguyen 2007; Nguyen et al 2007; MOC, in preparation	
Pilot-scale research on ABR and effluent polishing systems (CW, anaerobic filter and sand filter) in Bangkok; conducted by the Asian Institute of Technology (AIT) and Eawag in collaboration with the Thai Pollution Control Department (PCD), 2003–2005	EEM/AIT 2004; Koottatep et al 2006	
Laboratory-scale research on ABR treating toilet wastewater; conducted by AIT in Bangkok (PhD and MSc research), 2002–2008	Wanasen 2003; Khumkhom 2004; Sarathai 2007	
Constructed wetlands for Tsunami-hit areas in southern Thailand (project funded by Danida), 2004–2007	WMA 2005; Koottatep and Polprasert 2008	
On-site sanitation system for treatment of domestic wastewater on Koh Chang Island; conducted by AIT in collaboration with PCD, 2006	PCD 2006	

as the septic tank or the anaerobic filter. The unique design of the ABR makes it possible to separate the hydraulic retention time (HRT) from the solids retention time (SRT) in the reactor, making the ABR a high-rate anaerobic treatment system. Treatment efficiencies of the investigated ABR systems were significantly higher than the ones observed in conventional anaerobic treatment systems. The average removal of organic material (expressed as COD) and suspended solids (SS) in the different laboratory- and pilot-scale ABRs amounted to 72–90% and 78–94%, respectively (Khumkhom 2004; Nguyen et al 2007; Sarathai 2007), which represents a significant increase compared to conventional septic tanks. Hydraulic retention time (HRT, i.e. the average time water remains in the system), wastewater up-flow velocity in the system, the number of up-flow chambers, and peak flow factors (i.e. the ratio between maximum flow rate and average flow rate) were identified as the most significant design factors (Table 2). The system proved to be simple in construction, operation and maintenance, and economically competitive. Construction costs of full-scale ABRs in Vietnam and Thailand amounted to USD 150–270 per cubic metre of reactor, or USD 35–70 per person. The main limitation of the system is its inability to remove nutrients and pathogens to levels complying with Vietnamese and Thai domestic effluent standards, so that a polishing step is required before the treated wastewater can be discharged into the environment.

The constructed wetland (CW) – an efficient polishing system with aesthetic value: Ideally, the polishing process for an anaerobically treated effluent such as an ABR effluent should be aerobic, as oxidative processes complement the reductive anaerobic processes. Linking the two types of processes in this order in a treatment chain is the most efficient way to achieve complete biodegradation of organic material. The CW systems investigated in Vietnam and Thailand (Table 1) produced an effluent with organic material and solids concentrations as low as 15–30 mg/L (BOD) and 13–23 mg/L (SS), respectively (Koottatep et al 2005; Nguyen et al 2007). All wetland systems could meet Vietnamese and Thai national domestic effluent standards in terms of organic load and nutrients. Plant species such as cattails (*Typha angustifolia*) and common reeds (*Phragmites communis*) proved to be suitable as wetland vegetation. Operational problems such as filter bed clogging, plant die-off and odour nuisance were observed in full-scale CWs, mainly due to system overload and inefficient pre-treatment. The studies revealed that a surface area of 2.5–4 m² per person is required, at average costs of USD 60–120 per person (land price not included). The main research findings on CWs are summarised in Table 2.

Table 2

	Anaerobic baffled reactor (ABR)	Constructed wetland (CW)
Typical application	– Primary treatment of domestic wastewater at household or neighbourhood level (5–200 people)	– Secondary and tertiary treatment of pre-treated domestic wastewater at neighbourhood level
Treatment performance	– Removal efficiency: COD = 72–90% ^{a,b,c,i} ; SS = 78–94% ^{a,b,c,i} ; TP = 33% ^c ; TKN = 47% ^c	– Removal efficiency: COD = 80–90% ^{a,c} ; BOD = 75–85%; SS = 80–95% ^{a,c} ; TN = 40–60% ^{a,c}
System design, operation and maintenance	<ul style="list-style-type: none"> – 1 sedimentation chamber, 2–3 up-flow chambers^{a,b,c,i} – HRT = 48 hours^{a,b,c,i} – Size: 0.3–0.4 m³ per person – Critical up-flow velocity = 0.5–0.7 m/h^{a,b} – Reactor start-up period: 90 days^b – Critical hydraulic peak flow factor = 4^b – De-sludging frequency: 2–3 years^a 	<ul style="list-style-type: none"> – Series of vertical-flow units, horizontal-flow units, free-water surface units^f; 2 vertical-flow units in series^a – HRT = 2–4 days^{g,h} – Size: 2.5–4 m² per person^h – Harvesting of wetland plants: 3–4 times per year^h – Periodic cleansing of CW unit surface^f
Construction costs	<ul style="list-style-type: none"> – 150–270 USD/m³ of wastewater^{e,g} – USD 35–70 per person^{e,g} 	<ul style="list-style-type: none"> – 400–650 USD/m³ of wastewater^{g,h} – USD 60–120 per person^{g,h}
Strengths	<ul style="list-style-type: none"> – Simple design (no moving parts, no mechanical mixing) – High treatment efficiency (organic material and suspended solids) – High stability under organic and hydraulic shock loads – Low capital and operational costs – Plant operators do not need high-level academic qualifications 	<ul style="list-style-type: none"> – High treatment efficiency (including nutrients and pathogens) – National wastewater discharge standards can be met – Pleasant landscaping possible – Can be cheap in construction if filter material is locally available – Plant operators do not need high-level academic qualifications
Limitations	<ul style="list-style-type: none"> – Limited nutrient and pathogen removals – Effluent standards cannot be met – Potential production of greenhouse gases (e.g. CH₄) unless treatment or reuse facilities are installed 	<ul style="list-style-type: none"> – High permanent space requirement – Great care required during construction and acclimatisation

Treatment performance, system design, operation and maintenance requirements, construction costs, strengths and limitations of ABR and CW.

COD = chemical oxygen demand; BOD = biochemical oxygen demand; SS = suspended solids; TP = total phosphorus; TN = total nitrogen; TKN = total Kjeldahl nitrogen; HRT = hydraulic retention time.

Sources: ^a = Nguyen et al 2007; ^b = Sarathai 2007; ^c = Koottatep et al 2005; ^d = Khumkhom 2004; ^e = V.A. Nguyen (personal communication, 20 February 2008); ^f = Koottatep and Polprasert 2008; ^g = PCD 2006; ^h = T. Koottatep (personal communication, 9 April 2008);

ⁱ = Wanasen 2003.

22.3.2 Barriers to dissemination of decentralised wastewater management

The expert interviews conducted in Kunming, China, aimed to identify the potential and the limitations of introducing pollution control measures at the source to reduce nutrient discharge to surface water bodies, mainly in the form of decentralised wastewater treatment systems. Two-thirds of the 34 interviewees supported a decentralised approach to pollution control in a general way (Medilanski et al 2007). While the current level of implementation of such at-source measures in the city of Kunming was considered low (85% considered that they are ‘not at all’, ‘very little’ or ‘little’ implemented), 85% of stakeholders anticipated that by 2025, these measures would be ‘much’ or ‘very much’ implemented. Despite the high priority given to the implementation of at-source measures for domestic wastewater, the feasibility of such measures is considered ‘very low’ to ‘low’ (70%) at the moment. Technical difficulties and a lack of public acceptance were mentioned as main barriers. Perspectives on the situation in 2025 are, however, more promising, with feasibility improving to 85% for domestic wastewater.

Analysis of the interest and the influence of key stakeholders in introducing at-source control measures in Kunming revealed that a small number of key political stakeholders (the Congress, the city government, the Communist Party, environmental protection authorities) are the most important barrier to wide-scale introduction of such measures. A basic initial reluctance of the key political stakeholders to support the introduction of decentralised concepts was observed. It was argued that decentralised sanitation was not prestigious and lucrative enough, that technical options were not yet available, and that the probability of success could not be demonstrated (Medilanski et al 2007).

22.4 Discussion

Decentralised wastewater management represents a valuable alternative to conventional pollution control measures. Anaerobic systems such as the ABR can be considered the core technology in such decentralised concepts, being the first step in the sustainable treatment and reuse of domestic wastewater. The advantage of the ABR compared to conventional septic tanks is its high treatment efficiency in terms of organic matter and solids removal, its stability under hydraulic and organic shocks, and its ability to operate at low liquid but high solid retention times (Kooattatet et al 2005; Nguyen et

al 2007; Sarathai 2007). ABR effluent still contains high levels of nutrients and pathogens, requiring further treatment in a secondary and tertiary treatment process. Koottatep et al (2005), the Thai Pollution Control Department (PCD 2006) and Nguyen et al (2007) demonstrated that CW systems are well suited as a post-treatment step. Constructed wetlands not only provide advanced treatment at reasonable costs; if well designed and operated, they also have an aesthetic value. The CW system implemented on Phi Phi Island (a Tsunami-affected tourist island of Krabi Province, Thailand; Figure 2), which treats 400 m³ of wastewater per day, was well accepted and is frequently visited by authorities, scientists and tourists. By producing a source of irrigation water for nearby green areas, the treatment system helps to mitigate the acute water scarcity on the island. A treatment chain combining ABR and CW provides a technically and economically sound system for the treatment of domestic wastewater, and makes it possible to close the water and nutrient cycles by reusing treated wastewater in irrigation.

The expert interviews conducted in Kunming, China, indicate that decentralised approaches to pollution control are not yet perceived as an option that can be implemented on a wide scale. Interviews with key representatives of the Vietnamese Environmental Protection Agency (T.H. Ha, personal communication, 1 December 2004) and the Ministry of Communication, Transportation, Post and Construction in Lao PDR (K. Thaiphachanh, personal communication, 5 January 2007) confirmed this perception in other countries of Southeast Asia. According to Parkinson and Tayler (2003) constraints on wide acceptance and application of pollution control measures at the source may relate to inappropriate institutional and legislative frameworks, a lack of managerial capacity and availability of technical skills, and



Fig. 2
Constructed wetland system treating domestic wastewater of hotels and households on Phi Phi Island, Krabi Province, Thailand. (Photo by Thammarat Koottatep, 2007)

a lack of knowledge about and trust in technical innovations. These constraints, as well as possible measures for overcoming them, are further discussed below.

Social and political challenges: Overall, a lack of government commitment to address wastewater-related problems has led to a political and institutional environment that offers few incentives to manage wastewater effectively. The main challenge is to create informed demand for improved wastewater management systems. Advocacy at the political level is required, and at the community level there is a need for campaigns to promote the benefits of improved wastewater management. The Household Centred Environmental Sanitation (HCES) planning approach described by Eawag and the Water Supply and Sanitation Collaborative Council (Eawag and WSSCC 2005) provides a suitable framework for this purpose. The positive examples in Vietnam (Beauséjour and Nguyen 2007), China (Chuan et al 2005) and Thailand (Kootatep et al 2007), where decentralised wastewater treatment systems have been introduced in demonstration projects, indicate the important role of such projects in stimulating wider interest in the benefits of such approaches. The park-like CW system implemented in the tourist area of Phi Phi Island, Thailand (Figure 2), is frequently visited, which is evidence of its acknowledgement and reputation.

Institutional and legislative challenges: In 1997, 77% of the countries in Asia and the Pacific indicated a need to define formal wastewater management policies and enact further supporting legislation to improve enforcement (UNESCAP 1997). Performance incentives are still weak (Strauss and Montanero 2003). Official design standards are generally not framed in a way that supports the application of innovative systems such as the ABR or the CW discussed above. In China, for example, there is little legislative support for practical trials and implementation of innovative urban wastewater management systems (Medilanski et al 2007). There is a need to develop appropriate standards to be utilised for the design and construction of decentralised wastewater systems. The introduction of the ABR technology in national urban infrastructure standards of Vietnam is believed to be an important step towards its wider implementation in the country (MOC, in preparation).

Limited capacities to plan, implement and operate decentralised systems: The successful adoption of at-source pollution control measures is limited by the need to ensure that the operation and maintenance of the chosen technologies are compatible with the levels of knowledge and skills available at the local level (Parkinson and Tayler 2003). There is often a lack

of knowledge about decentralised options as well as shortages in the qualified work force and the skills needed for operation and maintenance. Environmental protection agencies in Vietnam, Laos and Thailand expressed the need to disseminate technical information in appropriate forms and languages in a way that is understandable to those who are responsible for the design and operation of decentralised wastewater management systems (T.H. Ha, personal communication, 1 December 2004; K. Thaiphachanh, personal communication, 5 January 2007). In addition, most authorities express a need for training local stakeholders to enable them to understand how technologies work and what their operational and maintenance requirements are. Technical guidelines in local languages, such as those developed by Nguyen (2007) and EEM/AIT (2004) on septic tanks, ABRs or CWs in the framework of the NCCR North-South programme, facilitate transfer of knowledge from the research community to local practitioners.

22.5 Conclusion

In rapidly growing cities of Southeast Asia, decentralised technologies for wastewater treatment have a great potential for mitigating the problems of water pollution and water scarcity. We were able to demonstrate that appropriate technologies for the decentralised treatment of wastewater exist. The investigated treatment systems (ABR, CW) can be applied at household and community levels alike, and produce an effluent that allows the safe reuse of treated wastewater for irrigation. However, such treatment systems have not been widely utilised and remain restricted to localised areas and pilot projects. The fact that most experts and local authorities interviewed consider today's decentralised solutions as technically inadequate and not feasible in Southeast Asia is an indication of the ineffective transfer of knowledge from research institutions to decision-makers and practitioners. In order to overcome the barriers to widespread recognition and implementation, capacity building is required at the four levels associated with advocacy and awareness raising, development of appropriate policies, institutional reform and strengthening, and technical and managerial training. Questions arising include the role that development agencies and research institutions should and can play in building up these capacities and promoting decentralised wastewater management. Studies are needed to identify the most appropriate partnerships between central and local governmental agencies, the private sector and the communities in decentralised wastewater management schemes, taking into account the socio-economic and environmental heterogeneity of Southeast Asian countries.

Endnotes

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References

Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- Babatunde AO, Zhao YQ, O'Neill M, O'Sullivan B. 2008. Constructed wetlands for environmental pollution control: A review of developments, research and practice in Ireland. *Environment International* 34(1):116–126.
- Barber WP, Stuckey D. 1999. The use of the anaerobic baffled reactor (ABR) for wastewater treatment: A review. *Water Research* 33(7):1559–1578.
- Beauséjour J, Nguyen VA. 2007. Decentralised sanitation implementation in Vietnam: A peri-urban case study. *Water Science and Technology* 65(5):133–139.
- * Chuan L, Ronghuai L, Jinming F, Morel A, Medilanski E. 2005. *Social Acceptance of Urine-diverting Dry Toilets in Zhonghe Village, Kunming, China*. Project Report. Dübendorf, Switzerland: Swiss Federal Institute of Aquatic Science and Technology (Eawag).
- * Eawag [Swiss Federal Institute of Aquatic Science and Technology], WSSCC [Water Supply and Sanitation Collaborative Council]. 2005. *Household-centred Environmental Sanitation: Implementing the Bellagio Principles in Urban Environmental Sanitation. Provisional Guideline for Decision-makers*. Dübendorf, Switzerland: Eawag. Also available at: http://www.eawag.ch/organisation/abteilungen/sandec/publikationen/publications_sesp/downloads_sesp/wsscc_hces_guidelines; accessed on 28 April 2009.
- EEM/AIT [Environmental Engineering and Management Department, Asian Institute of Technology]. 2004. *Decentralised Wastewater Management Systems Manual for Tourist Island Project* [in Thai]. Bangkok, Thailand: Pollution Control Department.
- * Huang DB, Bader HP, Scheidegger R, Schertenleib R, Gujer W. 2006. Confronting limitations: New solutions required for urban water management in Kunming City. *Journal of Environmental Management* 84(1):49–61.
- Kadlec RH, Knight RL, Vymazal J, Brix H, Cooper P, Haberl R, editors. 2000. *Constructed Wetlands for Pollution Control: Processes, Performance, Design and Operation*. International Water Association (IWA) Scientific and Technical Report, Vol. 8. London, UK: IWA Publishing.
- * Khumkhom R. 2004. *Determination of Optimum Operating Conditions of Baffled Septic Tank Systems Treating Blackwater* [MSc thesis]. Bangkok, Thailand: Asian Institute of Technology, School of Environment, Resources and Development.
- * Koottatep T, Panuvatvanich A, Morel A. 2006. Wastewater effluent polishing systems of anaerobic baffled reactor treating blackwater from households. In: UNAM [Universidad Nacional Autónoma de México], editor. *Proceedings of the 7th IWA Specialised Conference on Small Water and Wastewater Systems, Mexico City, Mexico, 7–10 March 2006*. London, UK: IWA publishing, pp 221–229.
- * Koottatep T, Polprasert C. 2008. Challenges of wetland systems for water pollution abatement in the tropics. In: *Proceedings of the International Conference on Managing Wetlands for Sustainable Development, Trang, Thailand, 9–11 January 2008*. CD-ROM. Songkhla, Thailand: Faculty of Environmental Management, Prince of Songkhla University.
- * Koottatep T, Polprasert C, Laugesen C. 2007. Integrated eco-engineering design for sustainable management of faecal sludge and domestic wastewater. *Journal of Korean Wetland Society* 9(1):69–78.
- Koottatep T, Surinkul N, Kamala AS, Polprasert C, Strauss M. 2005. Treatment of septage in constructed wetlands in tropical climate: Lesson learnt after seven years of operation. *Water Science and Technology* 51(9):119–126.
- Larsen TA, Gujer W. 2001. Waste design and source control lead to flexibility in wastewater management. *Water Science and Technology* 43(5):309–317.
- Mbuligwe SE. 2004. Comparative effectiveness of engineered wetland systems in the treatment of anaerobically pre-treated domestic wastewater. *Ecological Engineering* 23(4–5):269–284.

- * Medilanski E, Chuan L, Mosler HJ, Schertenleib R, Larsen TA. 2006. Wastewater management in Kunming, China: A stakeholder perspective on measures at the source. *Environment and Urbanization* 18(2):353–368.
- * Medilanski E, Chuan L, Mosler H, Schertenleib R, Larsen TA. 2007. Identifying the institutional decision process to introduce decentralized sanitation in the city of Kunming (China). *Environmental Management* 39:648–662.
- Meuser M, Nagel U. 1991. ExpertInneninterviews: Vielfach erprobt, wenig erdacht. Ein Beitrag zur qualitativen Methodendiskussion. In: Garz D, Kraimer K, editors. *Qualitativ-empirische Sozialforschung*. Opladen, Germany: Westdeutscher Verlag, pp 441–468.
- MOC [Ministry of Construction, Vietnam]. In preparation. *QCVN: Septic Tank – Design Code* [in Vietnamese]. Hanoi, Vietnam: Ministry of Construction. Draft available from Viet-Anh Nguyen.
- * Morel A, Diener S. 2006. *Greywater Management in Low and Middle-income Countries: Review of Different Treatment Systems for Households or Neighbourhoods*. Dübendorf, Switzerland: Swiss Federal Institute of Aquatic Science and Technology (Eawag).
- * Nguyen VA. 2007. *Septic Tank and Improved Septic Tank* [in Vietnamese]. Hanoi, Vietnam: Construction Publishing House.
- * Nguyen VA, Pham NG, Nguyen TH, Morel A, Tonderski K. 2007. Improved septic tank with constructed wetland, a promising decentralised wastewater treatment alternative in Vietnam. Paper No. XIRCSO730. In: NOWRA [National Onsite Wastewater Recycling Association], editor. *Proceedings of NOWRA's 16th Annual Conference: Water for All Life, Baltimore, MD, 12–13 March 2007*. Santa Cruz, CA: National Onsite Wastewater Recycling Association (NOWRA). Available at: <http://www.nowra.org/proceedings.html>; accessed on 13 November 2009.
- Parkinson J, Tayler K. 2003. Decentralised wastewater management in peri-urban areas in low-income countries. *Environment and Urbanisation* 15:75–89.
- PCD [Pollution Control Department, Thailand]. 2006. *Final Report on the Onsite Sanitation Systems on Koh Chang Island*. Bangkok, Thailand: PCD.
- * Sarathai Y. 2007. *Application of Anaerobic Baffled Reactor (ABR) and Vermi-composting Process for Treating Household Wastes* [PhD progress report]. Pathumthani, Thailand: Asian Institute of Technology. Available from Yuttachai Sarathai.
- Strauss M, Montangero A. 2003. *Faecal Sludge Management: Review of Practices, Problems and Initiatives*. Report. Engineering Knowledge and Research Project R8056: Capacity Building for Effective Decentralised Wastewater Management. London, UK: Department for International Development (DFID) and GHK International. Also available at: http://www.eawag.ch/organisation/abteilungen/sandec/publikationen/publications_ewm/downloads_ewm/FS_management_GHK.pdf; accessed on 10 June 2009.
- UNESCAP [United Nations Economic and Social Commission for Asia and the Pacific]. 1997. *Wastewater Management Policies and Practices in Asia and the Pacific*. Water Resources Series 79. Bangkok, Thailand: UNESCAP.
- * Wanasen SA. 2003. *Upgrading Conventional Stanks by Integrating In-tank Baffles* [MSc thesis]. Bangkok, Thailand: Asian Institute of Technology, School of Environment, Resources and Development.
- Witzel A. 1982. *Verfahren der qualitativen Sozialforschung: Überblick und Alternativen*. Frankfurt, Germany: Campus Verlag.
- WMA [Wastewater Management Authority, Thailand]. 2005. *Design Guideline for Wastewater Collection, Constructed Wetland, Reuse and Fee Collection Works on Phi Phi Island*. Capacity development of WMA. Bangkok, Thailand: WMA.
- * Zurbrügg C, Morel A, Schertenleib R. 2004. New approaches for improved sustainability in urban environmental sanitation infrastructure and services. Paper presented at the Conference on Social Sustainability of Environmental Technologies in Developing Countries, Desenzano del Garda, Italy, 21 October 2004. Available at: http://www.eawag.ch/organisation/abteilungen/sandec/publikationen/publications_sesp/hces_background; accessed on 22 October 2009.

23 **Innovative Tools for Environmental Sanitation Planning and River Basin Management in Southeast Asia**

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Abstract

There is a need for new approaches to planning of environmental sanitation systems that respond to user demand and guarantee human health, while simultaneously ensuring resource conservation and environmental protection. This article presents a new planning approach that emphasises stakeholder participation and resource conservation – the Household-Centred Environmental Sanitation approach – along with a series of tools to facilitate its implementation. The tools are based on the methods of material flow analysis, quantitative microbial risk assessment and stakeholder analysis, and were developed during case studies in Southeast Asia. They can help to assess a current environmental sanitation system and evaluate potential future systems with regard to resource management, water pollution control and microbial health risks. They can also be used to identify and involve stakeholders in order to plan demand-responsive environmental sanitation systems. Relationships between the various tools and between the planning approach and the tools are discussed as a basis for their integration.

Keywords: Environmental sanitation; river basin management; household-centred environmental sanitation; material flow analysis; quantitative microbial risk assessment; stakeholder analysis; Southeast Asia.

23.1 Introduction

Conventional approaches to addressing the problems of urban environmental sanitation⁹ and water pollution control have seldom been appropriate in developing countries (Zurbrügg et al 2004). New approaches should move away from end-of-pipe, supply-driven models and strive to close the water and nutrient cycle, while also responding to consumer demand. They should aim to provide users with the services these users want and for which they are willing to pay. To promote user ownership of services, decisions should be made at a level as close as possible to the source of the problem, in consultation with the people most directly affected (Eawag 2005; Schertenleib 2005).

Implementation of this type of people-centred approach to formulating ecologically sustainable environmental sanitation and river basin management concepts raises a series of questions. This contribution presents the Household-Centred Environmental Sanitation (HCES) planning approach and a series of tools to support its implementation. The tools are exemplified by case studies conducted in Kunming (China), Hanoi (Vietnam) and Bangkok and the Thachin river basin (Thailand).

23.2 Methods

23.2.1 The Household-Centred Environmental Sanitation (HCES) planning approach

The HCES approach places the household at the centre of the planning process and thus responds directly to the needs and demands of users. It is a multi-actor approach and emphasises the participation of all stakeholders in planning and implementing urban environmental sanitation services. Based on the concept of “zones” (household, neighbourhood, town/city, district/province, nation), it recommends addressing problems as closely as possible to where they occur. Only when a problem cannot be solved in a small zone is it addressed in the next larger zone. HCES is a multi-sector approach that takes account of water supply, sanitation, storm drainage and solid waste management in an integrated way. It is a “circular model” that targets resource conservation and reuse to reduce waste disposal in place of the traditional linear model of unrestricted supply and subsequent disposal (Eawag 2005).

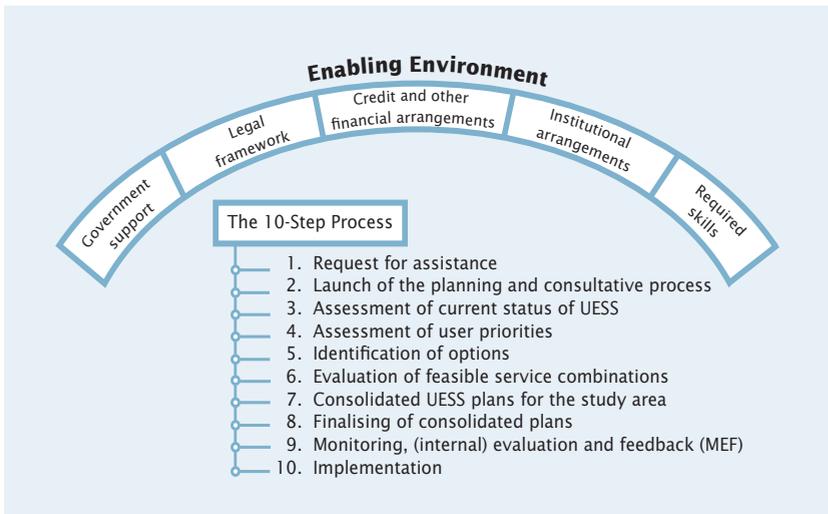


Fig. 1
The two main components of the HCES Approach: The Enabling Environment and the 10-Step Process. UESS = Urban Environmental Sanitation Services. (Source: Eawag 2005)

Guidelines for the application of this approach provide specific guidance with regard to (i) creating an enabling environment for the use of the HCES approach and (ii) undertaking a 10-step process for developing and implementing the HCES approach (Figure 1). The approach is currently being field-tested in several towns and cities in Africa, Asia and Latin America, with a focus on un-serviced or under-serviced areas in urban and peri-urban settings (SuSanA 2008).

Various methods are required to support implementation of the HCES approach. *Material flow analysis (MFA)* and *quantitative microbial risk assessment (QMRA)* can be applied to assess a given current environmental sanitation system (HCES Step 3, see Figure 1), as well as to simulate the impact of changes in the system on resource consumption, environmental pollution and microbial health risks. This, in turn, supports evaluation of potential future options, taking account of different sub-sectors such as water supply, sanitation, solid waste management and drainage in an integrated way (HCES Step 5). The results of assessments using the MFA and QMRA methods provide a basis for informed decision-making when selecting potential future options (HCES Step 6). Initiating and responding to consumer demand is one of the underlying principles of the HCES approach. *Stakeholder analysis* and involvement is therefore another essential method required throughout the entire planning process.

23.2.2 The material flow analysis (MFA) method

Material flow analysis describes and quantifies the flow of resources used and transformed as they flow through a system (e.g. a region, river basin or city). In industrialised countries, MFA has proven to be a suitable instrument for early recognition of environmental problems and development of countermeasures (Baccini and Bader 1996). In developing countries, MFA has so far successfully been used in the fields of regional water and resource management and in environmental sanitation. However, limitations in the availability and reliability of data as well as the means of compiling data are common problems faced by developing countries that restrict the use of MFA as a policy-making tool.

MFA consists of the following steps: (1) *System analysis* defines the temporal and spatial boundaries and identifies the relevant processes and flows in a system; (2) based on acquired system knowledge, the processes and flows are mathematically described (*model*); (3) *input data* for the model equations are derived from secondary data sources, expert knowledge and plausible estimations, and are continuously refined during the study; (4) the model is validated and calibrated by means of *plausibility* considerations; (5) *simulation of the current state* includes an uncertainty and sensitivity analysis to assess the model's uncertainties and identify the determining system parameters, respectively; (6) by addressing these parameters, potential mitigation measures are determined and evaluated (*scenario analysis*).

23.2.3 Quantitative microbial risk assessment (QMRA)

Quantitative microbial risk assessment is a method for predicting the consequences of potential or actual exposure of a population to infectious microorganisms and establishing associated health risks (Haas et al 1999). Methods for microbial risk assessment were first developed for drinking water and later applied to practices such as crop irrigation and discharge to recreational impoundments.

QMRA consists of four steps: (1) In *hazard identification*, the activities and pathogens that can affect human health in the focus area are identified, possible transmission routes determined, and hazard indicators chosen; (2) *exposure dose assessment* determines the exposure of the population to the indicator, focusing on pathways, concentrations, frequency of exposure, ingestion dose and the numbers of people exposed; (3) *dose-response*

analysis is concerned with assessment of the relationship(s) between pathogen exposure and infection; (4) the risk of infection is then calculated by integrating information from the exposure and dose-response analyses (*risk determination*).

23.2.4 Stakeholder analysis

Stakeholder analysis consists of three consecutive parts (DFID 1995): (1) *Preparation of a stakeholder characterisation table* that lists all potential stakeholders, their priorities in relation to the concept being addressed (e.g. a new environmental sanitation concept) and the impact of the new concept on these priorities (positive, negative or neutral); (2) *quantification of the decision-making power of each stakeholder and stakeholder interest in the concept*, represented in a stakeholder diagram showing interest versus decision-making power; and (3) based on the stakeholder diagram, *classification of stakeholders according to their relative importance* into key stakeholders, who are the most important decision-makers; secondary stakeholders, who have little interest and decision-making power; and primary stakeholders, who are situated between these two classes. Using this diagram, conclusions can be drawn concerning the risks and potentials that affect implementation of a new concept.

23.3 Results

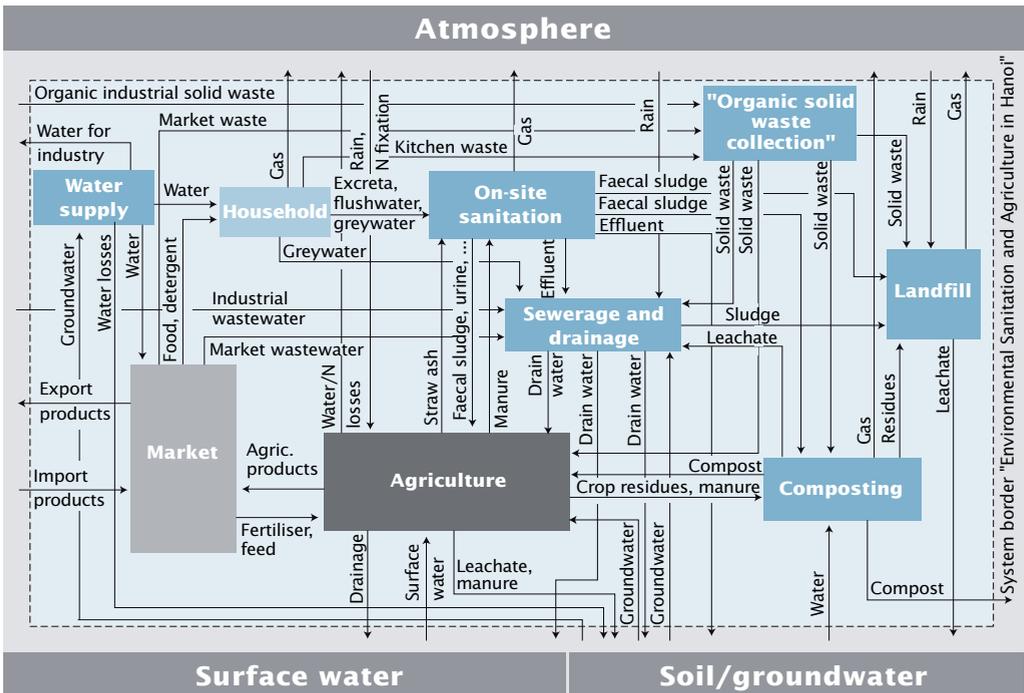
The methods presented above were further developed in case studies in Southeast Asia in order to adapt them to the requirements of the HCES approach and facilitate their application in the Southeast Asian regional context. The resulting tools – mathematical models and recommendations – are described below, and their integration in the HCES approach is discussed.

23.3.1 Tool 1: assessing potential environmental management options in the context of limited data availability

The first tool is based on the MFA method. It can be used to assess current environmental sanitation systems and evaluate the impact of interventions (scenario analysis) with regard to conserving resources and controlling water pollution. Two material flow models are presented here. Both models are based on the same modelling principles; the first describes resource flows in an urban region, the second investigates a river basin.

Assessing the impact of interventions in an environmental sanitation system: The first material flow model describes water and nutrient flows in the *environmental sanitation and agricultural system of Hanoi Province in Vietnam* (Figure 2). It was applied to simulate the impact of interventions aimed at reducing groundwater withdrawal, nutrient discharge into surface water, and the use of artificial fertilisers (Montangero et al 2007). Analysis of simulation results revealed that increasing the proportion of urine separation toilets would have a significant impact. Replacing septic tanks with urine diversion latrines could reduce phosphorus (P) and nitrogen (N) flows to surface water by $45 \pm 11\%$ and $58 \pm 15\%$, respectively. The percentage of demand for nutrients in Hanoi’s peri-urban agriculture covered by waste products would increase from $18 \pm 3\%$ to $59 \pm 12\%$ for N and from $17 \pm 3\%$ to $46 \pm 9\%$ for P. The Hanoi model can also be adapted to other urban regions in Southeast Asia, especially where on-site sanitation is the predominant wastewater disposal option. It is particularly suitable for discussing adaptations in environmental sanitation and agricultural systems, contributing to a better balance between nutrient demand and supply and thus helping to close the nutrient cycle.

Fig. 2 System analysis of environmental sanitation and agriculture in Hanoi Province, Vietnam. (Source: Montangero et al 2007)



The Hanoi case study also demonstrates the high potential of eliciting expert assessments to fill data gaps. This method enhances understanding of specific system components and provides prior probability distributions for unknown model parameters (Morgan and Henrion 1990). It is a promising method when data availability is limited and sound expert knowledge is available (Montangero and Belevi 2007, 2008).

Assessing the impact of interventions in a river basin: The second MFA model, developed in the Thachin river basin case study in Thailand, provides a basis for (1) quantifying the range of nutrient loads to be expected from the various point and non-point pollution sources in the river system; (2) identifying the key pollution flows in the basin on various spatial scales; (3) determining the key parameters responsible for these pollution flows; and (4) specifying effective mitigation measures (Schaffner et al 2009).

Analysis revealed that aquaculture is currently the dominant source of nutrient pollution in the Thachin river basin, followed by rice and pig production. Industries produce high nutrient loads, but with a considerable range of uncertainty. Other pollution sources (e.g. households, field crops and poultry production) are less significant. Scenario simulations showed that a significant reduction in the basin's nutrient loads could be achieved, for instance, by improved management of aquaculture wastewater, lower fertiliser application rates in rice farming, or optimum management of pig farm wastewater. The importance of the various pollution sources changes when the model is down-scaled to the provincial scale, thus highlighting the necessity of discussing remediation measures at an appropriate spatial scale (Schaffner 2007; Schaffner et al 2009).

This case study demonstrates the benefit of MFA in assessing the impact of pollution mitigation interventions in the particular context of intensely used lowland delta areas with complex hydrological systems (Schaffner et al 2005). The model developed can now be applied in similar river basins using average per-unit nutrient loads from the various pollution sources (transfer functions) determined in this study (Schaffner 2007).

23.3.2 Tool 2: assessing the impact of interventions on health risk

The second tool is a combined MFA and QMRA model that allows prediction of the health impacts of specific interventions. It was developed in a

case study in Klong Luang municipality, a peri-urban area north of Bangkok, Thailand. MFA in this case is applied to simulate the impact of interventions on pathogen flows in specific transmission routes. The resulting pathogen concentrations at critical points in the system are then fed into the QMRA model to assess respective health risks (Surinkul 2005), which are then compared to an acceptable risk level.

In Klong Luang municipality, the possible health risks posed by *E. coli* as a result of swimming, fishing and vegetable cultivation in canals, irrigation of farmland with canal water, and raw vegetable consumption were assessed by applying a conventional QMRA that made it possible to identify the activities with the greatest health impacts. The intervention of increasing wastewater treatment showed significant potential to decrease risk (Surinkul and Koottatep 2007). The integrated MFA/QMRA model can now be applied to determine the health impacts of specific interventions (Surinkul and Koottatep 2009).

23.3.3 Tool 3: bridging the gap between stakeholder analysis and stakeholder involvement

The third tool was developed to determine the feasibility of introducing new environmental sanitation concepts, as suggested by applying Tool 1, based on stakeholders' views. An important step in this approach is validation of the stakeholder analysis, based on the perception of the stakeholders themselves (Medilanski et al 2006, 2007). Specifically, the results of stakeholder analysis are presented to the stakeholders, who are asked to discuss and comment on them. This allows stakeholders to agree on significant corrections and actively call to mind the necessary decision-making processes, and thus ensures that all stakeholders share the same view of how to proceed and that the final analysis is based on a broad stakeholder consensus.

Tool 3 was applied to assess the feasibility of introducing urine separation in Kunming, China (Figure 3). The study concluded that although a number of primary stakeholders (the main experts in ecological sanitation and environmental protection) have a great interest in testing urine separation in an urban context, most of the key stakeholders (municipal government, party and congress) would be reluctant to accept such an idea. However, a pilot urine separation project conducted in a peri-urban area in a neighbouring province showed that even a single, relatively small successful pilot project can trigger a process of broad dissemination of such technologies.

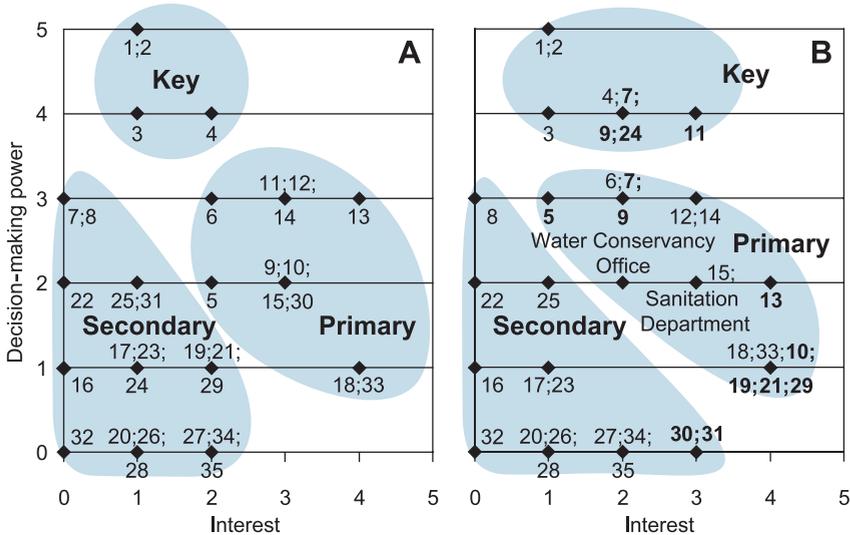


Fig. 3 Assessing the feasibility of introducing urine separation in Kunming: A) Stakeholder diagram prepared by the authors. B) Stakeholder diagram validated in a workshop with representatives of ten stakeholders. Changes recommended during the workshop are indicated by bold numbers. (Source: Medilanski et al 2007)

23.3.4 Integrating the tools in the HCES approach

Tools 1 and 2 are designed to generate a systematic overview of the entire environmental sanitation system or river basin. They help to visualise the links between different sectors such as water supply, sanitation, solid waste management, agriculture, and the environment, and thus comply with the integrated, *multi-sector* principle of the HCES approach. They comprise an assessment of the current situation and a simulation of potential options developed by a group of stakeholders. This corresponds to two main steps in the HCES approach and responds to its *multi-actor* perspective. Tool 3 is used throughout the HCES process and ensures that the designed environmental sanitation options respond to people's needs and preferences.

Tools 1 and 2 were mainly developed to be used at a single level (e.g. river basin, province, neighbourhood, or household). Analysing and visualising material flows between these levels could contribute to discussions about the appropriate level of decentralisation and hence render the integration of MFA into the HCES approach more valuable.

Effective communication is a prerequisite for successful application of the tools in the HCES approach. Information obtained about the current system

and potential future options using Tools 1 and 2 should be adequately communicated to all stakeholders so as to facilitate joint development of potential options and support informed decision-making. Tool 3 should ensure communication and interaction between MFA and QMRA experts and other stakeholders.

23.4 Conclusions and outlook

Lessons learnt from the application of the new approach and the tools presented in this article demonstrate the great potential that these tools have for planning sustainable environmental sanitation and river basin management concepts. The tools provide a scientific basis for stakeholders to make informed choices, support the systematic involvement of stakeholders, and help to determine strategies for introducing new concepts in a given decision-making structure and stakeholder constellation.

In order to guarantee the development of equitable and effective interventions, it is proposed to integrate the tools presented here into a broader framework combining health, ecological, social, economic and cultural assessments (Nguyen Viet et al 2009). Such a framework could be based on the concept of critical control points (initially developed for controlling food microbial hazards), coupled with an actor perspective taking account of vulnerability to risk and patterns of resilience. The framework would jointly address health and environmental sanitation improvements, on the one hand, and the recovery of resources, on the other. It would provide a basis for designing technical solutions as well as behavioural, social and institutional changes derived from the resilience patterns identified. Possible interventions could be assessed based on their potential to minimise specific risk factors, reduce vulnerability, improve health conditions, and ensure equity.

Endnotes

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⁹ Environmental sanitation consists of water supply, sanitation, storm drainage and solid waste management (Eawag 2005).

References

Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- Baccini P, Bader HP. 1996. *Regionaler Stoffhaushalt – Erfassung, Bewertung, Steuerung*. Heidelberg, Germany: Spektrum Akademischer Verlag.
- DFID [United Kingdom Department for International Development]. 1995. *Guidance Note on How to Do Stakeholder Analysis of Aid Projects and Programmes*. London, UK: DFID. Also available at: <http://www.euforic.org/gb/stake1.htm>; accessed on 28 April 2009.
- Eawag [Swiss Federal Institute of Aquatic Science and Technology], WSSCC [Water Supply and Sanitation Collaborative Council]. 2005. *Household-Centred Environmental Sanitation: Implementing the Bellagio Principles in Urban Environmental Sanitation. Provisional Guideline for Decision-makers*. Dübendorf, Switzerland: Eawag. Also available at: http://www.eawag.ch/organisation/abteilungen/sandec/publikationen/publications_sesp/downloads_sesp/wsscc_hces_guidelines; accessed on 28 April 2009.
- Haas CN, Rose JB, Gerba CP. 1999. *Quantitative Microbial Risk Assessment*. New York: John Wiley and Sons.
- * Medilanski E, Chuan L, Mosler HJ, Schertenleib R, Larsen TA. 2006. Wastewater management in Kunming, China: A stakeholder perspective on measures at the source. *Environment and Urbanisation* 18(2):353–368.
- * Medilanski E, Chuan L, Mosler HJ, Schertenleib R, Larsen TA. 2007. Identifying the institutional decision process to introduce decentralized sanitation in the city of Kunming, China. *Environmental Management* 39(5):648–662.
- * Montangero A, Belevi H. 2007. Assessing nutrient flows in septic tanks by eliciting expert judgement: A promising method in the context of developing countries. *Water Research* 41(5):1052–1064.
- * Montangero A, Belevi H. 2008. An approach to optimise nutrient management in environmental sanitation systems despite limited data. *Journal of Environmental Management* 88(4):1538–1551.
- * Montangero A, Cau LN, Viet Anh N, Tuan VD, Nga PT, Belevi H. 2007. Optimising water and phosphorus management in the environmental sanitation system of Hanoi, Vietnam. *Science of the Total Environment* 384(1–3):55–66.
- Morgan MG, Henrion M. 1990. *Uncertainty: A Guide to Dealing with Uncertainty in Quantitative Risk and Policy Analysis*. Cambridge, UK: Cambridge University Press.
- * Nguyen Viet H, Zinsstag J, Schertenleib R, Zurbrügg C, Obrist B, Montangero A, Surinkul N, Koné D, Morel A, Cissé G, Koottatep T, Bonfoh B, Tanner M. 2009. Improving environmental sanitation, health and well-being: A conceptual framework for integral interventions. *EcoHealth, Online First*. doi:10.1007/s10393-009-0249-6.
- * Schaffner M. 2007. *Applying a Material Flow Analysis Model to Assess River Water Pollution and Mitigation Potentials: A Case-Study in the Thachin River Basin, Central Thailand* [PhD dissertation]. Bern, Switzerland: University of Bern. Also available at: <http://www.north-south.unibe.ch/content.php/filterpage/id/27>; accessed on 22 October 2009.
- * Schaffner M, Bader HP, Scheidegger R. 2009. Modelling the contribution of point sources and non-point sources to Thachin River water pollution. *Science of the Total Environment* 407(17):4902–4915.
- * Schaffner M, Koottatep T, Bader HP, Montangero A, Scheidegger R, Schertenleib R. 2005. Assessment of water quality problems and mitigation potentials by using material flow analysis: A case study in the Thachin River Basin, Thailand. In: Herath S, Dutta D, Weesakul U, Gupta AD, editors. *Proceedings of the International Symposium on the Role of Water Sciences in Transboundary River Basin Management, Ubon Ratchathani, Thailand, March 12–14, 2005*. Pathumthani, Thailand: Regional Network Office for Urban Safety (RNU), Asian Institute of Technology, pp 109–115.

- * Schertenleib R. 2005. From conventional to advanced environmental sanitation. *Water Science and Technology* 51(10):7–14.
 - * Surinkul N. 2005. *Integrated Material Flux Analysis (MFA) and Quantitative Microbial Risk Assessment (QMRA) for Health and Environmental Sanitation Planning* [PhD proposal]. Bangkok, Thailand: Asian Institute of Technology and Swiss National Centre of Competence in Research (NCCR) North-South.
 - * Surinkul N, Koottatep T. 2007. Assessment of microbial infection risks posed by management practices of domestic wastes and urban agriculture activities: Case study in a peri-urban community in Thailand. Poster presented at WaterMicro 2007, the 14th International Symposium on Health-Related Water Microbiology, Tokyo, Japan, 9–15 September 2007. Available from Narong Surinkul.
 - * Surinkul N, Koottatep T. 2009. Advanced sanitation planning tool with health risk assessment: Case study in a peri-urban community in Thailand. *Human and Ecological Risk Assessment* 15(5):1064–1077.
- SuSanA [Sustainable Sanitation Alliance]. 2008. Planning for Sustainable Sanitation. SuSanA Fact Sheet. Available at: <http://www.susana.org/images/documents/05-working-groups/wg06/final-docs/en-susana-factsheet-WG06-planning-version-1.1.pdf>; accessed on 28 April 2009.
- * Zurbrügg C, Morel A, Schertenleib R. 2004. New approaches for improved sustainability in urban environmental sanitation infrastructure and services. Paper presented at the Conference on Social Sustainability of Environmental Technologies in Developing Countries, Desenzano del Garda, Italy, 21 October 2004. Available at: http://www.eawag.ch/organisation/abteilungen/sandec/publikationen/publications_sesp/hces_background; accessed on 22 October 2009.

24 **Accessibility as a Determinant of Environmental Dynamics and Socio-economic Disparities in Mainland Southeast Asia**

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Abstract

Access and accessibility are important determinants of people's ability to utilise natural resources, and have a strong impact on household welfare. Physical accessibility of natural resources, on the other hand, has generally been regarded as one of the most important drivers of land-use and land-cover changes. Based on two case studies, this article discusses evidence of the impact of access to services and access to natural resources on household poverty and on the environment. We show that socio-cultural distances are a key limiting factor for gaining access to services, and thereby for improved household welfare. We also discuss the impact of socio-cultural distances on access to natural resources, and show that large-scale commercial exploitation of natural resources tends to occur beyond the spatial reach of socio-culturally and economically marginalised population segments. We conclude that it is essential to pay more attention to improving the structural environment that presently leaves social minority groups marginalised. Innovative approaches that use natural resource management to induce poverty reduction – for example, through compensation of local farmers for environmental services – appear to be promising avenues that can lead to integration of the objectives of poverty reduction and sustainable environmental stewardship.

Keywords: Accessibility; social distance; poverty; forest cover change; Southeast Asia.

24.1 Background

Rural areas in mainland Southeast Asian countries are subject to intense social, economic and environmental dynamics (Hirsch 2000, 2001). This is true for Laos, Cambodia and Vietnam – the geographic focus of this article (Government of Lao PDR 2000; Rigg 2006). Emerging business and employment opportunities are bringing forth an increasing number of actors involved in natural resource use and management who differ in terms of social and economic status (Parnwell and Bryant 1996; Woods 2003; Ducourtieux et al 2005; Fullbrook 2006). This growing number of actors can increase the potential for spatially overlapping and conflicting interests with respect to natural resources (Badenoch 1999, 2002; Thomas et al 2004; Tomich et al 2004; Turner et al 2007). While traditional subsistence-oriented farming households, for instance, are likely to depend on various forest products for domestic and local consumption, more commercially-oriented entities might lay claim to the same forest for timber and utilisation of other forest resources on a larger scale.

Access and accessibility are important determinants of various actors' abilities to utilise natural resources for their own benefit. Access to markets, information and other services has been shown to have a great impact on household welfare (Grootaert 1999; Baulch and Hoddinott 2000; Diagne and Zeller 2001). Physical accessibility of natural resources, on the other hand, has generally been regarded as one of the most important drivers of land-use and land-cover changes (Chomitz and Gray 1996; Angelsen and Kaimowitz 1999; Geist and Lambin 2002; Verburg et al 2004). We argue that both physical and socio-cultural aspects of access are crucial to a place-based understanding of human–environment interactions.

Against this backdrop, we draw upon two case studies in mainland South-east Asia to assess the impact of access to services and access to natural resources on household poverty and the environment.

24.2 Poverty–environment interactions in the development discourse

The idea that poverty and environmental degradation are causally connected, sometimes referred to as the 'poverty–environment nexus', is a much and long debated matter (Reardon and Vosti 1995; DFID 2002; Dasgupta et al 2005; Gray and Moseley 2005; Lufumpa 2005; Buys et al 2006).

In the scientific literature, some base their argumentation on the hypothesis of a vicious circle in which the poor are viewed as the chief cause of environmental degradation because of their need to overexploit natural resources to make ends meet, which in turn makes them more vulnerable and poorer (WCED 1987; Lele 1991; Bryant 1997; Scherr 2000). Others support a contrasting view, where indigenous environmental knowledge is seen as a key asset and a motivation for the poor to protect their environment (Broken-sha et al 1980; Wilken 1987); from this perspective, commercialisation and intensification processes are considered to be the main causes of environmental degradation (e.g. Godoy 1984; Thrupp 1993). The idea of an environmental Kuznets curve suggests that the latter argument is true only up to a certain point of development, after which further development leads to greater environmental stewardship (Field 1997).

More recently, there has been a growing debate about the actual causes and culprits of environmental degradation in areas inhabited predominantly by the poor. Arguments range from blaming mainly traditional land-use practices, such as shifting cultivation, that are no longer sustainable due to population pressure (Myers 1993; Rambo 1996), to the contrary assertion that commercial logging, and not small-scale shifting cultivation, is to blame for forest losses and the resulting environmental degradation (e.g. Kerkhoff and Sharma 2006).

The latter view implies that even in areas predominantly inhabited by the poor, it is not necessarily the poor who are mainly responsible for environmental degradation. Other actors, who may reside outside the area and carry out some of their operations at a larger scale, might have a greater impact. Based on an analysis of international data, Redclift and Sage (1998) discussed this spatial mismatch between actors' places of residence and the locations in which they use natural resources, and also pointed out that this could lead to a spatial mismatch between resulting economic benefits and environmental degradation.

The varying impact of different actors on the environment once again raises the issue of a link between access and natural resources. An explicit and direct link between accessibility of natural resources and land-cover changes has been established in various studies (Chomitz and Gray 1996; Angelsen and Kaimowitz 1999; Geist and Lambin 2002; Verburg et al 2004; Castella et al 2005). Furthermore, natural resource users' access to services (such as credits, markets, information, etc.) has also been shown to shape land-use options and land-use practices (Leach and Mearns 1996; Lambin et al 2001).

The relation between accessibility and welfare, on the other hand, has received attention in various fields in the social sciences, particularly in the health care sector (Obrist et al 2007). Poverty proved to be an important factor in inadequate access to services (Gwatkin et al 2005). The following section discusses empirical evidence for linkages among accessibility, natural resources and poverty.

24.3 Accessibility, access, poverty and resource use: evidence from case studies

This section discusses the findings of two individual case studies: one looked at dimensions of social service accessibility and poverty in Vietnam, and the other at natural resource accessibility and forest cover changes in the lower Mekong basin. Although the two studies are not entirely comparable due to differences in both geography and the methodologies applied, some important conclusions can nevertheless be drawn.

The study that explored the relationship between poverty, natural resources, ethnicity and social service accessibility in Vietnam was based on information from the following sources: 1999 Vietnam population census data, 1999 small-area estimated household per capita expenditure data for the population of Vietnam (Minot et al 2006), official Vietnamese national forest cover and forest quality data for 1999, and spatially disaggregated information on physical accessibility of social services (Epprecht and Heinemann 2004).

People in poor areas of much of Southeast Asia tend to rely heavily on local natural resources, particularly on forest resources, for their livelihoods (Sunderlin and Thu Ba 2005). Analysing relationships between forest cover and poverty in Vietnam, Müller et al (2006) revealed that forests – as a proxy for natural resources – tend to be most abundant in areas where the incidence of poverty is highest (Figure 1).⁶ However, local people often have little control over natural resources. This is due to poorly defined user and property rights (McElwee 2004; Dasgupta et al 2005), limited or unequal knowledge of harvesting and processing techniques, and lack of information on marketing potentials, to name just a few factors.

Access to services, provided in small urban population centres, proved to be a determining factor for poverty incidence in Vietnam (Epprecht et al 2009). Moreover, Epprecht et al (2009) showed that access to such services

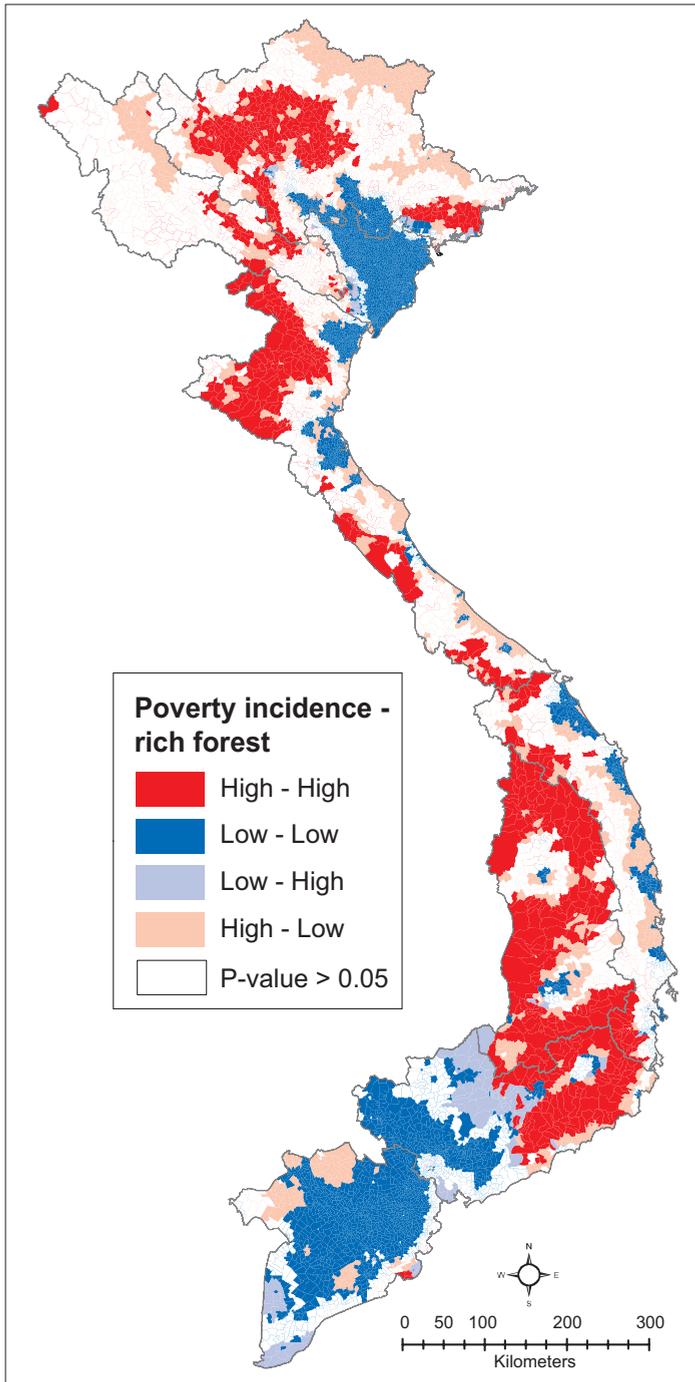
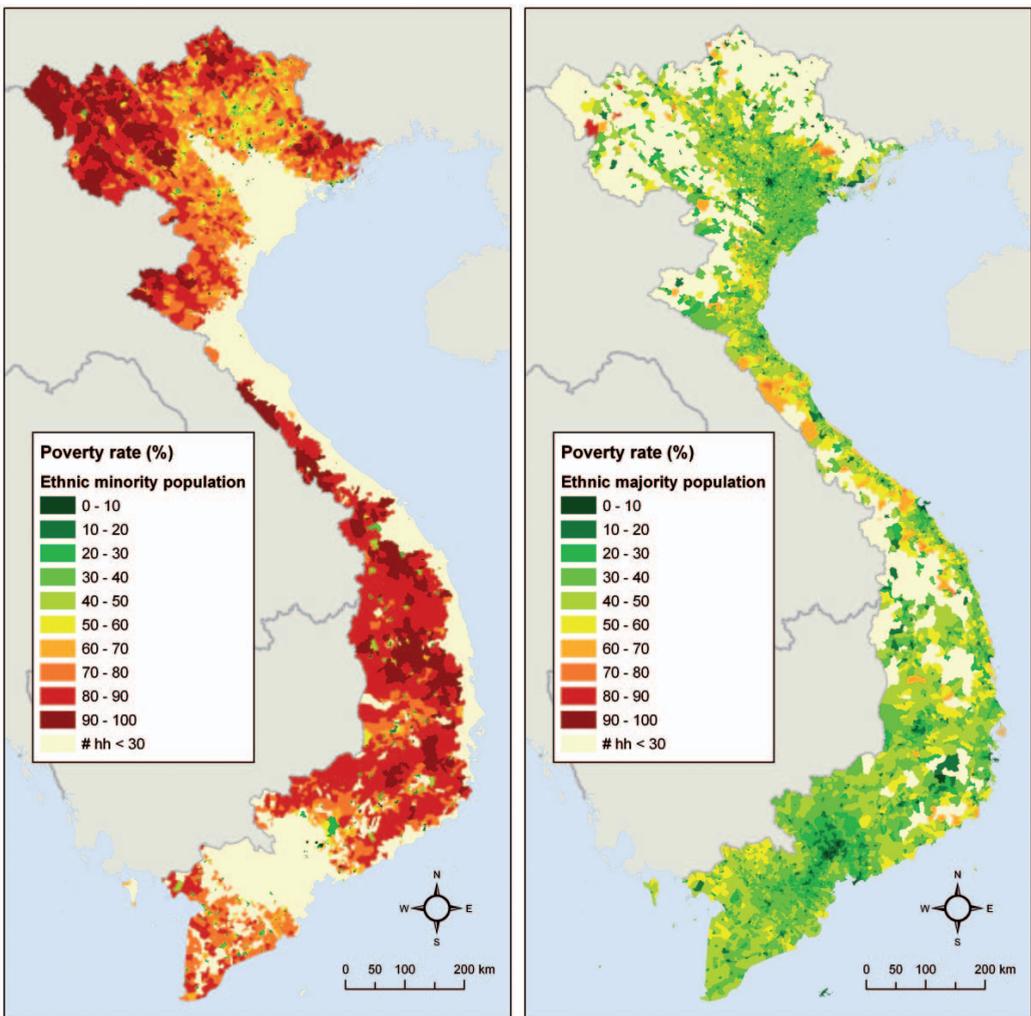


Fig. 1
Spatial coincidence
of poverty
incidence and
forests. (Source:
Müller et al 2006)

in Vietnam is determined much more by socio-cultural distance than by actual physical distance: regardless of physical access to towns, ethnic minority populations in Vietnam are consistently and significantly poorer than ethnic Vietnamese (Figure 2). Epprecht et al (2009) conclude that this finding is likely to reflect unequal opportunities for off-farm employment, lack of influence in decision-making, obstructed access to markets, services and information, and disadvantages in achieving higher levels of education.

Fig. 2
Poverty rates of ethnic minorities and the ethnic majority. (Source: Epprecht et al 2009)



The study conducted in the lower Mekong basin uses the only available and comparable regional land-cover data for 1993 and 1997, which are based on visual interpretation of Landsat imagery (Stibig 1996, 1997). The results of this study show that the accessibility of forests is a strong determinant of forest cover and forest quality dynamics (Heinimann 2006). The findings reveal that deforestation rates are significantly higher in villages closer to towns than in villages further away from towns, a fact that Heinimann (2006) attributes to a greater extent of commercial use of forest resources in areas closer to towns due to better marketing opportunities (Figure 3). However, most of the loss of economically and ecologically valuable dense forests nevertheless occurs far away from villages. Heinimann et al (2007) point out that the patterns of forest cover changes indicate that change in forest cover near villages occurs mainly in the form of forest degradation as a result of subsistence agriculture, whereas change in forest cover in more remote areas occurs mainly in the form of deforestation due to large-scale commercial activities that exploit the forest.

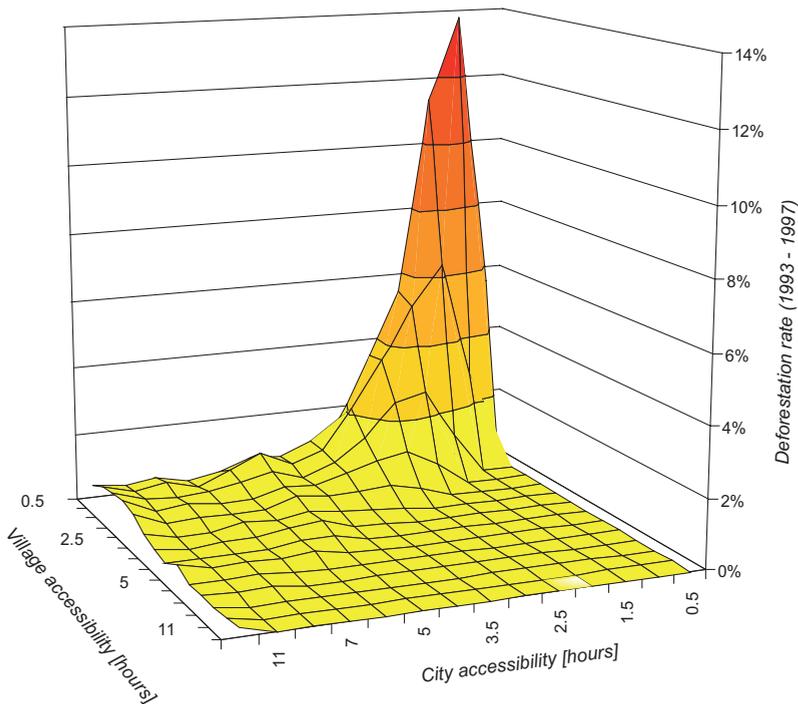


Fig. 3
Deforestation rates in the lower Mekong basin in relation to village and city accessibility. (Source: Heinimann 2006)

24.4 Discussion

The two studies confirm that physical accessibility is an important precondition for access to natural resources, and at the same time a strong determinant of welfare. In addition, socio-cultural distances proved to be a key limiting factor for access to services in Vietnam, and hence an additional factor determining household welfare. This reflects unequal opportunities among actors competing for access to and use of available natural resources. Access to local natural resources is only partially a function of their physical accessibility; it also depends on socio-cultural distance from the respective decision-makers. Despite good physical accessibility of local natural resources, local ethnic or other social minorities may have little control and few rights with regard to use of these resources, resulting in potentially limited access to resources.

On the other hand, improving physical accessibility of natural resources and markets for people in remote places may also improve access to these resources for commercially-oriented actors who tend to live in population centres and who are economically better off. This raises the question of which effect is stronger: Does improved physical accessibility – which is very likely to lead to some form of increase in commercial use of natural resources in the newly accessible places – mainly benefit local actors through better access to markets, or does it mainly improve access to natural resources for external actors? And how is this reflected in land-cover change patterns at the meso-scale?

Physically less remote and socially less marginalised people are largely better off in terms of financial and technical means, information, and possibly political influence (for example with regard to land-use rights). It is therefore plausible to assume that these actors benefit more from changes in accessibility of natural resources than actors who are more marginalised in a socio-economic sense. On this basis one would expect an increase in commercial exploitation of natural resources near villages that have become more easily accessible.

However, this is not supported by the results of the research conducted in the lower Mekong basin. Findings here revealed that commercially-motivated larger-scale activities resulting in forest loss occur mainly in areas that are not easily accessible from local villages. Forest resource use activities close to villages were shown to result in forest degradation rather than deforestation. These dynamics cannot be attributed to any specific actors on the basis of the two studies presented here.

Based on the findings of the two studies, we conclude that large-scale commercial natural resource exploitation tends to occur beyond the spatial reach of marginalised population segments. It is not possible to say conclusively whether increased forest degradation patterns in villages closer to urban areas are due to actors exploiting nearby natural resources for commercial purposes, or whether they are a result of activities conducted mainly by those who have better access to the respective resources. It is likely, however, that in many cases the poor lack the means to transport natural resources to markets far beyond their village area for commercial use, while the better-off typically do have the means to travel further to extract resources. Furthermore, although predominantly subsistence-oriented actors may engage in unsustainable natural resource use practices (e.g. for reasons of economic survival), it is likely that these actors' dependency on natural resources for their very survival makes them more cautious compared to spatially disconnected, purely commercially-oriented actors.

Although empirical evidence from these two studies does not conclusively show that improvement of physical accessibility primarily benefits commercial actors in terms of access to natural resources for commercial use, it is likely that physical accessibility – although necessary for poverty reduction as part of an effort to provide market opportunities and access to services – may have a negative impact on the local population.

24.5 Conclusion

Development dynamics in the form of rural commercialisation and an increase in the physical accessibility of ever greater parts of the region are fast-paced. Yet progress in ensuring the structural framework that must accompany these developments is relatively slow and time-consuming. This relates, for example, to guaranteeing land-use rights, improving the educational status of the local population, and providing adequate and timely information on available services in local languages. In this respect, efforts to reduce poverty accompanied by simultaneous environmental conservation or protection remain a big challenge.

Present power constellations, the slow pace of 'empowerment' of local communities through legal and educational improvements, and the high demand for and value of local resources at the regional level are an imminent threat to the local poor, and a long-term threat to the environment.

It is therefore essential that more attention be paid to improving the structural environment that presently leaves minority groups socially, economically and geographically marginalised (for example by ensuring faster devolution of land-use titles and developing legal mechanisms to claim and defend these rights). Innovative approaches that use natural resource management to induce poverty reduction – for example by compensating local farmers for environmental services as proposed by Gouyon (2003), Gutman (2003), the FAO (2004), and Wunder (2005), or more recently by compensating developing countries for reducing carbon emissions from deforestation (REDD) (Ebeling and Yasué 2008) – appear to be promising avenues for integrating the objectives of poverty reduction and sustainable environmental stewardship.

Consequently, future research within the framework of the Swiss National Centre of Competence in Research (NCCR) North-South programme in Southeast Asia will aim to link environmental service approaches with local people's access to information and services, their practices and options with respect to natural resource use, and the resulting impacts on household welfare. This will help to improve efforts to alleviate poverty and promote natural resource management.

Endnotes

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⁶ For details on the methodologies, see Müller et al (2006) and Sunderlin et al (2008).

References

Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- Angelsen A, Kaimowitz D. 1999. Rethinking the causes of deforestation: Lessons from economic models. *The World Bank Observer* 14:73–98.
- Badenoch N. 1999. *Watershed Management and Upland Development in Lao PDR: A Synthesis of Policy Issues*. Washington, D.C.: World Resources Institute. Also available at: http://pdf.wri.org/repsi_laowshed.pdf; accessed on 16 July 2009.
- Badenoch N. 2002. *Transboundary Environmental Governance: Principles and Practice in Mainland Southeast Asia*. Washington, D.C.: World Resources Institute. Also available at: <http://pdf.wri.org/transboundary.pdf>; accessed on 7 July 2009.
- Baulch B, Hoddinott J. 2000. Economic mobility and poverty dynamics in developing countries. In: Baulch B, Hoddinott J, editors. *Economic Mobility and Poverty Dynamics in Developing Countries*. London, UK: Taylor & Francis, pp 1–24.
- Brokensha D, Warren D, Werner O. 1980. *Indigenous Knowledge Systems and Development*. Lanham, MD: University Press of America.
- Bryant RL. 1997. Beyond the impasse: The power of political ecology in Third World environmental research. *Area* 29:5–19.
- Buys P, Chomitz K, Dasgupta S, Deichmann U, Larsen B, Meisner C, Nygard J, Pandey K, Pinnoi N, Wheeler D. 2006. The economics of decentralized poverty–environment programs: An application for Lao PDR. *Journal of Policy Modeling* 28(7):811–824.
- Castella JC, Manh PH, Kam SP, Villano L, Tronche NR. 2005. Analysis of village accessibility and its impact on land use dynamics in a mountainous province of northern Vietnam. *Applied Geography* 25(4):308–326.
- Chomitz KM, Gray DA. 1996. Roads, land use, and deforestation: A spatial model applied to Belize. *The World Bank Economic Review* 10:487–512.
- Dasgupta S, Deichmann U, Meisner C, Wheeler D. 2005. Where is the poverty–environment nexus? Evidence from Cambodia, Lao PDR, and Vietnam. *World Development* 33(4):617–638.
- DFID [Department for International Development]. 2002. *Linking Poverty Reduction and Environmental Management: Policy Challenges and Opportunities*. Washington, D.C.: DFID, Directorate General for Development of the European Commission, United Nations Development Programme (UNDP), The World Bank.
- Diagne A, Zeller M. 2001. *Access to Credit and Its Impact on Welfare in Malawi*. Research Report No. 116. Washington, D.C.: International Food Policy Research Institute.
- Ducourtieux O, Laffort JR, Sacklokham S. 2005. Land policy and farming practices in Laos. *Development and Change* 36(3):499–526.
- Ebeling J, Yasué M. 2008. Generating carbon finance through avoided deforestation and its potential to create climatic, conservation and human development benefits. *Philosophical Transactions of the Royal Society B* 363:1917–1924. doi:10.1098/rstb.2007.0029.
- * Epprecht M, Heinimann A, editors. 2004. *Socioeconomic Atlas of Vietnam: A Depiction of the 1999 Population and Housing Census*. Bern, Switzerland: Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern.
- * Epprecht M, Müller D, Minot N. 2009. How remote are Vietnam's ethnic minorities? An analysis of spatial patterns of poverty and inequality. *The Annals of Regional Science, Online First*. doi:10.1007/s00168-009-0330-7.
- FAO [Food and Agriculture Organization of the United Nations]. 2004. *Payment Schemes for Environmental Services in Watersheds*. Land and Water Discussion Paper. Rome, Italy: FAO.
- Field BC. 1997. *Environmental Economics: An Introduction*. 2nd edition [1994¹]. New York, NY: Irwin and McGraw-Hill.
- Fullbrook D. 2006. Beijing pulls Laos into its orbit. *Asia Times Online*. Available at: http://www.atimes.com/atimes/Southeast_Asia/HJ25Ae01.html; accessed on 8 July 2009.

- Geist HJ, Lambin EF. 2002. Proximate causes and underlying driving forces of tropical deforestation. *Bioscience* 52:143–50.
- Godoy AR. 1984. Ecological degradation and agricultural intensification in the Andean highlands. *Journal of Human Ecology* 12(4):359–383.
- Gouyon A. 2003. *Rewarding the Upland Poor for Environmental Services: A Review of Initiatives from Developed Countries*. Bogor, Indonesia: World Agroforestry Centre (ICRAF). Also available at: http://www.worldagroforestrycentre.org/sea/Networks/RUPES/download/paper/AGouyon_RUPES.pdf; accessed on 8 July 2009.
- Government of Lao PDR. 2000. *Poverty in the Lao PDR*. Participatory Poverty Assessment (PPA). Vientiane, Lao PDR: Government of Lao PDR.
- Gray LC, Moseley WG. 2005. A geographical perspective on poverty–environment interactions. *The Geographical Journal* 171(1):9–23.
- Grootaert C. 1999. *Social Capital, Household Welfare, and Poverty in Indonesia*. World Bank Policy Research Working Paper No. 2148. Washington, D.C.: The World Bank. Also available at: <http://go.worldbank.org/MDFR19U780>; accessed on 16 July 2009.
- Gutman P, editor. 2003. *From Goodwill to Payments for Environmental Services: A Survey of Financing Options for Sustainable Natural Resource Management in Developing Countries*. Washington, D.C.: World Wildlife Fund Macroeconomics Program Office (WWF-MPO). Also available at: http://assets.panda.org/downloads/fin_alt.pdf?bcsi_scan_EC783A0C3C997A81=0&bcsi_scan_filename=fin_alt.pdf; accessed on 8 July 2009.
- Gwatkin DR, Wagstaff A, Yazbeck AS, editors. 2005. *Reaching the Poor with Health, Nutrition and Population Services: What Works, What Doesn't, and Why*. Washington, D.C.: The World Bank.
- * Heinimann A. 2006. *Patterns of Land Cover Change in the Lower Mekong Basin: The Relevance of Mesoscale Approaches* [PhD dissertation]. Bern, Switzerland: Faculty of Natural Sciences, University of Bern, Swiss National Centre of Competence in Research (NCCR) North-South and Centre for Development and Environment (CDE).
- * Heinimann A, Messerli P, Schmidt-Vogt D, Wiesmann U. 2007. The dynamics of secondary forest landscapes in the lower Mekong basin: A regional-scale analysis. *Mountain Research and Development* 27:232–241.
- Hirsch P. 2000. *Underlying Causes of Deforestation in the Mekong Region*. Sydney, Australia: Australian Mekong Resource Centre.
- Hirsch P. 2001. Globalisation, regionalisation and local voices: The Asian Development Bank and rescaled politics of environment in the Mekong Region. *Singapore Journal of Tropical Geography* 22(3):237–251.
- Kerkhoff E, Sharma E. 2006. *Debating Shifting Cultivation in the Eastern Himalayas: Farmers' Innovations as Lessons for Policy*. Kathmandu, Nepal: International Centre for Integrated Mountain Development (ICIMOD).
- Lambin EF, Turner BL, Geist HJ, Agbola SB, Angelsen A, Bruce JW, Coomes OT, Dirzo R, Fischer G, Folke C, George PS, Homewood K, Imbernon J, Leemans R, Li XB, Moran EF, Mortimore M, Ramakrishnan PS, Richards JF, Skanes H, Steffen W, Stone GD, Svedin U, Veldkamp TA, Vogel C, Xu JC. 2001. The causes of land-use and land-cover change: Moving beyond the myths. *Global Environmental Change* 11(4):261–269.
- Leach M, Mearns R. 1996. *The Lie of the Land*. London, UK: The International Africa Institute.
- Lele SM. 1991. Sustainable development: A critical review. *World Development* 19:607–621.
- Lufumpa CL. 2005. The poverty–environment nexus in Africa. *African Development Review* 17(3):366–381.
- McElwee P. 2004. You say illegal, I say legal: The relationship between 'illegal' logging and land tenure, poverty, and forest use rights in Vietnam. *Journal of Sustainable Forestry* 19(1–3):97–135.
- * Minot N, Baulch B, Epprecht M. 2006. *Poverty and Inequality in Vietnam: Spatial Patterns and Geographic Determinants*. Research Report. Washington, D.C.: International Food Policy Research Institute.
- * Müller D, Epprecht M, Sunderlin WD. 2006. *Where Are the Poor – And Where Are the Trees? Targeting of Forest Conservation and Poverty Reduction in Vietnam*. CIFOR Working Paper. Bogor, Indonesia: Centre for International Forestry Research (CIFOR).

- Myers N. 1993. Tropical forests: The main deforestation fronts. *Environmental Conservation* 19:9–16.
- Obrist B, Iteba N, Lengeler C, Makemba A, Mshana C, Nathan R, Alba S, Dillip A, Hetzel MW, Mayumana I, Schulze A, Mshinda H. 2007. Access to health care in contexts of livelihood insecurity: A framework for analysis and action. *PLoS Medicine* 4(10):e308. doi:10.1371/journal.pmed.0040308.
- Parnwell MJG, Bryant RL, editors. 1996. *Environmental Change in South-east Asia: People, Politics and Sustainable Development Review*. London, UK: Routledge.
- Rambo AT. 1996. The composite swiddening agroecosystem of the Tay ethnic minority of the northwestern mountains of Vietnam. In: Rerkasem B, editor. *Montane Mainland Southeast Asia in Transition*. Chiang Mai, Thailand: Chiang Mai University Consortium, pp 69–89.
- Reardon T, Vosti SA. 1995. Links between rural poverty and the environment in developing countries: Asset categories and investment poverty. *World Development* 23(9):1495–1506.
- Redclift M, Sage C. 1998. Global environmental change and global inequality. *International Sociology* 13:499–516.
- Rigg JD. 2006. Forests, marketization, livelihoods and the poor in the Lao PDR. *Land Degradation and Development* 17:123–133.
- Scherr SJ. 2000. A downward spiral? Research evidence on the relationship between poverty and natural resource degradation. *Food Policy* 25(4):479–498.
- Stibig HJ. 1996. *Interpretation and Delineation from Satellite Images*. Technical Notes 2. Vientiane, Lao PDR: Mekong River Commission (MRC) and German Technical Cooperation (GTZ).
- Stibig HJ. 1997. *Forest Cover Monitoring Project*. Technical Notes 5. Vientiane, Lao PDR: Mekong River Commission (MRC) and German Technical Cooperation (GTZ).
- * Sunderlin WD, Angelsen A, Dewi S, Epprecht M, Müller D, Puntodewo A. 2008. Why forests are important for global poverty alleviation: A spatial explanation. *Ecology and Society* 13(2):24.
- Sunderlin WD, Thu Ba H. 2005. *Poverty Alleviation and Forests in Vietnam*. Bogor, Indonesia: Centre for International Forestry Research (CIFOR).
- Thomas PT, Chomitz K, Francisco H, Izac AMN, Murdiyarto D, Ratner BD, Thomas DE, van Noordwijk M. 2004. Policy analysis and environmental problems at different scales: Asking the right questions. *Agriculture, Ecosystems and Environment* 104(1):5–18. doi:10.1016/j.agee.2004.01.003.
- Thrupp LA. 1993. The political ecology of sustainable rural development: Dynamics of social and natural resource degradation. In: Allen P, editor. *Food for the Future: Conditions and Contradictions of Sustainability*. New York: John Wiley and Sons.
- Tomich TP, David ET, van Noordwijk M. 2004. Environmental services and land use change in Southeast Asia: From recognition to regulation or reward? *Agriculture, Ecosystems and Environment* 104(1):229–244. doi:10.1016/j.agee.2004.01.017.
- Turner BL, Lambin EF, Reenberg A. 2007. The emergence of land change science for global environmental change and sustainability. *PNAS [Proceedings of the National Academy of Science of the United States of America]* 104(52):20666–20671. doi:10.1073/pnas.0704119104.
- Verburg PH, Overmars KP, Witte N. 2004. Accessibility and land-use patterns at the forest fringe in the northeastern part of the Philippines. *Geographical Journal* 170:238–255.
- WCED [World Commission on Environment and Development]. 1987. *Our Common Future*. Oxford, UK: Oxford University Press.
- Wilken G. 1987. *Good Farmers: Traditional Agricultural Resource Management in Mexico and Central America*. Berkeley, CA: University of California Press.
- Woods K. 2003. *Transboundary Environmental Governance in the Mekong River Basin: Civil Society Spaces for Transboundary Participation*. Paper presented at the international conference on "Politics of the Commons: Articulating Development and Strengthening Local Practices", Chiang Mai, Thailand, 11–14 July 2003. Available at: http://dlc.dlib.indiana.edu/archive/00001110/00/Kevin_Woods.pdf; accessed on 8 July 2009.
- Wunder S. 2005. *Payments for Environmental Services: Some Nuts and Bolts*. CIFOR Occasional Paper No. 42. Bogor, Indonesia: Centre for International Forestry Research (CIFOR).

Part VII

Development Challenges in the Caribbean and Central America: Social Exclusion, Migration, and Environmental Governance





25 **Overcoming Barriers to Development in Central America, Mexico, and the Caribbean: Towards a New Research Agenda**

Maria Angelina Pérez Gutierrez¹

25.1 **The region**

The 25 countries² within the Caribbean and Central American region can be grouped in three categories: seven rather small countries that constitute the Central American Isthmus; the insular Caribbean countries; and the three larger countries of Mexico, Colombia and Venezuela. Historically, the region has been characterised by its geopolitical importance as a path that connects the Atlantic and Pacific oceans, as well as by its political and social complexity (see Chapter 27 in the present volume). The Swiss National Centre of Competence in Research (NCCR) North-South research programme, in its Joint Area of Case Studies (JACS)³ Caribbean and Central America (CCA), has developed activities in countries in all three categories (Table 1). Differences between the countries in the Human Development Index (HDI) and in the Gini Coefficient illustrate the variety of development conditions they face.

The growth of *social exclusion* has been a central concern in analysis of sustainable development problems faced by the region. Social exclusion is understood as a phenomenon affecting households that suffer from deficient reproductive conditions because they do not enjoy the benefits of prevailing social citizenship and because their participation in the labour market is doomed due to labour surplus (Pérez Sáinz and Mora Salas 2007). These households were thus identified by the research projects as a unit of analysis, and two basic causal factors were postulated: social abandonment of a sector of the population by ruling institutions, and labour market failures. The first indicates the absence of adequate public social policies, and the second indicates the prevailing accumulative process that generates a labour surplus of a structural nature. How can the region overcome these deficiencies?

Table 1

Country	NCCR North-South phase(s)	Population (millions) (2005)*	Urban population (in % of total population) (2005)*	Gini Coefficient (1992–2009) ***	HDI (2005)*	Surface area covered by forest (in % of total surface area) (2005)**
Honduras	1	6.8	46.5	55.3	0.700	41.5
El Salvador	1	6.7	59.8	49.7	0.735	14.4
Costa Rica	1 and 2	4.3	61.7	47.2	0.846	46.8
Dominican Republic	1	9.5	66.8	50.0	0.779	28.4
Haiti	1	9.3	38.8	59.5	0.529	3.8
Cuba	1 and 2	11.3	75.5	No data	0.838	24.7
Mexico	1 and 2	104.3	76.0	48.1	0.829	33.7
Venezuela	1	26.7	93.4	43.4	0.792	54.1

Joint Area of Case Studies (JACS) Caribbean and Central America (CCA): countries with research activities within the framework of the Swiss National Centre of Competence in Research (NCCR) North-South programme during its first two phases (2001–2005 and 2005–2009). HDI: Human Development Index.

Sources: * UNDP 2007; ** ECLAC 2006; *** UNDP 2009

25.2 Local emphasis in development approaches

Development alternatives in the Caribbean and Central America have been substantially modified in the last two decades by processes of global change and a clear emphasis at the national and international levels on promoting development through local initiatives. What are the reasons for this emphasis on the *local dimension*?

Among the recent processes of change in the Caribbean and Central America were three fundamental ones which enhanced the importance of the local scale (Sojo et al 1998). The first was a process of *institutional rebuilding*, which became possible thanks to the reestablishment of peace after the period of civil wars in Nicaragua, El Salvador and Guatemala in the late 1980s and early 1990s. The most important transformations derived from this process have been the reestablishment of law, the subordination of

armed forces to civil governments, and respect for human rights: all of them acknowledged crucial components for securing the viability of democracy. Institutional rebuilding gave rise to the need to increase access by the population to public decision-making, improve the quality of governance, and establish mechanisms for accountability. In all of these issues, *localities* are the privileged working scale.

Second, coinciding with institutional rebuilding but independent of it, a process of *administrative reform* took place, including decentralisation of governmental functions at the national level, with devolution either to the private sector or to local public administration. Decentralisation processes are transferring new functions and additional responsibilities to local governments, thus creating a need for new local policies and strategies.

Third, the Caribbean and Central American region has undergone a profound *economic transformation*. There was a general macro-economic readjustment in the 1990s, when the previous economic model – the imports substitution model sponsored by the United Nations Economic Commission for Latin America and the Caribbean (ECLAC) since the 1950s – lost its capacity to promote development. The majority of the countries in the region opened their economies to the dominant global economic forces, resulting in a new economic model characterised by substitution of the rule of the state by the rule of the market and a reorientation of economic growth in response to external demands. These changes promoted three economic sectors: new agricultural exports, sweatshop industries, and tourism, all rooted in the locational advantages of particular territories and thus anchored in localities.

Two additional processes of a different nature promote the importance of localities. The first is the increasing international migration of the population and, along with this, the role of remittances in the budgets of recipient households, communities and countries (Figure 1). The second is regional upheaval due to regionalisation of the commercial drug chain and, with it, the delinquency of regional organisations from Colombia to Mexico, affecting security in all of the Caribbean and Central American countries, although to different degrees in the various regions and localities.⁴

These processes have had social impacts that put social problems at the centre of the political agenda. The downside of this is that negotiations on development issues are often delegated to territorial scales that do not have the required institutional strength or support to deal with them.

Fig. 1
Nicaraguan immigrants in San José, Costa Rica, lining up to send money home to their families. Remittances play an important role in the budgets of recipient households, communities and countries. (Photo by Abelardo Morales)



25.3 Development problems: three research themes

The most crucial effects of global change studied in the region within the framework of the NCCR North-South, during its first phase from 2001 to 2005, were growing poverty with increasing environmental risks and deterioration of natural resources (Figure 2), territorial fragmentation and violence, and conflicts connected to governance problems. All of these were clearly linked to growth of social exclusion in the region. NCCR North-South research examined the social practices⁵ and integration strategies of population segments facing these problems, in order to understand their underlying logic and their impact on societal and territorial transformations.

By the end of Phase 1 of the NCCR North-South it was clear that current development trends were *increasing inequity* and *disrupting social and institutional cohesion* in urban and rural areas. This disruption was reflected in the flow of labour migrants throughout the region and in the number and importance of environmental conflicts between different economic sectors.⁶ Selection of research themes in the region for the second phase of the NCCR North-South was intended to frame regional reflection on these problems.

The first theme, *Social Exclusion, Inner Borders and Fragmentation*, focuses on the conditions encountered in social practices when dealing with the impact of increasing inequity on localities and their potential to overcome it. The second theme, *Poverty, Livelihoods and Migration*, focuses on how com-



Fig. 2
Slum area in La
Carpio, San José,
Costa Rica. (Photo
courtesy of
ProDUS, University
of Costa Rica,
2004)

munities deal with the loss of key members and the impact of their contributions through remittances. The third theme, *Local Strategies, Environmental Governance and Conflict Management*, concentrates on collective responses to environmental conflicts involving new economic activities linked to global interests as well as activities linked to local producers and inhabitants. The socio-territorial dimension of the social practices studied and analysed during Phase 1 of the NCCR North-South thus formed the basis on which research projects in Phase 2 were developed, with a continued emphasis on localities paralleled by the focus of (national and international) development cooperation agencies on local contexts.

Socio-territoriality in analytically significant territories (localities) implies that the social subjects (households, enterprises and institutions) share ‘something more’ than the local geographical setting. ‘Something more’ for households refers to shared socio-cultural factors (identity, cooperation, organisation and innovation trends) and their social integration. For the enterprises working in given economic sectors, ‘something more’ means greater productivity on the one hand, as well as greater competitiveness due to the positive effects of *social cohesion* derived from socio-cultural aspects shared by the community, on the other hand. Finally, for institutions ‘something more’ is *institutional density*: enough institutions, of a public and/or private nature, striving together towards the collective and corporate dimension of the corresponding development strategy (Pérez Sáinz and Andrade-Eekhoff 2003).

For this reason, research has focused on what has been called ‘neighbourhood communities’ – territories with analytical significance – in order to study the local dimension of globalisation, defined by a given community’s members’ linkages through belonging, where the community is an actor under the impact of global changes (Pérez Sáinz 2006). The analytical dimension at stake is *social cohesion*. Social cohesion should reflect the degree of equity promoted by the local development process as an indicator of local competitiveness in facing global markets. Social cohesion should also reflect the *aim of equity*, promoted by a common agenda shared among the institutions in a community with institutional density.

25.4 Main activities undertaken

Five PhD research projects, eight Master’s projects, and three Partnership Actions for Mitigating Syndromes (PAMS)⁷ were the activities undertaken during Phase 2 of the NCCR North-South (2005–2009) in the region. All had their own objectives and research questions, but all dealt with localities and global change. Regional balance among the three regional themes (*Social Exclusion, Inner Borders and Fragmentation; Poverty, Livelihoods and Migration; Local Strategies, Environmental Governance and Conflict Management*) will be achieved as soon as the last projects are completed. The discussions related to the research projects undertaken in the region within each of the three themes are reviewed in chapters 26–28 of the present volume. What follows is an overview of research activities dealing with the various themes.

The theme *Social Exclusion, Inner Borders and Fragmentation* was approached through research dealing with pathways to overcome obstacles to access to public goods by excluded sectors of the population: housing in central locations (and thus in the city), adequate sanitary conditions, and security. Work on some of the projects is continuing to this date. Existing results are discussed in Chapter 26 of the present volume.

Access to housing and the city is being studied in a project on “Popular Habitat, Urban Renewal and Social Mobilisation in the Central Neighbourhoods of Mexico City” by Anabel Monterrubio, as well as in a project entitled “Citizen Participation in Face of the Deterioration of Central Neighbourhoods of Mexico City” by Martín Nájera, both reinforced by a PAMS concerned with “Social Capital and Participatory Management as Instruments for the

Table 2

Title	Location	Duration	Main outcomes
Social Capital and Participatory Planning as Instruments for Improvement of an Old Neighbourhood	Tepito, Mexico City	June 2008 – June 2009	Methodology to identify and promote a participatory concept for the integration and promotion of community improvement projects by training interested inhabitants and thus strengthening social capital.
Strengthening Governance Processes for Sustainable Agriculture in Western Mexico	Jalisco, Mexico	December 2008 – December 2009	Strengthening capacities of farmers in organic farming through participatory training processes consisting of fieldtrips, workshops and meetings to exchange experiences. Proposals for the marketing of surplus production of rural families are included, opening opportunities for fair trade and responsible consumption of agro-ecological foods (Figure 3).
Community-based Ecological Greywater Management in the Municipality of Tepoztlán, Mexico	Tepoztlán, Mexico	January 2007 – April 2008	Generation of baseline knowledge about ecological alternatives to treat greywater, with a community-oriented perspective. Implemented by Sarar Transformación S.C. in the urban core and adjacent rural and peri-urban communities of Tepoztlán, Morelos. Tepoztlán mirrors the need of other Latin-American municipalities for adequate sanitation alternatives to reduce environmental degradation, adequately manage potential health risks, and foster better policies to address this and other environmental issues.

Improvement of an Ancient Neighbourhood in the City of Mexico: Tepito”. A project by Laura Aguirre entitled “Territory, Youth and Development: The Case of Young People in Ciudad Perdida 9” was completed in 2008.

Access to adequate sanitary conditions is being explored by projects concerned with “Implementation of Environmental Sanitation Policy in Human Settlements in Costa Rica: The Case of Household-centred Environmental Sanitation (HCES)” by Horacio Chamizo, and “Adequate Urban Articulation: The Case of La Europa in Curridabat” by Zuhra Sasa. A PAMS on developing greywater treatment technology in Mexico complemented this research.

Selection of Partnership Actions for Mitigating Syndromes (PAMS) carried out in the Joint Area of Case Studies (JACS) Caribbean and Central America (CCA).



Fig. 3
Conventional (A)
and organic (B)
farming in Western
Mexico. (Photos by
Peter Gerritsen)

Access to security is being studied in a first project on “Urban Violence and Changes in Tegucigalpa” by Marysabel Zelaya, a second on “Characterisation of Closed Neighbourhoods in Tegucigalpa” by Ivonne Chain, and a third on “Social Representations and Practices of Insecurity in the Post-War Era” by Lorena Umaña.

Three research projects are concerned with reflection on “Poverty, Livelihoods and Migration: International Migration and Its Impact on Local Livelihoods in Chiapas, Mexico” (by Jorge Angulo), “The Labour Situation of Guatemalan Women in Chiapas, Mexico” (by Susana Martínez), and “Borderline Livelihoods: A Case Study from Southern Chiapas, Mexico” (by Lukas Sieber).

Finally, two projects are contributing to “Local Strategies, Environmental Governance and Conflict Management: Analysis of the Process of Governance Regarding Sustainable Water Management in the Watersheds of Santiago-Ayuquila” (by Alejandra Guerrero) and “Governance in Water Management in the Municipalities of Unión Tula and Zapotitlan de Vadillo, Jalisco” (by Silvia Salcido). One PAMS linked to this research theme is entitled “Strengthening Governance Processes for Sustainable Agriculture in Western Mexico”.

Two of the so-called Transversal Package Projects (TPPs)⁸ were also present in the region, contributing to the theme on social exclusion: “Innovation in Decision-making Processes in Sustainable Urban Projects”, directed by Adriana Rabinovich, and “Operationalising Human Security for Livelihood Protection”, directed by Albrecht Schnabel.

25.5 Outlook for future research

Research in the JACS CCA regarding present development trends linked to global change has been focusing on increasing inequity in access to resources, especially territorial ones, with social segregation reflecting *social exclusion*. Impacts of these processes on livelihoods and biodiversity have been studied, with the three themes providing insights into social exclusion as the cause of increasing migration, the increasing vulnerability of people to natural and anthropogenic risks and insecurity, and governance problems at the local and national levels.

Two main causes of social exclusion were identified: the absence of adequate social public policies and the prevailing accumulative process that generates a labour surplus of a structural nature. Research activities also examined how these causes were dealt with in urban and rural settings, and how pathways to greater sustainability were negotiated. The main means of success were found to be participatory planning interventions (emphasising the empowerment potentials of participatory approaches, including those related to upgrading sanitation systems) and inter-municipal resource management agreements.

Further analysis of these issues are among the challenges defined for the third phase of the NCCR North-South programme; the corresponding research projects will be included in a first thematic node on Health, Services and Planning and another thematic node on Resources, Economy and Governance. Research projects in the JACS CCA will be conducted in both nodes; this new constellation of themes will enable the programme to explore further aspects of the complex realities dealt with by development-oriented research in the region.

Endnotes

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² According to the Association of Caribbean States (ACS); see <http://www.acs-aec.org/index.htm>; accessed on 3 September 2009.

³ The NCCR North-South is based on research partnerships with researchers and research institutions in the South and East. These partnership regions are called JACS (Joint Areas of Case Studies). Regional Coordination Offices (RCOs) were established in each of these JACS at the outset of the programme. The original function of the RCOs was to coordinate research; in the third phase of the programme, RCOs will consolidate the existing research network in the South and will become hubs for generating new research projects and partnerships.

⁴ According to data from the US Interagency Assessment of Cocaine Movement (IACM) cited in the United Nations Office on Drugs and Crime (UNODC) *World Drug Report* 2008, in 2006, between 530 and 710 tonnes of cocaine were sent from South America to the United States; of this amount, 90% passed through Central America and Mexico (UNODC 2008, p 76).

⁵ Social practices – understood as meaningful actions by individuals or social groups, with or without direct relation to the state and the market, based on collective attitudes – were analysed in terms of their impact on the transformation of space (Pedrazzini et al 2005).

⁶ Such conflicts occurred, for example, between the tourist sector and the agricultural export sector, as well as between environmental movements and traditional agrarian productive sectors, regarding impacts of activities on biodiversity or use of water resources.

⁷ Partnership Actions for Mitigating Syndromes (PAMS) are projects implemented by local actors together with scientific and non-scientific stakeholders. As a component of the NCCR North-South programme they are designed to implement and validate approaches, methods and tools developed in research, with a view to finding promising strategies and potentials for sustainable development. Moreover, they are intended to promote mutual learning and knowledge-sharing between academic and non-academic partners in sustainable development.

⁸ Transversal Package Projects (TPPs) were a Phase 2 component of the NCCR North-South that helped to cross disciplinary boundaries, with a view to achieving better integration of complex issues within the framework of the overall theme of sustainable development and syndrome mitigation. TPPs were interdisciplinary projects entrusted to research teams under the leadership of promising post-doctoral researchers from the North and the South.

References

Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- ECLAC [Economic Commission for Latin America and the Caribbean]. 2006. *Statistical Yearbook for Latin America and the Caribbean, 2005*. Santiago, Chile: ECLAC and United Nations. Also available at: http://websie.eclac.cl/anuario_estadistico/anuario_2005/; accessed on 17 November 2009.
- * Pedrazzini Y, Bolay JC, Kaufmann V. 2005. *Social Practices and Spatial Changes*. NCCR North-South Dialogue Series. Bern and Lausanne, Switzerland: Swiss National Centre of Competence in Research (NCCR) North-South and Laboratoire de Sociologie Urbaine, École Polytechnique Fédérale de Lausanne (LaSUR). Also available at: http://www.nccr-north-south.unibe.ch/publications/Infosystem/On-line%20Dokumente/Upload/IP5_SocialPractices_0105.pdf; accessed on 12 October 2009.
- Pérez Sáinz JP. 2006. Globalización y comunidad de vecindad: notas para el planteamiento de un concepto. *Íconos, Revista de Ciencias Sociales* 24:27–42.
- Pérez Sáinz JP, Andrade-Eekhoff KE. 2003. *Communities in Globalization: The Invisible Mayan Nahual*. Lanham, MD: Rowman and Littlefield.
- Pérez Sáinz JP, Mora Salas M. 2007. *La persistencia de la miseria en Centroamérica: una mirada desde la exclusión social*. San José, Costa Rica: Facultad Latinoamericana de Ciencias Sociales (FLACSO). Also available at: http://www.enlaceacademico.org/uploads/media/La_Persistencia_OK_01.pdf; accessed on 12 October 2009.
- Sojo C, Rojas F, Avendaño B, editors. 1998. *Reforma económica, estado y sociedad en Centroamérica*. Guatemala City, Guatemala: Facultad Latinoamericana de Ciencias Sociales (FLACSO).
- UNDP [United Nations Development Programme]. 2007. *Human Development Report 2007–2008, Fighting Climate Change: Human Solidarity in a Divided World*. New York: UNDP.
- UNDP [United Nations Development Programme]. 2009. *World Population Prospects: The 2008 Revision. Population Database*. <http://esa.un.org/unpp/>; accessed on 17 November 2009.
- UNODC [United Nations Office on Drugs and Crime]. 2008. *World Drug Report 2008*. Vienna, Austria: UNODC. Also available at: <http://www.unodc.org/unodc/en/data-and-analysis/WDR-2008.html>; accessed on 17 November 2009.

26 **Social Exclusion in Central American and Caribbean Urban Contexts and the Dynamics of Global Change**

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Abstract

This article presents a synthesis of the conceptual and methodological debate carried out by a group of researchers who explored problems of sustainable development and global change in the Central American and Caribbean region. The heart of the debate and corresponding empirical research results presented here focus on social exclusion and related socio-spatial segregation and fragmentation of urban space. Social exclusion in the region largely derives from inadequate public social policies, weak public institutions and vulnerable labour market opportunities, which impoverish and exclude high percentages of rural and urban populations. These problems are related to the global predominance of the financial sector, relocation of production, and the role of the state in deregulating the market. To identify how these global changes are related to social exclusion – reflected in households suffering from deficient reproductive conditions that affect their habitat and livelihoods – a series of research projects analysed existing social and territorial conditions, focusing specifically on housing, basic services and security. The objective was to identify and analyse conditions of social exclusion and understand their relations to the visible territorial impacts of global change – segregation and the privatisation of public space. The next step was to characterise the negative dimensions of these territorial impacts and the positive processes that neutralise them. The present article is organised in four sections: an introduction, a conceptual framework developed on the basis of the individual studies, a summary of main results, and conclusions that pave the way for future social exclusion studies in the region.

Keywords: Social exclusion; territories; residential segregation; privatisation of public space; livelihoods and habitat.

26.1 Introduction

The global economic crisis of the 1980s and 1990s deepened already existing inequalities in the distribution of income in Central America and the Caribbean, increasing poverty levels, segregation and the social and economic vulnerability of significant sectors of the population, while other, privileged minorities multiplied their wealth to levels without precedent (Portes et al 1997; Chossudovsky 2009). This situation is not limited to Central America or the Caribbean: it also exists in the rest of Latin and North America, as has been pointed out by several authors and international institutions (Menjívar Larín et al 1997; Sassen 1998; De Mattos 2009; see also the annual reports of the World Bank, the Inter-American Development Bank [IDB] and the United Nations' Economic Commission for Latin America and the Caribbean [ECLAC]).

Income inequality, together with increased fear and insecurity in the absence of adequate public security measures, have led to a territorial phenomenon, expressed in the enclosure of both rich and poor neighbourhoods and a resulting 'privatisation' or private use of public spaces in the cities (Blakely and Snyder 1997; Coy and Pohler 2002; Pirez 2002; Caldeira 2004; Low 2004; Glasze et al 2005; Coy 2006; Borsdorf and Hidalgo 2007). From a sociological point of view, physical and symbolic – or 'inner' – borders are created within the city (Pedrazzini et al 2005), resulting in overall urban fragmentation.

In socio-cultural terms, these dynamics – linked to the impact of the global economic crisis of the 1980s and 1990s – are modifying the forms of socialisation, life styles and social fabric of communities (Coy and Pohler 2002; Caldeira 2004). Urban enclosure and fragmentation in Central America are producing a progressive 'disarticulation' of communities' networks and livelihoods which had, until recently, played an important role in the survival strategies of the poor (Gellert 2000). These strategies have an anchoring that is strictly territorial, since it is in the territory – defined as a "[s]patial setting allowing for the development of specific activities", i.e. as "[t]he various conventional and material equipments that frame and enable specific actions" (Pattaroni et al 2008, p 9) – that the different forms of capital accumulation take place and are anchored. In addition to the visible 'disarticulation' of communities that can be observed in Central American urban settings, the overall social fabric is affected by increasing violence and insecurity (Pedrazzini et al 2003; Pedrazzini et al 2005).

Given the novelty, intricacy and scope of the phenomenon described above, there is a need for concerted interdisciplinary research on how to mitigate its negative impacts. Research carried out within the Swiss National Centre of Competence in Research (NCCR) North-South programme from 2001 to 2008 emphasised the study of social exclusion seen from territorial and cultural perspectives. The two most clearly related trends under study were social segregation and increased violence and insecurity.

The case studies that substantiate our arguments and conclusions addressed a broad range of issues: from gated communities and informal neighbourhoods in Tegucigalpa, Honduras, and San Salvador, El Salvador, to the social dynamics of neighbourhoods in Mexico City's historic centre, where rehabilitation and improvement projects have been implemented. These studies were inscribed within a line of research on "Social Exclusion, Inner Borders and Fragmentation", considered particularly relevant for Central America and the Caribbean by the NCCR North-South programme. They explored the nature and causes of the exclusion of specific disadvantaged groups from their territorial and cultural rights, and analysed the relation this exclusion has to increasing violence and insecurity, within the context of multifaceted global change. The studies were framed within a conceptual and theoretical debate that is summarised in the next section of this article. This is followed by a comparative presentation of main findings, and conclusions regarding questions and issues that still need to be addressed.

26.2 Conceptual framework

The central concepts underpinning the present line of research are *social exclusion*, *livelihoods*, and *territory*. With the use of these concepts an attempt is made, on the one hand, to conceptualise the relationship between households and the urban space they occupy, and, on the other hand, to define the exclusion/inclusion processes that people experience. These concepts come from several disciplines, including sociology, anthropology, and geography (Rodgers et al 1995; Silver and Wilkinson 1995; Bolay et al 2005; Pattaroni et al 2008).

26.2.1 Social exclusion: the symbolic significance of income

The *social exclusion* concept (as discussed in Koonings and Kruijt 2007 as well as Pérez Sáinz and Mora Salas 2007) further develops the concept of poverty and overcomes its limitations. Poverty is in itself an internationally agreed standard that refers to a household's monetary capacity to cover the cost of the so-called 'basic basket' of consumption goods. By contrast, in accord with the ideas of the United Nations Development Programme (UNDP), we share the notion that the social exclusion of both groups and individuals relates rather to the impossibility they experience of participating in development processes and gaining access to their benefits. The 'excluded' are those who find themselves in a state of disadvantage caused by economic as well as social, political and cultural processes that prevent them from fully participating in development processes (FLACSO and UNDP 1995, p 33).

In this sense, while low income alone does not create social exclusion, it does have *some* negative effects, as it affects the creation of social capital. For example, it becomes a hindrance to university studies and can lead to self-censorship. Sen (2000) and Byrne (2002) point out that the inability of individuals to relate to others and be part of community life may directly impoverish a person's life. Stable social relationships can act as community support for building individual and collective projects and thus promote development. Inequality gaps inhibit the consolidation of such relationships. Only social subjects with significant linkages outside disadvantaged communities and the territories they occupy succeed in becoming integrated into current social transformation dynamics (Baires et al 2006).

However, exclusion related to income can also take a socio-cultural form: indeed, certain forms of consumption are, according to the dominant global economic model, one way of exercising 'citizenship' (Baumann 1998; Clarke and Bradford 1998; Zukin 1998; García Canclini 2001). Exclusion through lack of access to consumption is therefore not only material but also cultural (De Freitas 2004). Spaces for cultural consumption destined for specific social groups that have not only sufficient economic resources, but also incorporate into their lives a series of new consumption practices, are replacing traditional public cultural spaces in the Central American and Caribbean region. For example, this is the case when spaces for recreation and consumption are concentrated in city zones that can be accessed only by car, or when spaces proliferate where – especially among urban youth – appearance, dress and behaviour become a *sine qua non* for admittance (Baires et al 2006).

Thus, global change processes anchored in territories generate forms of integration and exclusion that respond to global socio-economic logics. It is precisely the lack of capacity to become integrated in dominant economic practices that generates high percentages of exclusion in territorial transformations (Gacitúa et al 2000).

26.2.2 Livelihoods, ‘territories’ and ‘inner borders’: conceptual tools to understand urban fragmentation

Transformations of urban territories are generated by the social dynamics of the individuals that inhabit and use such territories. This is where the relationship between territory and livelihoods originates and is consummated. *Livelihood* refers to ways of life and subsistence that develop and are shaped within territories. According to Pattaroni et al (2008), inhabitants of contemporary cities live and are socially integrated by means of four types of ‘territories’ that give them access to housing, socialisation spaces, services, and economic activities. These territories are a conceptual construct useful for understanding how, in reality, humans create as well as live, socialise and work in different spaces that function along different organisational principles and produce corresponding results. The characterisation of and interaction between these territories influence urban inhabitants’ life systems and well-being (Table 1).

Table 1

Type of territory	Organisational principle	Good delivered
Functional territory	Normalisation	Efficiency
Merchant territory	Competition	Growth and prosperity
Sociability territory	Reciprocity	Solidarity and social capital
Dwelling territory	Comfort and ease	Ontological safety

Organisational principles of, and goods delivered by, the four types of urban territories in which livelihoods are embedded.

The combination of organisational principles and goods delivered produces complex social relationships that introduce, in the symbolic construction of territories, a series of processes that are difficult to comprehend and, hence, to manage. Two of these processes that specifically reflect social exclusion or inclusion are urban social fragmentation and the creation of mobile ‘inner borders’.

Source: Pattaroni et al 2008

Urban social fragmentation⁴ is considered a ‘syndrome’ of global change (Hurni et al 2004), as it contributes to the deterioration of urban inhabitants’ quality of life, especially in poor neighbourhoods, hampering the possibility of urban sustainable development (Pedrazzini et al 2003; Pedrazzini et al 2005). Urban social fragmentation leads to lack of reciprocity and thus to loss of *sociability territory*. This, in turn, makes it difficult to reach agreements for normalisation, resulting in inefficiency of the *functional territory*. Competition increases to a maximum, and growth and prosperity are dealt with in different ways, depending on the degree of social empowerment, affecting the *dwelling territory*. Promoting comfort and thus ontological safety becomes a matter of differentiation rather than collaboration. This is reflected in what we call ‘inner borders’. The creation of inner borders within a city or within a municipality, as part of this fragmentation process, is determined by public and private interventions through which, over time, inhabitants provide their environment with existence and meaning, creating distinct territorial identity, e.g. in the form of gated communities. Borders and territory formation thus have a symbolic dimension that must be defined and accounted for, keeping in mind that their dimension is not static.

Mobile inner borders is our own term for the ‘liminal spaces’⁵ (Zukin 1991) or ‘in-between spaces’ where identities are anchored through specific dynamics that assert and produce symbolic communities to which certain social groups adhere. In order to clarify this concept, we must first conceptualise the term ‘identity’. Social identities are the symbolic constructions of a ‘we’ in the face of ‘others’. This is a discursive process of marking and ratifying symbolic boundaries (Hall 1996). As long as the nation-state was a unifying and stable space of symbolic belonging, social identity was provided by nationality (Anderson 1991). Global socio-economic change, expressed, for example, in increased migration and more complex migration patterns, has increased the complexity of social identity construction processes while also making these processes visible, since social identity is built on shared values and these values have become immensely diverse (Basch et al 1993).

26.2.3 Symbolic dichotomies and the dynamics of territories

From the socio-cultural point of view, two types of relationships define these inner borders, the fundamental nature of which is mobile: the public–private dichotomy and the security–insecurity dichotomy.⁶ These dichotomies, in turn, contribute to the fragmenting of urban territories and experiences.⁷

Public–private: Public space is the civic space of common good, as opposed to the private space of individual interests. In the city, public space and the implicit covenant on which citizenship is founded become visible. Cities and public spaces express very well the image each society has of itself (Marks et al 2008).

Forms of coexistence are tested in public spaces since it is here that we meet the different ‘others’. Therefore, this becomes a possibility for strengthening community ties. Nevertheless, in Central American cities, encounters with the ‘other’ have become the cause of daily fears. Urban space is no longer an opportunity that fascinates, but rather something that is feared and fled from. This feeling prevailing in daily life has put an end to public expressions of solidarity in Latin American cities (De Freitas 2004).

The increasing preference for private spaces is part of the social fragmentation syndrome; it evidences how the urban cultural experience has changed. An increasing preference for the private is perceptible both in consumption and in supply trends: on the one hand, the middle and upper classes prefer to spend their ‘free’ or leisure time in private spaces rather than public ones; on the other hand, ‘cultural’ supply tends to remain concentrated in these private spaces, at a cost that is generally high (which is why cultural supply is provided by international chains) in exchange for the ‘lost security’ of public space (Martel 2006b).

Governments in the region have proven to be more and more incapable of guaranteeing public security (De Freitas 2004; Zelaya 2009). This is one of the reasons why privatisation of public and community space is taking place, serving the (frequently multi-national) corporate interests behind this trend. These dynamics reinforce different individual and collective ‘security’ practices (Pedrazzini et al 2003). As an answer to this deterioration of public order, borders (physical and symbolic) are created to differentiate public space from private space. As mentioned above, such borders are mobile, in this case because they are drawn across public spaces to facilitate their use as private spaces, and at the same time private spaces function internally as public spaces by blurring previously fixed borders.

Security–insecurity: As mentioned above, one of the characteristics of Central American cities is the perception of insecurity resulting from different forms of urban violence. City zones and persons are characterised

and stigmatised along the security–insecurity divide. Again, symbolic borders are established based on appearance, skin colour, socio-economic origins, etc. (De Freitas 2004; Baires et al 2006). In this way, fear is the feeling that is progressively uniting inhabitants in cities. Fears are individually experienced, socially constructed, and culturally shared (Pedrazzini et al 2003). Fear and the feeling of insecurity constitute unprecedented forms of community within cities; through both of them, invisible internal borders emerge where subjects and zones are identified as responsible for violence (Martel 2006a).

The feeling of insecurity affects the quality of people's lives and weakens the social fabric. The tendency is towards growing distrust in the social environment; as a consequence, people look for some way to escape this perceived reality. Gated neighbourhoods are one option they turn to, in the hope of locking out social violence, at least from their residential space. However, this option is only available to people who can afford a place in a gated neighbourhood. This leads to a large gap between people 'included' in the ghetto and those 'excluded' from it.⁸

This perception leads people to mistrust the management of public institutions responsible for public security.⁹ As indicated with regard to the public–private dichotomy, mistrust of the public administration is the reason why people increasingly turn to private solutions. The number of private security services has been steadily growing; a study carried out in Caracas identified more than 8 different security bodies, including private security companies, more than half of which were 'illegal', as they did not have official permits (De Freitas 2004).

As discussed above, the dichotomous relationships between security–insecurity and public–private generate forms of urban fragmentation that contribute to the deterioration of the social fabric. This is the case for all social groups, but it is experienced more dramatically by the urban poor, as explored by several studies summarised below.

26.3 Selected case study results

Within the framework of NCCR North-South research in Central America and the Caribbean, the territorial impacts of social exclusion were initially explored through an analysis of the increasing enclosure of residential areas in San Salvador and the growing privatisation of public spaces in Caracas,

both related to the increase of urban violence and perceived insecurity. Both are typical examples of the dichotomous security–insecurity and public–private relationships, mentioned above.

In San Salvador, Baires determined a clear trend towards controlling access to residential areas within the city by establishing physical barriers (Figure 1), even though this practice was not legally allowed. The required permits were not requested, nor was the action punished. An inventory of closed settlements was carried out in San Salvador in the year 2004, and a typology based on the income level of the households was established, showing that the trend affected all social strata. Data managed by the Planning Office of the Metropolitan Area of San Salvador (Oficina de Planificación del Área Metropolitana de San Salvador, OPAMSS) indicated that in 2004, 40% of the housing stock in San Salvador was located within a closed community. Interviews provided evidence that this trend was linked to fear; these results were supported by a statistical review. Moreover, the housing market was found to play a dominant role in reinforcing the trend.

In Caracas, De Freitas implemented an exploratory descriptive research project to analyse situations of violence and insecurity and their impact on the physical, cultural and symbolic spaces of the city. The research was carried out in the parish of San Bernardino, a sector of the city inhabited by people from all social strata and characterised by a presence of commer-



Fig. 1
Entrance to a gated
community in San
Salvador, El Salva-
dor. (Photo by
Sonia Baires)

cial and service activities, as well as significant public spaces (3.5% of total area). This qualitative study involved interviews with three categories of stakeholders (inhabitants, economic actors from the commercial and service sectors, and public officers and politicians); it also included a phase of non-participatory structured observation. Results indicated that there were perceptions of danger in the area, especially in relation to the poor neighbourhoods, where security measures were clearly concentrated. Public spaces were scarcely used by medium- and high-income groups, who preferred to use commercial centres as sociability territories. Recreational activities were mostly limited to daylight hours. There was no clear notion of public space, neither at the municipality nor at the police and institutional levels. Closing access to neighbourhoods was justified although it was not legal; it also contributed to raising real estate values.

In the second four-year phase of the NCCR North-South research programme from 2005 to 2009, projects aimed to evaluate how the patterns of both growth of urban gated communities and the renovation of historic urban centres related to social exclusion and segregation in different cities in Central America and the Caribbean, with special emphasis on the impact of these two patterns on public spaces and their role with regard to social cohesion.

Following the study by Baires, Ivonne Chain developed a research project entitled “Characterisation of Gated Urbanisation and Neighbourhoods as a New Residential Phenomenon in the City of Tegucigalpa” (Figure 2). She conducted an inventory of gated neighbourhoods for Tegucigalpa, Honduras, classifying them by physical elements, origination process, socio-economic category, type of security, and life style offered. Apart from mapping these neighbourhoods, she found that these closed communities originated in a type of social housing common throughout Honduras in the 1970s. These communities had then evolved into neighbourhoods that were closed for security reasons, finally becoming a residential trend for medium- and high-income classes during the 1990s.

As loss of public spaces within the neighbourhoods was found to occur both in centres and in areas at the periphery of Tegucigalpa, an ensuing project by Marysabel Zelaya, entitled “Urban Violence and Changes in Tegucigalpa, Honduras”, is now looking at accelerated processes of spatial reconfiguration in these urban areas, focusing on the public as well as the residential areas. The project aims to understand how and why these places have



Fig. 2
Inclusion and
exclusion: the
upper-class gated
community of Los
Hidalgos (A) and
an adjacent poor
neighbourhood (B)
in Tegucigalpa,
Honduras. (Photos
by Ivonne Chain)

changed and how the process of change affects the use and meaning of public space for the people who use it. The research is based on three in-depth case studies of one neighbourhood located in the centre of Tegucigalpa and two at the periphery, of which one is an informal neighbourhood and the other consists of condominiums. Similar to the study conducted by De Freitas, this project takes a qualitative approach based on stakeholder interviews, with a view to deepening the understanding of the mechanisms underlying security–insecurity and public–private relations.

How can the current resident population of centrally located settlements – including the poorest – continue to live in historic city centres in which, under the influence of global economic dynamics, renovation has become the trend? Anabel Monterrubio is focusing on this key question in the case of Mexico City, increasing knowledge about how inhabitants create, live, socialise and work, as proposed by Pattaroni et al (2008). Using a historical reconstruction of housing processes, as well as stakeholder mapping and interviews, to date she has inquired into the role of public policies and the land market as external determining factors. She is also inquiring into the inhabitants' perceptions, values and evaluations regarding their habitat, as internal factors that influence decisions on whether or not to continue living in Mexico City's historic centre. Her current results indicate that institutional strategies (in terms of norms, intervention project profiles, and economic resources) have been crucial for the local population's ability to continue to live in the centre. In addition, daily resistance by individuals and households to official injunctions to move, reinforced by organised resistance, have been important tools. Social movements (housing NGOs and support from university projects) have been instrumental in promoting collective social



Fig. 3
Ciudad Perdida 9
in Mexico City,
seen from within
(A) and from out-
side (B). (Photos by
Laura Aguirre)

practices in search of public policy alternatives that support permanent residence of former inhabitants in the city centre.

Finally, Laura Aguirre is examining Mexico City's development model, through a study of a poor neighbourhood enclosed within one of the wealthiest areas in the city and forgotten by urban development authorities until now. This is the case of the neighbourhood called Ciudad Perdida 9, where inhabitants perceive more advantages than disadvantages in living within the area, because the precarious physical and social conditions are compensated by better access to other benefits of an urban environment (Figure 3).

26.4 Conclusion

It is clear that the increase in violent behaviour and perceptions of insecurity in the Central American and Caribbean urban contexts has modified the character of social spatial segregation in the urban environment: it has led to patterns of enclosure in residential areas and privatisation of public space, leading in turn to increasing urban fragmentation. This phenomenon confirms the existence of increasing social exclusion processes recently observed and measured for several countries in the region by Pérez Sáinz and Mora Salas (2007).

By definition, social exclusion precludes sustainable development, since it introduces or increases social inequality, thus making it impossible for current and future generations to benefit from access to sustainably managed

resources. In urban areas, exclusion takes place when the four symbolic territories established by Pattaroni et al (2008) become dysfunctional. What can be done to mitigate the resulting problem of urban fragmentation and disarticulation of the social fabric?

The research conducted in Mexico City by Monterrubio underlines the importance of adequate public social policies to regulate the functioning of land markets for dealing with the residential dimension of the problem. In addition, the results show that there is a true potential for controlling the negative impact of social exclusion when social movements work together with academic groups, promoting processes to improve social capital. Indeed, this case study highlights one means of achieving the development of areas in historic city centres in which the majority of the population – rather than only an elite – has access to resources. However, its scope is still limited to confined areas within the city. May it be generalised?

Further topics for exploration arise from the current state of the art and empirical results, with a view to sharpening the understanding of social exclusion processes and increasing the database upon which possible measures can be proposed for policy- and decision-making. Research findings highlight the dominant trends in the evolution of urban areas triggered by global processes and intensified by the weakness of urban planning as a public responsibility, particularly in large cities. They also uncover the strong impact of private planning on the urban space – one of the critical phenomena determining present unsustainable urban expansion patterns (Caballero Zeitún 2007). Public planning is facing the aggressiveness of private real estate investment, which is geared to maximising immediate earnings by redesigning the city according to private demand, rather than giving priority to public interest, which would entail building and protecting the collective patrimony.

Endnotes

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- ⁴ For Navez-Bouchanine (2002), urban socio-spatial fragmentation is a result of globalisation, as it causes more poverty where the spatial modes of activities are highly concentrated, generating fragmentation in urban agglomerations. The main criteria for this kind of fragmentation are social exclusion, spatial enclaves and the absence of mobility.
- ⁵ Sharon Zukin (1991, p 41) reflects on Victor Turner's concept of liminality, in relation to what she calls 'urban landscapes'. According to her, "[n]ew urban spaces are formed, permeated and defined by liminality. All such spaces are 'betwixt and between' institutions, specially the sacred sphere of culture and the secular world of commerce". For a broader definition of liminality, see <http://parole.aporee.org/info/>
- ⁶ This issue was studied in depth by Julio De Freitas for the case of Parroquia de San Bernardino in Caracas, Venezuela (Pedrazzini et al 2003).
- ⁷ This entire section on symbolic dichotomies was first written in Spanish and is part of an article that is currently in process of publication (Baires, accepted).

⁸ Studies on this issue carried out in San Salvador by Sonia Baires, covering the period between 1992 and 2005, identified 300 new gated communities, corresponding to 13.5% of the municipality's territory and 10,307 households, covering all social classes. Interviews revealed that the main justification for enclosure was perceived insecurity.

⁹ Up to 60% of the people in the region are wary of the judiciary and security forces, according to a report on access to justice in Central America and Panama produced in 2000 by the United Nations Development Programme (UNDP) in conjunction with the Latin American Centre for Competitiveness and Sustainable Development (CLACDS) at INCAE and the Centre for Research in Law and Economics (CINDE) at Complutense University of Madrid (UNDP et al 2000).

References

Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- Anderson B. 1991. *Imagined Communities: Reflections on the Origin and Spread of Nationalism*. Revised edition. London, UK and New York, NY: Verso.
- * Baires S. Accepted. Exclusión social, fronteras internas y fragmentación urbana en Centroamérica. *Revista Centroamericana de Ciencias Sociales*.
- Baires S, Martel R, Romero C, Sánchez C. 2006. *Violencia y espacios públicos: el caso del AMSS*. San Salvador, El Salvador: UCA Editores.
- Basch L, Glick Schiller N, Szanton Blanc C. 1993. *Nations Unbound: Transnational Projects, Postcolonial Predicaments and Territorialized Nation-States*. London, UK: Routledge.
- Baumann Z. 1998. *Trabajo, consumismo y nuevos pobres*. Barcelona, Spain: Gedisa.
- Blakely E, Snyder M. 1997. *Fortress America: Gated Communities in the United States*. Washington, D.C. and Cambridge, MA: Brookings Institution Press and Lincoln Institute of Land Policy.
- * Bolay JC, Pedrazzini Y, Rabinovich A, Catenazzi A, Garcia Pleyan C. 2005. Urban environment, spatial fragmentation and social segregation in Latin America: Where does innovation lie? *Habitat International* 29(4):627–645.
- Borsdorf A, Hidalgo R. 2007. New dimensions of social exclusion in Latin America: From gated communities to gated cities, the case of Santiago de Chile. *Land Use Policy* 25(2):153–160.
- Byrne DS. 2002. *Social Exclusion*. Buckingham, PA: Open University Press.
- Caballero Zeitún EL. 2007. *La construcción de ciudades vulnerables*. Tegucigalpa, Honduras: Alin Editores.
- Caldeira T. 2004. *City of Walls: Crime, Segregation and Citizenship in Brazil*. Berkeley and Los Angeles, CA: University of California Press.
- Chossudovsky M. 2009. *The Globalization of Poverty and the New World Order*. Toronto, Canada: Global Research.
- Clarke D, Bradford M. 1998. Public and private consumption and the city. *Urban Studies* 35(5–6):865–888.
- Coy M. 2006. Gated communities and urban fragmentation in Latin America: The Brazilian experience. *Geojournal* 66(1):121–132.
- Coy M, Pohler M. 2002. Gated communities in Latin America megacities: Case studies in Brazil and Argentina. *Environmental and Planning B: Planning and Design* 29(3):355–370.
- De Freitas J. 2004. Caracas pública, privada y de nadie. *Comunicación* 127:20–24.
- De Mattos C. 2009. *Globalization and Urban Revolution in Latin America*. Paper presented at a virtual course on Urban Violence and Insecurity: A Gender Perspective, organised by the Centro de estudios urbanos y regionales (CEUR) Argentina and the United Nations Development Fund for Women (UNIFEM), from 1 July to 15 December 2009. Available from Sonia Baires.
- FLACSO [Facultad Latinoamericana de Ciencias Sociales], UNDP [United Nations Development Programme]. 1995. *Análisis de la exclusión social a nivel departamental: los casos de Costa Rica, El Salvador y Guatemala*. San José, Costa Rica and New York, NY: FLACSO and UNDP.
- Gacitúa E, Sojo C, Davis S. 2000. *Exclusión social y reducción de la pobreza en América Latina*. San José, Costa Rica: World Bank and Facultad Latinoamericana de Ciencias Sociales (FLACSO). Also available at: <http://www.flacso.or.cr/Exclusion-social-y-reduccion-d.102.0.html>; accessed on 16 October 2009.
- García Canclini N. 2001. *Consumers and Citizens: Globalization and Multicultural Conflicts*. Minneapolis, MN: University of Minnesota Press.
- Gellert G. 2000. Las migraciones como estrategias de sobrevivencia de los excluidos y sus determinantes territoriales. In: Gálvez Borrel V, Gellert G, editors. *Exclusión social y estrategias para enfrentarla*. Guatemala City, Guatemala: Facultad Latinoamericana de Ciencias Sociales (FLACSO), pp 173–343.

- Glazze G, Webster C, Frantz K. 2005. *Private Cities: Global and Local Perspectives*. London, UK: Routledge.
- Hall S. 1996. Introduction: Who needs identity? In: Hall S, du Gay P, editors. *Questions of Cultural Identity*. London, UK: Sage, pp 1–17.
- * Hurni H, Wiesmann U, Schertenleib R, editors. 2004. *Research for Mitigating Syndromes of Global Change: A Transdisciplinary Appraisal of Selected Regions of the World to Prepare Development-oriented Research Partnerships*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 1. Bern, Switzerland: Geographica Bernensia.
- Koonings K, Kruijt D. 2007. *Fractured Cities: Social Exclusion, Urban Violence and Contested Spaces in Latin America*. London, UK: Zed Books.
- Low S. 2004. *Behind the Gates: Life, Security, and the Pursuit of Happiness in Fortress America*. New York, NY: Routledge.
- Marks SP, Modrowski KA, Lichem W. 2008. *Human Rights Cities: Civic Engagement for Societal Development*. New York, NY and Nairobi, Kenya: People's Movement for Human Rights Learning (PDHRE) and United Nations Human Settlements Programme (UN HABITAT). Also available at: http://www.pdhre.org/Human_Rights_Cities_Book.pdf; accessed on 12 October 2009.
- Martel R. 2006a. De cómo las ciudades nos cuentan qué sociedades somos: notas sobre la cultura urbana. *Cultura* 94(September/October).
- Martel R. 2006b. Notas sobre la solidaridad y la convivencia en el espacio público. Unpublished paper. Available from Sonia Baires.
- Menjívar Larín R, Kruijt D, van Vucht Tijssen L, editors. 1997. *Pobreza, exclusión y política social*. San José, Costa Rica: Facultad Latinoamericana de Ciencias Sociales (FLACSO).
- Navez-Bouchanine F. 2002. Emergence d'une notion: quelques repères historiques. In: Navez-Bouchanine F, editor. *La fragmentation en question: des villes entre fragmentation spatiale et fragmentation sociale?* Paris, France: L'Harmattan, pp 19–44.
- * Pattaroni L, Kaufmann V, Pedrazzini Y, Bolay JC, Rabinovich A. 2008. *People and "Territories": Urban Sociology Meets the Livelihood Approach in the South*. NCCR North-South Dialogue No. 20. Bern, Switzerland: Swiss National Centre of Competence in Research (NCCR) North-South. Also available at: <http://www.north-south.unibe.ch/content.php/publication/id/2153>; accessed on 16 October 2009.
- * Pedrazzini Y, Baires S, De Freitas J. 2003. *Violencia, in-seguridad y transformación del espacio urbano en el contexto de la globalización. "Marco general" de la Línea de Actividad 3 IP5/JACS América Central y Caribe (ACC)*. Bern, Switzerland: Swiss National Centre of Competence in Research (NCCR) North-South. Also available at: <http://www.nccr-north-south.unibe.ch/publications/Infosystem/On-line%20Dokumente/Upload/LA3.pdf>; accessed on 12 October 2009.
- * Pedrazzini Y, Bolay JC, Kaufmann V. 2005. *Social Practices and Spatial Changes*. NCCR North-South Dialogue Series. Bern and Lausanne, Switzerland: Swiss National Centre of Competence in Research (NCCR) North-South and Laboratoire de Sociologie Urbaine, École Polytechnique Fédérale de Lausanne (LaSUR). Also available at: http://www.nccr-north-south.unibe.ch/publications/Infosystem/On-line%20Dokumente/Upload/IP5_SocialPractices_0105.pdf; accessed on 12 October 2009.
- Pérez Sáinz JP, Mora Salas M. 2007. *La persistencia de la miseria en Centroamérica: una mirada desde la exclusión social*. San José, Costa Rica: Facultad Latinoamericana de Ciencias Sociales (FLACSO). Also available at: http://www.enlaceacademico.org/uploads/media/La_Persistencia_OK_01.pdf; accessed on 12 October 2009.
- Pirez P. 2002. Buenos Aires: Fragmentation and privatization of the metropolitan city. *Environment and Urbanisation* 14(1): 145–158.
- Portes A, Dore-Cabral C, Landolt P. 1997. *The Urban Caribbean: Transition to the New Global Economy*. Baltimore, MD: The Johns Hopkins University Press.
- Rodgers G, Gore C, Figueiredo J. 1995. *Social Exclusion: Rhetoric, Reality, Responses. A Contribution to the World Summit for Social Development*. Geneva, Switzerland: International Institute for Labour Studies, International Labour Organisation (ILO), United Nations Development Programme (UNDP).
- Sassen S. 1998. Las ciudades en la economía global. In: Rojas E, Daughters R, editors. *La ciudad en el siglo XXI*. Washington, D.C.: Inter-American Development Bank, pp 21–20.

- Sen A. 2000. *Social Exclusion: Concept, Application, and Scrutiny*. Harvard University Social Development Papers No. 1. Manila, Philippines: Office of Environment and Social Development, Asian Development Bank. Also available at: http://www.adb.org/Documents/Books/Social_Exclusion/Social_exclusion.pdf; accessed on 12 October 2009.
- Silver H, Wilkinson F. 1995. *Policies to Combat Social Exclusion: A French–British Comparison*. Discussion Papers Series. Geneva, Switzerland: International Institute for Labour Studies.
- UNDP [United Nations Development Programme], CINDE [Centro de Investigaciones en Derecho y Economía, Universidad Complutense de Madrid], CLACDS [Centro Latinoamericano para la Competitividad y el Desarrollo Sostenible, INCAE]. 2000. *Acceso a la justicia en Centroamérica y Panamá: seguridad jurídica e inversiones*. San José, Costa Rica: UNDP.
- Zelaya M. 2009. Barrios cerrados, inseguridad y espacio público en Tegucigalpa, Honduras. Unpublished PhD proposal. Available from Sonia Baires.
- Zukin S. 1991. *Landscape of Power*. Berkeley, CA: University of California Press.
- Zukin S. 1998. Urban lifestyles: Diversity and standardisation in spaces of consumption. *Urban Studies* 35(5–6):825–839.

27 Migration, Poverty, Security and Social Networks: A Central American Perspective

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Abstract

This article provides a critical introduction to understanding the migration–poverty relationship from a different perspective, i.e. by focusing on the migration–livelihoods nexus from the point of view of social structures and people’s living conditions. The discussion presented here is based on analysis of different analytical approaches to migration in Central America and the Caribbean, developed within the framework of the Swiss National Centre of Competence in Research (NCCR), an international research programme focusing on mitigating syndromes of global change. The present appraisal provides a broader explanation of the scope of relationships in the development of social life reproduction strategies, envisaging migration as an answer to problems of inequality and as a resource for poverty alleviation strategies, from a Central American perspective.

Keywords: Migration; poverty; development; livelihoods; security; borders.

27.1 The context

Central American countries are situated in the Caribbean Basin⁴ in the tropical part of the continent, between the two large continental masses of North and South America. These countries have a geographical proximity to the United States and have been marked by a strong dependency on the U.S. for two centuries, owing to this superpower nation's foreign interventions and military invasions, which were aimed at maintaining its sphere of political and especially economic influence in almost all countries across the region.

The colonial past prior to U.S. influence also created differences between the mainland and insular territories. For instance, the Central American countries and Mexico, with the exception of mainland Belize, were Spanish colonies, along with Venezuela and, in the Caribbean, the Dominican Republic, Cuba and Puerto Rico; the remaining Caribbean islands were colonies of other European powers until not very long ago. In this framework, the geopolitics and the historical conditions of each of these societies gave rise to the establishment of national borders after each process of independence. These borders reflect the political fragmentation of the region, the weakness of its economies and political systems, and the existing features of the capital cities in these countries (Barrera et al 2004).

Up until the last quarter of the previous century, military governments and conditions of political instability prevailed in most countries of the region. Formal democracies were established at the end of the Cold War, but in many cases governance was hampered by weakness of the new democratic institutions. In recent decades, social inequality has been shown to be responsible for continual social conflict, upheaval and guerrilla movements. Its manifestations encompass a set of extreme differences in the distribution of wealth and, in addition, other forms of exclusion and semi-slavery of the indigenous majorities and people of African descent, especially in certain societies ruled by small white elites. These societies have also been characterised by gender discrimination, as women are subject to patriarchal systems.

In the recent context of globalisation, in most Central American countries social, ethnic and gender asymmetries have become more pronounced. As a direct consequence, promises of welfare for both men and women, respect for human rights and hopes of social equality have been left behind. On the other hand, the region has become one of the main sources of new international migration flows. Central America and Southeast Asia are among the

main providers of migrant labour for both the recipient economies in the North and for labour markets within the same region. This movement of people and labour has led to the establishment of complex migratory systems with characteristics that interact with the structural deficiencies that drive them and, in turn, new political borders and social divisions continue to be established.

According to statistical reports available from and compiled by the Population Division of the United Nations Economic Commission for Latin America and the Caribbean (ECLAC), the Latin American and Caribbean countries account for over 12% of international migrants in the world and they make up nearly 4% of the regional migrant population (ECLAC 2006). The greatest number comes from Mexico, followed by the Caribbean Community and Colombia (with approximately one million emigrants in each case). Countries such as Cuba, the Dominican Republic, El Salvador, Mexico, Nicaragua and Uruguay are nations with at least 8% to 15% of their population living abroad. Meanwhile, more than 20% of the Caribbean population is living outside their place of birth. More detailed data on immigrants and emigrants by country of residence and birth are given in Table 1.

In summary, the *Central American and Caribbean region* has been marked by processes of fragmentation, social polarisation and lack of governance. These conditions have caused a series of conflicts and political instability, and are among the causes that have generated heavy expulsion of population within a complex system of international migration. Far from resolving the structural and institutional weaknesses in the migrants' countries of origin, this complexity tends on the contrary to aggravate these problems by adding new factors of instability, conflict and insecurity.⁵

27.2 Poverty and migration: new insights

Research findings compiled to date in the region within the framework of the Swiss National Centre of Competence in Research (NCCR) North-South programme have provided a wealth of important results regarding the nexus of migration and poverty (Cedano and Dilla 2005; Dilla 2006; Morales-Gamboa and Pérez 2006; Hostettler 2007); analysis of *migration* – understood as a form of mobility that constitutes an expression of social practices articulated within the framework of globalisation (Sassen 2006) – rep-

Table 1

Immigrants and emigrants in Central America and the Caribbean around the year 2000: minimum estimates in thousands of persons and as a percentage of the total population, by country of residence (immigrants) and country of birth (emigrants).

Country	Total population (in millions)	Immigrants ^{a)}		Emigrants ^{b)}	
		Number (in thousands)	Percentage of population	Number (in thousands)	Percentage of population
Totals for the region	523.463	6,001	1.1	21,381	4.1
Costa Rica	3.925	296	7.5	86	2.2
Cuba	11.199	82	0.7	973	8.7
Dominican Republic	8.396	96	1.1	782	9.3
El Salvador	6.276	19	0.3	911	14.5
Guatemala	11.225	49	0.4	532	4.7
Honduras	6.485	27	0.4	304	4.7
Nicaragua	4.957	20	0.4	477	9.6
Panama	2.948	86	2.9	124	4.2
Mexico	98.881	519	0.5	9,227	9.6
Caribbean	11.782	853	7.2	1,832	15.5

^{a)} Data on immigrants in El Salvador and Nicaragua are taken from the 1990 censuses.

Source: ECLAC 2006, p 16.

^{b)} Estimates of emigrants are minimum numbers, since they cover a limited number of countries in Europe and Oceania.

resents an important contribution to a better understanding of the relationship between the *phenomenon* of migration and the production of new *livelihoods* – conceptualised here as new fields of social reproduction within a transnational dimension. Nevertheless, certain conceptual limitations underlying this relationship are of significant concern. We discuss these limitations below.

27.2.1 The migration–development nexus

Social analysis of poverty and migration has become more common in Latin America, especially because of the emphasis placed on remittances as a resource for bridging gaps in the social system (Maimbo and Ratha 2005; Hostettler 2007).⁶ This approach seems to be an improvement, as it goes beyond the previous, rather negative, explanation of migration as resulting exclusively from the poverty of migrants and their families. So, although the rigidity of *developmentalist* thinking remains, studies of resources generated by migration as a means of overcoming poverty have introduced new discussions in many countries of origin.

The *developmentalist* approach has placed a very particular emphasis on migration, as it focuses on the effects of remittances in countries of origin. Kapur points out, for example, that “[a]s with the euphoria surrounding private capital flows in the mid-1990s, the attractiveness of remittances is in part a reaction to the failures of earlier development mantras” (Kapur 2005, p 339). In this regard, there is a clear link involving multiple dimensions of migration and development. However, the developmentalist approach applied to migration studies focuses on the assumption that resource flows from migrants could turn into potential assets that will allow societies of origin to overcome conditions of underdevelopment and poverty that gave rise to migration. Examples include remittances, social capital, and the development of productive skills.⁷ As Levitt and Nyberg-Sørensen suggest: “we can see them [remittances] as a way to rectify years of uneven development” (Levitt and Nyberg-Sørensen 2004).

As a consequence, the developmentalist approach to migration and remittances has avoided analysis of multiple factors that interact within the transnational social fields in which migrants are embedded and the interlocking networks of social relationships through which ideas, practices and resources are unequally exchanged, organised and transformed. Similarly, analysis of the strategies developed by migrants for management, transfer and use of resources obtained from migration – such as remittances – has been neglected. In this sense, the approach continues to ignore the social conditions under which such strategies are designed, on many occasions considering the migrant simply as *homo faber* or dollar-maker. In this scenario, an anthropological glance at the study of such linkages contributes to the acknowledgement of social networks as a key cultural resource that migrant people, families and communities have in developing new transnational livelihoods from migration (Lomnitz 2001).

From the point of view of this discussion, migration–development interactions should be studied from the analytical and methodological angle of inequality, rather than poverty. By contrast to the existing definition of poverty as a static condition, inequality in the proposed perspective is understood as a dynamic-relational category (Morales-Gamboa 2004; Pérez-Sáinz and Mora Salas 2007). The proliferation of studies on poverty has led to the adoption of a series of *developmentalist* and *functionalist* approaches, featuring very quantitative techniques (Gallardo and Osorio 1998). These are inadequate for measuring non-economic dimensions; yet, they still prevail, despite efforts towards more openness for qualitative research method-

ologies to improve the understanding of existing social interactions. Hence, many studies are still being reduced to the *quantitative* and *developmentalist* paradigm (Boltvinik 2003).

27.2.2 Migration, security and borders

The concept of *security* was also found to be of particular significance in the debate on migration in Central America and the Caribbean, mainly because it is associated both with migration and with a geopolitical approach beyond the migratory issue – a combination that translates into the reinforcement of border control within the study area. It therefore seems appropriate to suggest incorporating this topic in further research as well, with a focus on a critical analysis of *how* and *where* the concept of security is elaborated, as well as on the impacts of security on migrant households' projects. The rationale for this recommendation is based on the following findings.

Important evidence is being explored by Albrecht Schnabel and his colleagues from the Central University of Venezuela in Caracas, who state that migrants, besides being affected by everlasting residential and labour insecurity, are often perceived as a threat by the inhabitants of recipient territories. In this context, the methodology of multi-stakeholder workshops can help to open up new dimensions of security, giving locals the chance to consider migrants as a solution instead of as a problem (Schnabel et al 2006; Schnabel et al, in preparation).

The role of frontiers with regard to demarcation of national territories, the rise of new forms of social inequality, and the enforcement of mechanisms favouring or hindering people's access to social and environmental resources became evident in research carried out by NCCR North-South researchers in border areas between the Dominican Republic and Haiti, and in border areas of Central America. In this respect, but also in the context of social reproduction strategies, border areas have become scenarios for the redefinition of social practices (Cedano and Dilla 2005; Dilla 2006; Morales-Gamboa and Pérez 2006; Poschet 2006).

It is particularly important to re-examine the link between migration, borders and livelihoods (Thieme 2008), because "the boundaries of social fields do not necessarily overlap with those of nations. National social fields are those that stay within national boundaries, while transnational social fields connect actors, through direct and indirect relations, across borders" (Lev-

itt and Nyberg-Sørensen 2004). In a research project recently initiated by Jorge Angulo (2008), the idea is explored that rural populations in the Mexican and Guatemalan border areas have redeveloped their own social practices and strategies and become a regional society. This has enabled them to overcome distress caused by different natural events as well as the negative effects of economic globalisation – defined as the opening and deregulation of global markets.

A study by Haroldo Dilla (2006) is another important contribution to the debate on migration and borders: it examines urban borderland intermediation in the Dominican Republic. This study provides a significant analysis of the spatial, political and economic features of a border that went through a transition from a closed border (with Haiti) to one with increasing economic exchanges and interdependence between formal and informal economic activities. This opening was driven by market and commercial interests and therefore took place in a fragmented manner.

The research illustrates that in spatial terms the opening of the border between the two nations was accompanied by a profound regional restructuring, with the emergence of ‘transborder corridors’ consisting of urban networks with multiple inequities between subjects. Furthermore, the study describes how – even though the geopolitical borderline retained a major significance – major social and territorial transformations occurred that were governed by progressive formal and informal permeability of the border. This created a multiplicity of boundaries that both separate and unify the populations on the two sides of the border.

In addition to these findings, Lena Poschet (2006) provides significant evidence for how recent economic, political and societal transformation – brought about with the opening of borders between Haiti and the Dominican Republic – shapes the spatial and social development of the borderland towns of Ouanaminthe in Haiti and Dajabón in the Dominican Republic. In particular, the study explores the fact that the transformations resulting from the opening of borders have not helped to diminish existing inequalities between these neighbouring cities, nor have they strengthened social ties, despite existing functional economic interaction.

Consequently, this research illustrates how both towns on the border, Ouanaminthe and Dajabón, have developed particular forms of dependency. Whilst for a considerable number of Haitians it is important to cross over into

the Dominican city in search of better living conditions in terms of income, health care and education, for most of the residents of Dajabón consulted during the research, crossing the Masacre River into Haiti is not essential. The fact that most of these Dominicans have never been to Ouanaminthe must also be emphasised, along with a widespread fear about going there based on the belief that conditions in Ouanaminthe are unsafe and precarious.

Poschet also observed a process of internal segregation marked by internal characteristics of both populations, where functional connections were unavoidably governed by the progressive permeability of the border. Furthermore, the author points out that although bilateral trade represents a key source of revenue for Haiti and the Dominican Republic, findings show that for Haiti, in terms of Haitian migration flows, the Dominican Republic has considerable importance as a destination for the export of labour force. In this regard, Dajabón's bi-national market constitutes a crucial source of earnings for both border towns. In summary, this study demonstrates that analysis of borderland intermediation is relevant in studying the multifaceted interactions taking place in borderland spaces.

A study by Susana Martínez (2006) focuses specifically on the gender aspects of international migration: the author examined the labour situation of Guatemalan women doing domestic work in Tapachula in the Mexican province of Chiapas. Her current work explores the problems and perceptions of emigrant women from rural areas working in the domestic services sector in the borderland region between Mexico and Guatemala. The study examines the role of international migration from the gender perspective and as part of the livelihood strategies of the households to which the migrant women belong and which they leave behind when they emigrate.

27.2.3 Migration, livelihoods and social networks

The study of livelihoods and migration reveals a series of ruptures in traditional ways of interpreting social reality and social practices. One such rupture involves another view of *territorial order*, which is referred to at various levels in the transnationalisation of the social life reproduction rationale: society, locality and family. With the increasing openness of national economies and economic interpenetration, social networks have become weighty and extended. Hence, survival strategies and people's material and symbolic resources have also assumed a transnational linkage, resulting in the establishment of new scenarios of daily life and coexistence, but also of conflict (Morales-Gamboa 2007, 2008).

A second rupture, closely related to the previous, occurs between the *actor* and the *system* as an expression of *desocialisation* (Touraine 1999). The establishment of the well-known *transnational* social field approach is a demonstration of both the duality and the vital ambiguity of such a rupture. This rupture is noted in a social relationship marked by a polar or multi-local reality between the actor's place of origin and his or her place of residence, through which he or she travels under the effect of an osmotic experience, characterised by multiple or dual belongings (Benhabib 2005; Kaufmann 2008).

Concurrently, this osmotic experience relates to a third rupture, between 'social reproduction logics' and 'regulation mechanisms'. Despite the fact that migration plays a key role in maintaining the economic and socio-political order within a region, it is part of a rupture of the normative order and the established forms of regulation of social life. Migration is also an example of the current limitations in migrant people's exercise of rights and, therefore, citizenship. Migrants are prone to threats of rejection and control policies, as well as being a focus of xenophobia. In this sense, lack of access to justice, the rupture of social belonging patterns and the absence of political participation place migrant people at risk of losing their citizenship or of living in precarious conditions of citizenship (Morales-Gamboa 2008).

Another issue articulated in the study of migration and social exclusion within the NCCR North-South research programme is the concept of *citizenship*. Being poor and excluded puts migrants in a situation where they are not only *not* recognised as citizens, but where their human rights are also violated by the criminalisation of immigration. By contrast, a tolerant and inclusive civic culture would be more able to open its doors to new members because it would not doubt its own moral principles and values (Soysal 1994; Bosniak 2006).

27.2.4 Challenges for migration research in the region

Consequently, while a number of statistical, evidence-based research projects in the Central American and Caribbean region exist and suggest a link between the characteristics of migration and poverty, such associations do not turn out to be the most adequate way of explaining the existing connection between migration and livelihoods. It seems more appropriate to explore the issue of the relationship between migration and livelihoods, considering the conditions of social structure and transnational features that generate a variety of forms of inequality and social exclusion.

The concept of a ‘culture of poverty’ seems to have been evoked first by Oscar Lewis (1966), based on the idea that poor families and groups have a fairly simple system of values and that these people remain in poverty because of their adaptation to the burdens of poverty. However, understanding livelihoods from the point of view of social structure instead of the ‘culture of poverty’ concept provides further explanation of the scope of livelihoods in terms of generation of social reproduction strategies as a response to inequality and as a true resource for empowerment of the poor (Pedrazzini 2006).

The migration–livelihoods relationship, as examined in relation to the conditions of social structure, makes it possible to link the study of migration to systems of social differentiation, taking account of gender variables, ethnic characteristics, and the places of origin of migrant people. In this respect, studies of men’s and women’s participation in migration processes and its effects on households and domestic life assume greater significance (Angulo 2008).

Similarly, there are various considerations concerning a possible rationale for redesigning development policies to focus on the relationship between migration and development (Villafuerte Solís 2008). From the perspective of development, migration is considered a livelihood and transnational social practice – a matter that leads to reconfiguration of the nation-state space as an analytical category of social relationships. Therefore, a geo-economic and geopolitical view appears to be appropriate for characterising the phenomena occurring in the Central American and Caribbean region.

Consequently, it is important to re-frame the study of migration from the perspective of livelihoods. Nevertheless, it is also necessary to place this relationship within the framework of the historical specificities in which migration occurs as a product of new reconfigurations of social life reproduction strategies at the transnational level, with the intention of overcoming a strictly utilitarian and functionalist approach.

The following analytical scenarios allow us to embed the questions derived from further conceptualisation:

- The expansion of free trade and the recent signing of the Central American Free Trade Agreement (CAFTA) create new pressures that will have effects on the growth of migration flows into the U.S. labour markets. Despite the fact that these migration flows represent a solution to the crisis,

at the same time they create new forms of economic and political dependency. The region then falls into a trap where on the one hand it opens up its borders for free trade, generating processes of denationalisation of the economies and the disarticulation of local productive activities and, therefore, causing job losses. On the other hand, it implements border security measures to avoid population exodus to the United States.

- People are confronted with unemployment, abandonment of productive activities, and the risk of falling into extreme poverty, besides facing economic globalisation, trade liberalisation, economic deregulation, and increasingly intense and recurrent natural disasters, arguably due to global climate change. In response, they implement strategies such as international migration as a way to make use of social resources at various levels; they also implement family strategies, thereby boosting social networks and enhancing social capital (Angulo 2008).
- Since the migration process is the focal point of ongoing research, it is necessary to clarify that this issue involves territorial interdependence. Thus it becomes necessary to study households with regard to social environment, i.e. by implementing the notion of ‘social structure’, with the purpose of identifying the ‘social exclusion’ and ‘social integration’ dimensions of the current globalisation process and its effects on social life (Sojo and Pérez 2003).⁸ Hence the way to approach the issue could be through ‘family units’, in order to observe their transformation and interaction with social structures.

As a result of these analytical scenarios, the following strategic research focus has been formulated by the NCCR North-South research team in the Caribbean and Central American region for Phase 3 of the NCCR North-South programme: identification and innovative promotion of social practices and mitigation of the effects of global change, through an analysis of livelihoods, strategies for poverty alleviation, and phenomena derived from migration practices.

27.3 Conclusions

Central American and Caribbean societies constitute a heterogeneous and fragmented region characterised by social polarisation and weak governance; where such conditions have stunted economic growth and caused con-

flicts, there have been wars – civil wars as in Central America during the 1980s – and continual political instability, as in Haiti. These developments have in turn generated heavy expulsion of populations, whether as refugees or as new international migration flows. This diaspora, far from resolving institutional and structural weaknesses in the countries of origin, has aggravated social inequalities and added new forms of dependency, instability, conflict and insecurity.

Although there is a common perspective suggesting a link between migration and poverty, an attempt to understand the relationship between *migration* and *livelihoods* from the standpoint of *social structure* and *living conditions* instead of from the perspective of a *culture of poverty*, allows for a broader explanation of the scope of such relationships in the development of social life reproduction strategies, while envisaging migration as an answer to problems of inequality and as a resource for empowering the poor. By re-framing the study of migration from the perspective of livelihoods, it is both possible and necessary to adopt a historical approach in order to analyse the dynamics of migration as a product of the reconfiguration of social life reproduction strategies at transnational scales, and in order to overcome strictly utilitarian and functionalist visions of migration.

In conclusion, the analytical relationship between migration, livelihoods and social practices allows for new steps to be taken in reflecting on the Central American and Caribbean region. If the results of previous phases of research are to be linked with ongoing research, it will be important to identify new thematic fields and scenarios of analysis related to the key problems in the region, under the theoretical and conceptual lens of the NCCR North-South.

Endnotes

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⁴ All countries, except for El Salvador, have coasts on the Caribbean Sea.

⁵ Further elaboration of these ideas can be found in Villafuerte Solís and García Aguilar (2008). On violence and insecurity, see also Pedrazzini (2005).

⁶ Silvia Hostettler conducted research on land-use changes, transnational migration and the impact of remittances in western Mexico for her PhD in Phase 1 of the Swiss National Centre of Competence in Research (NCCR) North-South programme (Hostettler 2007). This research was based on a political ecology approach. The results show that the impact of remittances on land-use changes is variable and depends on the socio-economic, political and environmental context of the community as well as the individual situation of the migrant household.

⁷ Further elaboration of these ideas can be found in Levitt and Nyberg-Sørensen 2004.

⁸ For a more extended analysis of such topics in the Latin American context we recommend the other articles compiled in Sojo 2003, especially Franco 2003 and Gordon 2003.

References

Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- Angulo J. 2008. De las montañas de Chiapas a los Estados Unidos, pasando por el Soconusco. Las prácticas migratorias de los campesinos indígenas de Chiapas. In: Villafuerte Solís D, García Aguilar MC, editors. *Migraciones en el Sur de México y Centroamérica*. Mexico City, Mexico: Miguel Ángel Porrúa, pp 321–342.
- * Barrera A, Bolay JC, García C, Hostettler S, Gerritsen PRW, Mejía R, Ortiz C, Sánchez M, Pedrazzini Y, Poschet L, Rabinovich A. 2004. JACS Central America and the Caribbean. Key challenges of sustainable development research priorities: Social practices as driving forces of change. In: Hurni H, Wiesmann U, Schertenleib R. *Research for Mitigating Syndromes of Global Change: A Transdisciplinary Appraisal of Selected Regions of the World to Prepare Development-oriented Research Partnerships*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 1. Bern, Switzerland: Geographica Bernensia, pp 293–327.
- Benhabib S. 2005. *Los derechos de los otros. Extranjeros, residentes y ciudadanos*. Barcelona, Spain: Editorial Gedisa.
- Boltvinik J. 2003. Tipología de los métodos de medición de la pobreza. Los métodos combinados. *Comercio Exterior* 63(5):453–463.
- Bosniak L. 2006. *The Citizen and the Alien: Dilemmas of Contemporary Membership*. Princeton, NJ: Princeton University Press.
- Cedano S, Dilla H. 2005. De problemas y oportunidades: intermediación urbana fronteriza en República Dominicana. *Revista Mexicana de Sociología* 67(1):99–126.
- * Dilla H. 2006. *Urban Borderland Intermediation in the Dominican Republic: Three Case Studies* [PhD dissertation]. Lausanne, Switzerland: Ecole Polytechnique Fédérale de Lausanne (EPFL); also available at: <http://www.ciudadesyfronteras.com/documentos/tesisharoldodilla.pdf>; accessed on 14 August 2009.
- ECLAC [Economic Commission for Latin America and the Caribbean]. 2006. *International Migration*. Latin American and the Caribbean Demographic Observatory Vol. 1. Santiago, Chile: Latin American and Caribbean Demographic Centre (CELADE) – Population Division of ECLAC and United Nations. Also available at: <http://www.eclac.org/publicaciones/xml/8/27498/Observatoriodemografico.pdf>; accessed on 14 August 2009.
- Franco R. 2003. Major themes in the social development of Latin America and the Caribbean. In: Sojo C, editor. *Social Development in Latin America: Issues for Public Policy*. San José, Costa Rica: Facultad Latinoamericana de Ciencias Sociales (FLACSO) and The World Bank, pp 61–102.
- Gallardo R, Osorio J. 1998. *Los rostros de la pobreza. El debate*. Mexico City, Mexico: Universidad Jesuita de Guadalajara (ITESO) and Universidad Iberoamericana.
- Gordon S. 2003. Social development and citizenship rights. In: Sojo C, editor. *Social Development in Latin America: Issues for Public Policy*. San José, Costa Rica: Facultad Latinoamericana de Ciencias Sociales (FLACSO) and The World Bank, pp 143–204.
- * Hostettler S. 2007. *Land Use Changes and Transnational Migration: The Impact of Remittances in Western Mexico* [PhD dissertation]. Lausanne, Switzerland: Ecole Polytechnique Fédérale de Lausanne (EPFL) and Swiss National Centre of Competence in Research (NCCR) North-South.
- Kapur D. 2005. Remittances: The new development mantra? In: Maimbo SM, Ratha D, editors. *Remittances: Development and Impact and Future Prospects*. Washington, D.C.: The World Bank, pp 331–360.
- * Kaufmann V. 2008. *Les paradoxes de la mobilité*. Lausanne, Switzerland: Presses Polytechniques et Universitaires Romandes (PPUR).
- Levitt P, Nyberg-Sørensen N. 2004. *The Transnational Turn in Migration Studies*. Global Migration Perspectives No. 6. Also available at: <http://www.gcim.org/gmp/Global%20Migration%20Perspectives%20No%206.pdf>; accessed on 29 July 2009.

- Lewis O. 1966. The culture of poverty. In: Gmelch G, Zenner W, editors. *Urban Life*. Prospect Heights, IL: Waveland Press, pp 393–403.
- Lomnitz L. 2001. *Redes Sociales, cultura y poder. Ensayos de antropología latinoamericana*. Mexico City, Mexico: Miguel Ángel Porrúa and Facultad Latinoamericana de Ciencias Sociales (FLACSO).
- Maimbo SM, Ratha D. 2005. *Remittances: Development and Impact and Future Prospects*. Washington, D.C.: The World Bank.
- * Martínez S. 2006. *International Migration on the Southern Border of Mexico: Guatemalan Women as Domestic Workers in Tapachula, Chiapas* [MSc research project]. San Cristóbal de las Casas, Mexico: Centro de Estudios Superiores de México y Centroamérica (CESMECA), Universidad de Ciencias y Artes de Chiapas (UNICACH). Available from Daniel Villafuerte Solís.
- Morales-Gamboa A. 2004. *La formación de redes de activos sociales en las estrategias frente a la pobreza: el caso de León Norte en Nicaragua*. Final Report of the Becas research programme on poverty in Central America and the Caribbean. San José, Costa Rica: Comparative Research Programme on Poverty of the Latin American Council of Social Sciences (CLACSO-CROP).
- Morales-Gamboa A. 2007. *La diáspora de la posguerra: regionalismo de los migrantes y dinámicas territoriales en América Central*. San José, Costa Rica: Facultad Latinoamericana de Ciencias Sociales (FLACSO).
- Morales-Gamboa A. 2008. Migraciones, regionalismo y ciudadanía en Centroamérica. In: Villafuerte Solís D, García Aguilar MC, editores. *Migraciones en el Sur de México y Centroamérica*. Mexico City, Mexico: Miguel Ángel Porrúa, pp 49–75.
- * Morales-Gamboa A, Pérez M. 2006. *Las prácticas sociales de transformación en el espacio urbano. El caso de la intermediación fronteriza entre San Carlos de Nicaragua y Los Chiles de Costa Rica*. Swiss National Centre of Competence in Research (NCCR) North-South Phase 1 Final Research Report. San José, Costa Rica: Facultad Latinoamericana de Ciencias Sociales (FLACSO).
- * Pedrazzini Y. 2005. *La violence des villes*. Paris, France: Editions de l'Atelier.
- * Pedrazzini Y. 2006. *Joint Area of Case Studies Caribbean and Central America (JACS CCA): From Phase 1 to Phase 2 – A Series of Scientific and Institutional Transitions*. Paper presented at the JACS Horn of Africa 2nd Regional Workshop of the Swiss National Centre of Competence in Research (NCCR) North-South, Bahr Dar, Ethiopia, 21–25 February 2006. Available from Yves Pedrazzini (yves.pedrazzini@epfl.ch).
- Pérez Sáinz JP, Mora Salas M. 2007. *La persistencia de la miseria en Centroamérica: una mirada desde la exclusión social*. San José, Costa Rica: Facultad Latinoamericana de Ciencias Sociales (FLACSO). Also available at: http://www.enlaceacademico.org/uploads/media/La_Persistencia_OK_01.pdf; accessed on 12 October 2009.
- * Poschet L. 2006. *Villes à la frontière et transformation de l'espace: le cas de Haiti et la République Dominicaine* [PhD dissertation]. Lausanne, Switzerland: Ecole Polytechnique Fédérale de Lausanne (EPFL).
- Sassen S. 2006. *Territory, Authority, Rights: From Medieval to Global Assemblages*. Princeton, NJ: Princeton University Press.
- * Schnabel A, Antillano JA, Granda Alviarez IC, Pedrazzini Y. In preparation. Operationalising human security in an urban setting: The experience of Caracas. In: Hurni H, Wiesmann U, editors. *Research for Development: A Synthesis of NCCR North-South Research, 2001–2008* [working title]. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 6. Bern, Switzerland: Geographica Bernensia. Manuscript available from Yves Pedrazzini (yves.pedrazzini@epfl.ch).
- * Schnabel A, Bürgi A, Pedrazzini Y, Shiferaw M, Iskakova GT, Supanaliyev BT, Antillano JA, Granda Alviarez IC. 2006. *Operationalising Human Security for Livelihood Protection: Analysis, Monitoring and Mitigation of Existential Threats by and for Local Communities*. Swiss National Centre of Competence in Research (NCCR) North-South Transversal Research Project. <http://www.north-south.unibe.ch/content.php/page/id/78>; accessed on 14 August 2009.
- Sojo C, editor. 2003. *Social Development in Latin America: Issues for Public Policy*. San José, Costa Rica: Facultad Latinoamericana de Ciencias Sociales (FLACSO).

- Sojo C, Pérez JP. 2003. Introduction: Reinventing the social dimension in Latin America. *In*: Sojo C, editor. *Social Development in Latin America: Issues for Public Policy*. San José, Costa Rica: Facultad Latinoamericana de Ciencias Sociales (FLACSO) and The World Bank, pp 13–60.
- Soysal YN. 1994. *Limits of Citizenship: Migrants and Postnational Membership in Europe*. Chicago, IL: The University of Chicago Press.
- * Thieme S. 2008. Sustaining livelihoods in multi-local settings: Possible theoretical linkages between transnational migration and livelihood studies. *Mobilities* 3(1):51–71.
- Touraine A. 1999. *Crítica de la modernidad*. Buenos Aires, Argentina: Fondo de Cultura Económica.
- Villafuerte Solís D. 2008. Migración y desarrollo en el Área del Plan Puebla Panamá. *In*: Villafuerte Solís D, García Aguilar MC, editores. *Migraciones en el Sur de México y Centroamérica*. Mexico City, Mexico: Miguel Ángel Porrúa, pp 171–217.
- Villafuerte Solís D, García Aguilar MC. 2008. *Migraciones en el Sur de México y Centroamérica*. Mexico City, Mexico: Miguel Ángel Porrúa.

28 Governance, Environmental Problems and Local Responses in Mexico, Central America and the Caribbean

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Abstract

Development in the Mexican, Central American and Caribbean region today is heavily influenced by economic globalisation, causing transformations of its societies. Legal reforms, the retreat of the state and free trade arrangements strengthen the role of national and transnational actors but weaken local stakeholders. This has led to the exclusion of many local actors and has had negative impacts on the natural environment. The present article illustrates that social processes in the Central American region are highly differentiated, as they are influenced by a great number of different factors. Ongoing research seeks to analyse factors that delay or prevent solutions from being implemented or from being sustainable. It also aims to understand concrete responses and processes of social change among local actors. The article is based on a synthesis of several research projects focusing on governance, environmental problems and local responses, within a thematic framework developed by researchers participating in the Swiss National Centre of Competence in Research (NCCR) North-South, a research programme on mitigating syndromes of global change. The framework was designed to enable an integrated approach to environmental problems and their underlying causes, and an analysis of local actors' responses regarding problems and solutions.

Keywords: Governance; environmental problems; local responses; Mexico; Central America; the Caribbean.

28.1 Introduction

We live in a highly globalised world characterised by increasing interdependence among nations. The term ‘globalised’ also refers to awareness of the world as a ‘whole’, redefining our thinking about many issues (Waters 1996). In the economic sphere, globalisation has to do with production, distribution and consumption of goods and services; it also relates to trade agreements and capital accumulation. In the political sphere, national and world governance are at issue. Finally, in the socio-cultural sphere, new expressions and symbols have emerged, which are exchanged at global scale through new patterns of social life (ibid.). The impacts of globalisation are multidimensional and affect multiple social actors, whose actions may take place at different organisational levels. In summary, globalisation impacts both daily social life and the natural environment.

The complexity of globalisation and its impacts represent a challenge to scientists seeking to promote sustainable development. Several academic institutions from Mexico, Central America and the Caribbean⁶ designed development-oriented research projects on sustainability issues within the framework of the Swiss National Centre of Competence in Research (NCCR) North-South programme (Hurni et al 2004). This article presents work conducted within the line of research on governance, environmental problems and local responses; after outlining the overall design of the research conducted and clarifying some theoretical concepts, it presents results, synthesising them in a discussion and drawing conclusions.

28.2 Research design and methodology

The projects in our line of research explore the changes brought about by globalisation in Mexico, Central America and the Caribbean, and focus on the responses of actors and institutions to these changes, as well as on gaining a better understanding of governance processes related to environmental management, including the socio-cultural and health dimensions. Currently, these issues are being investigated in three graduate theses and one post-doctoral research project (Chamizo 2008; Guerrero 2008; Masson 2008; Salcido 2008). Although these projects apply different methodologies, they share an actor-oriented perspective, comparing views and strategies of different actors, such as farmers, politicians, scientists, and others. This article is the result of group discussions on results and theoretical concepts, held by

the authors during the period from October 2007 through 2008 and based on a draft paper that was circulated and modified by the participating authors, resulting in the current final version.

28.3 Theoretical concepts and empirical evidence

Nature, resources, actors and governance processes are central concepts in this article. Nature (or the environment) is understood as ‘what is out there’, i.e. the world surrounding human beings. Indeed, many natural attributes surround us, such as trees, crops, animals, land, soil, forests, air, etc. Nature can thus be considered a biophysical entity that allows human beings (i.e. actors) to produce, harvest, gather, or hunt, as well as to smell, taste, touch, hear, or feel (natural resources) (Ingold 1996). In relation to this concept of nature, an understanding of ecological evolution plays a crucial role. Social, cultural, political and economic relationships also need to be included in this framework. They vary according to geographic location, infrastructure, season and activities performed. In other words, nature is produced and reproduced through both ecological evolution and a historical process of occupation and transformation of space by an entire society; it is therefore the result of a historical synthesis of nature–society exchanges (Botkin and Keller 2005; Gerritsen and Morales 2007).

Anthropogenic activities can cause environmental deterioration, for example in the quality of air and water, through generation of solid waste and wastewater, as well as through soil erosion and contamination. The current origin of many of these problems is linked to globalisation (Gerritsen and Morales 2007; Hostettler 2007). One of the negative consequences of globalisation that can be observed is unbalanced appropriation of nature, challenging governments to design sustainable management systems. This involves renewing nature–society relationships; in this respect, transdisciplinary approaches to natural resource management are promising (Hurni et al 2004).

Local actors are of strategic importance in natural resource management since they have a vested interest in sustainable development. An actor’s strategy is guided by values as well as potentials and limitations arising from the context in which action is embedded (Long 2001). The local context is the socio-physical space in which action acquires specificity. It not only contains local resources but is also the space where social processes such as

globalisation (as a whole) manifest their influence (Gerritsen and Morales 2007). Actors' strategies are dynamic; they change as a result of local and external processes. Moreover, the local context is not the exclusive space of one actor; on the contrary, a great many social actors encounter one another here. These encounters can be highly heterogeneous in nature and often include power struggles. Thus, the local context is an *arena* where actors negotiate values and worldviews (Leeuwis 2000). An actor's ability to influence the local context depends on their degree of agency, i.e. their knowledge of the (ecological, political and socio-economic) context and their ability to change it (Long 2001; Portner 2005; Bowen and Gerritsen 2007).

Mega-projects are a current trend in Mexico, Central America and the Caribbean; their aim is to optimise natural resource management in unexploited areas. They operate in highly strategic geopolitical spaces of great biological and cultural wealth. Efforts to strengthen these projects in public policies have been intensified during the past decade, as exemplified by the Plan Puebla Panamá (PPP), the North American Free Trade Agreement (NAFTA), and the United States, Central American and Dominican Republic Free Trade Agreement (RD-CAFTA), all of which are specific to the region. These policies are characterised by a contradiction: on the one hand, they pave the way for the construction of dams, bridges, highways, harbours and other infrastructure, and also allow for the introduction of agro-industrial production systems or mass tourism projects. On the other hand, they focus on intensified conservation and the creation of protected natural areas. They are also accompanied by new discourses that focus on nature protection and renewed attention to indigenous cultures. Consequently, new types of projects are emerging, such as eco- and ethno-touristic development projects (UNEP 2000; Escárzaga and Gutiérrez 2005; Masson 2008). Conflicting interests among local, national and transnational actors generate contradictions among different types of projects. For example, transnational companies are exploiting protected areas for tourism, genetics, aquifers, mining, timber, and oil (Fundación PROLANSTATE 2005; Viehweider 2007).

Within this context, sustainable development can turn out to be paradoxical. Projects and policies not based on indigenous rights and participation foster renewed expressions of racism and colonialism, and concretely threaten indigenous culture and territory (Minh-ha 1989; Restrepo 2004; Stavenhagen 2005; Masson 2006). Despite the recent approval of the Universal Declaration of Indigenous Rights by the United Nations, there are numerous violations against indigenous communities and organisations.

Governmental institutions play an important role in achieving sustainability. Often, however, problems in the local context are related to a lack of political will, insufficient promotion and low public awareness, poor policies at all levels, weak institutional frameworks, inappropriate and poorly utilised resources, and the absence of consideration of consumer preferences (Eawag/Sandec 2006; André de la Porte 2007).

Public policies can be understood as an interrelated set of decisions focusing on a specific area of social conflict or tension. Decisions are taken within a public institutional framework, which grants them enforcement capacity (Vallés 2002). Nevertheless, decisions should be adapted to the particularities of each locality. Thus conciliation among differing interests is important. Until now, many policies have been implemented in a top-down manner; this approach is based on the hierarchical primacy of (formal) authority with an autocratic management style and discontinuity between political administrative universes. In this model, hierarchical control is supposed to be sufficient to assure the desired effects (Meny and Thoenig 1992; Gerritsen and Morales 2007). However, collective actions developed in this way may fail to address the specific needs of certain actors, especially when representation is not – or only partially – recognised by political elites or (public or private) service providers. Such situations frequently lead to repressive action and human rights violations. Women's rights are especially vulnerable to such policies, which reinforce pre-existing gender differences (Masson 2008).

Current trends in Latin America, in general, and in the region under discussion, in particular, are geared towards privatisation of public services, assuming a progressive change in the role of the state regarding stewardship and regulation. However, the state often lacks capacity, and institutional design frequently does not favour market regulation (Chamizo 2008). Furthermore, the development of efficiency-oriented managerial models has displaced issues such as equity, sustainability, and resource access (UNEP 2000). Consequently, proposals for the democratisation of public management, which imply the development of citizenship in favour of equality and take account of the development of liberal democracies based on the participation of civil society, have become important. Such democratisation of public management has been carried out based on the design, implementation and development of the concept of governance (Chamizo 2008). In the present article we understand governance as the process of interaction between different actors for political decision-making within both formal

and informal institutional frameworks. Governance refers to government action that directs or guides interaction between actors towards solving conflicts and fulfilling needs (Kersbergen and Waarden 2001; Prats 2003).

From the perspective of governance, appropriate policy application relates to the formulation of objectives in such a manner that they can gradually be adapted to specific local conditions and thus are more easily linked to specific actor perspectives. Such adaptation not only depends on policy implementers but also on the context, the actors, and the particular social relationships constructed in the course of interaction (Vallés 2002). An institutional approach to actor coordination, including the participation of society at large, is required to find integral solutions to environmental problems that also allow for (active) inclusion of local actors' interests and perspectives.

28.4 Environmental costs and social problems

In Mexico, Central America and the Caribbean, the environmental costs of globalisation are high and will further increase unless the issues of social problems, economic stability and urban growth are resolved (Barrera et al 2004; André de la Porte 2007; Gerritsen and Morales 2007; Hostettler 2007). The main environmental problems that affect populations in terms of food security and cultural sovereignty are: water pollution and depletion and conflicts deriving from water use and management; excessive exploitation of land and marine resources; loss of biodiversity and habitat degradation; overgrazing; erosion of soil and loss of nutrients; deforestation; atmospheric pollution; contamination from heavy metals, pharmaceutical and industrial products; and lack of urban solid waste management (UNEP 2000; Schwentesius et al 2003; Barrera et al 2004). Related to this, land privatisation and mega-project development in many countries influence access to resources and self-sufficiency among local actors. In Mexico, a clear example of this is the 1992 agrarian reform and the subsequent weakening of rural community structures, which facilitated land sale and purchase. In Guatemala, similar processes are occurring within the framework of the latest agrarian reform (Janvry et al 1997).

Economic globalisation also affects agricultural production through the transformation of traditional diversified farming systems into mono-cultures (Portner 2005; Gerritsen and Morales 2007; Hostettler 2007). For instance, in the Garifuna zone of the northern coast of Honduras, indigenous communities find that single-crop farming and tourism projects limit their ability to continue fishing or growing cassava and rice. Their access to both the

sea and the land is reduced, if not altogether made impossible, which in turn increases migratory flows (Masson 2008). Moreover, remittances are emerging as a major source of survival and are reinforcing further monetarisation of farming communities (Portner 2005; Hostettler 2007; Viehweider 2007).

An important cultural impact of globalisation is related to changes in local actors' worldviews regarding nature, which is being valued more in economic or instrumental terms, thus affecting ancestral visions and imagery (Tuhiwai Smith 1999). This impact has complex consequences, especially when it leads to a process of identity recovery by means of tourism projects, for example, as in the case of the Lenca Route in Honduras, where it generated intra-community divisions (Masson 2008).

Gender issues in Mexico, Central America and the Caribbean are related to environmental problems. Reduced access to land is reinforced by gender discrimination that attributes land ownership mostly to men. Land privatisation represents a drawback for women's access to land (Arizpe 1989; Masson 2006). Current trends also reinforce gender differences with respect to food security and sovereignty: women are the ones who accept work overloads to provide family security, although they are first to suffer from food scarcity and its associated health problems. When new management schemes are developed for resolving environmental problems – for example, water contamination, reduced water availability or firewood scarcity – households are directly affected, particularly those managed by women. Women's health can be affected by pollution, but also by work overloads (Masson 2008).

Globalisation also has sanitary repercussions in Mexico, Central America and the Caribbean. In Costa Rica, almost 70% of the population have septic tanks, which is an appropriate solution when population densities are low; however, population density has increased, demanding new public regulations and policies. Despite this development, the regulatory framework established by the state has not changed, and continues to promote technologies that are inappropriate under the new conditions. Inadequate use of technology and lack of flexibility in public policies, also in terms of financial resources for infrastructure maintenance, have caused increased exposure to contamination and susceptibility to disease. It is usually women and children who are the most vulnerable, since they spend most of their time within their communities (Portner 2005) and come into contact with the environment more directly (e.g. when washing clothes or playing in contaminated water). Moreover, these groups generally have more limited access to health services (WSSCC 2006).

28.5 Responses from local actors and institutions

Globalisation has strengthened processes of migration by farmers and rural labourers to the cities in search of work, services and wealth (Portner 2005; Hostettler 2007). However, migrants in Mexico, Central America and the Caribbean often arrive at their destination with no skills, no contacts and nowhere to live. As a consequence, they are forced to build their own shelters in the most marginalised areas of the cities: ravines, dumps, and the peri-urban fringes that no one else will occupy (Torres 2008). Without water or sanitation services, access to transportation, or legal access to services, the residents of these informal settlements (slums) live in dangerous, unhealthy, contaminated surroundings. The lack of political interest in these areas or of political will to change the situation manifests itself in appalling conditions: standing, undrained water favours the proliferation of malaria and dengue, open defecation causes a near-constant epidemic of diarrhoea and skin disease, women are routinely assaulted at night when seeking a place to relieve themselves, and 'merchants' of clean water charge up to 6800% of what someone connected to the city network would pay (Davis 2006).

However, these problems have not gone unnoticed, and there are options for solutions; in fact, there are many. Where there is no access to a well or an aqueduct, rainwater can be collected to meet domestic needs and, in certain cases, to serve as a source of drinking water, thus reducing the need to purchase water or carry it over long distances (Gould and Nissen-Petersen 1999). Light or energy for cooking can be generated using bio-digesters that simultaneously collect and sterilise faecal material, thereby improving the health and well-being of both the owner (the family) and the community as a whole (FAO 1996; Rose 1999). In this respect, it is important to note that the problems of improving environmental sanitation (i.e. sanitation, solid waste, drainage, and water) are not technical, but institutional, legal and psychological. They are not technical, because cost-effective, appropriate technologies exist for almost every situation; the problem is more often the reluctance of city engineers and planners to venture the unknown. Furthermore, the design of codes and laws in Mexico and most Central American and Caribbean countries is inspired by earlier colonial legislation; in many cases alternative technologies are not only considered unsavoury, but are downright illegal (Chamizo 2008). In Costa Rica, for example, only septic tanks and sewer systems designed according to strict regulations are legal: an enormous and unnecessary barrier to making any progress towards sustainable sanitation for vulnerable populations. Management of alternative

solutions and overcoming the taboos associated with 'shit' are harder still; nevertheless, confronted with the choice between dying in filth or taking action, communities have stopped waiting for long-promised sewers and have started to act. One approach is that of Household-Centred Environmental Sanitation (Eawag/Sandec 2006), which can take place in private and public spaces, and with or without governmental or non-governmental support. However, self-management solutions are based on the assumption that local interest organisations and appropriate tools exist. Failures of self-management projects are often related to contexts of oppression, insecurity and weak local organisation, all of which are symptoms that drove people to these places in the first place (Smith and Marin 2004).

The current situation is a waiting game played out between governments that have no interest in or resources for financing services for 'slums', on the one hand, and the residents who endure increasingly dismal living conditions, on the other. Only rapid dissemination of knowledge (and not improved technologies!), social marketing leading to problem awareness (hygiene promotion) and the rewriting of archaic codes and laws will free the roughly 30% (Schteingart 1989) of Latin American city dwellers from the unserved environmental peril in which they live (Torres 2008).

It should be noted that despite the far-reaching impact of globalisation in Mexico, Central America and the Caribbean, a growing number of local actors are seeking alternative strategies to halt its negative effects (Toledo 2000; Gerritsen and Morales 2007). In rural areas, strategies seek to reinforce diversification, family employment and local resource use. These strategies arise not only in agricultural production, but also in the social, economic, technical and political fields (Toledo 2000; Portner 2005; Gerritsen and Morales 2007). Additionally, experience with these strategies demonstrates that it is possible to construct endogenous development models (Gerritsen and Morales 2007) which may serve as a platform for the design of new public policies that respond efficiently to the social, economic and environmental problems and necessities of each region (André de la Porte 2007; Hostettler 2007). Often, the design and implementation of these new development models, based on local actors' agency, productive autonomy and the creation of new rural-urban linkages, is an outcome of collective action of political organisations and social movements (Gerritsen and Morales 2007).

In Mexico, Central America and the Caribbean, many social movements are facing the local effects of globalisation and actively seeking to transform

their local realities through sustainable alternatives, including public policies and institutions. Regarding natural resources, their orientation is directed towards defending their ecological, food and cultural sovereignty on their territory. Their struggles have also generated new socio-cultural demands that focus on self-determination (Diaz-Polanco 1999; Escárzaga and Gutiérrez 2005). Moreover, they address the issue of sustainability by resisting land and resource privatisation and by proposing (and enforcing) other types of management and a different type of society–nature relationship (Gerritsen and Morales 2007).

28.6 Discussion and conclusion

In this article, we described research concerned with governance, environmental problems and local responses in Mexico, Central America and the Caribbean. We also presented the most important regional issues. Social processes in Mexico and the various Central American and Caribbean countries are highly differentiated and are influenced by a great many factors. Ongoing research is analysing these factors from the perspective of sustainable development.

The search for a (new) democratic governance model is a key issue, implying actor participation in supporting institutional frameworks that permit increased local decision-making (André de la Porte 2007). Conflict resolution as part of these democratic governance processes demands interaction between multiple actors in order to guarantee human rights and fulfilment of basic needs. Currently, both issues are pressing within the region, and special attention must be paid to gender issues. Making gender-related problems, activities and roles in sustainable development and democratic governance processes visible is the first step towards achieving equitable transformations and consequently equitable societies (Yuval-Davis 1997; Pateman 2000; Kabeer 2005).

In summary, governance research should necessarily include the search for sustainable development schemes that are constructed above all at the local level, thus allowing for a more democratic society to develop in a healthy environment. The acceptance of such representative democracy depends on the participation of, and on trust between, the actors involved. In this respect, Mexico, Central America and the Caribbean are still barren ground.

Endnotes

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⁶ These institutions are included in the Joint Area of Case Studies (JACS) Central America and the Caribbean (CCA), a component of the NCCR North-South programme.

References

Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- * André de la Porte C. 2007. *Integrated Water Resources Management: Limits and Potential in the Municipality of El Grullo, Mexico* [PhD dissertation]. Lausanne, Switzerland: Ecole Polytechnique Fédérale de Lausanne (EPFL) and Swiss National Centre of Competence in Research (NCCR) North-South.
- Arizpe L. 1989. *Women in the Development of Mexico and Latin America* [in Spanish]. Mexico City, Mexico: Centro Regional de Investigaciones Multidisciplinarias (CRIM) and Universidad Nacional Autónoma de México (UNAM).
- * Barrera A, Bolay JC, García C, Hostettler S, Gerritsen PRW, Mejía R, Ortiz C, Sánchez M, Pedrazzinni Y, Poschet L, Rabinovich A. 2004. JACS Central America and the Caribbean. Key challenges of sustainable development and research priorities: Social practices as driving forces for change. In: Hurni H, Wiesmann U, Schertenleib R, editors. *Research for Mitigating Syndromes of Global Change: A Transdisciplinary Appraisal of Selected Regions of the World to Prepare Development-oriented Research Partnerships*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 1. Bern, Switzerland: Geographica Bernensia, pp 293–327.
- Botkin DB, Keller EA. 2005. *Environmental Science: Earth as a Living Planet*. 5th edition [1982¹]. New York, NY: John Wiley and Sons.
- * Bowen S, Gerritsen PRW. 2007. Reverse leasing and power dynamics among agave farmers in western Mexico. *Agriculture and Human Values* 24(4):473–488.
- * Chamizo GHA. 2008. *Analysis of the Management of Public Policies for Environmental Sanitation in Human Settlements in Costa Rica, in the Period 1998–2006* [in Spanish; PhD dissertation]. San José, Costa Rica: University of Costa Rica.
- Davis M. 2006. *Planet of Slums*. New York, NY: Verso.
- Diaz-Polanco H. 1999. *Regional Autonomy: The Autodetermination of the Indian People* [in Spanish]. Mexico City, Mexico: Siglo XXI Editores.
- * Eawag/Sandec [Swiss Federal Institute for Aquatic Science and Technology, Department of Water and Sanitation in Developing Countries]. 2006. *Household-Centred Environmental Sanitation* [in Spanish]. Dübendorf, Switzerland: Eawag.
- Escárzaga F, Gutiérrez R, editors. 2005. *The Indigenous Movement in Latin America: Resistance and Alternative Project* [in Spanish]. Mexico City, Mexico: Benemérita Universidad Autónoma de Puebla (BUAP), Universidad Nacional Autónoma de México (UNAM), Universidad Autónoma de la Ciudad de México (UACM).
- FAO [Food and Agriculture Organization of the United Nations]. 1996. *Biogas Technology: A Training Manual for Extension*. Kathmandu, Nepal: FAO and Consolidated Management Services Nepal (CMS).
- Fundación PROLANSTATE [Fundación para la Protección de Lancetilla, Punta Sal e Tixiguat]. 2005. *Technical Report of the PROLANSTATE Foundation Regarding the Environmental Impact Study of the Project Los Micos Beach and Golf Resort* [in Spanish]. Tela, Honduras: Fundación PROLANSTATE. Also available at: <http://www.scribd.com/doc/11564217/Respuesta-Prolansate-a-Los-Micos-Beach-Resort>; accessed on 27 February 2009.
- * Gerritsen PRW, Morales J. 2007. *Local Responses to Economic Globalization: Regional Products from the South Coast Region of Jalisco* [in Spanish]. Guadalajara, Mexico: University of Guadalajara, Universidad Jesuita de Guadalajara (ITESO), Red de Alternativas Sustentables Agropecuarias de Jalisco (RASA).
- Gould J, Nissen-Petersen E. 1999. *Rainwater Catchment Systems for Domestic Supply, Design, Construction and Implementation*. London, UK: Intermediate Technology Publications.
- * Guerrero AA. 2008. *Analysis of Water Governance Processes on the Santiago and Ayuquila Rivers in the State of Jalisco* [in Spanish; PhD proposal]. Autlán, Mexico: University of Guadalajara and Swiss National Centre of Competence in Research (NCCR) North-South. Available from Alejandra Guerrero de León.

- * Hostettler S. 2007. *Land Use Changes and Transnational Migration: The Impact of Remittances in Western Mexico* [PhD dissertation]. Lausanne, Switzerland: Ecole Polytechnique Fédérale de Lausanne (EPFL) and Swiss National Centre of Competence in Research (NCCR) North-South.
- * Hurni H, Wiesmann U, Schertenleib R. 2004. *Research for Mitigating Syndromes of Global Change: A Transdisciplinary Appraisal of Selected Regions of the World to Prepare Development-oriented Research Partnerships*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 1. Bern, Switzerland: Geographica Bernensia.
- Ingold T. 1996. Hunting and gathering as ways of perceiving the environment. In: Ellen R, Fukui K, editors. *Redefining Nature: Ecology, Culture and Domestication*. Explorations in Anthropology. Oxford, UK: Berg, pp 117–156.
- Janvry A de, Gordillo G, Sadoulet E. 1997. *Mexico's Second Agrarian Reform: Household and Community Responses, 1990–1994*. Ejido Reform Research Project. La Jolla and San Diego, CA: Center for U.S.–Mexican Studies (USMEX) and University of California.
- Kabeer N, editor. 2005. *Inclusive Citizenship: Meanings and Expressions*. London, UK: Zed Books.
- Kersbergen K van, Waarden F van. 2001. *Shifts in Governance: Problems of Legitimacy and Accountability*. The Hague, The Netherlands: Social Science Research Council (MaGW) of the Netherlands Organization for Scientific Research (NWO). Also available at: <http://www.uu.nl/uupublish/content/NWOShiftsinGovernanceDefText.PDF>; accessed on 28 July 2009.
- Leeuw C. 2000. Reconceptualising participation for sustainable rural development: Towards a negotiation approach. *Development and Change* 31:931–959.
- Long N. 2001. *Development Sociology: Actor Perspectives*. London, UK: Routledge.
- * Masson S. 2006. Sexe/genre, classe, race: décoloniser le féminisme dans un contexte mondialisé. Réflexions à partir de la lutte des femmes indiennes au Chiapas [in French with English abstract]. *Nouvelles Questions Féministes* 25(3):56–75.
- * Masson S. 2008. *Conflicts on Indigenous Territoriality in Honduras: A Gender and Post-colonial Perspective*. Paper presented at the Swiss National Centre of Competence in Research (NCCR) North-South Site Visit at Universidad Nacional Autónoma de Honduras (UNAH) in Tegucigalpa, Honduras, on 21–25 April 2008. Available from Sabine Masson.
- Meny I, Thoenig JC. 1992. *Public Policies* [in Spanish]. Barcelona, Spain: Ciencia Política.
- Minh-ha T. 1989. *Woman, Native, Other*. Bloomington and Indianapolis, IN: Indiana University Press.
- Pateman C. 2000. Feminism and democracy [in French]. In: Ballmer-Cao TH, Mottier V, Sgier L, editors. *Genre et politique: débats et perspectives*. Collection Folio/Essais. Paris, France: Editions Gallimard, pp 88–119.
- * Portner B. 2005. *Land-use Strategies of Migrant and Non-migrant Households in Western Mexico* [MSc thesis]. Bern, Switzerland: University of Bern. Also available at: <http://www.north-south.unibe.ch/content.php/publication/id/1967>; accessed on 19 November 2009.
- Prats JO. 2003. The concept and analysis of governability [in Spanish]. *Revista Instituciones y Desarrollo* 14/15:239–269. Also available at: <http://www.grupochorlavi.org/php/doc/documentos/Elconceptoyel.pdf>; accessed on 27 February 2009.
- Restrepo E. 2004. Biopolitics and alterity: Dilemmas of the ethnicization of the black Colombians. In: Restrepo E, Rojas A, editors. *Conflicto e (in)visibilidad: retos en los estudios de la gente negra en Colombia*. Colección Política de la alteridad. Popayán, Colombia: Editorial University of Cauca, pp 271–300.
- Rose GD. 1999. *Community-based Technologies for Domestic Wastewater Treatment and Reuse: Options for Urban Agriculture*. Ottawa, Canada: International Development Research Centre (IDRC).
- * Salcido S. 2008. *Governance of Water Management in the Municipalities of Unión de Tula and Zapotitlán de Vadilla* [in Spanish; MSc proposal]. Atlán, Mexico: University of Guadalajara and Swiss National Centre of Competence in Research (NCCR) North-South. Available from Peter Gerritsen.

- Schteingart M. 1989. *The Producers of Habitable Space: State, Enterprise and Society in Mexico City* [in Spanish]. Mexico City, Mexico: El Colegio de México.
- Schwentesius R, Gómez MA, Calva JL, Hernández L, editors. 2003. *Can the Countryside Endure More?* [in Spanish]. Texcoco, Mexico: Universidad Autónoma de Chapingo and La Jornada.
- Smith S, Marin L. 2004. Water and the rural poor in Latin America: The case of Tlamacazapa, Guerrero, Mexico. *Hydrogeology Journal* 13:346–349.
- Stavenhagen R. 2005. The emergence of indigenous people as new political and social actors in Latin America [in Spanish]. In: Escárzaga F, Gutiérrez R, editors. *The Indigenous Movement in Latin America: Resistance and Alternative Project* [in Spanish]. Puebla, Mexico: Benemérita Universidad Autónoma de Puebla (BUAP), Universidad Nacional Autónoma de México (UNAM), Universidad Autónoma de la Ciudad de México (UACM), pp 49–61.
- Toledo VM. 2000. *Peace in Chiapas: Ecology, Indigenous Struggles and Alternative Modernity* [in Spanish]. Mexico City, Mexico: Universidad Nacional Autónoma de México (UNAM) and Ediciones Quinto Sol.
- Torres HG. 2008. *Social and Environmental Aspects of Peri-urban Growth in Latin American Megacities*. Paper presented at the United Nations Expert Group Meeting on Population Distribution, Urbanization, Internal Migration and Development, New York, 21–23 January 2008. Available at: http://www.un.org/esa/population/meetings/EGM_PopDist/P10_Torres.pdf; accessed on 27 February 2009.
- Tuhiwai Smith L. 1999. *Decolonizing Methodologies: Research and Indigenous Peoples*. London, UK: Zed Books.
- UNEP [United Nations Environment Programme]. 2000. *World Environmental Perspectives: Latin America and the Caribbean* [in Spanish]. Mexico City, Mexico: Mundi-Prensa.
- Vallés JM. 2002. *Political Science: An Introduction* [in Spanish]. 2nd edition [2000¹]. Barcelona, Spain: Ariel Ciencia Política.
- Viehweider T. 2007. *Bahía de Tela: Honduras and the Advancement of the Plan Puebla Panamá* [in Spanish]. Eco Portal.Net. El Directorio Ecológico y Natural. http://www.ecoport.net/Contenido/Temas_Especiales/Economia/Bahia_de_Tela_Honduras_y_el_avance_del_Plan_Puebla_Panama; accessed on 27 February 2009.
- Waters M. 1996. *Globalization*. London, UK: Routledge.
- * WSSCC [Water Supply and Sanitation Collaborative Council]. 2006. *For Her It's the Big Issue: Putting Women at the Centre of Water Supply, Sanitation and Hygiene*. Geneva, Switzerland: WSSCC.
- Yuval-Davis N. 1997. Women, citizenship and difference. *Feminist Review* 57(1):4–27.

Part VIII

Governance Issues in South America: Relationships and Conflicts Between State and Citizens





29 Research on Social Learning, Capacity Building and Institutional Strengthening in South America

Manuel De La Fuente¹

29.1 Introduction

The Joint Area of Case Studies (JACS)² South America (SAM) of the Swiss National Centre of Competence in Research (NCCR) North-South was established in August 2003, sponsoring research activities in Bolivia and Peru and later in Argentina, which joined the JACS SAM in 2004. The three countries have several problems in common, primarily relating to high rates of unemployment, power and economic inequality, the emergence of new forms of collective action, environmental hazards, conflicts over access to and control of natural resources, erosion of indigenous institutions, and loss of biological diversity.

In an attempt to understand these problems, JACS SAM researchers focused on the following three themes: 1) *Social Movements, Decentralisation and Citizenship*; 2) *Urban Risks*; and 3) *Biodiversity, Protected Areas and Indigenous People*. These three topics are linked by the common issue of governance. Therefore, most of the studies were conducted within a Governance Analytical Framework (Hufty 2009), studying actors, nodal points, social norms and processes. Several studies conducted within the JACS SAM also included a gender perspective.

29.2 Social movements, decentralisation and citizenship

Bolivia and Argentina share a similar history. Long periods of military dictatorship in the 1980s gave way to a process of democratisation, which still prevails in both countries. Democracy was revived thanks to the resistance exerted particularly by the labour movement. Left-wing governments took



Fig. 1
Mobilisation: a
march of unem-
ployed women
workers in
Argentina. (Photo
by Alejandra
Andreone)

power, but they did not last long, and the new governments shifted towards a neo-liberal position. Application of the neo-liberal economic model in the 1980s and 1990s, with its high social costs in both countries – especially during the implementation of a decentralisation process in Bolivia – triggered a new cycle of protests and the emergence of new social movements (Figure 1). These circumstances sparked the interest of JACS SAM researchers at the Graduate Institute of International and Development Studies in Geneva (IHEID)³ in studying the new social actors who emerged.

In Bolivia, Alejandra Ramírez, Carlos Crespo and other researchers from the multidisciplinary Centro de Estudios Superiores Universitarios of the Universidad Mayor de San Simón (CESU-UMSS) in Cochabamba, along with the author of the present article, who was then JACS SAM Regional Coordinator, analysed the impact of the decentralisation process taking place in

Bolivia on urban and rural grassroots movements in the Cochabamba region. The findings in rural areas showed that decentralisation processes required a modification of traditional forms of action by peasant and/or indigenous organisations. They had to adapt to new regulations, and developed successful strategies that enabled them to take control of several municipal governments. However, once in power, indigenous people and peasants displayed several shortcomings (Antezana and De La Fuente 2009). In urban areas, research showed that grassroots movements also took advantage of the spaces opened up by the decentralisation process in their struggle to get municipalities to meet the needs of the city's working-class neighbourhoods. Thus, a new form of citizenship developed in the cities.

In the case of Argentina, researchers directed by Osvaldo Battistini from the Centro de Estudios e Investigaciones Laborales – Programa de Investigaciones Económicas Sobre Tecnologías, Trabajo y Empleo (CEIL–PIETTE), a research institute that belongs to the Argentinean National Scientific and Technical Council, analysed the movements of unemployed people and workers in recovered factories. One of these research projects, “Between Resistance and Political Construction”, showed that social policies are a frame of reference for the establishment of people's organisational practices. In addition, researchers at CEIL–PIETTE focused on “Gender in Unemployed Workers' Organisations”. One of their main findings was that women have very little access to leadership roles, despite being over-represented in unemployed workers' organisations. Moreover, the research revealed that public policies related to unemployed or poor workers do not include a gender perspective.

Researchers at CEIL–PIETTE also implemented a Partnership Action for Mitigating Syndromes (PAMS⁴; see Table 1), which allowed them to become better acquainted with unemployed workers' issues. At the same time, the PAMS provided workers with administrative training, enabling them to improve the operation of their self-managed enterprises and thus enhance their income.

Overall, the research carried out with regard to social movements, decentralisation and citizenship showed that Bolivia and Argentina have societies in which social organisations had, and continue to have, a very strong influence on the design and control of public policies (see Chapter 30 in the present volume).

Table 1

Project title	Related JACS research theme	Institution	Country of implementation
Drinking water system for the community: 'Habitat para la Mujer Maria Auxiliadora'	1	Centro de Investigación, Promoción y Desarrollo de la Ciudad (CIPRODEC)	Bolivia
Capacity building programme for social control and governance of sustainable biodiversity management in the Tunari National Park	3	Agroecología Universidad de Cochabamba (AGRUCO)	Bolivia
Support for processes of agreement between social actors for sustainable management of biodiversity and natural resources in the Cordillera of Tunari	3	Agroecología Universidad de Cochabamba (AGRUCO)	Bolivia
Support for processes of governance between political and social stakeholders for urban risk management in high-risk areas of the east and north-east slopes of the city of La Paz	2	Fundación La Paz	Bolivia
Establishment of coordination mechanisms among unemployed workers' productive enterprises in Argentina	1	Centro de Estudios e Investigaciones Laborales – Programa de Investigaciones Económicas Sobre Tecnologías, Trabajo y Empleo (CEIL-PIETTE)	Argentina
Knowledge for socio-economic development: Latin American Applied Research Network on Social Economy	2	Instituto del Conurbano, Universidad Nacional General Sarmiento	Argentina
Amarakaeri Communal Reserve: institutional strengthening	3	Racimos de Ungurahui and Federación Nativa del Río Madre de Dios y Afluentes (FENAMAD)	Peru
Support for local risk management in Bolivia	2	Fundación La Paz and Fundación para el Desarrollo Participativo Comunitario (FUNDEPCO)	Bolivia
Formulation of proposals for management of protected areas, biodiversity and natural resources for the Constituency Assembly	3	Agroecología Universidad de Cochabamba (AGRUCO)	Bolivia
Extractive industries and Biosphere Reserve management: a social learning and capacity building initiative for socio-ecological sustainability	3	Instituto del Bien Común (IBC)	Peru
Fighting against poverty reproduction: exploring strategies with young men and women who live on informal waste gathering in Buenos Aires	1	Centro de Estudios e Investigaciones Laborales – Programa de Investigaciones Económicas Sobre Tecnologías, Trabajo y Empleo (CEIL-PIETTE)	Argentina

List of Partnership Actions for Mitigating Syndromes (PAMS) implemented in the Joint Area of Case Studies (JACS) South America (SAM).

29.3 Urban risks

Most Bolivian and Peruvian cities face another core problem: high risks of natural and human-induced hazards. The situation in La Paz, for instance, is quite critical due to the fact that the city is growing in a largely unplanned manner, on very steep slopes with a gradient above 45° . Settlements on hill-sides (*laderas*) surrounding the city, representing 60% of the overall urban space, are critically exposed to landslides, floods, and other natural hazards (Figure 2; see Chapter 31 in the present volume).

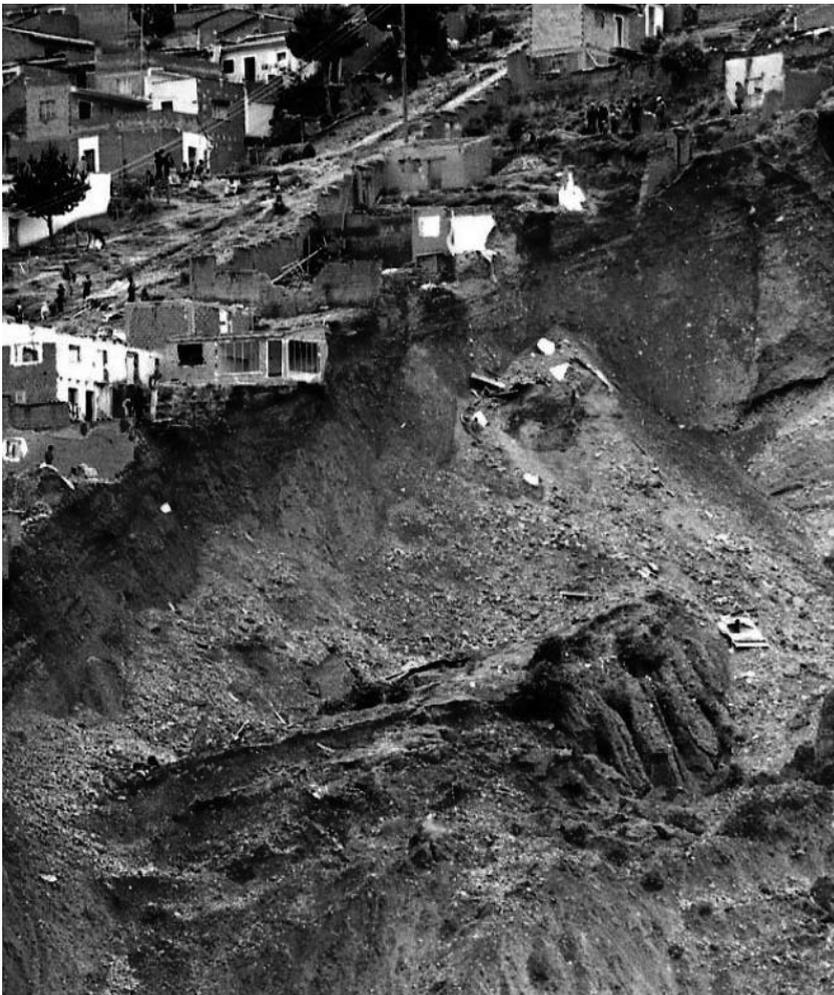


Fig. 2
Landslide in a sprawling urban settlement of La Paz. (Photo by Luis Salamanca Mazuelo)

The situation in Cusco is very similar to that of La Paz. Inhabitants of settlements in both cities, despite having suffered a series of disasters and living in a situation of risk and vulnerability, do not want to move. The researchers in the JACS SAM and at IHEID felt that it was important to understand these people's desire to stay in such exposed places and, in a more general way, their perceptions of their living conditions. At the same time, it was also important to know what the municipal, departmental and central governments are doing to appropriately manage these risk situations. All of these questions were addressed in a series of research projects in La Paz and Cusco.

Two PhD candidates from the Postgrado en Ciencias del Desarrollo at the Universidad Mayor de San Andrés (CIDES-UMSA), Luís Salamanca Mazuelo and Fabien Nathan, analysed perceptions of natural risks among the population of La Paz and studied government elaboration of risk management policies, also in La Paz. In addition, they participated in a NCCR North-South Transversal Package Project (TPP)⁵ entitled "From Vulnerability to Resistance", led by Brigit Obrist. Similar studies were conducted in Cusco by researchers of the Centro Bartolomé De Las Casas (CBC) – a graduate institution in Cusco – and two Master's students and a senior researcher at IHEID.

Some research results showed that the population is not fully aware of the risks inherent in the surroundings it is living in. Another important finding was that public policies in Bolivia are developed using a vertical top-down approach. Given that the Bolivian state is structurally very fragile, the national agenda has largely been designed by international cooperation agencies. As a consequence, political stakeholders, technocrats or bureaucrats do not take ownership of public policies, and social organisations are not even conscious of the risk situation (see Chapter 31 in the present volume).

Two PAMS were designed to raise awareness of these problems. They were implemented by two foundations – the Fundación La Paz and the Fundación para el Desarrollo Participativo Comunitario (FUNDEPCO). Some of the outcomes show that the population and local authorities are now more aware of the vulnerabilities and risks that affect them. Thus, they can now work to prevent natural disasters through better planning that includes a risk perspective. Furthermore, they are in a position to respond more rapidly and adequately in the event of a natural disaster. Two additional outcomes of these PAMS were a series of publications, including an atlas of threats, risk and vulnerability, as well as collaboration of the JACS SAM with another funding agency (OXFAM Great Britain). This not only strengthened the out-

puts and outcomes of the PAMS, but also gave the JACS SAM the opportunity to carry out other academic activities (research, seminars, publications) that were funded jointly with OXFAM Great Britain.

29.4 Biodiversity, protected areas and indigenous people

Bolivia and Peru face further core problems related to conflicts over access to and control over natural resources, erosion of indigenous institutions, and loss of biological diversity. One of the mechanisms for conservation of nature and biodiversity was the creation of protected areas; however, this did not include the perspectives of local social actors, especially the indigenous people, who have accumulated valuable knowledge on these areas over centuries. In many cases the creation of protected areas thus gave rise to conflicts, which, in turn, sparked governance problems in some indigenous communities.

Researchers in the JACS SAM, at IHEID and at the Centre for Development and Environment (CDE)⁶ sought to understand the dynamics of these problems. Their study area encompassed the region between Vilcabamba (Peru) and Amboró (Bolivia), which is a transboundary area very rich in biodiversity. Marc Galvin was the first PhD candidate to start research on the Peruvian side of this area. His dissertation consisted of an analysis of the traditional knowledge policy in Peru. He showed that discussions on the Peruvian Traditional Knowledge (TK) Law are built on ideologies, mainly in response to international debates. This is one of the reasons that explain the failure of the TK Law. After finishing his dissertation, together with Tobias Haller of the University of Zurich, Marc Galvin initiated a project entitled “People, Protected Areas and Global Change” to capitalise on research done on this issue in Latin American (Vilcabamba/Amboró area), African and Asian regions within the NCCR North-South programme (Galvin and Haller 2008).

In addition, in the Peruvian part of the Vilcabamba/Amboró area, Alex Álvarez and Jamil Alca Castillo completed a Master’s thesis at CBC and are now completing their studies at PhD level. Their current research explores issues in the Amarakaeri Communal Reserve. They are hosted by the Instituto del Bien Común (IBC), a Peruvian NGO that has an agreement with the JACS SAM to conduct research on “Discourses on the Future of Amazonian Bio-

Fig. 3
Andean migrant settlers extracting gold in the buffer zone southwest of the Amarakaeri Communal Reserve. Although commercial resource extraction is forbidden by the park law, these activities continue to be the main source of income for many settler groups. The position of the state in this regard is ambiguous. (Photo by Jamil Alca Castillo, 2006)



diversity: Indigenous Territoriality, Conservation and Development for Progress”. The purpose of this project is to ‘map’ the main discourses about biodiversity, conservation and development, as expressed by various actors involved in the creation and management of two protected areas in the Peruvian Amazon region (Figure 3). The areas are the Zona Reserva Sierra del Divisor (ZRSDD), in northeastern Peru, and the Amarakaeri Communal Reserve, in the country’s southeast.

In the Bolivian part of this area, among the most important research conducted was the work done by Sébastien Boillat, Elvira Serrano and Dora Ponce Camacho, of Agroecología Universidad de Cochabamba (AGRUCO). They studied the Tunari National Park (TNP), which was created in 1964 to halt the expansion of the city of Cochabamba onto the hillsides and protect the city from natural disasters. The current legal framework for the area was established in 1991, prohibiting grazing and restricting agricultural and forestry activities in the area. These restrictions clash with the interests of around 400 Quechua peasant communities living in the TNP (see Chapter 32 in the present volume). Also in the Bolivian part of this area, Patrick Bottazzi of the Graduate Institute of International and Development Studies in Geneva (IHEID) recently completed his PhD dissertation entitled “To the Border of

Institutional Territory: Ethnicity, Protected Areas and Land Settlement in the Bolivian Amazon”.

However, analysis was not enough; it was also important to empower the indigenous communities that lived in this area and help establish a dialogue among the different stakeholders so they could jointly find solutions. This endeavour was pursued within three PAMS developed by AGRUCO and Racimos de Ungurahui, a Peruvian NGO. Nowadays, Bolivian and Peruvian peasants and indigenous organisations are more aware of their rights in the TNP and are able to find ways to manage their protected areas.

29.5 Perspectives

The choice of the JACS SAM research themes at the beginning was appropriate since they address crucial problems faced by the region. Nevertheless, the situation is changing rapidly in South America; therefore, it is appropriate to hold a workshop with scholars from the three countries to discuss the advisability of introducing new research themes.

With the future in mind, it is important that JACS SAM researchers continue their efforts to strengthen their institutional partners. Furthermore, they have to promote networking among these institutions in a more efficient way. There must be more exchange between the various research teams, and it is important to initiate comparative studies. One example could be a study of the mobility of elites from civil society to the state. Analysis of relations between the state and grassroots movements is an aspect addressed in almost all research conducted within the JACS SAM. Moreover, although it is evident that leaders of social movements often become government authorities, there has been no systematic study of this phenomenon. Hence, it is important to conduct such a study in a comparative way, with similar research questions and a similar methodology. Another comparative analysis could be carried out on the influence of international cooperation, which has a strong impact on the orientation of decentralisation processes, on governmental risk management policies, and on protected area management, among other things. These are all topics studied by the three JACS SAM research teams; some of the PhD studies highlight this influence, but not in a systematic way. Finally, the role of social movements in tackling certain environmental and ecological issues is a transversal theme that might be worth further investigation.

Endnotes

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² The NCCR North-South is based on research partnerships with researchers and research institutions in the South and East. These partnership regions are called JACS (Joint Areas of Case Studies). Regional Coordination Offices (RCOs) were established in each of these JACS at the outset of the programme. The original function of the RCOs was to coordinate research; in the third phase of the programme, RCOs will consolidate the existing research network in the South and will become hubs for generating new research projects and partnerships.

³ IHEID (formerly Institut universitaire d'études du développement, or IUED) is an Institutional Partner (IP) of the NCCR North-South.

⁴ Partnership Actions for Mitigating Syndromes (PAMS) are projects implemented by local actors together with scientific and non-scientific stakeholders. As a component of the NCCR North-South programme they are designed to implement and validate approaches, methods and tools developed in research, with a view to finding promising strategies and potentials for sustainable development. Moreover, they are intended to promote mutual learning and knowledge-sharing between academic and non-academic partners in sustainable development.

⁵ Transversal Package Projects (TPPs) were a Phase 2 component of the NCCR North-South that helped to cross disciplinary boundaries, with a view to achieving better integration of complex issues within the framework of the overall theme of sustainable development and syndrome mitigation. TPPs were interdisciplinary projects entrusted to research teams under the leadership of promising post-doctoral researchers from the North and the South.

⁶ CDE is also an Institutional Partner (IP) of the NCCR North-South.

References

Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- *Antezana F, De La Fuente M. 2009. Decentralisation, social movements and peasant municipality management in Bolivia. In: Geiser U, Rist S, editors. *Decentralisation Meets Local Complexity: Local Struggles, State Decentralisation and Access to Natural Resources in South Asia and Latin America*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 4. Bern, Switzerland: Geographica Bernensia, pp 127–153.
- * Galvin M, Haller T, editors. 2008. *People, Protected Areas and Global Change: Participatory Conservation in Latin America, Africa, Asia and Europe*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 3. Bern, Switzerland: Geographica Bernensia.
- * Hufty M. 2009. *The Governance Analytical Framework*. Geneva, Switzerland: Graduate Institute of International and Development Studies (IHEID). Also available at: <http://www.nccr-north-south.unibe.ch/publications/Infosystem/On-line%20Dokumente/Upload/GovernanceFrameworkE.pdf>; accessed on 12 November 2009.

30 **Reconstruction of Relationships Between the State and Social Organisations in Argentina and Bolivia since the 1990s**

Alejandra Ramírez¹, Florencia Partenio², Ariel Wilkis³, and Manuel De La Fuente⁴

Abstract

What processes have been involved in the reconstruction of relationships between social organisations and the state in Bolivia and Argentina since the 1990s? This was the key question addressed in a study of the impact of public policies on the relationships among social and state agents in both countries, where new public policies are characterised by a process of administrative and political decentralisation. The research conducted showed that both countries have societies in which social organisations had, and continue to have, a very strong influence on the design and control of public policies. Hence the relationships between the state and social organisations are not based on dichotomies. Rather, they are marked by different forms of interpenetration, with the state influencing organisations and vice versa. These forms of interpenetration continuously trigger processes of social and state reconstruction. Gender issues are becoming an increasingly important aspect in these processes.

Keywords: Decentralisation; citizenship; social movements; social organisations; Argentina; Bolivia.

30.1 Introduction

This article presents a summary of research carried out in Bolivia and Argentina within the framework of the Swiss National Centre of Competence in Research (NCCR) North-South programme. The issue that provides the basis for the integration of research in both countries arises from an international debate initiated by Corcuff (1996), Honneth (1997), Morin (2004), Elias (2008) and other sociologists, who question the classic dichotomy between the state and civil society. In research carried out in Bolivia – one of the poorest countries of Latin America – and in Argentina – one of the wealthiest – we analyse the remaking of the socio-political configuration between social organisations and the state from the 1990s onwards, within different types of state decentralisation models. Parallel studies of these processes in both countries – the implementation of decentralisation in Bolivia since 1994 and the transformation of social policies in Argentina from the 1990s onwards – allow us to take a stance on this international debate. Analyses of public policies undertaken in both countries revealed common characteristics that enabled us to compare and assess both histories as emerging processes of decentralisation of state resources, in which decisions and tasks are transferred to other government levels (Bresser Pereira 1998), and in which social organisations become important actors in the circulation and distribution of such resources. Hence public policy analysis, the characteristics of social organisations, and the new relationships between social organisations and state agents emerging in a decentralised administrative context represent the variables that are taken into account in this article to understand the similarities and peculiarities of the decentralisation processes in each country.⁵

In this article, we accept the challenge of understanding the uniqueness of social processes based on the assumption of interrelationships – rather than opposition – between the different aspects of societies, rather than assuming an artificial construction and use of classic dichotomies. As Chantal Mouffe points out in an interview with Markus Miessen (Miessen 2007), in post-political societies we need to find new ways of understanding relationships between the various components of civil and political society. For the specific case of Latin America, following Cunill Grau (1995) and Haidar (2005), among others, we assume that it is not possible to conceive of analysis of the state and of social organisations separately. We therefore need to create new instruments and perspectives that will allow us to understand the increasing interdependence and interpenetration between state agents and

social stakeholders – even more so in the context of decentralisation politics since the 1990s.

30.2 Methodology

The Bolivian research project, carried out by a group of researchers from the NCCR North-South and the Centro de Estudios Superiores Universitarios, Universidad Mayor de San Simón (CESU-UMSS), investigated the impact of decentralisation processes on the new power relationships among grassroots territorial organisations (in Spanish: *Organización Territorial de Base*, OTB)⁶, neighbourhood councils, unions, associations and municipal governments in three rural municipalities, one semi-urban metropolitan area and one metropolitan area of Cochabamba.⁷ In Argentina, research carried out since 2004 by the team at the Centro de Estudios e Investigaciones Laborales, Programa de Investigaciones Económicas sobre Tecnología, Trabajo y Empleo (CEIL-PIETTE) has focused on reconstructing organisation and mobilisation processes among unemployed workers' organisations⁸, workers in recovered factories, and *cartoneros* and *quemeros*⁹ in the Buenos Aires metropolitan area (*Área Metropolitana Buenos Aires*, AMBA).

In methodological terms, the research approach in both countries was based on semi-structured interviews (more than 100 interviews in Bolivia and 120 in Argentina); observation of daily activities and public events; analysis of state programmes; a review of documents and bibliographic material; and, for Bolivia, a press review (1994–2004). In the case of Argentina, these techniques were combined with workshops organised and carried out within the framework of the NCCR North-South Partnership Actions for Mitigating Syndromes (PAMS)¹⁰, in a project entitled “Establishment of Coordinated Mechanisms between Unemployed Workers' Productive Enterprises in Argentina”.¹¹ This project demonstrated the usefulness of adopting gender as a theoretical perspective, since this approach implies an epistemological positioning and a methodology that privileges all participants, encouraging them to express themselves even if they are not accustomed to speaking in public. This approach involves a considerable investment in terms of time and fieldwork activities in order to create a favourable environment for all participants.

The following two sections of the present article provide summaries of the two teams' syntheses. This is followed by a section in which we return to our original research question and propose future perspectives.

30.3 The case of Bolivia

30.3.1 Decentralisation processes

In Bolivia, the collapse of the 1952 State¹², combined with neo-liberal structural adjustments (1985), clearly exposed the profound social inequality that existed between the urban and rural sectors and between those close to and those isolated from the sphere of government. This resulted in the emergence of various proposals for state decentralisation as of the late 1980s, which materialised in the enactment of several laws¹³ that allowed formal inclusion of people in public decision-making and equitable resource redistribution at the national level, through transfer of a budget for joint participation based on the number of inhabitants in each municipality. This changed the relationship between social organisations and the state.

More specifically, a system of participatory planning was installed at three levels: public policy programming, management, and social monitoring. To implement the participatory planning, two types of organisations were created: OTBs and monitoring committees (in Spanish: *Comité de Vigilancia, CV*)¹⁴, both of which were formed on the basis of existing organisations such as agrarian unions, indigenous communities or neighbourhood councils, suggesting a kind of regularisation or legalisation of such organisations. The municipality became the privileged administrative unit at the national level, thus consolidating autonomy at the local level.

30.3.2 Social organisations involved in decentralisation

In rural areas, decentralisation processes required that farming and/or indigenous organisations adjust their traditional forms of action. They had to adapt to the new regulations and develop strategies – which will be examined below – to appropriate the process and take on municipal power. For the social organisations, taking over new functions also implied facing a variety of technical and political difficulties, linked, for example, to their unawareness of regulations, planning techniques and management procedures. Nevertheless, despite all the problems encountered, local-level social organisations were included in the sphere of public policy management and control. Many local peasants and indigenous leaders became members of local government authorities (e.g. mayors, municipal authorities) and, later on, national government authorities (e.g. congressmen).

However, more sceptical views suggest an opposite relationship: since social organisations were given the opportunity to exercise greater control over the central government, the state also started exercising greater control over social organisations. Indeed, one of the main changes in the national political panorama as of the 1990s was that the 1994 Law on Popular Participation (*Ley de Participación Popular*, LPP) enabled the state to introduce its presence throughout the Bolivian territory – something that did not exist before – not only by modifying traditional organisations, but also by imposing stronger control of the population in rural areas.¹⁵

In urban areas, ‘regulated’ participation by social organisations in designing public policy soared towards the end of the 1980s, when regional councils were formed, made up of neighbours in city sectors. The councils deliberated “like the municipal council” and determined lines of action and urban management for their regions (Vargas 2005). The new regulation was rapidly adapted to the organisations’ characteristics and demands. The significant growth of the number of OTBs and their adoption of various strategies in government spheres shows the increasing inclusion of civil society in government administration.

30.3.3 New relationships between the state and social organisations in Cochabamba

In rural areas, decentralisation processes transformed local-level power relations, changing local governance and opening up possibilities for peasants and indigenous people to exercise their political rights and actively participate (Antezana and De La Fuente 2009). In the case of municipalities – where decision-making was limited to local authorities and where local provincial elites exercised their influence (Crespo and Antezana 2006) – the LPP opened up a range of opportunities for participation, creating scenarios in which formerly excluded groups became powerful and started taking over the administration of municipal governments. The strategies that social organisations – be they indigenous organisations or labour unions – developed for this purpose shifted from striking alliances with traditional political parties to participating in municipal elections and gradually creating political instruments of their own, e.g. the Movement for Socialism (*Movimiento al Socialismo*, MAS). As the decentralisation process became consolidated, indigenous and peasant candidates entered public spaces in municipalities and institutions linked to popular participation.¹⁶ This led to an irreversible empowerment of these social stakeholders, who began to prevail in municipal public administration.

In semi-rural areas, another type of stakeholder emerged – linked to productive activities and with strong NGO ties – with significant incidence on public administration: producers' associations, including those formed for irrigation, the so-called *regantes*. Upon taking over municipal administration, they started excluding and discriminating against peasants from more distant localities, thereby re-adopting the provincial elites' former racist and corrupt practices (Crespo and Antezana 2006).

In urban areas, neighbourhood councils were rapidly transformed or assumed the functions of OTBs;¹⁷ in this process, formerly relegated stakeholders – migrants and working class people – started taking over administrative posts, developing a variety of strategies (Ramírez and Calisaya, in press) to participate actively in decision-making and in ongoing control of local public administration. Strong political ties developed between OTBs and CVs, on the one hand, and public municipal officials as well as the mayor's political party, on the other hand. In some cases, local daily papers denounced the political co-opting of the former (Ramírez and Calisaya, in press). A twofold relationship was established: local stakeholders began to influence public policies, but at the same time official party representatives began to take on functions of social organisations, mainly in CVs.

The first stage of implementation of the decentralisation process saw a consolidation of OTBs, mainly in areas with a greater need for public services. Gradually, better-off sectors started establishing such organisations as well, giving them other characteristics: for example, a focus on promoting culture and heritage. In general, exercising citizenship through participation in OTBs in the urban sector became a common practice, also among women. A strong NGO momentum made this possible in spite of various obstacles such as illiteracy, lack of awareness of the regulations, and an unequal power distribution between women and men (Ramírez 2007; for the urban case, see Ramírez, in press, and Suárez and Sánchez 2007).

Generally speaking, in both the urban and rural sectors, the decentralisation process paved the way for greater participation by women in the public arena, even when such participation involved various problems, as pointed out by Clisby (2005). This happened even though, in some cases, it destroyed or eliminated the political and economic importance of traditional women's organisations such as mothers' clubs (Clisby 2005; Ramírez, in press; Suárez and Sánchez 2007).



To sum up, the decentralisation processes led to a complex interrelationship between the state and local social organisations in urban and rural municipalities. This relationship took on the following characteristics: 1) social organisations started becoming part of the public administration, either indirectly – by way of the OTBs or by imposing demands through conflicts and confrontations (Figure 1) – or directly – through participation in municipal governments; 2) at the same time, local and national governments began to have a greater influence on social organisations; 3) in the course of this process, basic infrastructure was improved at the local level without necessarily entailing a boost to economic productivity; 4) in rural areas there was an increase in social monitoring of public administration based on links established between CVs and social organisations, whereas in urban areas, social monitoring relied more on the individual exercise of citizenship than on the role of CVs, due to the political co-optation of the latter; 4) a lack of knowledge of regulations and of conscious and informed exercise of citizenship among social organisations and citizens appears to have been the main obstacle keeping them from efficiently dealing with the challenges posed by decentralisation processes.

Fig. 1
The democratisation process in Bolivia has led to frequent confrontations between newly empowered social groups and state authorities, revealing that it is fraught with contradictions that need to be dealt with. (Photos by Carlos Crespo)

30.4 The case of Argentina

30.4.1 The restructuring of the field of social policy in the 1990s

Programmatic interests of neo-conservative sectors that controlled the public policy agenda in the 1990s had the objective of dismantling traditional state social-policy institutions. In this process, a convergence of political and economic interests and ‘technical knowledge’ emerged among officers of local state and multilateral credit organisations. This convergence was endorsed by deregulatory and private sector conceptions of social protection for salaried workers. It also influenced compensation policies for people ‘outside’ the labour market or with scarce economic resources (focalised policies). In this way, the focalised policies of the 1980s became the paradigm of state intervention in the matter of social welfare.

Throughout these years, the state modified its presence through interventions that targeted the working classes’ living conditions. Similarly, a process of extension and diversification of different types of social organisations emerged, with the goal of producing resources and/or transferring them to poor households, NGOs, social movements, religious networks, political parties, etc.¹⁸

30.4.2 Mobilisation and organisation processes

Mobilisation of the population’s most vulnerable sectors, women’s participation in such mobilisation (Freytes Frey et al 2006; Partenio 2006), and the leading role taken by union militants and suburban city leaders challenged assumptions about ‘political apathy’ and ‘exclusion’, which were terms used to define the working classes’ lack of political consciousness and participation at earlier stages. However, these three processes did not take place in the same way; each had a different inflection.

The socio-political reconfiguration of the working classes was characterised by the creation of organisations for the unemployed. Many of these grass-roots organisations originated during the 1980s; however in the mid-1990s unemployment ranked higher both on the public agenda and in social conflict, and the new organisations began playing a crucial role in politicising the unemployment issue.

Three key elements – social mobilisation, neighbourhood community work (such as the creation of communal dining halls and lunchrooms, the planting of vegetable gardens and orchards, the providing of clothes for the community and the launching of productive micro-enterprises) and competition with other political organisations or parties – provide an entry point for understanding these organisations’ political logic of representing the poor and impoverished.

Moreover, processes of recovering factories were based on a strategy which, in most cases, consisted of combining permanent presence of workers in enterprises that were bankrupt or undergoing foreclosure, with their playing a leading role in the autonomous management of these enterprises (Figure 2). A central feature in these processes was the revision of the working day. On the one hand, the tasks carried out by workers were diversified, not only with a modification of the tasks related to production, but also adding new activities (management responsibilities such as administrative and commercial duties, protest actions, negotiation with government officials, meetings with representatives of other worker-recovered factories, etc.). On the other hand, workers were obliged to stay in the factory over longer periods to “guard” and “defend” their jobs against the threat of eviction. Since the early 2000s, particularly in 2002 and 2003, these processes have multiplied, determining the particular modality of demanding a source of employment called ‘recovery’ (Fernández Álvarez 2006).



Fig. 2
A worker in a
recovered factory:
the “7 de Septiembre” cooperative.
(Photo by Florencia
Partenio)

30.4.3 Relationships between the state and social organisations

The configuration of the field of social policy, structured by the ideology of focalised policies and caring for populations ‘at risk’, was one of the conditions for the development of social mobilisation movements and unemployed workers’ organisations in the state. There was a close relationship between the consolidation and growth of these organisations and the expansion of social plans¹⁹ distributed by the government, which created a sort of ‘virtuous circle’ around social policy (Freytes Frey and Cross 2007).

The worker-recovered factories had an ambiguous position in this respect. Their subjective orientation was marked by the workers’ resistance to dependence on social plans. Demands for expropriation laws were based, among other motives, on the intention to maintain a certain distance from the world of assistance, and to belong to the productive labour world (Fernández Álvarez and Wilkis 2007). However, worker-recovered factories also depended on certain innovations within the field of social policy that led to them being considered as stakeholders and a possible target group for subsidies.

The transformation of the field of social policy and the orientation of unemployed workers’ organisations and worker-recovered factories were governed by the category of “social economy”. Indeed, from 2003 onwards, changes in government-led social policy were introduced, arguing for the avoidance of political patronage, creating work rather than increasing ‘social assistance’ (Cross and Freytes Frey 2007). In terms of those newly in charge of social policies, this change is a ‘productivist turn’ that results from the ‘social assistance approach’ of the earlier stage.²⁰

This redefinition of government policy stems from various sources. Some core aspects of the former mobilisation process – in which work was promoted as a tool for social integration and the ‘indignity’ of social plans was sustained – were revisited. However, recommendations made by multilateral credit organisations, which controlled the awarding of funds indispensable for sustaining ‘emergency’ programmes, were also implemented.

Within this framework, various strategies were designed to redefine the beneficiary population according to a classification using “employable” and “unemployable” as criteria. While the modification of the “Unemployed

Male and Female Heads of Household Plan” (in Spanish: *Plan Jefes y Jefas de Hogar Desocupados*, PJJHD) led to transfer of ‘employables’ to labour reinsertion programmes, the rest of the beneficiaries were to be placed in other programmes, such as “Families for Social Inclusion”. This programme was designed to provide a variable subsidy based on the number of young children under care; it does not demand ‘labour compensation’, but requires certification that children attended school and have completed the immunisation schedule. According to demand, this programme contains an important gender bias and is intended mainly for women.

In other articles (Cross and Partenio 2005), we analysed the activities of women in unemployed workers’ organisations, who participate mainly by performing daily tasks such as administration of social policy, canteens and community clothing units, thus contributing to the material reproduction of their movement (Figure 3). With the implementation of the “Families for Social Inclusion” programme, a shift away from household work was proposed. Furthermore, policies that sought to reactivate productive micro-enterprises were designed: different productive enterprises were thus operated along with other types of enterprises²¹ in a single place and were incorporated into a field marked by government definitions and processes of social mobilisation.

Fig. 3
Women doing
community work
for unemployed
workers’ organisa-
tions in Argentina.
(Photos by Alejandra
Andreone)



The objective distance that existed between unemployed workers' organisations and worker-recovered factories during the cycle of protests appears to be reduced to the rhythm of the re-configuration of the field of social policy, now focusing on the promotion of social economy. This new configuration tends to bring together the demands of both groups and the regulations for (and tensions between) their economic and political activities; for example, it leads to making the criterion of sustainable economics of the undertakings compatible with the action to support community activities. This has generated new dilemmas for the stakeholders who were in charge of the involved civil society organisations, incorporating, furthermore, other productive experiences such as those of recyclers' organisations and social enterprises consisting of men and women cardboard pickers – *quemeros* and *cartoneros* (Carenzo and Roig 2007; Partenio and Fernández Álvarez 2007; Cross and Freytes Frey 2009).

30.5 Conclusions

This article has aimed to reconstruct the processes that reconfigured the relationships between state agents and social organisations studied in Bolivia and Argentina, in order to analyse the complex interrelationships between the two players in the two countries. It shows that Bolivia and Argentina are clearly societies where social organisations have had an increasing influence on local and national government policies, even more so since the implementation in the 1990s of administrative and political decentralisation processes.

The case studies demonstrate that the dichotomy between the state and social organisations is problematic. Overcoming it when discussing the two countries' decentralisation processes makes it possible to understand how the state and social organisations simultaneously changed within a process in which the state affected social organisations' orientations not only externally, but also internally, and vice versa. In fact, interpenetration occurred in different ways: from the state into the organisations (imposing regulations, for instance the LPP in Bolivia; social plans, for instance the PJJHD in Argentina; frameworks for demands; regulations for social organisations, e.g. the regulation of OTBs in Bolivia or the regulation of social policy beneficiary populations in Argentina; etc.) and from the social organisations into the state (creating specific agencies to address new demands; local leaders' participation in public functions in municipal governments; social organisations beginning to plan and manage public policy; etc.). The above

shows that we need to re-think the traditional dichotomy between the state and social organisations and to provide new elements to understand Latin American processes, as well as to develop projects in the region that combine research and development.

This article also raises new questions and possible ways of comparing the local realities of Latin American countries, such as Argentina and Bolivia, assuming that this may also help to understand other regional realities. Indeed, as Roniger (2006) pointed out when referring to the citizenship debate, “the Latin American cases have general significance for the study of citizenship [and the relationship between the state and civil society organisations] at large” (p 501). Our findings have allowed us to highlight three lines of continuity to this end: a) building leadership and political militancy, as well as participation of organisations’ members in state agencies; b) the relationship between participation and gender issues in the redefinition of socio-political configurations in both countries, considering the different orientations that social policies produced and their effect from the gender perspective; c) the role of NGOs and international organisations as significant stakeholders – whose incidence has not yet been fully analysed – within the framework of the state–social organisations configuration.

Endnotes

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⁵ In addition, this study takes into account the governance analytical framework, the strategies and rules used by social actors, and the diverse socio-political processes that occur in each country (see Hufty 2009).

⁶ Spanish acronyms are used throughout this article, as they are widely used by the research community.

⁷ The Department of Cochabamba covers a valley region that links Bolivia's highlands and lowlands both geographically and from a social and cultural point of view. Since the pre-Hispanic period, this region has been known as a place in which different Bolivian cultures mix and coexist (see Sánchez 2008). This feature has become increasingly important in recent years. Cochabamba is Bolivia's most important department in that it receives migrants from other places – the country's highlands and lowlands. Hence, studies in this area can to some extent also reflect realities in other regions of the country.

- ⁸These unemployed workers' organisations were commonly called 'picketeer movements' (*movimientos piqueteros*), given that picketing (*piquete*), i.e. the blocking of main roads and routes, was the main characteristic of their pressure tactics. This is how they called attention to the precarious situation of unemployed people in the Buenos Aires metropolitan area.
- ⁹*Cartoneros* are people who sort household waste in order to sell it later, while *quemeros* are people who retrieve discarded materials from sanitary landfills or 'burning places' for trading.
- ¹⁰Partnership Actions for Mitigating Syndromes (PAMS) are projects implemented by local actors together with scientific and non-scientific stakeholders. As a component of the NCCR North-South programme they are designed to implement and validate approaches, methods and tools developed in research, with a view to finding promising strategies and potentials for sustainable development. Moreover, they are intended to promote mutual learning and knowledge-sharing between academic and non-academic partners in sustainable development.
- ¹¹Participatory techniques were used for the implementation of the PAMS project. They provided the technical means for designing collective productive action to solve organisational problems.
- ¹²This is the name for the Bolivian state in the period of 1952–1985, in which social organisations had a strong hand in the design and implementation of public policy, both in rural areas (peasant unions) and in urban areas (workers' unions, business organisations, neighbourhood councils).
- ¹³Mainly the 1994 Law on Popular Participation (*Ley de Participación Popular*, LPP), the 1995 Law on Decentralisation (*Ley de Descentralización*), and the 1999 Law on Municipalities (*Ley de Municipalidades*).
- ¹⁴A CV's task is to make sure that the local government accomplishes what was planned in the annual operational budget (*Presupuesto Operativo Anual*, POA), whereas the OTBs participate in preparing and determining the POA.
- ¹⁵It is interesting to analyse, for instance, how each community began to register its total population with national bodies after the enactment of the LPP, in order to get its share of the budget for joint participation. Indeed, a community's share of this budget depends on the number of its registered inhabitants.
- ¹⁶According to Córdova (2008), during the municipal election in 2004, a political peasant organisation – in this case MAS – won the elections in 34 of the 45 municipalities of Cochabamba.
- ¹⁷At present, there are around 393 OTBs and 353 neighbourhood councils in Cochabamba (De La Fuente and Ramírez 2007).
- ¹⁸These organisations are heterogeneous with regard to their origins, institutional framework and political-ideological orientation, and in many cases they compete with one another; however, together they represent the organisational structure through which the working classes reproduce their living conditions (Wilks 2007).
- ¹⁹In 2002, social programmes were unified in the 'Unemployed Male and Female Heads of Household Plan' (in Spanish: *Plan Jefes y Jefas de Hogar Desocupados*, PJJHD). Their potential beneficiaries were, above all, male and female heads of households with young or handicapped children under their care or with a pregnant cohabitant. In addition to this programme, social organisations had access to other nutritional and health plans, etc.
- ²⁰We analysed these categories as tools to disqualify or qualify field agents and their use of state resources. The refocusing of social policies tends to lend the categories of 'assistance' and 'patronage' new topicality as a means to challenge opponents and impose (new) intervention criteria (Wilks 2004).
- ²¹Considering their relationship with social policies, we can classify these micro-enterprises into three types: working cooperatives, which are established on the basis of the worker-recovered factories; productive micro-enterprises, created by social policy programmes; and enterprises created by the formalisation of *cartoneros*' and *quemeros*' activities.

References

Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- * Antezana F, De La Fuente M. 2009. Decentralisation, social movements and peasant municipality management in Bolivia. In: Geiser U, Rist S, editors. *Decentralisation Meets Local Complexity: Local Struggles, State Decentralisation and Access to Natural Resources in South Asia and Latin America*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 4. Bern, Switzerland: Geographica Bernensia, pp 127–153.
- Bresser Pereira LC. 1998. La reforma del Estado en los años noventa. Lógica y mecanismos de control. *Desarrollo Económico* 38(150):517–550.
- * Carengo S, Roig A. 2007. *El conflicto de valorización de los residuos sólidos urbanos en el área metropolitana de Buenos Aires*. Paper presented at the International Symposium on "Governance: Towards a Conceptual Framework" held in Geneva, Switzerland, 22–24 November 2007. Available from the Institut universitaire d'études du développement (IUED), Geneva, on a CD-ROM edited by IUED.
- Clisby S. 2005. Gender mainstreaming or just more male-streaming? Experiences of popular participation in Bolivia. *Gender and Development* 13(2):23–36.
- Corcuff P. 1996. *Les nouvelles sociologies*. Collection 128. Paris, France: Nathan.
- Córdova E. 2008. Los actores políticos en Cochabamba. In: García A, García F, editors. *Configuraciones políticas en los departamentos de Bolivia. La construcción plural del nuevo campo político*. La Paz, Bolivia: United Nations Development Programme (UNDP) and International Institute for Democracy and Electoral Assistance (IDEA), pp 33–69.
- * Crespo C, Antezana F. 2006. *Transparencia, segregación social y racial en la gestión municipal campesina. Los casos de Bolívar y Tiquipaya*. Cochabamba, Bolivia: Swiss National Centre of Competence in Research (NCCR) North-South and Centro de Estudios Superiores Universitarios, Universidad Mayor de San Simón (CESU-UMSS).
- * Cross C, Freytes Frey A. 2007. *De los planes como herramienta de organización a los desafíos de la autogestión: los dilemas de las organizaciones piqueteras frente a los cambios en la política social*. Paper presented at the 8th National Congress on Labour Studies (Congreso Nacional de Estudios del Trabajo) held in Buenos Aires, Argentina, 8–10 August 2007. Available from Asociación Argentina de Especialistas en Estudios del Trabajo, Buenos Aires, on a CD-ROM edited by this association.
- * Cross C, Freytes Frey A. 2009. The social and ecological dimensions of a decentralisation process: Participation by social movements in the sustainable management of urban solid waste in Buenos Aires. In: Geiser U, Rist S, editors. *Decentralisation Meets Local Complexity: Local Struggles, State Decentralisation and Access to Natural Resources in South Asia and Latin America*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 4. Bern, Switzerland: Geographica Bernensia, pp 93–126.
- * Cross C, Partenio F. 2005. *The Construction and Meaning of Women's Spaces in Organizations for the Unemployed*. Paper presented at the Women and Globalisation Conference held at the Centre for Global Justice, San Miguel de Allende, Mexico, 27 July–3 August 2005. Also available at: http://www.globaljusticecenter.org/papers2005/cross_partenio_eng.htm; accessed on 14 July 2009.
- Cunill Grau N. 1995. La rearticulación de las relaciones Estado–Sociedad: en búsqueda de nuevos sentidos. *Reforma y Democracia* 4:25–58.
- * De La Fuente M, Ramírez A. 2007. *Descentralización, gobernanza local y construcción de ciudadanía. El caso municipal boliviano*. Paper presented at the International Symposium on "Governance: Towards a Conceptual Framework" held at the Institut universitaire d'études du développement (IUED), University of Geneva, Switzerland, 22–24 November 2007. Available from Alejandra Ramírez.

- Elias N. 2008. *La société des individus*. New edition [1939¹]. Paris, France: Agora-Fayard.
- Fernández Álvarez MI. 2006. *De la supervivencia a la dignidad. Una etnografía de los procesos de recuperación de fábricas en la Ciudad de Buenos Aires* [PhD dissertation]. Buenos Aires, Argentina: Ecole de Hautes Etudes en Sciences Sociales (EHESS) and University of Buenos Aires.
- * Fernández Álvarez MI, Wilkis A. 2007. La question du chômage défiée: les processus de "recuperation" d'usines par les travailleurs en Argentine. *Revue Autrepart* 43(3):11–24.
- * Freytes Frey A, Cross C. 2007. Movimientos Piqueteros: alcances de su construcción política. *Revista Política y Cultura* 27:121–141.
- * Freytes Frey A, Cross C, Partenio F, Crivelli K, Fernández Álvarez MI. 2006. Women in organisations for poor unemployed working people: Reshaping female roles through political commitment. In: Premchander S, Müller C, editors. *Gender and Sustainable Development: Case Studies from NCCR North-South*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 2. Bern, Switzerland: Geographica Bernensia, pp 233–245.
- Haidar V. 2005. El descentramiento del Estado en el análisis del poder (político): un diálogo crítico entre la sociología histórica y el enfoque de la gubernamentalidad. *Espacio Abierto Cuaderno Venezolano de Sociología* 14(2):239–264.
- Honneth A. 1997. *La lucha por el reconocimiento: por una gramática moral de los conflictos sociales*. Barcelona, Spain: Crítica-Grijalbo Mondadori.
- * Hufty M. 2009. *The Governance Analytical Framework*. Geneva, Switzerland: Graduate Institute of International and Development Studies (IHEID). Also available at: <http://www.nccr-north-south.unibe.ch/publications/Infosystem/On-line%20Dokumente/Upload/GovernanceFrameworkE.pdf>; accessed on 12 November 2009.
- Miessen M. 2007. *Articulated Power Relations – Markus Miessen in Conversation with Chantal Mouffe*. Roundtable: Research Architecture. London, UK: Centre for Research Architecture, Goldsmiths College, University of London. Also available at: <http://roundtable.kein.org/node/545>; accessed on 14 July 2009.
- Morin E. 2004. *Pour entrer dans le XXI siècle*. Paris, France: Editions du Seuil.
- * Partenio F. 2006. *Género y política: reconstruyendo la organización de las mujeres dentro de los movimientos piqueteros*. Paper presented at the 7th Seminário Internacional Fazendo Género held in Florianópolis, Brazil, 29–30 August 2006. Also available at: http://www.fazendogenero7.ufsc.br/artigos/F/Florencia_Partenio_38_B.pdf; accessed on 18 August 2009.
- * Partenio F, Fernández Álvarez MI. 2007. *Procesos de recuperación de fábricas/empresas en Argentina: reflexiones en torno a las dinámicas de "autogestión"*. Paper presented at an international meeting on "La economía de los trabajadores: autogestión y distribución de la riqueza", Buenos Aires, Argentina, 19–21 July 2007. Available from Florencia Partenio.
- Ramírez A. 2007. Prólogo. In: Suárez E, Sánchez R, editors. *Mecanismos, niveles de participación política, y toma de decisiones de mujeres concejalas del departamento de Cochabamba*. La Paz, Bolivia: Programa de Investigación Estratégica en Bolivia (PIEB), Centro de Estudios Superiores Universitarios, Universidad Mayor de San Simón (CESU-UMSS), Dirección de Investigación Científica y Tecnológica (DICyT), pp XI–XV.
- * Ramírez A. In press. Ciudadanía y mujeres: narrativas de ejercicio ciudadano de mujeres en ámbitos de gobernanza urbana. In: De La Fuente, editor. *Participación popular, derechos humanos y ciudadanía en Cochabamba*. Cochabamba, Bolivia: Swiss National Centre of Competence in Research (NCCR) North-South, Centro de Estudios Superiores Universitarios, Universidad Mayor de San Simón (CESU-UMSS), Graduate Institute of International and Development Studies (IHEID), Plural.
- * Ramírez A, Calisaya VH. In press. Gobernanza local y construcción de ciudadanía en ámbitos urbanos. Estudio de caso: municipio de Cercado, Cochabamba. In: De La Fuente, editor. *Participación popular, derechos humanos y ciudadanía en Cochabamba*. Cochabamba, Bolivia: Swiss National Centre of Competence in Research (NCCR) North-South, Centro de Estudios Superiores Universitarios, Universidad Mayor de San Simón (CESU-UMSS), Graduate Institute of International and Development Studies (IHEID), Plural.

- Roniger L. 2006. Citizenship in Latin America: New works and debates. *Citizenship Studies* 10(4):489–502.
- Sánchez W, editor. 2008. *Retóricas y narrativas de identidad en los valles de Cochabamba, Chuquisaca y Tarija*. La Paz, Bolivia: UNIR Bolivia.
- Suárez E, Sánchez R, editors. 2007. *Mecanismos, niveles de participación política, y toma de decisiones de mujeres concejalas del departamento de Cochabamba*. La Paz, Bolivia: Programa de Investigación Estratégica en Bolivia (PIEB), Centro de Estudios Superiores Universitarios, Universidad Mayor de San Simón (CESU-UMSS), Dirección de Investigación Científica y Tecnológica (DICyT).
- Vargas G. 2005. Gestión local. In: *Estados de Investigación: Cochabamba*. La Paz, Bolivia: Programa de Investigación Estratégica en Bolivia (PIEB), Centro de Estudios Superiores Universitarios, Universidad Mayor de San Simón (CESU-UMSS), Swedish International Development Cooperation Agency (ASDI), Dirección de Investigación Científica y Tecnológica (DICyT), pp 361–400.
- Wilks A. 2004. Las revistas de la calle: nuevas experiencias en el campo de la asistencia a los "sin techo" y desempleados. Un estudio de caso sobre la empresa social "Hecho en Buenos Aires". In: Forni F, editor. *Caminos solidarios de la economía Argentina. Redes innovadoras para la integración*. Buenos Aires, Argentina: Ediciones CiCCUS, pp 191–219.
- Wilks A. 2007. *Réflexions ethnographiques à propos des transferts d'"aide"*. Paper presented at the Séminaire Ethnographie et Histoire Économique held at the Ecole Normale Supérieure (ENS) in Paris, France, 4 June 2007. Available from Ariel Wilks.

31 Risk Perception and Management in La Paz, Bolivia, and Cusco, Peru

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Abstract

Migration, accelerated growth and lack of planning have led to the emergence of highly vulnerable cities such as La Paz and Cusco, which have elevated levels of exposure to hazards (floods, landslides and earthquakes). Local governments and citizens have not succeeded in putting risk management on the political agenda. This study presents results of research on the social construction of disaster risks in La Paz and Cusco. It confirms Maskrey's statement that "the population only prioritises risk when confronted by specific adverse phenomena, and responds to this risk in the overall context of other social, economic and political risk that they confront on a daily basis" (Maskrey 1989).

Keywords: Hazard; vulnerability; risk; urban risk; risk management; migration; accelerated growth; planning; Bolivia; Peru.

31.1 Introduction: issues presented by case studies

Natural disasters affect an increasing number of people worldwide. Seventy-five percent of the world population live in areas prone to earthquakes, tropical cyclones, floods, or droughts, and were affected by disaster at least once between 1980 and 2000 (UNDP 2004). Disasters are closely related to development processes (Vargas 2003). Furthermore, the most severely affected populations tend to be the poorest and least resourceful, and those who receive less protection from the state. Bolivia and Peru are highly vulnerable countries at permanent risk. Despite the fact that most research on disasters has been conducted in the South, it was carried out mainly by researchers from the North due to limited academic and scientific resources in the South (Lavell 2005). By contrast, the present research, facilitated by the Swiss National Centre of Competence in Research (NCCR) North-South, has been carried out mainly by partners from the South.⁴

31.1.1 Relevant historical and geographical features of the areas studied

The two cities of La Paz and Cusco (Figure 1) are both highly exposed to natural hazards as a result of urban growth.

Historically, La Paz was built with an inherent strong socio-spatial segregation. Duly planned areas were occupied by the Spanish, while the indigenous population grew on the margins of secure areas, developing in a chaotic manner. This model has been reproduced until today, the only change being the groups in power who control the land. Those in control attach great value to land that is safe and stable, displacing those with few resources to marginal areas and hill slopes.

The 1952 revolution produced mass migration from rural areas as a side-effect. Resulting settlements and constructions have defined the design of urban growth, which began to invade new zones on the lower hillsides. During the 1970s, La Paz underwent accelerated growth. New waves of migrants invaded the mid-level slopes on the hillsides, initially in illegal or public areas, without basic infrastructure. As a result, the municipal government lost control of the city, initiating a process of physical and environmental vulnerability in these settlements.

The migrants were the victims of segregation, with restricted and unequal access to infrastructure and public resources. They even had to submit to



Fig. 1
Map of South
America with the
study areas of La
Paz and Cusco.
(Map by Luis
Salamanca
Mazuelo)

political blackmail in order to legalise their settlements. This inequality was accentuated by the neo-liberal model forcibly imposed in 1985.

Nowadays, La Paz extends from 2800 m to 4000 m above sea level and has a variety of microclimates. Erosion in the valley has produced noticeable dissimilarities in altitudes as well as a rugged topography, which includes rifts, areas with moderate to steep slopes, small plateaus, and sectors that are isolated from each other due to numerous watercourses. The city is cloistered in a deep valley that forms the basin of the Choqueyapu River. It covers an area of 8310 ha, and the population reached 798,585 inhabitants in 2001. La Paz has an unstable physical configuration due to geological and hydrological conditions and more than 380 underground rivers.

Some human settlements have been established on very steep slopes with a gradient above 45°, or in spaces that are not suitable for construction, mainly located on hillsides (*laderas*) surrounding the city; these represent 60% of the overall urban space. The main hazards are landslides, floods, mudslides, and hailstorms.

Cusco is the result of a juxtaposition of Incan, colonial, republican and contemporary cities. In recent years, rural–urban migration has led to accelerated urban growth, increasing the unplanned presence of marginal settlements. Most of these are located in areas that are prone to physical and environmental hazards. Some people have no other option than living on the hillsides adjacent to or surrounding the historical centre, or in other dangerous zones. These inadequate uses of space have generated physical risks in the city (Guzmán Pacheco 2005).

The city is located in the south-eastern area of the Andes in Peru, with an elevation varying between 3150 and 3700 m above sea level, and an area of 3400 ha occupied by 339,000 inhabitants. It is shaped by a valley floor, esplanades, and part of the basin's hillsides. The characteristics of the original inter-Andean valley have gradually been modified: more and more of its agricultural sectors have been transformed into human settlements. Likewise, steep areas with natural and cultivated forests that had shaped the city's landscape have been supplanted by urban settlements, as well.

The majority of human settlements in Cusco are located in a marginal urban vicinity, classified as areas prone to physical and environmental hazards. Consequently, they have a higher vulnerability. Over the last few years, intense rain in Cusco led to a series of landslides and floods (Guzmán Pacheco 2005; Hammond 2006).

31.1.2 Scope of the study

In view of the constant disasters endured in La Paz and Cusco, the research done within the NCCR North-South programme aimed to understand risk in its entirety, especially the processes of social construction of risk that contribute to disaster. This article focuses mainly on two major dimensions: risk perception and risk management.

Risk perception, understood as representation of risk by the people involved, defines the awareness of the problem which conditions the adoption of protective measures. Perception is thus part of the social construction of risk, understood as societal processes that create or increase risk. Another part of these processes is risk management, i.e. the way in which the issue is dealt with at all levels.

Both cities are quite similar in many respects: they have populations of less than one million, are situated at high altitudes, and are typical Andean human settlements with a strong millenary indigenous presence (Inca/Aymara), colonisation by the Spanish, and then rapid urban growth due to “rural exodus”. Both are surrounded by vast, hazardous hill slopes (Figure 2), where the poorest tend to live at risk of landslides, whereas the city centres are considerably more wealthy and safe, although both are threatened by flooding. The climate is quite similar, as well, with 4 months of intense rainfall each year. These similarities justify a systematic comparison. This article opens a debate which needs to be enriched through future research.

31.2 Methodology

The methodology used involved studying people’s knowledge and practices and linking them in an inductive way. People’s risk perceptions, embedded in their daily lives, were investigated and then put into a broader context of vulnerability and risk by the use of maps, reports, and statistics. This made it possible to analyse their concerns as well as the processes by which problems are rendered invisible. On this basis, processes were then explained theoretically and critically.



Fig. 2
Dangerous slopes
in La Paz. (Photo by
Fabien Nathan)

Work on two PhD and two MA studies was done in La Paz and Cusco. The PhD projects studied the vulnerability of La Paz in depth, with qualitative and quantitative instruments such as focus groups, participatory observations, literature reviews, housing census, surveys, and interviews. Geographic information systems (GIS) were also used. In-depth case studies were done, not only at the city level but also in several exposed neighbourhoods on the city's hill slopes; these included in situ participatory observation of inhabitants that had been at risk for more than two years. The two MA studies applied similar qualitative methods in Cusco.

31.3 State of the art

31.3.1 Risk management

Disaster management: Prior to the 1980s, the dominant perspective of several institutions was one of disaster management, based on the principle that disasters are the result of natural hazards, and that nothing can be done to control and minimise these hazards or to avoid disasters. Rather, attention was given to disaster management methods, especially the design of systems to provide services related to emergencies (Hewitt 1983), such as early warning systems. Tools to predict hazards and improve emergency management were developed within a framework of vertical and centralised management. This vision is known as the 'natural sciences approach' (Cardona Arboleda 2002).

The 'physicalist' school of thought (Hewitt 1983) replaced the previous vision. It produced significant advances in research by incorporating the study of loss and damage. It stated that for an event to be identified as a disaster there should be a measurable impact on the environment, society, or economy. Hazards continued to be seen as the cause of disasters, but the concept of vulnerability emerged to explain damage, loss, and other effects (Maskrey 1993). Thus, the social objective of applied sciences was the design of structural measures to mitigate losses caused by extreme events.

Introducing the key concept of vulnerability made it possible to move to the idea that the impacts associated with hazards showed major irregularities in time and space. From then on, risk was defined as a function of hazards as well as of vulnerability. This vision recognises the existence of social and political responsibilities to prevent losses. Researchers and practitioners

began to challenge both governments and the general public to implement risk reduction measures (Cardona Arboleda 2002).

The two approaches described above were framed by what is known as ‘disaster management’. This is related to processes that have already occurred, and therefore interventions were curative in nature.

Social theory of disaster: A third perspective emerged and developed into what is known as ‘the social theory of disaster’. This approach stated that vulnerability is social and does not refer solely to potential physical damage or demographic determinants. In this view, a disaster can occur only when the loss caused by an event surpasses the capacity of the population to endure it, or when the effects prevent the population from easily recovering (Blaikie et al 2003). Vulnerability could thus no longer be defined without taking into account the capacity to absorb, respond to, and recover from disasters (Cardona Arboleda 2002). From this perspective, an event that could go unnoticed in a large country might be seen as a catastrophe in a small country, depending on the capacity of each social system involved (Hewitt 1983). Clearly, the effects of natural disasters were now seen as a development issue (Maskrey 1993).

This idea was propelled by the Social Studies Network on Prevention of Disasters in Latin America, which stated that vulnerability was the result of social, economic and political processes. Therefore, in order to model vulnerability, it was necessary to take into account – aside from the physical aspects – social factors such as shortcomings in collective and family economies, absence of basic social services, lack of access to property and credit, discrimination, contamination of air and water resources, and absence of educational opportunities, among other things⁵.

Today, vulnerability may be described as

a tendency to undergo damage, i.e. a state of fragility, or a set of conditions, that raises the susceptibility of a community to the impact of a damaging phenomenon. On the other hand, vulnerability is the incapacity to anticipate, cope with, resist to, adapt to and recover from a hazard. Vulnerable units are either not resistant, i.e. incapable of withstanding shock (without adapting), and/or not resilient, i.e. incapable of absorbing shock and adapting to come back to an acceptable state. (Nathan 2008b, p 346)

Many conceptual frameworks exist today with regard to vulnerability and can be usefully applied to La Paz (Nathan, in press) and Cusco.

Current understanding of risk management: Wilches-Chaux (1998, p 18) defines risk management as the “ability of a community to precisely transform those conditions that are the causes, before a disaster occurs. Risk emerges from the confluence within the same community of two ingredients: hazard and vulnerability conditions.”

There is a tendency at the international level and among scholars to link *human security* to vulnerability/disaster (Nathan 2008b). Today, most international agencies and research entities have adopted *risk management*. It is possible to say that a *social field* (Bourdieu 1984) of international risk management is now being created, with actors and logics in permanent struggle and sometimes contradiction (Nathan 2004).

31.3.2 Risk perception

Risk perception research in risk and disaster studies: It is crucial to take into account the anthropological dimensions in risk and disaster studies (Hoffman and Oliver-Smith 2002). An understanding of the successes and failures of risk-management practices would require connecting the cognitive structures to the existing social structures. The existence of a risk culture, the degree of tolerance to hazards, and the definition of acceptability limits obey cultural and political logics (Douglas 1987). As a city produces a specific culture as well as a multi-cultural space with ethnic and social differences, this dimension must not be neglected (Wolfenstein 1957).

There is a variety of actors who ‘perceive’ and have an influence on risk management: the municipal authorities that have responsibility for local public policy; the national authorities that design norms and general frameworks; the experts who define the characteristics of hazards; the actors in the land market who are capable of selling any piece of land; the media that report or do not report risks and disasters; and the inhabitants who settle in dangerous zones.

The perception of exposed people was studied because it is the most tangible level at which to understand the risk problem. Investigations were guided by two simple questions: Are exposed people conscious of risk? And if they are, why do they expose themselves in this manner?

Evolution of risk perception research: Abundant literature has endeavoured to provide answers to these questions, from the points of view of psychology, sociology, and anthropology.

Cultural studies – criticised for oversimplification (Boholm 1996) – study social and cultural differences in risk perception without taking into account other aspects, such as psychological factors: the difficulty of evaluating probabilities; evaluation in case of uncertainty (Adger 2006); underestimation of a hazard when settling in a place (Mileti 1999); or the reluctance to take preventive and mitigation measures.

The theory of bounded rationality shows that individuals lack the cognitive means to achieve absolute rationality (Simon 1957). Attitude theory confirms that behaviour depends on beliefs, values, and attitudes. Studies of habits show that these play a major role in the reception of a message, as does social conformity, which leads to imitating the behaviour of others. However, these multiple explanations are not sufficient to isolate a decisive variable in risk perception.

Current understanding of risk perception: Most researchers agree on the importance of institutional, economic and family contexts in the assessment of a situation. Risk perception may be quite different in urban areas compared to rural areas (Burton et al 1993). Furthermore, in countries of the South “cultural adaptation to precariousness” and the creation of an urban culture that mixes hyper-modernity and *bricolage* (Deler et al 1998) influence the evaluation of urban risks.

Other individual factors have been found (Boholm 1996). However, there is one explanatory factor that is particularly important to us, but which is generally ignored: the *adaptation of expectations to opportunities*. For Bourdieu (2007), each person assesses his or her range of possibilities and defines his or her expectations based on this assessment, which corresponds to objective possibilities according to the person’s social position. This could explain a certain resignation or risk acceptance due to adaptive realism or, more simply, to a lack of options. Social pressure forces people to accept extreme living conditions, probably in order to benefit from certain advantages derived from this situation, such as proximity to strategic parts of the city and to labour sources (Nathan 2008a; Salamanca Mazuelo and Quiroga Becerra de la Roca, in preparation).

31.4 Main results

31.4.1 High vulnerability and inadequate risk management

In La Paz, according to the study of socio-economic vulnerability (Salamanca Mazuelo 2008), the people who live on the hillsides are vulnerable because they (self-)construct their informal properties without ownership rights, technical guidance, soil studies, or use of adequate techniques. They have no connection to sewage networks; this leads to water filtration and landslide risk.

Moreover, La Paz faces an extreme shortage of land. The little existing constructible land remains in the hands of small groups of speculators. When the municipal government habitates new lands, they are immediately appropriated by these groups.

Hillside families have very few means of subsistence. Their neighbourhoods are poorly accessible, and the people have poor access to education and health services. The higher parts of the slopes are unsafe due to poor illumination and insufficient police services. At the same time the population exhibits a high level of identification with these places.

The municipal government has no effective response to these highly exposed groups. It mostly performs emergency management instead of risk management. Work remains to be done in land-use planning, zoning regulations, construction codes, education, public training, reforestation, and many other domains.

The population, for its part, prioritises social venues, sports facilities and asphalt, with no interest in geotechnical studies to identify the quality of soils and improve the stability of their homes. Both policy-makers and residents remain silent on the subject of risk-management issues, as neither find it convenient to bring problems to light (Nathan 2008a).

In Cusco, the Municipality of Cusco is the regulating entity for city planning and ordering. It has tools such as the Regulatory Plan for Cusco, and plays a fundamental role in risk management. This document includes a study of landslide risks and contemplates expansion zones in suitable places. However, the regulation is violated by citizens and authorities alike, the latter having constructed a municipal camping place in a riverbed two blocks away from the city centre.

The lack of risk prevention by relevant institutions and the weak participation of citizen organisations accentuate urban vulnerability. In addition, there is no multi-sector risk preparedness plan. As a result, preparedness is not prioritised in municipal budgets, since the issue is not on the agenda (Guzmán Pacheco 2005). On the other hand, institutions do not respond efficiently to emergencies, and some relocation solutions are not accepted by the population (Hammond 2006). Thus, authorities and citizens share the responsibility for disasters. Neither the population nor the authorities are capable of responding effectively. The authorities are expected to do everything, but they exempt themselves from the responsibility since there is no clear definition of roles and attributions overlap. Furthermore, the weak organisation of the population and insufficient communication between citizens and the local government reduce the possibility of an efficient risk-management system.

One could thus say that in both cities, vulnerability is high, especially for poor city dwellers relegated by the ‘free’ landownership market to the most dangerous places on the periphery. The municipalities are the main organisations in charge of risk management. However, until now they have not been able to provide a sustainable solution to the problem of disaster risk. Planning and regulation are either insufficient, inaccurate or unapplied. They largely remain ideas disseminated by the authorities themselves – even in La Paz, where popular participation is organised by law with a neighbourhood participatory budget. Furthermore, in both cities even emergency response is highly inadequate.

31.4.2 Perception among the population: La Paz and Cusco

In La Paz, risks and disasters are not socially visible, i.e. they are not considered according to the magnitude of the problem, or even not visualised as a problem at all. The exposed people on the hillsides tend to hide their exposure and declare that the soil they live on is “firm”, or emphasise that other hazards are more important to them, such as lack of interpersonal safety and economic issues (Nathan 2008a). Even if a house collapses, neighbours, the municipality or the media tend not to report it. Damage of great magnitude is required for a disaster to be reported.

Risk tends to be underestimated, trivialised or denied by the exposed people, neighbourhood leaders, and municipalities alike. At the level of the exposed households, some are precise about exposure, hazards and risks and express



Fig. 3
Damaged homes
in La Paz. (Photo by
Fabien Nathan)

deep concern, although there are significant individual differences. At the collective level, for example in neighbourhood committees, there is neither sound knowledge of the issue nor socialisation of fears and concerns among neighbours.

However, exposed people are not ignorant, indifferent, or irrational, nor do they make cynical calculations, as often claimed. In addition to the above-mentioned explanations, there are other factors to consider, such as lack of trust in the authorities; certain cultural elements; interest of inhabitants in obtaining improvements in their neighbourhoods and insisting on their habitability; the willingness of neighbourhood leaders to avoid depreciation in their zone; or tolerance of dangerous situations (Figure 3). Moreover, victims and exposed people are often marginalised and removed from political power. Inequality and symbolic violence resulting from discrimination are also at stake, as well as acceptance of natural hazards in order to deal with more important social hazards (Nathan 2008a).

Research has revealed a convergence of the interests of exposed people, neighbourhood leaders and municipalities to minimise the problem. Silence

has a social function in that it responds to the interests of stakeholders. This allows the establishment of a sort of *omerta* attitude towards risk (Nathan 2008a). This situation impedes integral risk management, especially bottom-up, given the absence of the ‘push factor’ necessary to compel local authorities to address root problems.

In Cusco, people seemed unaware of the risk when they procured their parcels of land. Many focused on short-term economic and social considerations that were overriding in decision-making, preventing them from taking efficient action concerning their safety (Hammond 2006).

The people who are aware of hazards try to “live with risk” (Guzmán Pacheco 2005), gradually increasing their consciousness. This leads to an institutionalisation of risk coexistence by social and institutional actors, inducing infringement and discretionary use of regulations (Guzmán Pacheco 2005).

In the event of disaster, the population of the zones under study in Cusco ascribed responsibility mainly to nature and religious beliefs (*Pachamama*, *Apus* and other Inca values). This perception of disasters discards the possibility of assuming one’s own responsibility for some of the causes (Rey 2005; Hammond 2006).

In both cities, the people currently exposed to hazards focused on more important economic and social considerations when choosing land for settlement, mainly through self-construction for the first newcomers, then through purchase of a relatively cheap house built by the ‘first generation’. However, while people in Cusco reported that they had tried to find more information about risk, this was not stated very strongly in La Paz, except in some extreme cases where disasters had already occurred. In other cases, even when disaster had previously struck, more information was not sought. Furthermore, although religious beliefs such as belief in *Pachamama* or ‘hard’ evangelism were also stated in La Paz, they did not seem as relevant to people’s protective behaviour as in Cusco. More data would be needed to explore these issues, especially in Cusco. In both cases, Bourdieu’s view on social adaptation (Bourdieu 2007) is quite useful to explain a certain tolerance of living with risk. Many people revealed this process of adaptation to harsh conditions in semi-structured interviews, when they mentioned that they are now ‘accustomed’ to the hazards of the place.

31.4.3 NCCR North-South books and projects

An academic contribution to the risk-management debate was made in the form of a book entitled *Theoretical Approaches to Disaster and Local Risk Management (Critical Construction of the Concept)* (in Spanish; Torrico Cañaviri et al 2008a). This book offers a critical review of the discussion of the risk-management concept from the point of view of researchers in the South. Two major outputs are publications dealing with the inclusion of risk management in national planning: 1) *Planning Development at the Municipal Level with a Focus on Risk Management* (in Spanish; Torrico Cañaviri et al 2008b) and 2) *Instruments of Risk Management in Development Planning* (in Spanish; Torrico Cañaviri et al 2009). In addition, the *Atlas of Vulnerabilities in Bolivian Municipalities* (Quiroga Becerra de la Roca et al 2008) is a valuable tool for supporting decision-making and planning processes. Finally, two publications, one of them currently in preparation, provide more specific insights into risk management: 1) *Flooding in Beni* (in Spanish; Salamanca Mazuelo et al 2007) and 2) *107 Years of Disasters in Bolivia* (in Spanish; Salamanca Mazuelo and Quiroga Becerra de la Roca, in preparation).

Two Partnership Actions for Mitigating Syndromes (PAMS)⁶ on “Support for Local Risk Management in Bolivia” and “Improving Governance of Urban Risks in La Paz East and North-East Areas” have raised awareness among the population and created opportunities to lobby for the incorporation of prevention and mitigation in development processes within municipal policy. These PAMS were designed on the basis of Luis Salamanca’s PhD research and of a resilience study carried out in a Transversal Package Project (TPP)⁷ on “Social Vulnerability and Resilience”.

31.5 Conclusions and recommendations

Disasters which may occur both in La Paz and in Cusco are caused not only by hazards, but also by the way in which populations have been pushed to settle in high-risk areas with low-quality housing, inadequate infrastructure, and no suitable training. This is due to the type of development that is being implemented, which has aggravated social inequalities and consolidated social exclusion. Poor and exposed populations tend to adapt to this situation through the social mechanism Bourdieu (2007) has made evident in other settings. Challenging these inequitable development processes would thus be part of the solution.

Public policy construction happens in a top-down manner, since there is no clear demand from the people exposed for integral risk management. Both political authorities and residents prefer not to render this problem visible.

Risk management should be implemented at the community level, generating capacity, reinforcing social structures and providing technical information, but also helping people to improve their living conditions and engage in secure economic activities. Furthermore, land redistribution and improvement of access to health and education should be proposed. It is necessary to design a strategy to oblige both actors – citizens and authorities – to recognise their deficiencies and their concealment of the issue.

Endnotes

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⁴ See Hufty (2007, 2009) for the political and sociological analysis in which the present research was framed; this conceptual framework was developed by the team of NCCR North-South researchers at the Graduate Institute of International and Development Studies (IHEID) as of 2000.

⁵ More detailed information on these issues can be found on the Network's website:

www.desenredando.org

⁶ Partnership Actions for Mitigating Syndromes (PAMS) are projects implemented by local actors together with scientific and non-scientific stakeholders. As a component of the NCCR North-South programme they are designed to implement and validate approaches, methods and tools developed in research, with a view to finding promising strategies and potentials for sustainable development. Moreover, they are intended to promote mutual learning and knowledge-sharing between academic and non-academic partners in sustainable development.

⁷Transversal Package Projects (TPPs) were a Phase 2 component of the NCCR North-South that helped cross disciplinary boundaries, with a view to achieving better integration of complex issues within the framework of the overall theme of sustainable development and syndrome mitigation. TPPs were interdisciplinary projects entrusted to research teams under the leadership of promising post-doctoral researchers from the North and the South.

References

Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- Adger WN. 2006. Vulnerability. *Global Environmental Change* 16:268–281.
- Blaikie P, Cannon T, Davis I, Wisner B. 2003. *At Risk, Natural Hazards, People's Vulnerability and Disasters*. London, UK: Routledge.
- Boholm Å. 1996. Risk perception and social anthropology: Critique of cultural theory. *Ethnos* 61(1/2):64–84.
- Bourdieu P. 1984. *Questions de sociologie*. Paris, France: Minuit.
- Bourdieu P. 2007. *El sentido práctico*. New edition [1991¹]. Mexico City, Mexico: Siglo XXI Editores.
- Burton I, Kates RW, White GF, editors. 1993. *The Environment as Hazard*. 2nd, revised edition [1978¹]. New York, NY: Guilford Press.
- Cardona Arboleda OD. 2002. *Estimación holística del riesgo sísmico utilizando sistemas dinámicos complejos* [PhD dissertation]. Barcelona, Spain: Universidad Politécnica de Cataluña (UPC).
- Deler JP, Le Bris E, Schneider G, editors. 1998. *Les métropoles du Sud au risque de la culture planétaire*. Collection Hommes et Sociétés. Paris, France: Karthala.
- Douglas M. 1987. Les études de perception des risques: un état de l'art. In: Fabiani JL, Theys J, editors. *La société vulnérable*. Paris, France: Presses de l'Ecole Normale Supérieure, pp 55–60.
- * Guzmán Pacheco E. 2005. *Gestión de riesgo de desastres en zonas urbanas marginales del Cusco* [MSc thesis]. Cusco, Peru: Centro de Estudios Regionales Andinos Bartolomé de Las Casas (CBC).
- * Hammond M. 2006. *Aportes desde la comunicación social para el desarrollo de las Estrategias de Prevención y Mitigación de Riesgos* [MSc thesis]. Cusco, Peru: Centro de Estudios Regionales Andinos Bartolomé de Las Casas (CBC).
- Hewitt K, editor. 1983. *Interpretations of Calamity*. Boston, MA: Allen and Unwin.
- Hoffman SM, Oliver-Smith A, editors. 2002. *Catastrophe and Culture: The Anthropology of Disaster*. Santa Fe, NM: School of American Research Press.
- Hufty M. 2007. *Una propuesta para concretizar el concepto de gobernanza: el marco analítico de la gobernanza*. Geneva, Switzerland: Graduate Institute of International and Development Studies (IHEID).
- Hufty M. 2009. *The Governance Analytical Framework*. Geneva, Switzerland: Graduate Institute of International and Development Studies (IHEID). Also available at: <http://www.nccr-north-south.unibe.ch/publications/Infosystem/On-line%20Dokumente/Upload/GovernanceFrameworkE.pdf>; accessed on 12 November 2009.
- Lavell A. 2005. *Los conceptos, estudios y práctica en torno al tema de los riesgos y desastres en América Latina: evolución y cambio, 1980–2000. El rol de la red, sus miembros y sus instituciones de Apoyo*. Curridabat, Costa Rica: Facultad Latinoamericana de Ciencias Sociales (FLACSO). Also available at: <http://bibliotecavirtual.clacso.org.ar/ar/libros/flacso/secgen/lavell.pdf>; accessed on 8 April 2009.
- Maskrey A. 1989. *El manejo popular de los desastres naturales*. Lima, Peru: Intermediate Technology Development Group (ITDG).
- Maskrey A, editor. 1993. *Los desastres no son naturales*. Ciudad de Panamá, Panama: La Red.
- Mileti DS. 1999. *Disasters by Design: A Reassessment of Natural Hazards in the United States*. Washington, D.C.: Joseph Henry Press.
- * Nathan F. 2004. *La gestion des risques de catastrophe naturelle au niveau global: cohérences et incohérences d'un domaine en constitution*. Working paper. Geneva, Switzerland: Graduate Institute of International and Development Studies (IHEID) and Swiss National Centre of Competence in Research (NCCR) North-South.
- * Nathan F. 2008a. Risk perception, risk management and vulnerability to landslides in the hill-slopes in the city of La Paz, Bolivia. A preliminary statement. *Disasters* 32(3):337–357.

- * Nathan F. 2008b. Natural disasters, vulnerability, and human security. In: Brauch HG, Grin J, Mesjasz C, Krummenacher H, Behera NC, Chourou B, Oswald Spring Ú, Kameri-Mbote P, editors. *Facing Global Environmental Change: Environmental, Human, Energy, Food, Health and Water Security Concepts*. Hexagon Series on Human and Environmental Security and Peace, Vol. 4. Berlin, Heidelberg, New York: Springer-Verlag, pp 1121–1130.
- * Nathan F. In press. Vulnerability to natural hazards: Case study on landslide risks in La Paz. In: Brauch HG, Oswald Spring Ú, Mesjasz C, Grin J, Kameri-Mbote P, Chourou B, Dunay P, Birkmann J, editors. *Coping with Global Environmental Change, Disasters and Security: Threats, Challenges, Vulnerabilities and Risks* [working title]. Hexagon Series on Human and Environmental Security and Peace, Vol. 5. Berlin, Heidelberg, New York: Springer-Verlag. Draft available from Fabien Nathan.
- * Quiroga Becerra de la Roca R, Salamanca Mazuelo L, Espinoza J, Torrico G. 2008. *Atlas de vulnerabilidades de los municipios de Bolivia*. La Paz, Bolivia: Swiss National Centre of Competence in Research (NCCR) North-South, Oxfam, Graduate Institute of International and Development Studies (IHEID), Swiss Tropical Institute (STI).
- * Rey N. 2005. Anthropologie du risque urbain dans les laderas de Cuzco (Pérou). *Cahiers des Amériques Latines* 46:133–149.
- * Salamanca Mazuelo L. 2008. *Agua tatay, Agua tatay. La construcción de la política pública en gestión del riesgo* [PhD dissertation]. La Paz, Bolivia: Postgrado en Ciencias del Desarrollo, Universidad Mayor de San Andrés (CIDES–UMSA).
- * Salamanca Mazuelo L, Quiroga Becerra de la Roca R. In preparation. *107 años de cronologías de desastres naturales en Bolivia*. La Paz, Bolivia: Swiss National Centre of Competence in Research (NCCR) North-South, Oxfam, Graduate Institute of International and Development Studies (IHEID), Swiss Tropical and Public Health Institute (Swiss TPH).
- * Salamanca Mazuelo L, Tellez S, Torrico Cañaviri G. 2007. *Inundaciones en el Beni*. La Paz, Bolivia: Swiss National Centre of Competence in Research (NCCR) North-South, Swiss Tropical Institute (STI), Graduate Institute of International and Development Studies (IHEID).
- Simon HA. 1957. *Administrative Behaviour*. 2nd edition. New York: Macmillan.
- * Torrico Cañaviri G, Ortiz Cañipa S, Salamanca Mazuelo L, Quiroga Becerra de la Roca R. 2008a. *Los enfoques teóricos del desastres y la gestión local del riesgo (Construcción crítica del concepto)*. La Paz, Bolivia: Swiss National Centre of Competence in Research (NCCR) North-South, Oxfam, Fundación para el Desarrollo Participativo Comunitario (FUNDEPCO).
- * Torrico Cañaviri G, Ortiz Cañipa S, Salamanca Mazuelo L, Quiroga Becerra de la Roca R. 2008b. *Planificando el desarrollo municipal con enfoque de gestión del riesgo*. La Paz, Bolivia: Swiss National Centre of Competence in Research (NCCR) North-South, Oxfam, Fundación para el Desarrollo Participativo Comunitario (FUNDEPCO), Swiss Tropical Institute (STI), Graduate Institute of International and Development Studies (IHEID).
- * Torrico Cañaviri G, Ortiz Cañipa S, Salamanca Mazuelo L, Quiroga Becerra de la Roca R. 2009. *Instrumentos de gestión del riesgo en la planificación del desarrollo*. La Paz, Bolivia: Swiss National Centre of Competence in Research (NCCR) North-South, Oxfam, Fundación para el Desarrollo Participativo Comunitario (FUNDEPCO), Swiss Tropical Institute (STI), Graduate Institute of International and Development Studies (IHEID).
- UNDP [United Nations Development Programme]. 2004. *Un informe mundial. La reducción de riesgos de desastres un desafío para el desarrollo*. New York, NY: John S. Swift.
- Vargas R. 2003. *Formulación de un modelo general para la gestión del riesgo en ciudades* [diploma thesis]. Bogotá, Colombia: Universidad de los Andes.
- Wilches-Chaux G. 1998. *Auge, caída y levantada de Felipe Pinillo, mecánico y soldador o yo voy a correr el riesgo*. Lima, Peru: La Red, Intermediate Technology Development Group (ITDG).
- Wolfenstein M. 1957. *Disaster: A Psychological Study*. London: Routledge and K. Paul.

32 **Protected Areas and Indigenous Peoples in Bolivia and Peru: Dilemmas, Conflicts, and Ways Out**

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Abstract

Recognition of the limitations of the traditional ‘fortress approach’ to governance of protected areas has led to a new model that seeks to reconcile environmental conservation with human development and promote participation by local populations. Based on a comparative analysis of four case studies in Bolivia and Peru, the present article shows the processes, problems and potentialities that emerge from the inclusion of indigenous peoples in the governance of protected areas. It demonstrates that there are many political, economic, social and cultural obstacles to reconciling conservation with development. The article identifies four critical points that need to be addressed in order to understand and mitigate these obstacles: 1) the discontinuities between formal legal frameworks and local practice; 2) the difficulties of integrating conservation with economic activities; 3) the challenge of establishing an intercultural dialogue among the actors involved; and 4) the preponderant but ambiguous position of the state. In each of these points, the conflicting interests of and the unequal power relationships between the state, indigenous peoples, conservation organisations and extracting companies are the key drivers that create the obstacles.

Keywords: Protected areas; indigenous peoples; participatory conservation; governance; social conflicts; natural resource management; Amazon; Andes.

32.1 Introduction

Protected areas are created in order to safeguard biodiversity in a context of growing global demand for natural resources and pressure on land. However, they also have negative impacts on the livelihoods of local people. In this sense, protected areas represent a response to as well as a constituent element of global change (Galvin and Haller 2008). Before the 1980s, the dominant method of governing protected areas was shaped by the ‘fortress approach’, which emphasised state control, restricted the use of resources, and sometimes displaced local populations from these areas (Stevens 1997). In many cases, this focus led to an increase in social conflicts that gravely compromised the long-term effectiveness of protected areas and was also ethically questionable (Brechtin et al 2002). Many scholars and practitioners have since proposed responding to this problem by seeking to reconcile environmental conservation with human development, and promoting the participation of local populations in the management of protected areas.¹¹ This has resulted in a change of analytical paradigm, reinforced by the emergence of the concept of ‘bio-cultural diversity’ in the 1990s, which is based on the recognition that there is a link between biological and cultural diversity (Posey 1999).¹² This is partly why we now see a proliferation of ‘nature–society hybrids’ in the world of conservation (Zimmerer 2000) which recognise that sustainable use of biodiversity and natural resources can be compatible with conservation.

In South America, the inclusion of indigenous peoples and peasant communities in conservation efforts, recognising the contribution of their traditional activities in sustaining biodiversity, has been increasingly promoted by international conservationist organisations. However, this tendency contrasts with the increasingly weak role of the state in the management of protected areas as a result of privatisation and deregulation policies that have tended to benefit both the legal and the illegal private sector (Nelson and Sportza 2000). Under these conditions, there is persistent uncertainty about the efficiency of protected areas in integrating conservation with long-term local development.

An in-depth analysis of case studies in protected areas carried out by the Swiss National Centre of Competence in Research (NCCR) North-South (Galvin and Haller 2008) showed that participatory conservation is possible if it brings economic and political benefits to the local people(s) involved. However, it also showed that the paradigm shift towards more equitable and efficient implementation of protected areas through participation is far from complete.

The objective of this article is to describe the processes, problems and potentialities that emerged from inclusion of indigenous peoples in the governance of four protected areas, two in Bolivia and two in Peru. This analysis led to the identification of four critical points that must be addressed when seeking to reconcile conservation with development in the South American context: 1) the discontinuities between formal legal frameworks and local practice in the management of natural resources; 2) the difficulties of integrating conservation with economic activities; 3) the challenge of establishing an intercultural dialogue between the actors involved; and 4) the ambiguous position of the state.

3.2.2 Analytical framework and methods

Our analysis contains several theoretical references under the broad heading of political ecology, taking an approach based on institutionalism that focuses on the management of common-pool resources (Ostrom 1990) as a starting point. Furthermore, the case studies were analysed using an actor-oriented approach (Long 1992; Wiesmann 1998) that focused on different actors' perspectives on resource management as expressed in their discourses, narratives and practices. This actor-oriented approach was given further depth by theoretical contributions from ethno-science (Atran 1991; Rist and Dahdouh-Guebas 2006) which helped to understand how actors construct their discourses, narratives and practices using specific forms of knowledge and perceptions of the relationship between society and nature.

Finally, the governance-analytical framework, which refers to the way the management of protected areas is shaped by formal and informal norms that are the result of interaction among the actors involved (Hufty et al 2007; Galvin and Haller 2008), made it possible to identify the continuities and discontinuities between the case studies in a joint interdisciplinary exercise.

The research was carried out in four protected areas (Figure 1) that are part of a 'hotspot' of biodiversity in the area of transition between the Andean mountain ranges and the Amazon plains. These case studies were selected in order to represent a broad spectrum of geographical, cultural, political and economic contexts, including lowland as well as highland areas, Andean and Amazonian indigenous peoples, and different Bolivian and Peruvian political and economic contexts. Moreover, the selected areas reflect different stages in the consolidation of protected areas, from areas created 40 years ago, such

Protected Areas and Studied Areas in Bolivia and Peru



Fig. 1
Location of the four study areas in a hotspot of Andean biodiversity. (Map by Sébastien Boillat; source of data on protected areas: UNEP-WCMC and IUCN 2006)

as the Tunari National Park (TNP), to areas still in the process of implementation, such as the Sierra del Divisor Reserved Zone (SD-RZ). The main actors involved in the four case study areas were state representatives, indigenous peoples, conservationist organisations, and extracting companies.

32.3 Results

32.3.1 The Pilon Lajas Biosphere Reserve and Indigenous Territory: between market and conservation rationale

The creation of the Pilon Lajas Biosphere Reserve and Indigenous Territory (Pilon Lajas) in 1992 was a response to a joint demand from indigenous populations (Tsimane’ and Mosekene) and from a Bolivian non-governmental organisation (NGO) involved in agro-ecology. When the Agrarian Reform Law (INRA Law) was adopted in 1996, the 400,000 ha of the reserve were regularised through a collective and homogeneous land title in the name of a

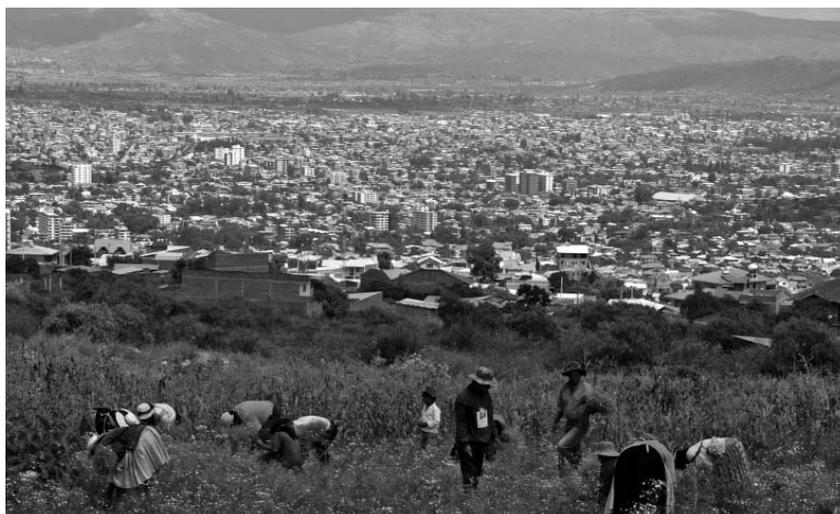
single and unique indigenous political instance, apart from local communities. This way, Pilón Lajas became an area where resource use was restricted, leading to a ‘double denial’: on the one hand, the restrictions deny the effective and growing influence of a strong lumber market in which indigenous people participate, and on the other hand, the collective title denies the need expressed by these people for greater land security at both community and individual levels (Bottazzi 2008). This situation of ‘double denial’ favours open access to forest resources in the name of integrated conservation. The absence of alternatives to an exaggeratedly collectivist vision of property over space, emanating from the ‘new conservationist essentialism’, leaves openings for the introduction of a fundamentally proprietary paradigm subject to market rationale.

32.3.2 Misunderstood worlds: urban dreams and rural struggles in the Tunari National Park

The Tunari National Park (TNP) was created in 1962 to halt the expansion of the city of Cochabamba towards the hillsides and to protect the city from natural disasters. In 1991, the current legal framework was established, prohibiting grazing and restricting agricultural and forestry activities in the 300,000 ha allocated to the Park. Over 385 Quechua peasant communities live in the TNP. They were not consulted about the creation of the Park; they opposed the legal framework and impeded its implementation, with the exception of an area close to the city (1% of the total area of the TNP). In this same area, however, the TNP has not managed to prevent illegal trafficking in land destined for urbanisation. Peasant organisations regulate the local management of natural resources through productive and social practices sustained by principles of integrality, diversification, respect and reciprocity, while maintaining high ecosystem diversity (Figure 2). These activities reflect a concept of unity between society and nature, characterised by a spiritual relationship to the land.

The government of the Department of Cochabamba – which administers the TNP – and the conservationist organisations of Cochabamba insist on strict protection of the area. Biodiversity specialists at the local university see the TNP as an opportunity to promote conservation of native forests. Both of these actors propose a separation between economic and social development and natural and recreational areas, a suggestion that contrasts with the peasant concept of a society–nature relationship (Boillat et al 2008). The TNP’s classification as a National Park entails a superposition of the rights of the

Fig. 2
Urban dreams and
rural reality: Que-
chua peasants
from the area of
the Tunari National
Park harvesting
flowers to be sold
in the city of
Cochabamba.
(Photo by
Sébastien
Boillat, 2006)



national state over the legal tutelage of local political authorities (municipalities) regarding the management of natural resources. At the same time, peasant organisations propose autonomous management of resources based on the rights granted to them by the Agrarian Reform Law.

In the wake of the change of government in Bolivia and following implementation of a partnership project¹³ supported by the NCCR North-South, some conservationist organisations began to recognise the role of the peasant population in biodiversity management in the TNP. The peasant organisations, for their part, declared themselves in favour of a change in the legal framework for the area to permit traditional agricultural activities. However, other conservationist actors fear that such a change would make the area more vulnerable to land trafficking.

32.3.3 The Amaraeri Communal Reserve: co-management and uncertain partnerships

The Amaraeri Communal Reserve (ACR), extending over 400,000 ha, was created in 2002 owing to the ecological and cultural value of the area it covers. It was the result of a process of indigenous political self-determination through conservation, promoted by indigenous organisations with NGO support. The Harakmbut, Matsiguenka and Yine communities are estab-

lished on the outskirts of the reserve. Their representatives constitute the Executor of the Management Contract (EMA) and have signed a co-management contract with the state. The ACR legal framework permits hunting, fishing and harvesting activities, whereas commercial activities such as logging and gold extraction are not allowed. However, illegal continuation of the latter in the area has not been completely halted. These activities are the main source of income for groups of settlers, lumberjacks and miners, mainly from the Andean areas, who prioritise short-term economic development.

Contact with the market economy has led many indigenous people to become involved in these activities as well, mostly in a situation of indebtedness and disadvantage (Alca 2008). Some indigenous people, especially youths and those more closely linked with the market economy, had great expectations regarding economic benefits from the ACR; they became disillusioned, for example, with the inefficiency of a multi-communal ecotourism company. For this reason, some indigenous people perceive the ACR as a limitation that has mainly benefited those defending the interests of conservation. The problem is aggravated by the ambiguous position of the state, which is encouraging conservation on the one hand and promoting policies focusing on extraction of natural resources on the other. In 2005 the state granted a concession for exploitation of hydrocarbons (Lot 76) that covers the entire territory of the reserve and neighbouring areas (Álvarez et al 2008). This situation shows the permanent uncertainty in which the co-management of the ACR has been implemented.

32.3.4 Are conservation and sustainable development incompatible? The Sierra del Divisor Reserved Zone (SD-RZ)

The Sierra del Divisor is the only mountainous region in the lowland jungles of Peru, on the border with Brazil. In 2006 this area covering 1,400,000 ha was classified in the transitory category of 'Reserved Zone', for the purpose of protecting its biodiversity and endemic species as well as providing greater protection for the Isconahua indigenous group living in voluntary isolation within the area. The question of the final classification of the area opened up a process of negotiation between the state and the different actors. During the classification process, indigenous federations expressed their profound discontent with the work of some conservationist institutions; the latter were seen as making money in the name of indigenous peoples or the environment without generating concrete benefits. The federations shared the view of other local population groups that they would get no benefit from a protected area.

The predominant impression among indigenous people was one of expropriation; they felt that classification as a protected area would mean a ban on the use of forestry resources and would pose an obstacle to their territorial demands (Oliart and Biffi 2009). Conservationist organisations recognise the sustainability of traditional indigenous practices, but do not consider indigenous people capable of resisting pressure from logging companies that hire them or bribe their leaders. In fact, there are many signs in the area of illegal felling by settlers and indigenous people hired as cheap labour. The state – i.e. the actor with the greatest decision-making power regarding the SD-RZ – has assumed an ambiguous position that is clearly perceived as such by the different actors. On the one hand, the state takes measures to protect biodiversity and indigenous rights; on the other hand, it offers excellent conditions for extracting companies. For example, a contract for petroleum extraction has been granted on two lots (135 and 138) that overlap with the area of the SD-RZ. In conclusion, the case of the SD-RZ demonstrates the absence of an alliance between conservationist organisations and indigenous peoples, as well as the conflictive and ambiguous relationships that exist between the state and other actors.

32.4 Synthesis

32.4.1 Discontinuities between normative frameworks

In the cases of the ACR and Pilón Lajas, the new paradigm of including indigenous peoples in conservation efforts is explicitly and officially expressed in the formal legal framework. In the case of the TNP, the contribution of the peasant communities to biodiversity conservation has only very recently been recognised, and formal regulations have not yet been updated. The case of the SD-RZ shows the inverse tendency to apply a more rigorous category of conservation which restricts participation by indigenous people in its management, in line with the conservationists' 'new enclosure movement' (Pimbert and Pretty 1995).

All cases showed that formal regulations are usually very ineffective, regardless of the stage of consolidation of the protected area. In the cases of the ACR, Pilón Lajas and the SD-RZ, this is reflected in lumber extraction and illegal mining activities, which are not traditional activities of the indigenous populations. By contrast, in the case of the TNP, it is the banning of traditional activities that would be too conflictive to be applied in practice.

In all cases, informal regulations of access to land and resources prevail at the local level, showing a clear lack of continuity between the formal legal frameworks and local practices. These discontinuities are expressed in the superposition of contradictory norms from different sectors (conservation, land tenure, logging and mining) and at different levels (national, sub-national, municipal and local). As a consequence, even 'inclusive' conservation policies cannot be merged into an integral framework for the regulation of access to natural resources, and no authorities are clearly designated for the different levels of decision-making.

32.4.2 Conservation and economic activities

In the cases of the ACR, Pílon Lajas and the SD-RZ, the involvement of indigenous communities in illegal activities is clearly linked to the strengthening of their relationship to the market economy, particularly through contact with the population of settlers and immigrant extraction workers. In this framework, extraction of resources continues to be the most attractive economic activity for them, despite its illegality and the subordinate position of indigenous people in relation to other actors in the extraction value chain (Figure 3).

This situation demonstrates that the protected areas have indeed failed to bring true benefits to the least powerful social groups, and that the economic integration of conservation has not been achieved. A similar phenomenon can be observed in the case of the TNP with the spread of illegal urbanisation, which has not been stopped.

These observations show that the models of incentives promoted by conservation policies, including alternative economic activities such as ecotourism or handicrafts, have little effect and provide insufficient benefits, given the weight and force of non-sustainable, extractive economic activities.

This situation raises the need for reflection on the relationship between indigenous communities and the market economy. The hypothesis which states that by entering the market economy indigenous communities are not following a rationale of creating and accumulating capital, but are hoping to ensure their subsistence and strengthen themselves in the face of external actors (Orozco et al 2006), deserves to be explored.



Fig. 3
A Yine woman from the Comunidad Nativa de Diamante, a beneficiary of the Amara-kaeri Communal Reserve. She is carrying a bag of yucca to feed the family. (Photo by Jamil Alca Castillo, 2007)

32.4.3 From inter-relation to intercultural dialogue between actors

This analysis has demonstrated that a significant source of conflict in protected areas can be found in the different visions of the relationship between society and nature that prevail in conservationist and indigenous organisations. For many conservationists, the main purpose of protected areas continues to be the conservation of biodiversity, and in general it is biological criteria that drive their creation, as in the case of the SD-RZ. There is a tendency among some to idealise the traditional indigenous way of life as automatically being sustainable, while at the same time rejecting the role of indigenous people who have already entered the market economy in the conservation of biodiversity. In this setting, there is still a dual vision, of society with its economic development, on the one hand, and nature, which is to be conserved and where the ‘traditional indigenous’ is no more than an element in its preservation, on the other hand.

From the point of view of indigenous organisations, the conservation argument is mainly seen as a tool for obtaining territorial recognition, as in the case of the ACR and Pilón Lajas, where the indigenous communities do not necessarily prioritise the sustainability of their practices in a biological-

ecological sense. On the contrary, some indigenous organisations reject the conservation option when they see that this becomes a threat to self-determination where their territory is concerned. In this sense, if we acknowledge sustainability as a normative concept (Lélé and Norgaard 1996), the need to maintain self-determination over their territory and a diversified relationship between society and nature can be interpreted as an indigenous criterion of sustainability.

Finally, this analysis shows that partnership between conservationists and indigenous peoples has mainly been instrumentalised by both parties, as observed in other South American cases (Conklin and Graham 1995). This alliance has not been the result of an intercultural dialogue, where agreed forms of perception and valuation of natural resources and their dynamics are discussed, but rather of the mere identification of some specific common interests.

32.4.4 Position of the state

In the areas studied, it can be observed that the various processes for decentralising natural resource management can make local indigenous and non-indigenous populations vulnerable to external pressure to extract resources. The cases presented here have given greater visibility to the ambiguous position of the state: together with conservationist organisations, the state promotes conservation policies, but at the same time subordinates conservation to policies favouring non-sustainable extraction of resources by private companies. In this context, the state appears to be guided by short-term economic interests and thus unable to establish or apply an equitable regulatory framework for the protected areas. This situation generates distrust towards state-based regulations among the local population – whether indigenous, settlers or mestizo groups – and also among some conservationist organisations. This highlights the need to strengthen and to clarify the role of the state in creating spaces for negotiation and social control for the co-management of natural resources.

Endnotes

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- ¹¹ Key instruments in this respect include the 2004 Convention on Biological Diversity (CBD) Programme of Work on Protected Areas and the preceding Durban agreements; see Larsen and Oviedo (2005).
- ¹² For a complete review of key literature on the concept of bio-cultural diversity, see Maffi (2005).
- ¹³ This refers to a so-called Partnership Action for Mitigating Syndromes (PAMS), a programme component of the Swiss National Centre of Competence in Research (NCCR) North-South that serves as a vehicle for testing the practical application of development-oriented research results. PAMS are carried out by local organisations in cooperation with civil society and researchers of the NCCR North-South. Each project is designed to implement strategies developed jointly by researchers and local stakeholders. Based on a transdisciplinary approach to development research, PAMS aim at mutual learning and knowledge-sharing between academic and non-academic partners in sustainable development.

References

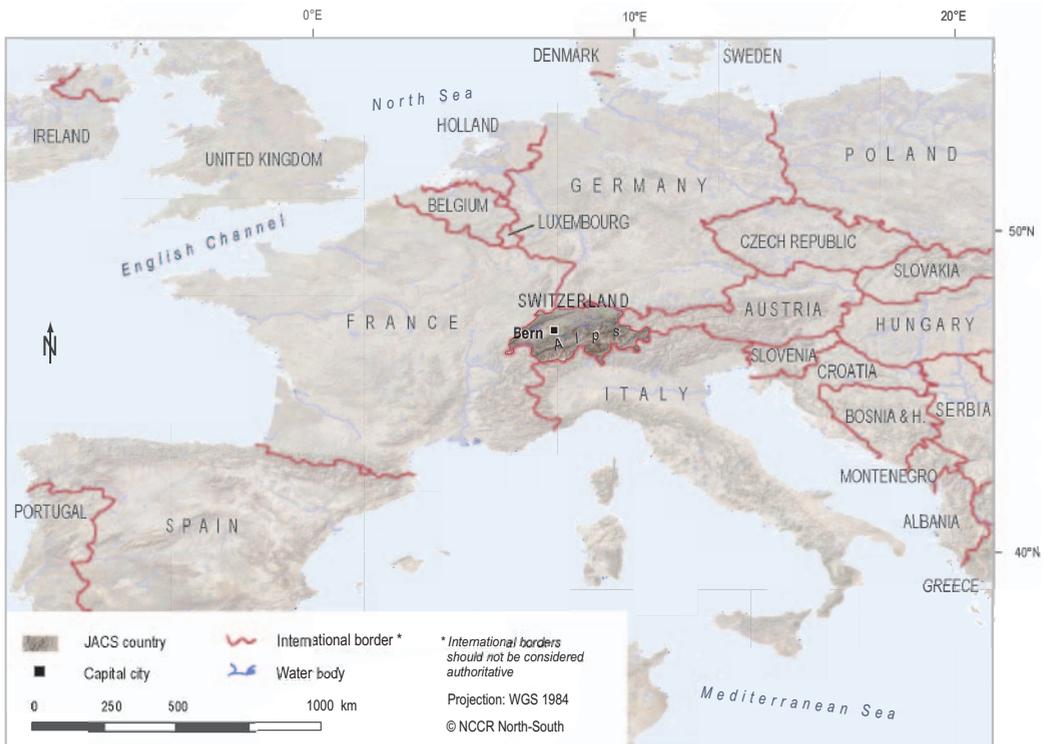
Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- * Alca J. 2008. Estrategias de gestión forestal y gobernanza local: el caso de la Reserva Comunal Amaraakaeri – Perú. In: Serna-Mendoza CA, Alvarez-León R, Rodríguez-López M, editors. *Desarrollo sostenible y medio ambiente: el pensamiento y las acciones estatales, universitarias, empresariales e investigativas al servicio de la sostenibilidad*. Manizales, Colombia: University of Manizales, pp 19–40.
- * Álvarez A, Alca J, García A, Galvin M. 2008. The difficult invention of participation in a protected area: The case of the Amaraakaeri Communal Reserve (Peru). In: Galvin M, Haller T, editors. *People, Protected Areas and Global Change: Participatory Conservation in Latin America, Africa, Asia and Europe*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 3. Bern, Switzerland: Geographica Bernensia, pp 111–144.
- Atran S. 1991. L'ethnoscience aujourd'hui. *Information sur les sciences sociales* 30(4):595–662.
- * Boillat S, Rist S, Serrano E, Ponce D, Delgadillo J. 2008. Struggling 'ontological communities': Transformations of discourses of conservationists and peasants in the Tunari National Park in Bolivia. In: Galvin M, Haller T, editors. *People, Protected Areas and Global Change: Participatory Conservation in Latin America, Africa, Asia and Europe*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 3. Bern, Switzerland: Geographica Bernensia, pp 37–80.
- * Bottazzi P. 2008. Linking 'socio' and 'bio' diversity: The stakes of indigenous and non-indigenous co-management in the Bolivian Lowlands. In: Galvin M, Haller T, editors. *People, Protected Areas and Global Change: Participatory Conservation in Latin America, Africa, Asia and Europe*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 3. Bern, Switzerland: Geographica Bernensia, pp 81–110.
- Brechin SR, Wilshusen PR, Fortwangler CL, West PC. 2002. Beyond the square wheel: Toward a more comprehensive understanding of biodiversity conservation as social and political process. *Society and Natural Resources* 15:41–64.
- Conklin BA, Graham LR. 1995. The shifting middle ground: Amazonian Indians and ecopolitics. *American Anthropologist* New Series 97(4):695–710.
- * Galvin M, Haller T, editors. 2008. *People, Protected Areas and Global Change: Participatory Conservation in Latin America, Africa, Asia and Europe*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 3. Bern, Switzerland: Geographica Bernensia.
- * Hufty M, Dormeier-Freire A, Plagnat P, Neumann V, editors. 2007. *Jeux de gouvernance: Regards et réflexions sur un concept*. Collection Développements. Paris, France and Geneva, Switzerland: Karthala and Institut de Hautes Études Internationales et du Développement (IHEID).
- Larsen PB, Oviedo G. 2005. Protected areas and indigenous peoples: The Durban contributions to reconciliation and equity. In: McNeely J, editor. *Friends for Life: New Partners in Support of Protected Areas*. Gland, Switzerland: International Union for Conservation of Nature (IUCN).
- Lélé S, Norgaard RB. 1996. Sustainability and the scientist's burden. *Conservation Biology* 10(2):354–365.
- Long N. 1992. From paradigm lost to paradigm regained? The case for an actor-oriented sociology of development. In: Long N, Long A, editors. *Battlefields of Knowledge: The Interlocking of Theory and Practice in Social Research and Development*. London, UK: Routledge, pp 16–43.
- Maffi L. 2005. Linguistic, cultural, and biological diversity. *Annual Review of Anthropology* 34:599–617.

- Nelson JG, Sportza LM. 2000. Evolving protected area thought and practice. *The George Wright Forum* 17(2):59–69. Also available at: <http://www.georgewright.org/172nelson.pdf>; accessed on 7 March 2003.
- * Oliart P, Biffi V. 2009. *Encuentros y desencuentros en los discursos sobre el futuro de la biodiversidad amazónica: territorialidad indígena, conservación y desarrollo para el progreso*. Informe taller temático interno. Oxapampa and Lima, Peru: Instituto del Bien Común.
- * Orozco S, García Linera A, Stefanoni P. 2006. *“No somos juguete de nadie”. Análisis de la relación de movimientos sociales, recursos naturales, Estado y descentralización*. La Paz, Bolivia: Plural editors.
- Ostrom E. 1990. *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge, UK: Cambridge University Press.
- Pimbert MP, Pretty JN. 1995. *Parks, People and Professionals: Putting ‘Participation’ into Protected Area Management*. Discussion Paper No. 57. Geneva, Switzerland: United Nations Research Institute for Social Development (UNRISD). Also available at: <http://www.eldis.org/vfile/upload/1/document/0708/DOC21521.pdf>; accessed on 14 July 2009.
- Posey DA. 1999. Introduction: Culture and nature – the inextricable link. In: Posey D, editor. *Cultural and Spiritual Values of Biodiversity: A Complementary Contribution to the Global Biodiversity Assessment*. London, UK: Intermediate Technology Publications, pp 1–18.
- * Rist S, Dahdouh-Guebas F. 2006. Ethnoscience: A step towards the integration of scientific and indigenous forms of knowledge in the management of natural resources for the future. *Environment, Development and Sustainability* 8(4):467–493.
- Stevens S, editor. 1997. *Conservation through Cultural Survival: Indigenous Peoples and Protected Areas*. Washington, D.C.: Island Press.
- UNEP–WCMC [United Nations Environmental Programme World Conservation Monitoring Centre] and IUCN [International Union for Conservation of Nature]. 2006. *World Database on Protected Areas*. 2006 Release. <http://www.wdpa.org>; accessed on 9 September 2009.
- Wiesmann U. 1998. *Sustainable Regional Development in Rural Africa: Conceptual Framework and Case Studies from Kenya*. African Studies Series. Bern, Switzerland: Geographica Bernensia.
- Zimmerer KS. 2000. The reworking of conservation geographies: Nonequilibrium landscapes and nature–society hybrids. *Annals of the Association of American Geographers* 90(2):356–369.

Part IX

Regional Development Dynamics in the Swiss Alps





33 Sustainable Development and Nature Protection in the Swiss Alps: Finding the Balance

Astrid Wallner¹

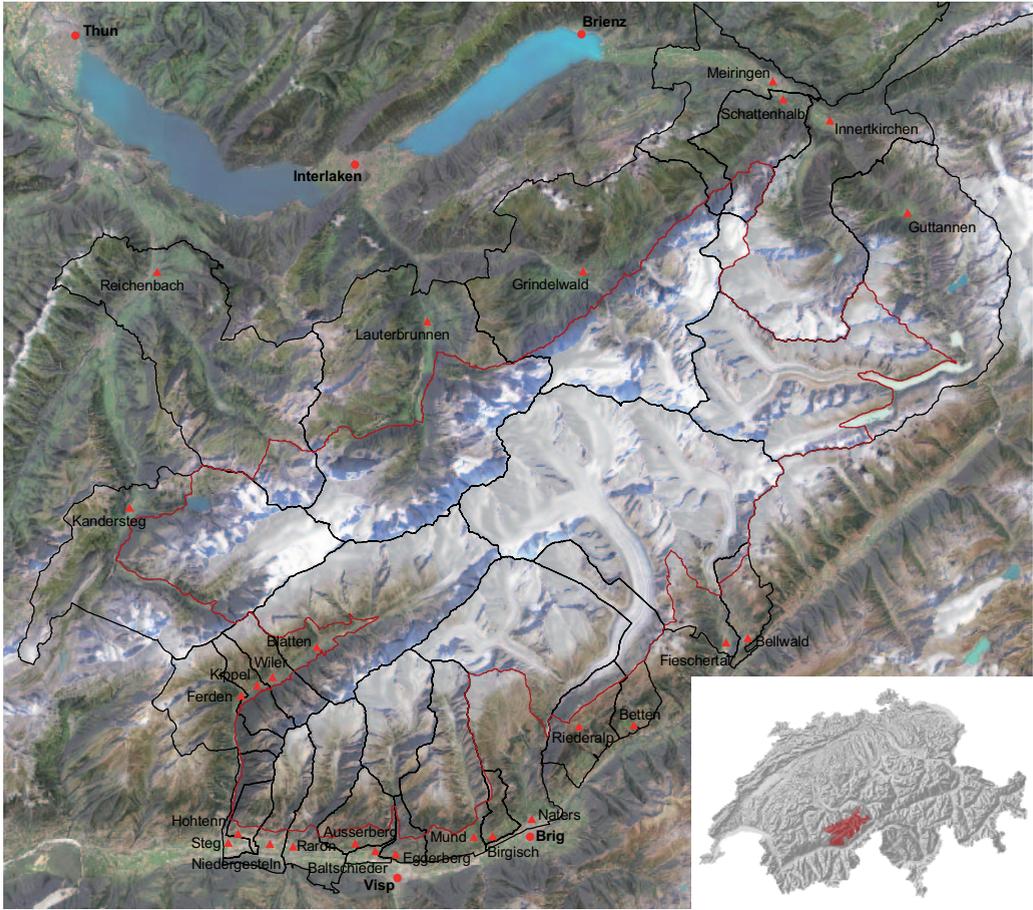
33.1 Introduction

The Alps are the highest and largest mountain system in Europe. In Switzerland, they cover 60% of the country's area. However, only 20% of the Swiss population live in the Alps. Nevertheless, the mountains contribute much to Switzerland's identity. Even though the country's main economic activities are concentrated in the lowlands, the Swiss Alps are more than just a peripheral area: they provide historic examples of problematic interactions involving human development and the environment (Bätzing 2003). The interplay of economic issues with cultural values has been a central factor in the development of the Swiss Alps, where agriculture, forestry, tourism and trade are the mainstays of local livelihoods today. Agrarian mountain cultures and adapted land-use systems have played a key role in creating and maintaining diversity and uniqueness in the Alps (Liechti and Wiesmann 2004). The Alps served as important bridges between major European centres, and transalpine trade had a fundamental influence on the development of the Alps. However, at the beginning of the 19th century, the Alps were heavily affected by structural changes due to the industrial revolution. They began to lose their supplementary position in European agricultural production, and marginalisation and impoverishment spread throughout many mountain areas. Subsequently, the Alps became a peripheral region in a rapidly developing Europe. In the mid-19th century tourism emerged as a new form of use of Alpine landscapes. In some parts of the Alps this development counterbalanced the marginalisation of traditional mountain agriculture, and sub-centres of economic development emerged. In this highland–lowland context, the Swiss Alps today constitute a peripheral, sensitive and valuable area within a global core region of economic development and globalisation.

Multifaceted demands on land use as well as continuously changing economic and social structures and processes led to increased change in mountain landscapes (Baumgart 2005). In the 1980s, a research project on “Socio-Economic Development and Ecological Capacity in Mountain Regions”

was started in the Swiss Alps within the framework of the Man and the Biosphere (MAB) Programme of the United Nations Educational, Scientific and Cultural Organisation (UNESCO). The guiding questions were the carrying capacity of a region and the balance between the ecosystem and human activities (Messerli and Messerli 1978). This integrated view of mountain regions as areas of production, recreation and protection formed a basis for discussions regarding inscription of the Jungfrau-Aletsch region on the UNESCO World Heritage List (Figure 1; Liechti et al, accepted).

Fig. 1
Focus area of the
Joint Area of Case
Studies (JACS)
Swiss Alps (ALP).
(Map by Centre for
Development and
Environment)



- Legend**
- Centre of associated commune
 - Regional centre
 - ⬭ Perimeter of the World Heritage Site
 - ⬭ Border of associated commune



Sources of Data:
Swiss Federal Office of Topography;
National and commune borders:
GG25 © 2005 (DV002213)
Main centres in communes:
SWSIS/NAME5 © 2004 (DV012687)
Relief: PK100 © 1998 and PK500 © 1999
(DV 351.4)
Swiss Agency for the Environment:
Perimeter of the World Heritage Site, 2005
Satellite Image

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Map compilation and cartography:
CDES (Centre for Development and Environment),
Institute of Geography, University of Bern,
in cooperation with the Swiss Alps Jungfrau-
Aletsch World Heritage Association,
Naters, 04.2009

Today, researchers of the Swiss National Centre of Competence in Research (NCCR) North-South in the Joint Area of Case Studies (JACS)² Swiss Alps (ALP) can draw on the experience of integrated and interdisciplinary research gained in this MAB project. The core research questions in the JACS ALP relate to the balance between endogenous and exogenous driving forces and the potential to foster sustainable regional development. Close collaboration with the Swiss Alps Jungfrau-Aletsch UNESCO World Heritage Site – which was formally established in 2001 – allowed the JACS ALP to contribute to the development of integrated management of this World Heritage Site (WHS) and its surrounding contexts. Therefore, the research scope of the JACS ALP has incorporated issues relating to the challenge of preserving the delicate natural environment of high mountain areas and to simultaneously balancing the interests of conservation and development in the region (Figure 2).

The JACS ALP research focus on issues relating to the Swiss Alps Jungfrau-Aletsch WHS shaped the selection of themes for this synthesis. The underlying research questions within these selected themes were the following:

- Discussions on conservation and development of a region relate to both global and local dynamics and interests. How can these be balanced in order to pursue sustainable regional development?



Fig. 2
Sheep farming is part of the traditional agricultural use of the Alpine region and is still practised today, even though its economic significance is low. (Photo by Karina Liechti)

- A process of socio-political negotiations is decisive in order to make sustainability meaningful, explicit and operational. In such negotiations, the involved actors construct their own individual ‘realities’, ascribing meanings to the issues under consideration. How decisive are these different meanings in the negotiation of pathways to sustainable regional development?
- Finding pathways to sustainable regional development – where conservation does not impede development – is a complex societal problem that requires the integration of actors from the world of science and from the life-world. This situation sets the frame for transdisciplinary research. What are the potentials and limitations of transdisciplinary approaches?

The three selected themes, 1) *Sustainable Regional Development*, 2) *Meanings of Conservation and Nature*, and 3) *Conservation and Development*, complement each other and together constitute an exemplary approach to analysis of the dynamics of regional development in the Swiss Alps.

33.2 Main research outputs

33.2.1 Sustainable regional development

The Swiss Alps Jungfrau-Aletsch WHS and its surrounding region extend over an area of 1629 km², encompassing territory in the cantons of Bern and Valais, in five planning regions, and in 26 communes. The political and administrative environment of the Swiss Alps Jungfrau-Aletsch WHS consists of a federal system on three levels: the communal, the cantonal and the federal (Hammer 2007; see Figure 1 in Chapter 34 on p 536 of the present volume). Due to this institutional complexity, responsibility for the different economic sectors and activities related to the WHS is shared by a multitude of administrative units. For example, the primary sector (agriculture and forestry) is managed at the federal level. The national policy of agricultural subsidies has a basic impact on the region but is barely influenced by regional actors. At the same time, there is a tendency towards more regional cooperation in linking agricultural and ecological needs for the benefit of cultural landscapes. Policies in this area are mainly in the hands of the cantons. Analysis of this institutional complexity has shown that division of responsibilities among different administrative levels has impacts on coordination and cooperation in practice (Hoppler and Strässle 2007). Moreover, it also leads to ‘non-negotiable’ situations at the local level, such as is

the case, for example, for ecological standards – an issue that is discussed and decided upon at the federal level and in which local actors hardly have a say (Wallner et al 2008).

Next to institutional complexity, there is also a disciplinary complexity inherent in the Swiss Alps Jungfrau-Aletsch WHS region. This region encompasses a glaciated high-alpine area and also links two major hubs of regional economic development: the highly developed tourist region in the eastern Bernese Oberland to the north, and the upper part of the main valley of the Valais to the south, where remote traditional agriculture was superseded by industrial and tourism development during the second half of the 20th century (Wiesmann et al 2005). In order to provide a comprehensive overview of the disciplinary complexity of the region, various baseline studies on diverse topics, including geology, hydrology, glaciology and biology, as well as on regional development, tourism and management were carried out (Wallner et al 2007). The results are highly relevant, as they laid the groundwork for long-term monitoring in the WHS region.

33.2.2 Negotiating conservation

A multi-stakeholder participatory process was launched in order to negotiate overall goals, specific objectives and concrete projects related to the Swiss Alps Jungfrau-Aletsch WHS. This methodology had been used in a similar setting in the remote Tajik Pamir Mountains (Breu et al 2005) and was adapted and enhanced for the Swiss context. Analysis of this process revealed eight different pathways to development and conservation, thereby contributing to the discussion of local and global stakes relevant to the issue of sustainable regional development (Aerni 2005; Wiesmann et al 2005; Wallner et al 2008). In order to achieve sustainable regional development, it is necessary to actively involve all relevant stakeholders. However, each of these actors involved have their own particular ideas about the meaning of regional development and how the Swiss Alps Jungfrau-Aletsch WHS can contribute to it. These different meanings play a decisive role when it comes to negotiating pathways to sustainable regional development. Therefore, it is important not only to assess which local and global dynamics are relevant for the development of a region, but also to appraise the existing different meanings of development that influence the negotiations (see Chapters 34 and 35 in the present volume, respectively). These assessments are crucial when it comes to the elaboration of a management plan that must have the support of the stakeholders concerned.

Wiesmann et al (2005) showed that different visions and perceptions of nature and landscape are an underlying current in the debate on the development of the Jungfrau-Aletsch region. These different visions and perceptions influence the positions taken in negotiations. Liechti (2008) has addressed this issue, and her research helped to improve understanding of how the ecological dimension becomes manifest in negotiations of sustainable regional development, how meanings associated with an issue under negotiation are constructed, and whose ascribed meanings are decisive in shaping a concrete way forward. The results indicate that several distinct, but interrelated dimensions – process, history, identity, existence, and power – contribute to the construction of meaningful spaces. On the one hand, consideration of these dimensions has the potential to foster improved understanding of actor perspectives in interactions. On the other hand, it can be useful in understanding, setting up or supporting negotiation processes for sustainable regional development.

33.2.3 Mutual learning

The multi-stakeholder participatory process chosen represents a chance to integrate knowledge from society at large into the realm of science. This integration, linking the scientific world with other parts of society, constitutes the focus of transdisciplinary research (Wiesmann et al 2008). Analysis of the multi-stakeholder participatory process carried out in the Swiss Alps Jungfrau-Aletsch WHS region (Wiesmann et al 2005; Wallner et al 2008; Wallner and Wiesmann 2009) showed that participatory processes hold great potential for striking a balance between conservation and development, thereby contributing to mutual learning processes between various stakeholder groups from the scientific community and society at large. However, there are also limitations to these processes, due mainly to the fact that there is always an inherent power play between the stakeholders involved in such processes (see Chapter 36 in the present volume). Nevertheless, the multi-stakeholder participatory process in the Swiss Alps Jungfrau-Aletsch WHS region supported social learning processes that led to a partial shift from strategic to communicative action through the creation of appropriate social spaces, and thereby confirmed the results of an analysis of similar participatory planning processes in other countries (Rist et al 2006). The fact that the creation of social spaces is essential for social learning processes has been further confirmed by the findings of Schneider et al (2009).

33.3 Outlook

A region such as the Swiss Alps Jungfrau-Aletsch WHS or the Swiss Alps in general is never an isolated nucleus. On the contrary, such regions are greatly influenced by local as well as national and global developments. The influence of developments at various scales will be the focus of further NCCR North-South research in the Swiss Alps.

The issue of striking a balance between conservation and regional development is a persistent one in the Swiss Alps. The multi-stakeholder participatory process in the region of the Swiss Alps Jungfrau-Aletsch WHS has helped to address various conflicting issues and raise awareness of differing views among and also within the involved stakeholder groups. However, mutual understanding has not yet solved conflicts. How can persistent conflicts at the regional level be tackled, and which concessions have to be made by the different stakeholder groups in order to overcome the main conflicting issues?



Fig. 3
The glacial lake at the Lower Grindelwald Glacier in May 2009. From a great distance the lake looks rather small. However, there is potential danger in the possibility that the natural dam could break and cause a flood in the river valley. (Photo by Astrid Wallner)



Fig. 4
Researchers from
Mali and Kyr-
gyzstan interview-
ing a sheep farmer
in the Lötschental,
Switzerland.
(Photo by Karina
Liechti)

Another important issue is continuous structural change in the agricultural sector as a result of national and international agricultural politics and their interconnection with international trade agreements. This poses a challenge to the cultural landscape as we know it today, at the regional level. The close interrelationship between the traditional agricultural landscape and the contrasting high-alpine natural landscape is the centre of attraction in the Alpine region. However, recent changes in agricultural policies are influencing land use, and in some areas this can lead to re-wilding of former agricultural land. Will this development lead to a loss of attraction?

At the same time, global phenomena such as climate change are posing a challenge to Alpine tourist regions through rising snow lines owing to higher temperatures. Snow security is important for Alpine skiing areas if they hope to continue to attract as many tourists as they have so far. Furthermore, climate change can lead to an increase in natural hazards such as rock slides triggered by the melting of permafrost. This has implications for the security of hiking trails, for example, but also – as in the case of the glacial lake at the bottom of the Lower Grindelwald Glacier (Figure 3; Swissinfo 2009) – for the security of villages, their inhabitants, and tourists. How can a region that has devoted itself to pursuing pathways to sustainable regional development handle such challenges arising at the local level, but in many cases also at the national and international levels? Research on these issues in the Alpine region can be linked to similar issues in other regions and thereby foster new collaboration among researchers from the North and the South (Figure 4).

Endnotes

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² The NCCR North-South is based on research partnerships with researchers and research institutions in the South and East. These partnership regions are called JACS (Joint Areas of Case Studies). Regional Coordination Offices (RCOs) were established in each of these JACS at the outset of the programme. The original function of the RCOs was to coordinate research; in the third phase of the programme, they will become hubs for generating new research projects and partnerships. The JACS Swiss Alps is the only JACS that is not located in the global South or East; it served as a basis for transferring approaches from South to North and vice versa and studying the outcomes of this exchange.

References

Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- * Aerni I. 2005. *Positionen im Aushandlungsprozess nachhaltiger Entwicklung. Partizipation im Weltnaturerbe Jungfrau-Aletsch-Bietschhorn* [MSc thesis]. Bern, Switzerland: University of Bern. Also available at: <http://www.north-south.unibe.ch/content.php/publication/id/2031>; accessed on 30 October 2009.
- Bätzing W. 2003. *Die Alpen. Geschichte und Zukunft einer europäischen Kulturlandschaft*. Munich, Germany: C.H. Beck.
- * Baumgart K. 2005. *Bewertung landschaftsrelevanter Projekte im Schweizer Alpenraum: Die Methode der Discrete-Choice-Experimente*. Bern, Switzerland: Geographica Bernensia.
- * Breu T, Maselli D, Hurni H. 2005. Knowledge for sustainable development in the Tajik Pamir mountains. *Mountain Research and Development* 25(2):139–146.
- * Hammer T. 2007. Natur- und Landschaftsschutz – Das institutionelle Umfeld. In: Wallner A, Bäsclin E, Grosjean M, Labhart T, Schüpbach U, Wiesmann U, editors. *Welt der Alpen – Erbe der Welt. UNESCO Welterbe-Region Jungfrau–Aletsch–Bietschhorn*. Bern, Switzerland: Haupt, pp 241–270.
- * Hoppler J, Strässle D. 2007. *Planungsinstrumente und -prozesse rund um das Weltnaturerbegebiet Jungfrau-Aletsch-Bietschhorn* [MSc thesis]. Bern, Switzerland: University of Bern. Also available at: <http://www.north-south.unibe.ch/content.php/publication/id/2034>; accessed on 30 October 2009.
- * Liechti K. 2008. *Negotiating Sustainable Regional Development: The Relevance of Meaningful Spaces in Times of Change* [PhD dissertation]. Bern, Switzerland: University of Bern.
- * Liechti K, Wallner A, Wiesmann U. Accepted. Linking a World Heritage Site to sustainable regional development: Contested natures in a local negotiation process. *Society and Natural Resources*.
- * Liechti K, Wiesmann U. 2004. An integrated view of the dynamics of regional development as a basis for mutual learning. In: Hurni H, Wiesmann U, Schertenleib R, editors. *Research for Mitigating Syndromes of Global Change: A Transdisciplinary Appraisal of Selected Regions of the World to Prepare Development-oriented Research Partnerships*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 1. Bern, Switzerland: Geographica Bernensia, pp 365–379.
- Messerli B, Messerli P. 1978. Wirtschaftliche Entwicklung und ökologische Belastbarkeit im Berggebiet. *Geographica Helvetica* 4:203–210.
- * Rist S, Chiddambaranathan M, Escobar C, Wiesmann U. 2006. "It was hard to come to mutual understanding...": Multidimensionality of social learning processes in natural resource use in India, Africa and Latin America. *Journal of Systemic Practice and Action Research* 19:219–237.
- * Schneider F, Fry P, Ledermann T, Rist S. 2009. Social learning processes in Swiss soil protection: The 'From Farmer – To Farmer' Project. *Human Ecology* 37:475–489.
- Swissinfo. 2009. Oberland villages on flood alert. *Swissinfo*. http://www.swissinfo.ch/eng/science_technology/Oberland_villages_on_flood_alert.html?siteSect=514&sid=10730079&cKey=1243019811000&ty=nd; accessed on 27 August 2009.
- * Wallner A, Bäsclin E, Grosjean M, Labhart T, Schüpbach U, Wiesmann U, editors. 2007. *Welt der Alpen – Erbe der Welt. Die UNESCO Welterbe-Region Jungfrau–Aletsch–Bietschhorn*. Bern, Switzerland: Haupt.
- * Wallner A, Rist S, Liechti K, Wiesmann U. 2008. Protection: A means for sustainable development? The case of the Jungfrau-Aletsch-Bietschhorn World Heritage Site in Switzerland. In: Galvin M, Haller T, editors. *People, Protected Areas and Global Change: Participatory Conservation in Latin America, Africa, Asia and Europe*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 3. Bern, Switzerland: Geographica Bernensia, pp 471–504.

- * Wallner A, Wiesmann U. 2009. Critical issues in managing protected areas by multi-stakeholder participation – Analysis of a process in the Swiss Alps. *eco.mont* 1(1):29–34.
- * Wiesmann U, Biber-Klemm S, Grossenbacher-Mansuy W, Hirsch Hadorn G, Hoffmann-Riem H, Joye D, Pohl C, Zemp E. 2008. Enhancing transdisciplinary research: A synthesis in fifteen propositions. *In: Hirsch Hadorn G, Hoffmann-Riem H, Biber-Klemm S, Grossenbacher-Mansuy W, Joye D, Pohl C, Wiesmann U, Zemp E, editors. Handbook of Transdisciplinary Research*. Berlin, Germany: Springer, pp 433–441.
- * Wiesmann U, Liechti K, Rist S. 2005. Between conservation and development: Concretizing the first World Natural Heritage Site in the Alps through participatory processes. *Mountain Research and Development* 25(2):128–138.

34 Sustainable Regional Development: Reconciling Global and Local Dynamics and Stakes in the Swiss Alps

Rosmarie Sommer¹, Astrid Wallner², and Urs Wiesmann³

Abstract

This article explores how global and local dynamics and stakes can be brought together when trying to combine conservation and regional development. For this purpose we analyse a series of studies carried out in the area of the Swiss Alps Jungfrau-Aletsch UNESCO World Heritage Site (WHS). The approaches used in these studies to analyse the diversity and development of the region included data collection and evaluation of indicators such as population development, number of working places, occupation rates in various economic sectors and commuter balance, as well as interviews with key informants and assessment of existing planning tools. The major challenge of the newly declared World Heritage Region is that it is neither a political or administrative nor a cultural unit but constitutes a completely new type of space that breaks up and crosses traditional boundaries. The studies revealed an economic tertiarisation process and migration of the population from remote areas to regional centres. Tourism was identified as the key economic sector in the region. Regarding regional sustainability, the studies identified a need for quality dialogue and negotiation of interests and stakes. It was shown that in dealing with sustainability at the local level, many key issues cannot be resolved on the ground, as they depend on regional or national decisions, e.g. the conditions for tourism promotion in the region or economic validation of agricultural activity. We conclude from these findings that national or even international factors do not provide a basis for location-specific solutions, as they are often too general, and that the global label does not ensure sustainability in a designated WHS region; this depends entirely on local and regional dynamics.

Keywords: World Heritage Site; protected area; sustainable regional development; management; negotiation; Switzerland; Swiss Alps.

34.1 Introduction

34.1.1 From the Brundtland Report to the Johannesburg Declaration

High intentions prevailed when the idea of ‘sustainable development’ found its way into the global policy debate on future development in 1992 at the Rio Conference (Earth Summit), based on the Brundtland Report entitled “Our Common Future” (WCED 1987). The Brundtland Report argued that environment and development are inseparable; the environment is where we live, and development is what we do in attempting to improve our well-being in the world in which we live. The Brundtland Commission defined sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED 1987). Meeting human needs and reducing hunger and poverty, while also trying to maintain the planet’s life support systems, ultimately requires a change in fundamental human values, attitudes, and behaviour (Leiserowitz et al 2005). Consequently, the concept of sustainable development calls for a global agenda for change (WCED 1987).

With Agenda 21 (United Nations 1992), the United Nations implemented consensus among the participating states at the Rio Conference on a global action programme for sustainable development. The standard definition of sustainable development was expanded at the 2002 World Summit on Sustainable Development (United Nations 2006), when the three dimensions of sustainability – the economic, socio-cultural and ecological – were broadly recognised. The Johannesburg Declaration (United Nations 2004) that resulted from the Summit expressed consensus on the three dimensions of sustainable development, their interplay, and the levels of their implementation as “a collective responsibility to advance and strengthen the interdependent and mutually reinforcing pillars of sustainable development: economic development, social development and environmental protection – at the local, national, regional and global levels” (United Nations 2004; see also Kates et al 2005). Since then, many policies, plans and tools have been designed to promote sustainable development; nevertheless, sustainable development is “not yet integral to the machinery of government or business, or people’s daily lives” (Bass 2007, p 1).

34.1.2 Translating sustainability into context

The term ‘sustainable development’ has been subjected to a wide range of interpretations (Kates et al 2005) and is very controversial when it comes to concrete application (Liechti 2008). Sustainability is a normative concept concerned with target values, which always reflect a standard established by society (Wiesmann 1998). As a normative concept, sustainability can only be defined in practical contexts (Kates et al 2005). Sustainable *regional* development is thus a more contextualised form of sustainability (Liechti 2008).

The question of which individuals or which societies establish target values is of great importance in contextualising sustainability and finding the best strategies for achieving it (Wiesmann 1998). Regarding the interplay of the three dimensions of sustainability with a view to fostering sustainable development, the challenge is to find a balance between the target values for ecological, socio-economic and socio-cultural interests. Even though the concept of sustainability was originally rooted in environmental concerns, its socio-economic and socio-cultural dimensions tend to overrule ecological considerations (Wiesmann and Messerli 2007; Liechti 2008). However, development at the local, regional, national or global levels is sustainable only if, as a minimum condition, there is no long-term depreciation in any of the values used to evaluate socio-economic, socio-cultural or ecological sustainability (Wiesmann 1998). The interrelations outlined in this first section are further explored below based on analysis of various studies of a concrete case – the Swiss Alps Jungfrau-Aletsch UNESCO World Heritage Site (WHS).

34.2 The Jungfrau-Aletsch region

34.2.1 From conservation negotiations to regional development

In 2001, 15 communes in the Jungfrau-Aletsch region signed the Charter of Konkordiaplatz, “testifying to their willingness to support the sustainable future development of this World Heritage Region” by preserving the region and its diversity for both present and future generations and aiming to promote sustainable development of the region’s economy, community, and ecology (Jungfrau-Aletsch-Bietschhorn World Heritage Association 2005a). The original signatories were joined by 11 additional communes

in 2005, when the WHS was expanded to cover a larger area. The discussions leading up to the decision to sign the Charter originated in negotiations on inscription of the Jungfrau-Aletsch area on the UNESCO World Heritage List.⁴ Based on international scientific debate, and linking conservation goals to development issues, the local WHS Management Centre launched an extensive participatory process in 2003 to “negotiate and prioritise overall goals, specific objectives, necessary measures, and concrete projects for the region” (Wiesmann et al 2005; see also Hoppler et al 2008).

The Jungfrau-Aletsch region is an example of how international acknowledgement benefits sustainable regional development. We analyse this example in the present article, focusing on how local and global dynamics and stakes can be brought together when trying to combine conservation and regional development. For this purpose we review the findings of a series of studies carried out in the area of the Swiss Alps Jungfrau-Aletsch WHS regarding sustainable regional development (Wiesmann 2003; Wiesmann and Liechti 2004; Aerni 2005; Wiesmann et al 2005; Aerni et al 2007; Hoppler and Strässle 2007; Wiesmann et al 2007a; Wiesmann et al 2007b; Hoppler et al 2008).

34.2.2 Glaciated areas and traditional Alpine agriculture in the Jungfrau-Aletsch region

The Jungfrau-Aletsch site in the Swiss Alps, with an area of 824 km², corresponding to approximately 2% of the total area of Switzerland (41,293 km²), was declared a UNESCO World Natural Heritage Site in 2001. Universal significance was attributed to the site because of its glaciations, its status as a source of geological data and a witness to climate change, its extraordinarily beautiful landscape, and its great ecological and cultural diversity. Although the WHS consists mainly of natural high-mountain landscape – 85% of its area is situated above an altitude of 2000 m and 88% is covered by unproductive vegetation or altogether vegetation-free – the outstanding characteristic of the region is close proximity of glaciated areas and traditional Alpine agriculture. The Swiss Alps Jungfrau-Aletsch WHS, together with the surrounding and contrasting cultural landscape, thus constitutes a multifunctional space that is both a natural area and an important residential and economic space. This was taken account of in the planning process for the WHS by including not only the 824 km² designated as the actual Swiss Alps Jungfrau-Aletsch WHS, but the entire territory of the communes participating in the WHS. This entire territory is referred to as the Swiss Alps Jungfrau-Aletsch World Heritage (WH) Region.

34.2.3 The complexity of the Jungfrau-Aletsch region

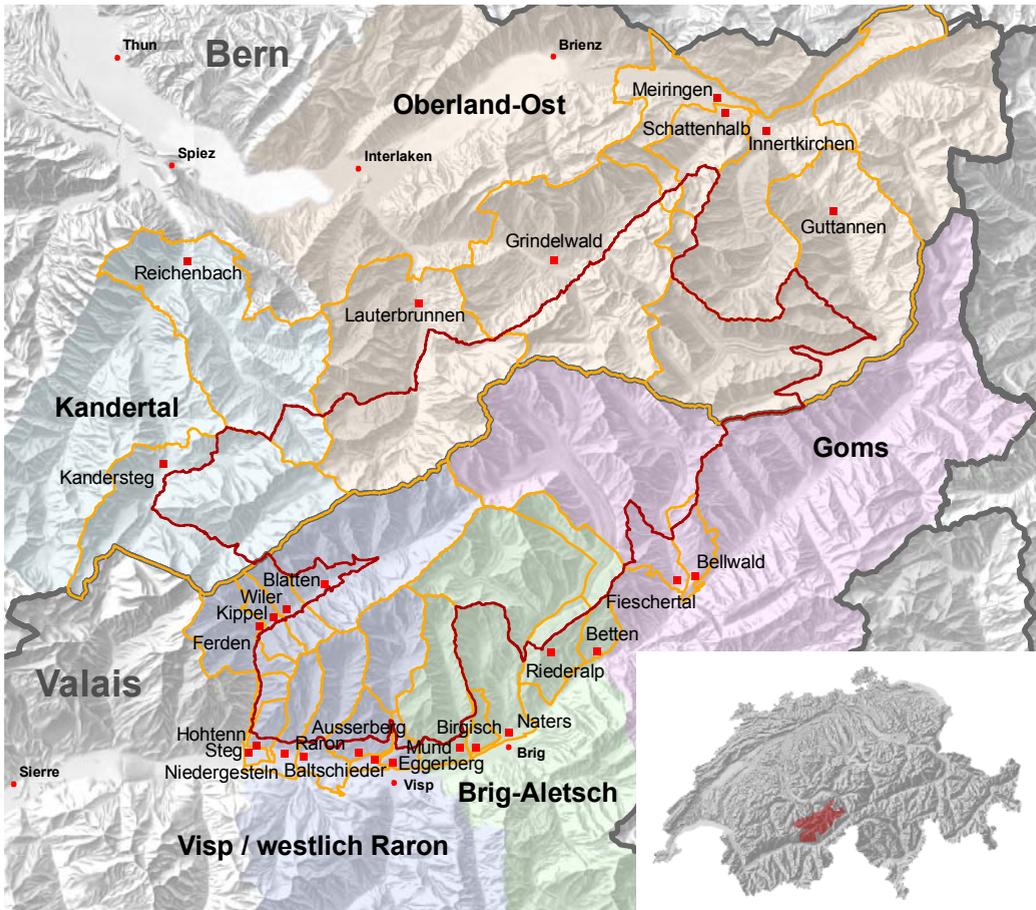
The key challenge in the Swiss Alps Jungfrau-Aletsch WH Region lies in the fact that it is neither a political or administrative nor a cultural unit, but constitutes a completely new type of space. The Swiss Alps Jungfrau-Aletsch WHS straddles the boundary between the 2 cantons of Bern and Valais, includes 5 planning regions, and covers areas in 26 communes (Figure 1). Communes enjoy a high degree of autonomy within the Swiss political and administrative environment, which consists of a federal system comprising communal, cantonal and federal levels that share official responsibilities in accordance with the cantonal and federal constitutions (Hoppler et al 2008; Wallner et al 2008). The regional planning associations are a result of the 1974 Federal Law on Investment Assistance in Mountain Regions (*Bundesgesetz über Investitionshilfe für Berggebiete*), which was designed to foster investment in infrastructure and thereby enhance living conditions in mountainous areas (Hoppler and Strässle 2007; Wallner et al 2008).

The WH Region is thus situated in a politically and administratively highly complex setting. In addition, complexity also characterises the historically shaped cultural landscape:

Due to its transboundary position (straddling the border between two cantons [...]), the WHS is related to two major hubs of regional economic development: the highly developed tourist region in the eastern Bernese Oberland to the north, and the upper part of the main valley of Valais, where remote traditional agriculture was superseded by industrial and tourism development during the second half of the 20th century, to the south. (Wiesmann et al 2005)

94.4% of the area inside the WHS perimeter is under national landscape protection. 41% of the area has at least one additional, overriding protection status, for example that of a biotope of national importance, a cantonal or a communal nature reserve, a federal hunting reserve, or others. Inscription on the World Heritage List does not override national legislation (UNESCO 1972). However, in accordance with the relevant UNESCO Convention, the World Heritage Site label commits the Swiss Confederation to maintain existing protection of the area and to establish a management scheme for the site.

Given the complexity of the WH Region, decision-making on economic and natural space will always remain a challenge. Thus continuous processes of coordination among the various stakeholders will be of great importance.



Map key:

- Centre of associated commune
- Centre of commune with more than 2000 inhabitants
- Perimeter of the World Heritage Site
- Border of associated commune
- Cantonal borders

Political setting of the World Heritage Region

Regional Planning Associations:

- Canton of Bern:
 - Kandertal
 - Oberland-Ost

Canton of Valais:

- Visp / westlich Raron
- Brig-Aletsch
- Goms

Sources of data:

National borders, lakes: GG25 © 2002
 Swiss Federal Office of Topography (DV002213)
 Main centre in communes: SWISSNAMES © 2004
 Swiss Federal Office of Topography (DV012687.1)
 Perimeter of the World Heritage Site, 2005,
 Swiss Agency for the Environment, Forests and Landscape
 Relief: PK100 © 1998 and PK500 © 1999,
 Swiss Federal Office of Topography (DV 351.5)

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Map compilation and cartography:

Centre for Development and Environment (CDE), Institute of Geography, University of Bern, in cooperation with the Swiss Alps Jungfrau-Aletsch World Heritage Site Association, Naters, 12.2008

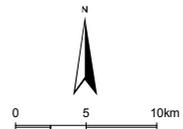


Fig. 1

Map of the Swiss Alps Jungfrau-Aletsch World Heritage Site and the surrounding region (World Heritage Region) showing the WHS perimeter, communal borders, planning regions, cantonal borders, land use, and the region's location in Switzerland. (Map by Centre for Development and Environment)

34.3 Global and local dynamics and stakes in the Jungfrau-Aletsch region

In the following we reflect on the findings of the various studies undertaken in the Swiss Alps Jungfrau-Aletsch WH Region in order to discuss how global and local stakes have been influencing regional development. The approaches used in these studies to analyse the diversity and development of the region included data collection, evaluation of indicators such as population development, number of working places, rates of occupation in the various economic sectors, and the commuter balance, as well as interviews with key informants and assessment of existing planning tools. Re-examination of these studies revealed a number of salient dynamics that pose challenges in the region.

Tertiarisation: The tertiary sector gained in importance from 1985 until 2001 and became central to the economy of the region (Aerni et al 2007). Tourism, with its up- and downstream industries, is now by far the dominant sector (Wiesmann et al 2007a). This has helped to profile the region for a broad clientele beyond its boundaries, intensified interaction with outside visitors, life concepts and ideas, and fostered economic turnover and value added. The result, and the respective price of this transformation, has been accelerated infrastructure development, e.g. housing development (and cable car construction), loss of certain local livelihood opportunities in traditional economic domains such as mountain agriculture, and interference with previously less frequented natural landscapes.

Concentration and peripherisation: With respect to migration, tertiarisation of the economy leads to concentration of settlements and economic activity in regional centres and communes close to these centres, and to a relative decline in activity in remoter areas (Aerni et al 2007). Concentration of settlements in the WH Region is found largely along its border, where most of the regional centres are located. Settlements that function as regional centres are becoming key providers of employment. With the exception of the places frequented by tourists, residential and economic spaces are increasingly becoming segregated. The growing mobility of the population further increases the possibility of spatial separation of living and working places. To keep economically weaker places attractive as living space in the future, it will be necessary to maintain basic provision of services and living quality in these areas (Aerni et al 2007).

Dominance of tourism: Over the last two centuries, tourism has become the key economic sector in the Jungfrau-Aletsch region. The motivations for travelling to this Alpine region were manifold and included scientific interest, the search for romance, nativeness and recreation, as well as the feeling of liberty inspired by the landscape. Alpinism and pioneer tourism emerged, culminating in modern forms of tourism such as skiing, snowboarding, hang-gliding, and others. The Jungfrau-Aletsch region today is also a very important destination for summer and winter alpinism, alpine hiking, and other forms of nature-based tourism. The tourism sector has always been subject to change. Times of immense, often uncontrolled growth have alternated with drastic declines. The development of tourism is closely linked to prevailing economic conditions at the global, national, regional and local levels. With growing internationalisation, the tourism market is increasingly responding to external factors such as changing market preferences, exchange rate fluctuations, and economic recession. In earlier times, crises in other regions of the world might have increased the risk of travel, while today most of all larger-scale economic activities and currency fluctuations influence international tourism flow to Europe and, correspondingly, expensive Alpine holiday places. Despite growing internationalisation and uncertainty in the tourism sector, the chances of the region maintaining its independence and authenticity are still regarded as good; if economic fluctuations and shifts in ideals can be anticipated, the region could remain attractive for tourism for longer periods (Wiesmann et al 2007a). Tourism is a source of income in the more remote areas of the WHS region and thus counterbalances depopulation processes taking place there. The studies synthesised here, as well as stakeholder interactions, suggest, however, that agriculture does not benefit proportionately from the economic value added generated by tourism (Hoppler et al 2008).

Natural landscapes and traditional agriculture: Dialogue between the various stakeholders suggests that risks due to the effects of global, regional and local change faced by the cultural landscapes in the WH Region must be assessed as greater than those facing the natural landscapes inside the perimeter of the WHS (Wiesmann and Liechti 2004; Wallner et al 2008). Currently, about 15% of the area under investigation is forested, and this area is continually expanding (Wallner et al 2008). When agricultural land is abandoned in cultural areas, it quickly turns into fallow or forested land mostly closed off to future agriculture. But as diversified smallholder mountain agriculture is the underlying success factor responsible for the attractiveness of the region – in addition to its natural treasures – a decrease in

the number of people working in the agricultural sector, and the consequent decrease in ecosystem services, could have negative impacts on the tourism sector. Tertiarisation of the economy and agrarian policies that are not conducive to smallholder mountain agriculture have been among the main factors responsible for this development. The WHS is an area designated for conservation for future generations. The subtle balance in the WH Region between conserved natural areas, extensive agriculture and tourism constitutes a fragile system of mutual dependence.

Identity and responsibility: The WHS has generated value added for the participating communes in terms of identity and shared responsibility for a unique natural landscape hosting multiple and diverse expressions of socio-cultural and economic activities among its resident population (Wiesmann and Liechti 2004; Wiesmann et al 2005). Designation as a WHS has provided an internationally acknowledged label for a shared landscape as a common asset for regional development. Moreover, several sub-regions were linked together through a joint participatory assessment of issues and potentials which resulted in a Management Plan for the Swiss Alps Jungfrau-Aletsch World Heritage Region (Jungfrau-Aletsch-Bietschhorn World Heritage Association 2005b).

34.4 Discussion and conclusions

Based on a global dynamics – global discourse on protected areas – a negotiation process is taking place at the regional/local level on sustainable development in the area of the Jungfrau-Aletsch WHS. The WHS can be understood as a spatial unit only by its confines as a WHS. Global sustainability standards require a socio-political negotiation process in the WHS region that contextualises the concept of sustainability in the form of sustainable regional development.

Today the term ‘sustainability’ is widely used by governments, international organisations, and an increasing number of business and civil society groups. But to date, sixteen years after the Rio Conference, development remains far from sustainable. Broadening negotiations on the conservation of the region to include the issue of actively protecting the natural landscape without hindering economic development in the region has made sustainability concrete in the Swiss Alps Jungfrau-Aletsch WH Region in ecological, economic and socio-cultural terms. Traditional and local approaches

might hold the key to future achievement of sustainable development on the ground, but the concept will also be constructed globally, creating shared public goods. In a nutshell, the concept of sustainable development deals with global dynamics and at the same time seeks concretisation and contextualisation in a local framework, thereby also addressing local dynamics. This complements Hammer's (2001) observations that the processes of globalisation, regionalisation and localisation are mutually dependent. All these processes induce change. The driving forces behind them respond to transformation processes in the agricultural and industrial sectors, as well as to the recreational and tourism behaviour of human populations at all regional and global levels.

The global WHS label requires that the beauty of the natural landscape of the Jungfrau-Aletsch region be conserved. Agriculture plays a central role in the conservation of both natural and cultural landscapes. However, as a result of structural transformation in the region, which shows a shift from agriculture to tourism, the continuous maintenance of landscape by agriculture is no longer ensured. As the cultural landscape is very important for the attractiveness of the region as a whole, it must be consciously maintained and managed. This task cannot be left to farmers alone. Current Swiss regional development policy in mountain regions includes the concepts of both conservation and development. The core of this policy is the 1974 Federal Law on Investment Assistance in Mountain Regions, designed to promote economic investments in mountain regions. At the time this law was passed, the ultimate goal was basic provision of services for the local population. Today, Swiss regional policy has been transformed into a more holistic vision of promoting infrastructure for development, and the attractiveness of sites for entrepreneurial activity as well as tourism.

However, global policy changes in transportation, agriculture, energy and development of settlements are more decisive factors in regional development today than the modest public resources made available through the country-wide regional policy. For example, the World Trade Organisation (WTO) negotiations on trade liberalisation have put tremendous pressure on the heavily protected Swiss agricultural sector; liberalisation of public procurement has hit small enterprises in rural areas hard; and rejection of membership in the European Economic Community (EEC) in 1992 by Swiss voters forced the Swiss government to adopt a policy of small steps towards integration. Enforced liberalisation of agricultural markets led to loss of income which was increasingly compensated by payments for environmen-

tal services. This major policy shift is the guarantor of multifunctional agricultural activity in mountain areas by way of maintaining the cultural landscape, which in turn guarantees attractiveness of the environment as a key asset for tourism (Thierstein 2000). Very recent global dynamics, such as rising fuel prices and the consequences of the incomplete WTO negotiations on agricultural trade, may put the functioning of the balanced local system of nature-based income generation and tourism at further risk. Therefore, the question arises of what will happen to the Swiss Alps Jungfrau-Aletsch WHS when its surrounding areas are modified under national and international pressure. Mountain agriculture today can hardly exist without income from non-agricultural employment. Tourism, as the main economic sector in the region, will play an increasingly important role as a source of income.

No data currently exist to support or disprove the expectations of some stakeholders that the global label of a UNESCO World Heritage Site will bring additional tourism to a region. Doubts persist whether tourism can be a sufficient motor to drive regional development, and who will profit. Benefit-sharing of tourism-based value added with the local agricultural sector requires re-thinking strategies and value chains of goods, as well as valuation of ecosystem services provided by local farming communities. Value added generated by farmers must be adequately validated in relation to maintenance and care of the natural and cultural landscapes as a source of capital for local tourism. Heavy dependence on tourism constitutes an elevated risk in terms of exposure to market fluctuations (Wiesmann 2003). This should be mitigated in combination with domestic tourist markets and alternative livelihood opportunities for the local population. Specific studies would be needed to identify an optimal mix of mass tourism, alternative forms of tourism, and local niche markets in other sectors. Such studies should focus on questions such as: How can specific forms of sustainable and nature-oriented tourism be consolidated?

The regional WHS Charter of Konkordiaplatz greatly motivated the development of an endogenous vision among the population in the region of the Swiss Alps Jungfrau-Aletsch WHS. The necessary dialogue between the various stakeholders (administration, communities, political officials, commerce and industry, development and conservation institutions) was initiated by their affiliation in the new unit of the globally designated WHS. However, agreements reached in the participatory process have a largely informal character and cut across the existing regional planning instruments and planning frameworks in place at federal, cantonal and local levels

(Wiesmann et al 2005). The dynamics generated by the broad-based participatory process have yet to be translated into committed steps of action in the framework of formal planning instruments. It remains to be seen if the globally declared WHS region can act as a long-term vehicle for endogenous direction of sustainable regional development.

Sustainability calls for quality dialogue and negotiation of interests. In dealing with sustainability at the local level, however, many key issues cannot be resolved on the ground, as they depend on regional or national decisions, e.g. the conditions for promoting tourism in a region, or economic validation of agricultural activity. At the same time, national or even international factors do not provide for location-specific solutions; they are often too general. Decision spaces remain within the reach of local actors. We conclude that the global label does not automatically ensure sustainability of a designated WHS region; it is important to have a global frame, but regional and local sustainability depends entirely on local and regional dynamics.

Endnotes

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⁴ Declaration of a UNESCO World Heritage Site: The World Heritage Convention (UNESCO 1972) defines the kinds of sites which can be considered for inscription on the list, and sets out the duties of the parties. Based on the Convention, the Budapest Declaration on World Heritage accordingly defines that states that are parties to the Convention will “seek to ensure an appropriate and equitable balance between conservation, sustainability and development, so that World Heritage properties can be protected through appropriate activities contributing to the social and economic development and the quality of life of our communities” (UNESCO 2002).

References

Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- * Aerni I. 2005. *Positionen im Aushandlungsprozess nachhaltiger Entwicklung. Partizipation im Weltnaturerbe Jungfrau-Aletsch-Bietschhorn* [MSc thesis]. Bern, Switzerland: University of Bern. Also available at: <http://www.north-south.unibe.ch/content.php/publication/id/2031>; accessed on 21 August 2009.
- * Aerni I, Wallner A, Wiesmann U. 2007. Regionalentwicklung – Heterogener Wirtschafts- und Lebensraum. In: Wallner A, Bäschlin E, Grosjean M, Labhart T, Schüpbach U, Wiesmann U, editors. *Welt der Alpen – Erbe der Welt. Die UNESCO Welterbe-Region Jungfrau-Aletsch-Bietschhorn*. Bern, Switzerland: Haupt, pp 185–197.
- Bass S. 2007. *A New Era in Sustainable Development*. IIED Briefing. London, UK: International Institute for Environment and Development (IIED). Also available at: <http://www.iied.org/pubs/pdfs/11071IIED.pdf>; accessed on 19 August 2009.
- Hammer T. 2001. Biosphärenreservate und regionale (Natur-) Parke – Neue Konzepte für die nachhaltige Regional- und Kulturlandschaftsentwicklung? *GAIA* 10(4):279–285.
- * Hoppler J, Strässle D. 2007. *Planungsinstrumente und -prozesse rund um das Weltnaturerbegebiet Jungfrau-Aletsch-Bietschhorn* [MSc thesis]. Bern, Switzerland: University of Bern. Also available at: <http://www.north-south.unibe.ch/content.php/publication/id/2034>; accessed on 20 August 2009.
- * Hoppler J, Wallner A, Wiesmann U. 2008. *Governmental Complexity in the Swiss Alps: Planning Structures Relevant to a World Natural Heritage Site*. NCCR North-South Dialogue No. 18. Bern, Switzerland: Swiss National Centre of Competence in Research (NCCR) North-South.
- Jungfrau-Aletsch-Bietschhorn World Heritage Association. 2005a. Charter of Konkordiaplatz (Amended by Additional Communes). *Swiss Alps Jungfrau-Aletsch World Heritage*. http://www.jungfraualetsch.ch/fileadmin/webdav/homepage_dokumente/Vision_Charta/Charta/Charter_Additional_Communes.pdf; accessed on 27 July 2009.
- * Jungfrau-Aletsch-Bietschhorn World Heritage Association. 2005b. *Management Plan for the Jungfrau-Aletsch-Bietschhorn World Heritage Site*. Naters and Interlaken, Switzerland: Jungfrau-Aletsch-Bietschhorn World Heritage Association. Summary available at: http://www.jungfraualetsch.ch/fileadmin/webdav/homepage_dokumente/Managementplan_Summary_engl.pdf; accessed on 27 July 2009.
- Kates R, Parris T, Leiserowitz A. 2005. What is sustainable development? Goals, indicators, values, and practice. *Environment: Science and Policy for Sustainable Development* 47(3):8–21. Also available at: <http://www.environmentmagazine.org/Editorials/Kates-apr05-full.html>; accessed on 19 August 2009.
- Leiserowitz A, Kates R, Parris T. 2005. Do global attitudes and behaviours support sustainable development? *Environment* 47(9):22–38.
- * Liechti K. 2008. *Negotiating Sustainable Regional Development: The Relevance of Meaningful Spaces in Times of Change* [PhD dissertation]. Bern, Switzerland: University of Bern.
- Thierstein A. 2000. Regionalpolitik in der Schweiz: Der lange Marsch vom Berg in die Stadt. *IDT-Blickpunkte* 2:15–16.
- UNESCO [United Nations Educational, Scientific and Cultural Organisation]. 1972. *Convention Concerning the Protection of the World Cultural and Natural Heritage*. Paris, France: UNESCO. Also available at: <http://whc.unesco.org/en/conventiontext/>; accessed on 27 July 2009.
- UNESCO [United Nations Educational, Scientific and Cultural Organisation]. 2002. *26COM 9 – Budapest Declaration on World Heritage*. Paris, France: UNESCO. Also available at: <http://whc.unesco.org/en/budapestdeclaration/>; accessed on 19 August 2009.
- United Nations. 1992. *Agenda 21*. UN Department of Economic and Social Affairs. Division for Sustainable Development. <http://www.un.org/esa/sustdev/documents/agenda21/english/agenda21toc.htm>; accessed on 27 July 2009.

- United Nations. 2004. *Johannesburg Declaration on Sustainable Development: From Our Origins to the Future*. UN Department of Economic and Social Affairs. Division for Sustainable Development. http://www.un.org/esa/sustdev/documents/WSSD_POI_PD/English/POI_PD.htm; accessed on 27 July 2009.
- United Nations. 2006. *Johannesburg Summit 2002*. UN Department of Economic and Social Affairs. Division for Sustainable Development. http://www.un.org/jsummit/html/basic_info/basicinfo.html; accessed on 21 August 2009.
- * Wallner A, Rist S, Liechti K, Wiesmann U. 2008. Protection: A means for sustainable development? The case of the Jungfrau-Aletsch-Bietschhorn World Heritage Site in Switzerland. In: Galvin M, Haller T, editors. *People, Protected Areas and Global Change: Participatory Conservation in Latin America, Africa, Asia and Europe*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 3. Bern, Switzerland: Geographica Bernensia, pp 471–504.
- WCED [World Commission on Environment and Development]. 1987. *Our Common Future*. Oxford, UK: Oxford University Press. Also available at: <http://www.un-documents.net/wced-ocf.htm>; accessed on 19 August 2009.
- Wiesmann U. 1998. *Sustainable Regional Development in Rural Africa: Conceptual Framework and Case Studies from Kenya*. African Studies No. 14. Bern, Switzerland: Geographica Bernensia.
- Wiesmann U. 2003. *Grindelwald: Probleme und Optionen nachhaltiger Entwicklung in einer touristischen Berggemeinde*. Excursion Guide for the 54th German Geographers' Day held in Bern, Switzerland, on 28 September 2003. Bern, Switzerland: Geographica Bernensia.
- * Wiesmann U, Liechti K. 2004. The contributions of World Natural Heritage Sites to sustainable regional development – Two case studies from the North and the South. *Revue de géographie alpine – Journal of Alpine Research* 92(3):84–94.
- * Wiesmann U, Liechti K, Rist S. 2005. Between conservation and development: Concretizing the first World Natural Heritage Site in the Alps through participatory processes. *Mountain Research and Development* 25(2):128–138. doi:10.1659/0276-4741(2005)025[0128:BCAD]2.0.CO;2.
- Wiesmann U, Messerli P. 2007. Wege aus den konzeptionellen Fallen der Nachhaltigkeit – Beiträge der Geographie. In: Swiss Academy of Humanities and Social Sciences, editor. *Nachhaltigkeitsforschung – Perspektiven der Sozial- und Geisteswissenschaften*. Bern, Switzerland: Swiss Academy of Humanities and Social Sciences, pp 123–142.
- * Wiesmann U, Aerni I, Ruppen B, Wallner A. 2007a. Tourismus – Schlüssel zur nachhaltigen Entwicklung. In: Wallner A, Bäschlin E, Grosjean M, Labhart T, Schüpbach U, Wiesmann U, editors. *Welt der Alpen – Erbe der Welt. Die UNESCO Welterbe-Region Jungfrau-Aletsch-Bietschhorn*. Bern, Switzerland: Haupt, pp 221–239.
- * Wiesmann U, Wallner A, Schüpbach U, Ruppen B. 2007b. Management – Zwischen Schutz und Nutzung. In: Wallner A, Bäschlin E, Grosjean M, Labhart T, Schüpbach U, Wiesmann U, editors. *Welt der Alpen – Erbe der Welt. Die UNESCO Welterbe-Region Jungfrau-Aletsch-Bietschhorn*. Bern, Switzerland: Haupt, pp 271–284.

35 **Negotiating Conservation: The Construction of Meaningful Spaces in a World Heritage Debate**

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Abstract

According to their personal experience, social background and resultant degree of affectedness, people have certain ideas about the meaning of a World Heritage Site (WHS): What can be expected from it? What relation can and should one have to it? Dealing with potentially different meaningful spaces is decisive when it comes to negotiating pathways to the sustainable development of a WHS region. The multiple realities that exist in a pluralistic world must be taken seriously and addressed adequately. The present article describes how the Jungfrau-Aletsch-Bietschhorn WHS was socially constructed by exploring visual and verbal representations of the WHS during the local decision-making process preceding inscription (1998–2001). The results demonstrate that in visual representations (images) the WHS was to a large extent idealised as an unspoiled natural environment. Such a picture-book-like image has no direct link to the population's daily needs or their questions and anxieties about the consequences of a WHS label. By contrast, verbal representations (articles, letters to the editor, and comments) were dominated by issues concerning the economic development of the region, fears of disappropriation, and different views of nature. While visual and verbal representations differ significantly, their combination may have contributed to the final decision by a majority of the people concerned to support the application for inscription of the Jungfrau-Aletsch-Bietschhorn region in the World Heritage List of the United Nations Educational, Scientific and Cultural Organisation (UNESCO).

Keywords: World Heritage Site; decision-making processes; meaningful spaces; sustainable regional development; Swiss Alps.

35.1 Introduction

World Heritage Sites, according to the World Heritage Convention of the United Nations Educational, Scientific and Cultural Organisation (UNESCO) (UNESCO 1972), are considered as sites of outstanding universal value from the points of view of science, aesthetics, and conservation. In the case of the Jungfrau-Aletsch-Bietschhorn World Heritage Site³ in the Swiss Alps, this outstanding universal value is related to its classic glacial features, its geological records, its alpine and sub-alpine habitats with great diversity of wildlife and excellent examples of plant succession, and its impressive vista that has played an important role in European tourism, literature, and art (UNESCO World Heritage Centre 2003). These values are said to be of the highest importance to the international community as a whole (UNESCO 2005, Art. 49; see also Art. 77) and must be preserved for coming generations.⁴ But who is this international community? Who defines outstanding universal value? And, most importantly, is this value also reflected at the local scale?

In the present article, we demonstrate that in the process of negotiating about a World Heritage Site (WHS), people construct their own individual 'realities', ascribing meanings to the issues under consideration, and thus, in a spatial sense, they construct their own individual meaningful spaces. According to their personal experience, social background and the resultant degree of affectedness, people have certain ideas about the meaning of a WHS, for example: What can be expected from it? What relation can and should one have to it? Thus, to put it simply, the Jungfrau-Aletsch-Bietschhorn WHS does not represent the same values for a local livestock herder as it does for a glaciologist or a winter sports tourist. By exploring how the region was represented in the local press during the decision-making process (visual and verbal representations), we identified what meanings the persons concerned ascribed to the Jungfrau-Aletsch-Bietschhorn WHS, how the WHS was socially constructed, and thus how it became a meaningful space to the actors involved. We point out that the existence (and handling) of these different meaningful spaces is decisive when it comes to negotiating pathways to the sustainable development of a WHS region. The multiple realities that exist in a pluralistic world must be taken seriously and addressed adequately.

35.2 Theoretical background

The research presented here takes a social-constructivist perspective (Berger and Luckmann 1966), advancing the view that meaning is not inherent to objects but ascribed (Werlen 2000, p 307). The primary emphasis of social constructivism is on looking into the question of how we interpret and represent our environment – implying a refusal to take the environment as a given that can only be depicted in one specific way – and on seeking to understand how environmental claims are created, legitimated, and contested (Hannigan 1995, p 3; Rydin 2003, p 16). A constructivist perspective does not deny the existence of the material world.

However, it is not the material world which conveys meaning: it is the language system or whatever system we are using to represent our concepts. It is social actors who use the conceptual systems of their culture and linguistic and other representational systems to construct meaning, to make the world meaningful and to communicate about the world meaningfully to others. (Hall 1997, p 25)

Incorporated meanings structure the way actors interact with their environment. Only through the attribution of meanings do ‘things’ really become things. In the context of the present article, this means that the World Heritage Site cannot be experienced directly, but only through the lenses of internalised meanings. Subject to our personal and social background and hence our degree of affectedness, and in our interactions with other people and the environment, we make the WHS a meaningful space. Or in the words of Jäger (2001, p 42): “[...] all meaningful reality is existent for us because we make it meaningful or because it has been allocated some meaning by our ancestors or neighbours and is still important to us.” Meaningful spaces can be merely individual constructions, but usually they are conventionalised and shared collectively among the members of certain social groups.

Meanings are shaped and reshaped in a complex process of internalisation, storing and recollection of experiences. As humans are not in a position to witness the endless variety of matters of concern with their own eyes, the media play a crucial role in the construction of meaning. Even though Luhmann’s statement that “whatever we know about our society, or indeed about the world in which we live, we know through the mass media” (Luhmann 2000, p 1) is exaggerated in regional contexts, the media not only make different perspectives and meanings visible, but also contribute significantly

to creating 'realities'. The way meaningful spaces became visible and were constructed by the media in the case of the Jungfrau-Aletsch-Bietschhorn WHS is further elaborated below.

35.3 The Swiss Alps – meaningful spaces in historical perspective and current debate

The Swiss Alps are a famous example of changing 'realities': Whereas in the 18th century the Alps were seen as gruesome and ugly, a place to avoid, a century later Thomas Cook was successfully organising cheap trips to the Alps for British tourists. The horrible Alps had changed to an attractive and inviting landscape, a sublime place which was a 'must see'. The people inhabiting the Alps were romanticised as happy mountaineers, leading a modest life in harmony with their environment. Representing an antipode to inhospitable cities, the Alps were regarded as the embodiment of an idyllic rural life. This view of the Alps as a pristine and mostly unspoiled natural space neglected age-long efforts to cultivate the environment. In the 20th century, this idealised and romanticised view, spread through tourism brochures, posters and postcards, became a commonplace among the broad public (Stremlow 1998).

The state of the art of research on (different) views of the Swiss Alpine space was recently surveyed by Backhaus et al (2007). As a result, these authors derived a landscape model consisting of four poles, where 'nature' and 'culture' mark the polarities of one axis, while 'individual' and 'society' mark the poles of the intersecting axis. They locate six dimensions of landscape within the 4-pole model: corporeal/sensory, aesthetic, identificatory, political, economic, and ecological (Backhaus et al 2008). The dimensions can be seen as foci that people (or academic disciplines) adopt when dealing with landscape. For instance, research focusing on the ecological dimension of a landscape is concerned with natural-scientific issues such as biodiversity. On the other hand, research located in the aesthetic dimension emphasises the value attributed to beauty or to personal pleasure. Both views offer meanings that complement each other and should thus be correlated in a democratic dialogue. An effort to combine the aesthetic with the economic dimension is exemplified in the work of Baumgart (2005): By applying discrete-choice experiments, she aimed to translate the 'meanings' of landscape transformations, or rather the value of the aesthetic dimension of landscapes, into monetary terms. She showed that a development project is more likely to be supported if it fits the traditional patterns of Alpine landscapes.

The ‘outstanding universal values’ of the Jungfrau-Aletsch-Bietschhorn WHS – when they are related to the landscape model above – are explicitly linked to the ecological, aesthetic and identificatory dimensions (see introduction). In the concrete local context, however, as is shown below, other dimensions contributed to the construction of meaningful spaces as well.

35.4 Methods

The present analysis focuses on the four years prior to the declaration of the Jungfrau-Aletsch-Bietschhorn region as a WHS in 2001, the key time frame during which negotiations on World Heritage candidature took place. It is based on press coverage of the Jungfrau-Aletsch-Bietschhorn WHS in the *Walliser Bote*, the most important daily newspaper in the Oberwallis (the German-speaking part of the Canton of Valais), which has a print run of about 27,000 and reaches 85% of the region’s households (WEMF AG 2004). Two types of data were analysed: visual representations (72 press photos of the WHS) and verbal representations (122 press articles on the WHS).

Spatial appropriation categories were applied to the visual representation data. These categories were developed in a procedure that moved back and forth between theoretical considerations, empirical use of the provisional categories, and the image material (for a detailed description, see Müller and Backhaus 2007). For the categorisation of images, the main distinction was made between pictures that depict ‘unspoiled natural environment’ and those showing ‘traces of cultural appropriation’ (i.e. artefacts or activities). Pictures in the second category were further differentiated in several sub-categories. This analysis resulted in an overview of the visually communicated type of spatial appropriation that resembles an ‘area statistic’ for the specific region – not, however, of its ‘real’ space, but of its pictorial representation in the *Walliser Bote*.

The verbal representations were analysed using content analysis methodology in general (according to Mayring 2004) and ‘summarising content analysis’ in particular. This procedure makes it possible to reduce the material in such a way that the essential contents are preserved, but the text is shortened to a manageable length (Mayring 2004, p 268). The result of the analysis is an overview of the issues most prominently discussed in the *Walliser Bote*.

35.5 Results and discussion

35.5.1 Visual representation of the Jungfrau-Aletsch-Bietschhorn WHS

The results regarding the visual representations show that during the period of examination the *Walliser Bote* presented the WHS to a large extent as an unspoiled natural environment. 21.6% of the visual image surface area shows no cultural activities or artefacts at all (Figure 1, “natural environment”). Regarding the 78.4% that falls under the category of “cultural space”, 14.3% of the visual image surface area portrays the WHS as a “harmonic space”, i.e. as an idyllic, museum-like space, with no evidence of concrete land use. The category of “experiential space in general” is the largest category (24.8%). Pictures in this category depict the WHS predominantly

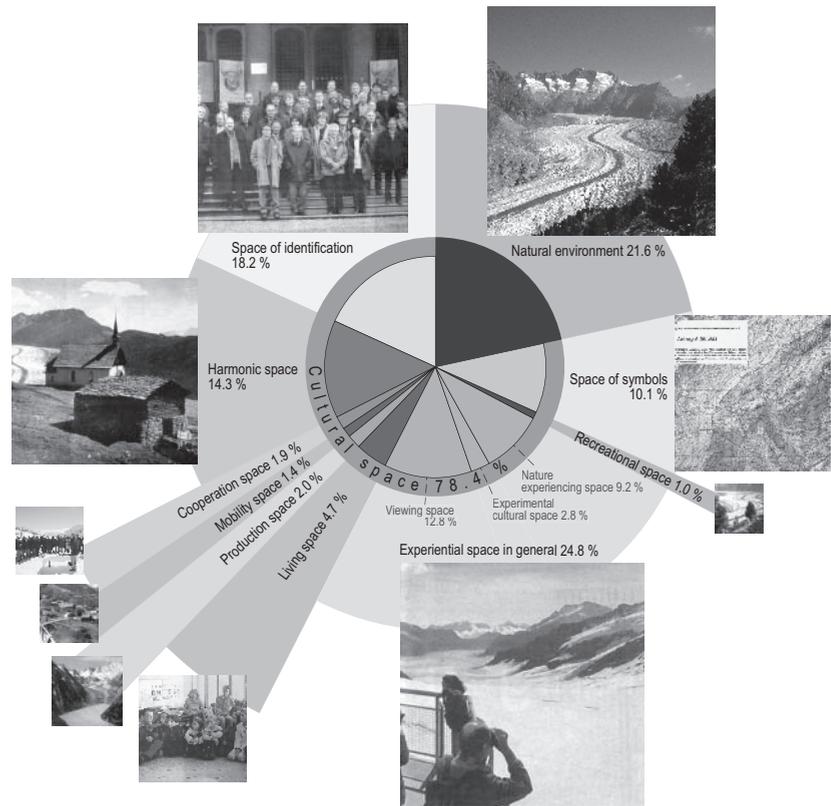


Fig. 1
The image of the Jungfrau-Aletsch-Bietschhorn World Heritage Site as presented in the *Walliser Bote* between 21 February 1998 and 13 December 2001. (Graph by Urs Müller, photos courtesy of *Walliser Bote*)

as a space for experiencing nature (“nature experiencing space”) and enjoying grandiose views (“viewing space”); fun-sport activities are not shown. The high percentage of the category “space of identification” is due largely to pictures of opinion leaders supporting the WHS candidature. Finally, the category “space of symbols” embraces graphic illustrations such as maps of the WHS perimeter. Images focusing directly on economic or residential appropriations (“living space”/“production space”) are insignificant.

If we analyse the 78.4% of the image surface area showing “cultural space” more closely, the impression of the WHS being portrayed as a natural landscape almost devoid of people becomes more striking. More than half of the image surface area for “cultural space” is dedicated to pictures showing cultural appropriation with a natural background (Müller 2007, p 247). Furthermore, the most famous landscape component of the WHS, the Great Aletsch Glacier, dominates visual communication. More than half of the pictures (37 of 72) present the iconic view of the glacier, highly staged for aesthetic appeal and reminiscent of a promotion calendar.

In summary, the visual portrait of the WHS drawn by the *Walliser Bote*, the most important regional source of information, had no direct link to the population’s daily needs. Questions and anxieties about the consequences of a WHS label and the commitment to sustainable development prevalent among the population concerned were not taken into account. Instead, the potential WHS was depicted in a way similar to how it would be shown in a touristy promotion brochure, addressing the assumed values of target groups outside the region. This kind of visual communication met with criticism from some of the regional inhabitants. People fearing heteronomy complained that instead of providing information, the media and promoters of the WHS tried to ‘persuade’ the population by appealing to their emotions. Rather than being convinced by a picture-book-like presentation, people wanted to know the benefits and the costs of a WHS label.

35.5.2 Verbal representation of the Jungfrau-Aletsch-Bietschhorn WHS

The verbal representations show some similarity to the visual representations in terms of associating the WHS with a place of outstanding beauty. The natural features of the region are valued positively above all because of their aesthetic appeal. “This unique landscape is formed by wind, cold, sun and the powerful flow of the glacier. Fauna and flora cover this landscape in

every season so that it bristles with beauty” (*Walliser Bote*, letter to the editor, 9 March 2000; see Walliser Bote 2000b; this and the following citations from the *Walliser Bote* were translated into English by Karina Liechti). In this realm, the media debate concurs with the international view and the universal values crucial for inscription in the World Heritage List. Other natural features, such as the value of biodiversity, plant succession, or glacier morphology, although represented in the pictures, were rarely elaborated in more detail in the articles.

Apart from the above-mentioned similarities to the visual representations with regard to aesthetics, the verbal representations show a different and more differentiated pattern that reflects debates on how to deal with the picture-book-like WHS. In contrast to visual representation, verbal discussion was dominated by issues concerning the region’s economic development. Discussion thus focused on how to deal with the WHS’s ‘outstanding beauty’, thereby anchoring the aesthetic images. Two conflicting lines of argumentation were identified. One associated the WHS with economic loss due to its potential to impede infrastructural expansion. Applying an economic interpretation of sustainable development was justified in the following terms: “It is our uppermost duty to keep options for [infrastructural] extension open in order to provide a secure livelihood for future generations” (*Walliser Bote*, general article, 2 April 1998; see Walliser Bote 1998b). The other line of argumentation described the WHS as having the potential to enhance economic and mainly touristic development. The WHS was presented as a means to bring more tourists to the region: “Inscription of the region in the World Heritage List would spur a big international marketing campaign that we could never pay for by ourselves” (*Walliser Bote*, general article, 26 March 1998; see Walliser Bote 1998a). The disputes in this discussion were related to a major debate regarding the level and the status of protection required for the WHS. While some people – mainly with backgrounds in conservation – emphasised the need for enhanced nature protection and saw the WHS as a means of advancing this purpose, others – mainly opponents of the WHS – associated the WHS with attempts by outsiders to deprive local inhabitants of their right to determine the development of their region on their own: “Never should we allow foreign organisations, people from Paris, Bern [...] to decide what we have to do and how we do things in our mountains” (*Walliser Bote*, letter to the editor, 7 March 2000; see Walliser Bote 2000a).

A general look at the verbal representations reveals that the understanding of sustainable regional development was the most controversial aspect of the debate. Even though both the proponents and the opponents of the WHS focused on sustainability as the main objective – in terms of the care of future generations – the means of achieving this objective were highly contested (for further information, see Liechti et al, accepted).

35.5.3 Combining the visual and the verbal

While visual and verbal representations differ significantly to a large extent, their combination may have contributed to the final decision of the majority of people concerned to support the application for inscription of the Jungfrau-Aletsch-Bietschhorn region in the World Heritage List. The prominence of economic arguments and narratives about intergenerational responsibility in the verbal representations, and their combination with the aesthetic appeal of the natural environment in the visual representations, may have built a common meaningful space for one part of the population. However, other parts of the population attributed completely different meanings to the WHS; this was shown, for instance, in the discussion of protection and spatial deprivation (see above). Thus distinct meaningful spaces were created. The related contested views, prominent in the run-up to the candidature, remained an issue in negotiations after the inscription of the region in the World Heritage List in 2001. This became most prominently visible in the course of a participatory process (Figure 2) that involved the local population as well as various organisations (for more information, see Wiesmann et al 2005).

35.6 Conclusions and open questions

35.6.1 Practical considerations

As mentioned above, World Heritage Sites are considered sites of outstanding universal value from the points of view of science, aesthetics, and conservation. From the constructivist perspective taken here, WHSs are social constructions that reflect the values and power relations prevailing at the time of their implementation. Thus, the declaration raises the question of who defines what as worthy of protection, and for which reasons. WHSs have been created against the will of the people directly concerned – particularly in countries of the so-called developing world. Such heteronomy



Fig. 2
Negotiating the
World Heritage
Site. (Photo courtes-
y of *Jungfrau*
Zeitung, 2005)

is not possible in the Swiss context (Wiesmann and Liechti 2004). Here, a WHS must evolve in a participatory bottom-up process, or a potential candidature must be backed by proof of strong support among the people concerned. Hence, promoters of a WHS candidature are confronted with the question of how (at least the majority of) local people can be motivated to take part in World Heritage or sustainability initiatives. Referring only to the aforementioned ‘universal values’ of a scientific, aesthetic or conservationist nature is unlikely to bring success. Such values are too abstract and too meaningless for local people, as they do not have enough in common with local people’s lives. Even worse: Presenting the WHS as an aesthetically staged, picture-book-like natural space could even provoke opposition, as it suggests conservation of ‘outstanding values’ as the only aim of a WHS – disregarding existing (sustainable) uses of the region. However, since the Budapest Declaration of 2002, WHSs have had to strike a balance between conservation and development, “so that World Heritage properties can be protected through appropriate activities contributing to the social and economic development and the quality of life of our community” (UNESCO

2002). Achievement of sustainable development is closely associated with the participation of all actors. One-dimensional communication that aims only to affect people emotionally (for instance, with both shocking and idealised ‘picturesque’ images) can lead to polarisation within a population and hence to obstruction of the participatory process. Comprehending different constructions of ‘reality’ and different meaningful spaces, and taking them seriously, is thus an important precondition for sustainable development (Liechti 2008).

35.6.2 Theoretical considerations

From the applied social-constructivist perspective, spatial classifications such as the labelling of a region as a WHS are not rooted in the nature of things but rather in people’s socio-culturally determined interests. Thus, to put it bluntly, people’s conceptions of the world tell us more about the needs, values and beliefs of those striving to make some sense of reality than about ‘reality’ itself (Graeser 2000, p 298). Nevertheless, in addition to a methodological problem (see below), we also want to raise a theoretical shortcoming of the purely social-constructivist perspective.

While it is certainly beyond dispute that statements about ‘reality’ are historically and socio-culturally constituted and thus contingent, the other side of the coin is not taken seriously enough. While, for instance, the values a region has to offer that could qualify it as a WHS are a social construction, whether a region corresponds to such values or not is obviously no pure construction. A region without glaciers cannot strive for the label of ‘containing Europe’s largest glacier’ as the Jungfrau-Aletsch-Bietschhorn WHS did. But how can the bio-physical basis be incorporated into theories of social construction without plunging into naive realism (Escobar 1999, p 3)? How, for instance, can we deal with ‘nature’ from a constructivist perspective without offering support to the dangerous position that ‘environmental problems’ may be mere fictions (Eden 2001, p 82)? While actor-network theory (ANT) is probably the most promising approach to overcome the nature/culture (object/subject) dichotomy, in recognising the bio-physical background of constructions, ANT does not go beyond Gibson’s (1986) ecological approach to perception (Latour 2005, p 72) – leaving as many open questions as Gibson did (Müller 2007, pp 19ff.). Thus, the theoretical edifice is in need of further development.

35.6.3 Methodological considerations

Even if ‘reality’ cannot be constructed completely arbitrarily, there still remain many ways of conceiving it. The media in particular, which claim to record ‘reality’, create it instead (Bourdieu 2001). Analyses of the reproduction and dissemination of representations of ‘reality’ thus remain an important challenge for scientific research. Further studies should take into account that dominant representations are an outcome of social power relations. The “power of constructing reality” (Bourdieu 1991, p 166) is a matter of symbolic power, i.e. the symbolic capital successfully realised by actors in specific (here, journalistic) fields. If we want to understand why a certain person or perspective is published rather than another, we have to find ways to examine an actor’s position in social space and investigate his/her available social, economic and cultural capital. Furthermore, with respect to internalisation of media discourses by audiences, the relationship between media reports and people’s beliefs is still elusive. While media analyses shed light on the views spread by public discourse, they cannot grasp what people actually think about an issue or, in our example, their actual motivation for participating in sustainability initiatives. Thus, in order to gain a comprehensive understanding of decision-making processes, investigations of media producers and media consumers should be added to the media analyses presented here.

Endnotes

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³ In 2008 the site was renamed Swiss Alps Jungfrau-Aletsch UNESCO World Heritage Site. Given that this article deals with the period from 1998 to 2001, we use the name that was relevant during that time.

⁴ According to UNESCO’s 2005 guidelines for the implementation of the World Heritage Convention, “[o]utstanding universal value means cultural and/or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity. As such, the permanent protection of this heritage is of the highest importance to the international community as a whole” (UNESCO 2005, Art. 49; see also Art. 77).

References

Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- Backhaus N, Reichler C, Stremlow M. 2007. *Alpenlandschaften: von der Vorstellung zur Handlung*. Zurich, Switzerland: vdf.
- Backhaus N, Reichler C, Stremlow M. 2008. Conceptualizing landscape: An evidence-based model with political implications. *Mountain Research and Development* 28(2):132–139.
- * Baumgart K. 2005. *Bewertung landschaftsrelevanter Projekte im Schweizer Alpenraum: Die Methode der Discrete Choice-Experimente*. Bern, Switzerland: Geographica Bernensia.
- Berger PL, Luckmann T. 1966. *The Social Construction of Reality: A Treatise in the Sociology of Knowledge*. New York, NY: Doubleday.
- Bourdieu P. 1991. *Language and Symbolic Power*. Cambridge, UK: Polity Press.
- Bourdieu P. 2001. Television. *European Review* 9(3):245–256.
- Eden S. 2001. Environmental issues: Nature versus the environment? *Progress in Human Geography* 25(1):79–85.
- Escobar A. 1999. After nature: Steps to an antiessentialist political ecology. *Current Anthropology* 40(1):1–30.
- Gibson JJ. 1986. *The Ecological Approach to Visual Perception*. New edition [1979]. Hillsdale, NJ and London, UK: Lawrence Erlbaum Associates.
- Graeser A. 2000. *Bedeutung, Wert, Wirklichkeit: Positionen und Probleme*. Bern, Switzerland: Peter Lang.
- Hall S, editor. 1997. *Cultural Representations and Signifying Practices*. London, UK: Sage.
- Hannigan J. 1995. *Environmental Sociology: A Social Constructionist Perspective*. London, UK: Routledge.
- Jäger S. 2001. Discourse and knowledge: Theoretical and methodological aspects of a critical discourse and dispositive analysis. In: Wodak R, Meyer M, editors. *Methods of Critical Discourse Analysis*. London, UK: Sage, pp 32–62.
- Latour B. 2005. *Reassembling the Social: An Introduction to Actor-Network-Theory*. New York, NY: Oxford University Press.
- * Liechti K. 2008. *Negotiating Sustainable Regional Development: The Relevance of Meaningful Spaces in Times of Change* [PhD dissertation]. Bern, Switzerland: University of Bern.
- * Liechti K, Wallner A, Wiesmann U. Accepted. Linking a World Heritage Site to sustainable regional development: Contested natures in a local negotiation process. *Society and Natural Resources*.
- Luhmann N. 2000. *The Reality of the Mass Media*. Cambridge, UK: Polity Press.
- Mayring P. 2004. Qualitative content analysis. In: Flick U, von Kardorff E, Steinke I, editors. *A Companion to Qualitative Research*. London, UK, Thousand Oaks, CA, New Delhi, India: Sage.
- * Müller U. 2007. *Die Kraft der Bilder in der nachhaltigen Entwicklung. Die Fallbeispiele UNESCO Biosphäre Entlebuch und UNESCO Weltnaturerbe Jungfrau-Aletsch-Bietschhorn*. Zurich, Switzerland: vdf.
- Müller U, Backhaus N. 2007. The Entlebuchers: People from the back of beyond? *Social Geography* 2:11–28.
- Rydin Y. 2003. *Conflict, Consensus and Rationality in Environmental Planning: An Institutional Discourse Approach*. New York, NY: Oxford University Press.
- Stremlow M. 1998. Die Alpen aus der Untersicht – von der Verheissung der nahen Fremde zur Sportarena. Kontinuität und Wandel von Alpenbildern seit 1700. Bern, Switzerland: Haupt.
- UNESCO [United Nations Educational, Scientific and Cultural Organisation]. 1972. *Convention Concerning the Protection of the World Cultural and Natural Heritage*. Paris, France: UNESCO. Also available at: <http://whc.unesco.org/en/conventiontext/>; accessed on 27 July 2009.

- UNESCO [United Nations Educational, Scientific and Cultural Organisation]. 2002. *26COM 9 – Budapest Declaration on World Heritage*. Paris, France: UNESCO. Also available at: <http://whc.unesco.org/en/budapestdeclaration/>; accessed on 19 August 2009.
- UNESCO [United Nations Educational, Scientific and Cultural Organisation]. 2005. *Operational Guidelines for the Implementation of the World Heritage Convention 2005*. Paris, France: UNESCO. Also available at: <http://whc.unesco.org/archive/opguide05-en.pdf>; accessed on 15 July 2009.
- UNESCO World Heritage Centre. 2003. Jungfrau-Aletsch-Bietschhorn. *UNESCO World Heritage*. <http://whc.unesco.org/en/list/1037>; accessed on 15 July 2009.
- Walliser Bote. 1998a. Skepsis hüben wie drüben [general article]. *Walliser Bote*, 26 March 1998, p 11.
- Walliser Bote. 1998b. Erschliessung des Aletschgebietes? [General article.] *Walliser Bote*, 2 April 1998, p 23.
- Walliser Bote. 2000a. Unesco – muss das sein? [Letter to the editor.] *Walliser Bote*, 7 March 2000, p 19.
- Walliser Bote. 2000b. Unesco World Heritage List – Jungfrau/Aletsch [letter to the editor]. *Walliser Bote*, 9 March 2000, p 25.
- WEMF AG. 2004. *MACH Basic 2003*. Zurich, Switzerland: WEMF AG.
- Werlen B. 2000. *Sozialgeographie*. Bern, Switzerland: Haupt.
- * Wiesmann U, Liechti K. 2004. The contributions of World Natural Heritage Sites to sustainable regional development – Two case studies from the North and the South. *Revue de géographie alpine – Journal of Alpine Research* 92(3):84–94.
- * Wiesmann U, Liechti K, Rist S. 2005. Between conservation and development: Concretizing the first World Natural Heritage Site in the Alps through participatory processes. *Mountain Research and Development* 25(2):128–138.

36 **Managing a World Heritage Site: Potentials and Limitations of Transdisciplinary Approaches**

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Abstract

Balancing the conflicting priorities of conservation and economic development poses a challenge to management of the Swiss Alps Jungfrau-Aletsch UNESCO World Heritage Site (WHS). This is a complex societal problem that calls for a knowledge-based solution. This in turn requires a transdisciplinary research framework in which problems are defined and solved cooperatively by actors from the scientific community and the life-world. In this article we re-examine studies carried out in the region of the Swiss Alps Jungfrau-Aletsch WHS, covering three key issues prevalent in transdisciplinary settings: integration of stakeholders into participatory processes; perceptions and positions; and negotiability and implementation. In the case of the Swiss Alps Jungfrau-Aletsch WHS the transdisciplinary setting created a situation of mutual learning among stakeholders from different levels and backgrounds. However, the studies showed that the benefits of such processes of mutual learning are continuously at risk of being diminished by the power play inherent in participatory approaches.

Keywords: World Heritage Site; protected area; management; transdisciplinarity; sustainable regional development; negotiation; Switzerland.

36.1 Introduction

There is common agreement in international political and scientific discourse on nature protection that two basic factors strongly influence the success of concrete approaches: (1) linking protection approaches and goals to development issues; and (2) granting local participation in and endogenous ownership of such processes (Pimbert and Pretty 1997; Cleaver 2001; Wiesmann et al 2005). When focusing specifically on World Natural Heritage Sites, a twofold significance is relevant: on the one hand, World Natural Heritage Sites are established to preserve phenomena of nature that are extraordinary and unique at a global scale; on the other hand, they are also localised in and hence related to and significant for specific regional contexts. Therefore, preserving global values depends on local development, local action, and local actors (Wiesmann and Liechti 2004). This has implications for the management of protected areas.

The protected area of the Swiss Alps Jungfrau-Aletsch UNESCO World Heritage Site (WHS) – designated by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) World Heritage Committee in 2001 – concentrates on the uninhabited high-alpine zone (see Figure 1 in Sommer et al 2009, on p 536 of the present volume). This area is located in a region containing settlements and small-scale cultural landscapes. The region composed of the protected area and the surrounding settlements constitutes a world-renowned tourist attraction as well as an important economic base for the local residents (35,000 people living in the area).

It is the declared aim of the communes that have a share of land within the perimeter of the WHS to preserve not only the area designated as a WHS but the whole region in all its diversity for future generations, and to promote sustainable development of the region as an economic, living, recreational and natural space (Jungfrau-Aletsch-Bietschhorn World Heritage Association 2007). The combination of striving for both protection and economic use in the same region leads to tensions between conflicting priorities; these tensions constitute one of the greatest challenges in managing the Swiss Alps Jungfrau-Aletsch WHS. Additional challenges to management of the WHS stem from the dynamics of change in the natural and the cultural landscapes (Wiesmann et al 2007). In natural landscapes, for example, processes of change are intensified by global changes such as climate change. This is especially relevant in the case presented here, since mountain habitats are particularly vulnerable to climate change (this fact has been internationally

recognised, see UNFCCC 2007); moreover the Intergovernmental Panel on Climate Change (IPCC) denote mountain ecosystems as among the most threatened in Europe (Hill et al 2010). At the same time continuous structural change, for example in agriculture, leads to radical changes in the cultural landscape. Although both types of changes have always occurred, the rate of change has drastically increased during the last few decades. In the face of the challenges posed both by the quest to combine protection and regional development, as well as by natural and cultural landscape dynamics, a way must be found to preserve the environment with its inherent natural beauty without preventing regional development. How can such a complex situation be dealt with?

36.2 Transdisciplinarity and participation

Preserving ecology without preventing regional development is a complex societal problem that calls for a knowledge-based solution. This requires integrating knowledge from various scientific disciplines as well as from other societal fields. This involves transdisciplinary research, which is defined as “research that includes cooperation within the scientific community and a debate between research and the society at large” (Wiesmann et al 2008). Transdisciplinarity takes account of the fact that knowledge exists and is produced in societal fields other than science. This implies transgression of boundaries, not only between various scientific disciplines but also between science and other societal fields. Furthermore, “transdisciplinarity implies that the precise nature of a problem to be addressed and solved is not predetermined and needs to be defined cooperatively by actors from science and the life-world” (ibid.). We are thus dealing with different forms of knowledge in transdisciplinary research: systems knowledge, which stems from describing, analysing and interpreting complex empirical processes; target knowledge, aimed at determining goals for better dealing with problems; and transformation knowledge, which examines how existing practices can be changed. Non-scientific forms of knowledge are included by taking account of interrelations between the various forms of knowledge. One way of integrating knowledge from societal fields other than science is by participation. For a long time, participation by local stakeholders and hence local knowledge was not integrated into management of protected areas. Today, it is internationally acknowledged that local participation is an important asset in successful management of protected areas, and there is a vast amount of literature dealing with the question of participation by

local populations in relation to protected area management and/or sustainable development (e.g. Brechin and West 1990; McNeely 1995; Price 1996; Geiser 2001; Papageorgiou and Vogiatzakis 2006; Fletcher et al 2007; Sneddon and Fox 2007; Wallner et al 2007; Stoll-Kleemann and Welp 2008).

But even though there is general agreement that public participation is an important principle and goal for achieving ecologically sustainable and socially just environmental governance (Sneddon and Fox 2007), participation is an exceedingly difficult objective to define and implement (Cooke and Kothari 2001). Pimbert and Pretty (1997) distinguished at least seven different types of participation on the basis of the degree of involvement. Webler and Tuler (2000) interpret participation as a means to facilitate processes of deliberation between different stakeholders who – based on the principles of fairness and empathy – collectively use and broaden public spaces, aiming at structural and personal transformations with a view towards more sustainable forms of development. Furthermore, participation is “a concept and process intimately connected to the political and economic dynamics of the particular geographical and historical contexts within which it is being applied” (Sneddon and Fox 2007).

As outlined above, in the case of the Swiss Alps Jungfrau-Aletsch WHS, the challenge was to find a way to preserve the environment without preventing regional development. Since this was a situation where a knowledge-based solution was sought for a complex societal problem, there was a need for transdisciplinary research. This was met by initiating a multi-stakeholder participatory process in order to negotiate concrete objectives and actions for the WHS. Through this process it was possible to detect important aspects and grounds for dispute regarding the WHS, and thereby obtain important inputs regarding management of the WHS. This participatory process – which was part of the planning process for the future of the region – was accompanied by an interdisciplinary research project on sustainable regional development (Wiesmann and Liechti 2004; Wiesmann et al 2005, 2007; Wallner et al 2008; Liechti et al, accepted) and on social learning processes (Rist et al 2004). The boundaries between different kinds of scientific disciplines and between science in general and societal fields other than science were transgressed by having people from various scientific fields and from the region under consideration discuss the issue of protection and conservation at the same table. Furthermore, the problem to be addressed was defined cooperatively by actors from science and the life-world, integrating and producing different kinds of knowledge.

The discussions preceding the WHS nomination process, as well as the multi-stakeholder participatory process itself have been analysed in various studies (Aerni 2005; Wiesmann et al 2005; Wallner et al 2008; Liechti et al, accepted). In this article, the findings of these studies are re-examined against the background of transdisciplinary research. The aim is to detect key issues prevalent in transdisciplinary research settings and to address potentials and limitations of transdisciplinary approaches. The methods used in the studies included semi-structured interviews with participants in the participatory process, standardised questionnaires filled in by participants in the participatory process, and analysis of newspaper articles published in the run-up to the formalised democratic votes on candidature in the communes involved.

36.3 The case of the Swiss Alps Jungfrau-Aletsch World Heritage Site

In Switzerland, labels for protected areas are only granted if the communes, regions and cantons concerned contribute financially to the establishment and management of the proposed protected area (Swiss Regulation for Parks of National Importance). In other words, acceptance and support from the local population is a basic prerequisite for the designation of a protected area. This support is not always existent, as was clearly demonstrated in 2000 when part of the local population rejected extension of the Swiss National Park (Müller 2001; Frei 2002). According to a common strategy in Switzerland, the planned extension of the Swiss National Park was put to the vote in a formalised democratic decision-making process in the communes concerned. While one commune supported the extension, another voted against it and thereby caused the entire project to fail. At about the same time, formalised decision-making with respect to protected areas took place in two other regions in Switzerland: in the Entlebuch, regarding its declaration as a UNESCO Biosphere Reserve, and in the Jungfrau-Aletsch area, regarding its inscription on the UNESCO World Heritage List. In both cases, the populations of the communes concerned expressed their support of the project ideas after lengthy and intense discourse, by voting in favour of the project in question in a formal process of democratic decision-making. This fulfilled the requirement of local acceptance and support of a protected area prior to its designation. Both sites were accepted by the respective UNESCO committees in 2001, and the Swiss Alps Jungfrau-Aletsch WHS was extended in 2007.

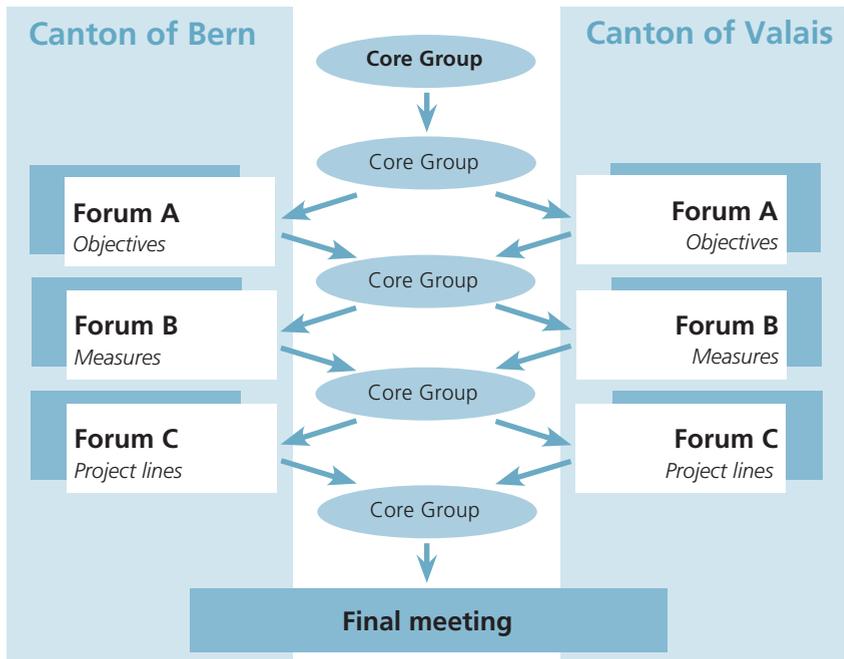


Fig. 1 Phases of the multi-stakeholder participatory process conducted in 2004 to negotiate the Swiss Alps Jungfrau-Aletsch World Heritage Site.

In each canton, two discussion groups met simultaneously: one dealing with questions regarding agriculture, forestry, tourism and trade, and one dealing with questions regarding education, sensitisation, and natural and cultural values. These groups each met in three rounds (Forums A–C), with a core group consisting of the Swiss Alps Jungfrau-Aletsch World Heritage Site Management Centre, facilitators and researchers taking intermediate steps between the rounds.

However, having a site declared as a World Heritage Site, a Biosphere Reserve, or any other form of protected area does not end the process of participation. In the case of the Swiss Alps Jungfrau-Aletsch WHS, local people’s expectations were high after the votes in the communes and formal declaration of the WHS. However, the high level of acceptance was based on diverse and sometimes conflicting expectations. While some stakeholders expected increased conservation efforts, others expected increased attention to be given to cultural landscapes. Expectations regarding immediate economic gains based on the World Heritage label dominated the reasoning of various stakeholder groups as well. The original democratic approval of the Swiss Alps Jungfrau-Aletsch WHS did not solve persisting conflicts related to balancing conservation and development (Wiesmann et al 2005). Therefore, the scientific advisory group of the WHS Management Centre suggested implementing a multi-stakeholder participatory process (Figure 1) in order to

concretise the WHS by negotiating and prioritising overall goals, specific objectives, necessary measures and concrete projects for the region. Contradictions between acceptance and expectations were thus to be overcome, and the management would be able to work on the basis of broad acceptance. One of the main challenges in this process was the fact that the region in which the Swiss Alps Jungfrau-Aletsch WHS is situated is characterised by a high level of complexity. In terms of administrative units, the WHS comprises parts of two cantons, of 26 communes, and of 5 mountain planning regions. What we call the Jungfrau-Aletsch World Heritage Region is neither a political nor an economic, social or cultural unit. Nevertheless, the fact that 26 communes have part of their territory within the perimeter of the WHS forces them to negotiate goals and measures pertaining to the WHS.

36.4 Transdisciplinarity in practice

There are several stumbling blocks in the practice of transdisciplinarity. The following are the most common and persistent ones: participation, integration, values, management, education, and evaluation (Wiesmann et al 2008). These issues can hamper transdisciplinary research. Analysis of the above-mentioned studies related to the Swiss Alps Jungfrau-Aletsch WHS revealed three key issues that are crucial when trying to find a local pathway to sustainable regional development and nature conservation: integration of stakeholders into participatory processes, perceptions and positions, and negotiability and implementation. These three key issues reflect some of the stumbling blocks mentioned above.

36.4.1 Integration of stakeholders into participatory processes

Aerni (2005) interviewed 21 participants in the multi-stakeholder participatory process in which concretisation of the Swiss Alps Jungfrau-Aletsch WHS was negotiated. The selected participants were interviewed at the beginning as well as at the end of the participatory process, enabling Aerni to analyse the changes in people's perceptions regarding the project as a whole as well as regarding the participatory process as a part of the whole project.

An important issue mentioned in these interviews relates to the selection and integration of stakeholders. Participants in the process were selected in various ways: some were directly approached by the WHS Management Centre and invited to participate, while others joined the process based on calls placed

in regional newspapers. This guaranteed that all of the 35,000 people living in the region had a chance to join the process. Most interviewees approved of this selection process with regard to broad involvement of the population.

However, interviewees mentioned that it had been extremely difficult to integrate people who felt less concerned by the WHS, as well as people who were not very well linked or organised in social networks and who were not able to formulate a common interest regarding the WHS. One interviewee stated that more farmers should have participated in the process rather than only representatives of farmers' organisations. This statement clearly shows how difficult it is to define who speaks for whom and about which issue: if a representative of a farmers' organisation speaks on behalf of the farmers, do the farmers truly feel represented? Yet the process was open to everybody and not just to representatives of organisations. No matter how open a process is, it is impossible to avoid people criticising it for not being open enough. In some cases, criticism might be passed on the process by people who were asked to actively participate but declined to do so.

Opening the process not only to inhabitants of the region but also to organisations with a stake in the region – such as nature conservation groups – revealed a basic conflict between the local inhabitants' views of sustainable regional development and outsiders' visions of protection (Wiesmann et al 2005). This was due to the fact that nature conservation groups had a greater number of representatives from outside than from inside the region because they build on well-established national networks. External and local stakeholders have different views of an area regarding the needs for protection and for development; therefore, the positions of nature conservation representatives conflicted in many aspects with those of local stakeholder categories.

With regard to transdisciplinary research, these results show that sufficient consideration has to be given to the role each stakeholder participating in the process plays in his or her own stakeholder group. By fostering mutual learning, it might be possible to integrate people criticising the process at a later point. Furthermore, it must be acknowledged that stakeholders range from the local level to the regional and even sub-regional and national levels, and that the great majority of these are stakeholders from societal fields other than science, whose perceptions of nature and economic development can differ among each other even more than the perceptions of stakeholders from various scientific disciplines.

36.4.2 Perceptions and positions

In most cases, negotiations regarding protected areas are negotiations on how to protect areas without interfering with regional development. This is due to the fact that protected areas are usually surrounded by areas that form the economic and living space for local communities. The position we take regarding nature protection is influenced by our perception of nature; therefore, negotiating protected areas implies talking about perceptions of nature and landscapes. In the case of the Swiss Alps Jungfrau-Aletsch WHS, different perceptions of nature and landscape were found to be an underlying current in the multi-stakeholder participatory process (Wiesmann et al 2005). Three main visions could be differentiated: a vision of pristine nature, including aspects of wilderness and a wide range of conservation issues; a vision of nature related to humankind and manifested as a cultural landscape; and a vision dominated by the utility of nature, focusing on economically relevant natural resources.

Liechti et al (accepted) analysed the prevalent conceptions of nature in more detail and identified eight constructions of nature. These different constructions of nature stood alone, appeared in combination, or opposed each other. Despite the underlying controversies, common agreement on the future of the region was found because it was possible to build on common values such as the aesthetic appeal of the region and intergenerational responsibility for the region. Furthermore, the people who had initiated the discussion on a WHS in the region played a guiding role in this process: "Due to their different professional backgrounds and their comprehensive view of nature, they were able to approach different actors on the basis of their individual values" (ibid.). These protagonists included people from the region as well as from outside, and from the local/regional as well as the national levels. Discussions on the possibility of a candidature of the area as a WHS had actually started in the 1970s but had to be dropped more than once due to the conflicting interests of the parties involved.

With respect to transdisciplinary research, these results show that different and especially conflicting perceptions influence negotiations and therefore have to be addressed by creating an atmosphere of mutual learning (Wiesmann et al 2008). In the case presented here, facilitating a situation of mutual learning was essential for developing broad ownership of the problems at hand and thereby detecting common values hidden behind differing perceptions.

36.4.3 Negotiability and implementation

Establishing protected areas usually implies the appointment of new management bodies. In most cases, these management bodies are not a political entity and therefore usually have no political mandate. Nevertheless, they play an important role in negotiations. They can initiate processes such as participatory processes. In the case of the Swiss Alps Jungfrau-Aletsch WHS, it was the WHS Management Centre (i.e. the administration of the WHS) that initiated the multi-stakeholder participatory process and was responsible for continuation of the initiatives that emerged from this process. It can thus be said that management bodies have the ability to negotiate. But this does not automatically imply that everything is negotiable. In the area of the Swiss Alps Jungfrau-Aletsch WHS, many persisting conflicts among stakeholder groups stem from the fact that there are existing legal norms which cannot be negotiated by the stakeholders involved because they are defined by the state government. Nevertheless, these legal norms are often very important to the local population and are therefore always mentioned in negotiations. For example, existing legal norms in the region of the Swiss Alps Jungfrau-Aletsch WHS assure a high level of protection of the natural landscape, while at the same time high direct payments to compensate farmers for ecological services assure a relatively high level of biodiversity conservation. This framework of existing legal norms means that ecological standards represent a kind of ‘non-negotiable’ feature in the participatory process (Wallner et al 2008).

Once a process of negotiation is concluded, it is time to think about implementation. In the case of the Swiss Alps Jungfrau-Aletsch WHS, the multi-stakeholder participatory process did not end with the definition of objectives and measures. Continuation of the process was secured by involving some participants in the development of concrete project proposals based on the jointly defined objectives and measures. The process of developing the projects, having them evaluated by the Swiss Alps Jungfrau-Aletsch WHS Foundation Board and securing funding for implementation was time-consuming. While a small group of people worked intensively, the general public could barely detect concrete signs of action. A considerable time-lag between the participatory process and the visibility of continuous results bears a risk of losing recently established ownership and responsibility (Wallner and Wiesmann 2009). This in turn can lead to uncertainties concerning the outcomes of the process, and can result in the newly created management body being seen as responsible for the ‘right’ development in

the area. This attitude makes it easier for local stakeholders to cope in case things do not develop in the direction they had anticipated: they can blame the failure of a project on the management body and accuse it of not having worked in the anticipated direction instead of taking responsibility for the process themselves.

With regard to transdisciplinary research, this shows the importance of recalling that “transdisciplinary research is basically bound to socio-political contexts, giving rise to uncertainties concerning the validity of outcomes beyond these contexts” (Wiesmann et al 2008).

36.5 Mutual learning and power play

Management in the area of the Swiss Alps Jungfrau-Aletsch WHS would be a much simpler task if it concentrated only on the area actually declared as a World Heritage Site. But since the uniqueness of this region also lies in the contrast between the high-alpine natural landscape and the traditional cultural landscapes that adjoin the perimeter and are primarily shaped by centuries of agricultural use and culture, it does not make sense to draw the management boundary congruent to the WHS perimeter. The involved communes testified to their willingness to promote conservation of the natural landscape and at the same time promote sustainable development of the whole region as an economic, living, recreational and natural space. For the WHS management this means, as stated at the outset, that it is confronted with the complex situation of finding a way to preserve ecological stability and variability in addition to the inherent natural beauty of the area without preventing sustainable regional development.

Looking at the process launched in the area of the Swiss Alps Jungfrau-Aletsch WHS in order to discuss, in a first step, the issue of establishing a World Heritage Site in the area and then, in a second step, to negotiate objectives and activities to reach these objectives, we find a management situation that can be called ‘management as mutual learning’ (Stoll-Kleemann and Welp 2008). This management style characterises a situation that promotes the

ideal condition for communication, where activities of different sectors are coordinated and participation is regarded as a central element right from the start of planning processes (problem for-

mulation). Expert knowledge presented in an understandable manner results in well-informed citizens who can take an active role in the participatory process. Thus the entire planning system is more transparent, accountable, and legitimate. (ibid., p 164)

Such a management situation represents a transdisciplinary research setting: the problems are defined in cooperation among actors from the scientific community and society, and knowledge from societal fields other than science is integrated into the process. In the case of the Swiss Alps Jungfrau-Aletsch WHS, mutual learning was facilitated at different levels. First of all, mutual learning has taken place between the different local stakeholder groups. Secondly, mutual learning during the negotiations on objectives for the WHS made it possible to overcome differing opinions among stakeholders from the local, regional and national levels. And thirdly, the participatory process offered an opportunity for mutual learning between society and science. This extensive situation of mutual learning made it possible for all involved stakeholders to detect common values despite conflicting interests. This is a decisive step in strengthening local people's sense of ownership and thereby also enhancing their responsibility for the region. From this point of view, we can conclude that transdisciplinary approaches bear a great potential in relation to management of protected areas.

However, upon a closer look at the three issues discussed in this article – integration of stakeholders into participatory processes, perceptions and positions, and negotiability and implementation – it becomes apparent that there remains one aspect which can limit the success of transdisciplinary approaches in protected area management. This aspect is power play. Power play becomes evident in the following situations:

- When discussing who should (have) participate(d). Examples: The results of a participatory process are questioned by people who did not participate (who declined active participation even though they had the chance to participate); or the results are questioned by people who did participate but think that they should have had a greater say due to their political position in society.
- When differing perceptions dominate. Example: The aesthetic appeal of and intergenerational responsibility for the region were found to be common values that could diminish underlying controversies. What happens when no such common values can be found?

- When ‘non-negotiable’ features are put at the centre of negotiations. Example: The argument of not being able to discuss all aspects dealing with regional development because some of these aspects are beyond the influence of the region itself can be used to question decisions taken at the regional level.
- When assessing the success of implementation. Example: The newly created management body constitutes a new player in the region. On the one hand, this management body can be blamed if development does not go in the anticipated direction. On the other hand, it can be viewed as a player dominating the direction of negotiations and thereby interfering with traditional decision-making.

Power play is another key issue in management of protected areas (Wallner et al 2007). The situation of mutual learning created by applying transdisciplinary approaches is continuously challenged by underlying power play.

Endnotes

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References

Publications elaborated within the framework of NCCR North-South research are indicated by an asterisk (*).

- * Aerni I. 2005. *Positionen im Aushandlungsprozess nachhaltiger Entwicklung. Partizipation im Weltnaturerbe Jungfrau-Aletsch-Bietschhorn* [MSc thesis]. Bern, Switzerland: University of Bern. Also available at: <http://www.north-south.unibe.ch/content.php/publication/id/2031>; accessed on 21 August 2009.
- Brechin SR, West PC. 1990. Protected areas, resident peoples, and sustainable conservation: The need to link top-down with bottom-up. *Society and Natural Resources* 3(1):77–79.
- Cleaver F. 2001. Institutions, agency and the limitations of participatory approaches in development. In: Cooke B, Kothari U, editors. *Participation: The New Tyranny?* London, UK: Zed Books, pp 36–55.
- Cooke B, Kothari U, editors. 2001. *Participation: The New Tyranny?* London, UK: Zed Books.
- Fletcher R, Johnson I, Bruce E, Khun-Neay K. 2007. Living with heritage: Site monitoring and heritage values in Greater Angkor and the Angkor World Heritage Site, Cambodia. *World Archaeology* 39(3):385–405.
- Frei M. 2002. *Bedeutung von Partizipation – untersucht am Beispiel der Entstehung des Nationalparks Hohe Tauern im Land Salzburg und am Beispiel der Erweiterung des Schweizerischen Nationalparks* [MSc thesis]. Zurich, Switzerland: Swiss Federal Institute of Technology Zurich (ETHZ).
- Geiser U. 2001. Reading 'participation in forest management' through 'modern' and 'post-modern' concepts, or: Where to start normative debates? In: Tovey H, Blanc M, editors. *Food, Nature and Society: Rural Life in Late Modernity*. Aldershot, UK: Ashgate, pp 209–231.
- * Hill M, Wallner A, Furtado J. 2010. Reducing vulnerability to climate change in the Swiss Alps: A study of adaptive planning. *Climate Policy* 10(1):70–86.
- * Jungfrau-Aletsch-Bietschhorn World Heritage Association. 2007. *Management Strategy and Management Plan for the Jungfrau-Aletsch-Bietschhorn World Heritage Site*. Naters, Switzerland: Jungfrau-Aletsch-Bietschhorn World Heritage Association. Summary available at: http://www.jungfrau-aletsch.ch/fileadmin/webdav/homepage_dokumente/Managementplan_Summary_engl.pdf; accessed on 27 July 2009.
- * Liechti K, Wallner A, Wiesmann U. Accepted. Linking a world heritage site to sustainable regional development: Contested natures in a local negotiation process. *Society and Natural Resources*.
- McNeely JA, editor. 1995. *Expanding Partnerships in Conservation*. Washington, D.C.: Island Press.
- Müller U. 2001. *Wie funktioniert Partizipation bei Naturschutzvorhaben in der Schweiz? Untersucht am Beispiel der Erweiterung des schweizerischen Nationalparks* [MSc thesis]. Zurich, Switzerland: University of Zurich.
- Papageorgiou K, Vogiatzakis LN. 2006. Nature protection in Greece: An appraisal of the factors shaping integrative conservation and policy effectiveness. *Environmental Science and Policy* 9(5):476–486.
- Pimbert ML, Pretty JN. 1997. Parks, people and professionals: Putting 'participation' into protected-area management. In: Ghimire KB, Pimbert MP, editors. *Social Change and Conservation: Environmental Politics and Impacts of National Parks and Protected Areas*. London, UK: Earthscan, pp 297–330.
- Price MF. 1996. People in biosphere reserves: An evolving concept. *Society and Natural Resources* 9:645–654.
- Rist S, Chiddambaranathan M, Premchander S, Wiesmann U. 2004. *Learning Processes and Platforms for Negotiating Sustainable Resource Management (SRM)*. Final Report on the Social Learning for Sustainability (SOLES) Joint Research Project. Bern, Switzerland: Centre for Development and Environment (CDE), University of Bern.

- Sneddon C, Fox C. 2007. Power, development, and institutional change: Participatory governance in the Lower Mekong Basin. *World Development* 35(12):2161–2181.
- * Sommer R, Wallner A, Wiesmann U. 2009. Sustainable regional development: Balancing local and global dynamics and stakes. In: Hurni H, Wiesmann U, editors. *Global Change and Sustainable Development: A Synthesis of Regional Experiences from Research Partnerships*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 5. Bern, Switzerland: Geographica Bernensia, pp 531–545.
- Stoll-Kleemann S, Welp M. 2008. Participatory and integrated management of biosphere reserves: Lessons from case studies and a global survey. *GAIA* 17(1):161–168.
- UNFCCC [United Nations Framework Convention on Climate Change]. 2007. *Climate Change: Impacts, Vulnerability and Adaptation in Developing Countries*. Bonn, Germany: UNFCCC. Also available at: http://unfccc.int/files/essential_background/background_publications_htmlpdf/application/txt/pub_07_impacts.pdf; accessed on 21 July 2009.
- * Wallner A, Bauer N, Hunziker M. 2007. Perceptions and evaluations of biosphere reserves by local residents in Switzerland and Ukraine. *Landscape and Urban Planning* 83(1–2):104–114.
- * Wallner A, Rist S, Liechti K, Wiesmann U. 2008. Protection: A means for sustainable development? The case of the Jungfrau-Aletsch-Bietschhorn World Heritage Site in Switzerland. In: Galvin M, Haller T, editors. *People, Protected Areas and Global Change: Participatory Conservation in Latin America, Africa, Asia and Europe*. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 3. Bern, Switzerland: Geographica Bernensia, pp 471–504.
- * Wallner A, Wiesmann U. 2009. Management of protected areas by multi-stakeholder participation – Analysis of a process in the Swiss Alps. *eco.mont* 1(1):45–50. doi:10.1553/eco.mont1s45.
- Webler T, Tuler S. 2000. Fairness and competence in citizen participation: Theoretical reflections from a case study. *Administration and Society* 32:566–595.
- * Wiesmann U, Biber-Klemm S, Grossenbacher-Mansuy W, Hirsch Hadorn G, Hoffmann-Riem H, Joye D, Pohl C, Zemp E. 2008. Enhancing transdisciplinary research: A synthesis in fifteen propositions. In: Hirsch Hadorn G, Hoffmann-Riem H, Biber-Klemm S, Grossenbacher-Mansuy W, Joye D, Pohl C, Wiesmann U, Zemp E, editors. *Handbook of Transdisciplinary Research*. Berlin, Germany: Springer, pp 433–441.
- * Wiesmann U, Liechti K. 2004. The contributions of World Natural Heritage Sites to sustainable regional development – Two case studies from the North and the South. *Revue de géographie alpine – Journal of Alpine Research* 92(3):84–94.
- * Wiesmann U, Liechti K, Rist S. 2005. Between conservation and development: Concretizing the first World Natural Heritage Site in the Alps through participatory processes. *Mountain Research and Development* 25(2):128–138. doi:10.1659/0276-4741(2005)025[0128:BCAD]2.0.CO;2.
- * Wiesmann U, Wallner A, Schüpbach U, Ruppen B. 2007. Management – Zwischen Schutz und Nutzung. In: Wallner A, Bäschlin E, Grosjean M, Labhart T, Schüpbach U, Wiesmann U, editors. *Welt der Alpen – Erbe der Welt. UNESCO Welterbe-Region Jungfrau-Aletsch-Bietschhorn*. Bern, Switzerland: Haupt, pp 271–284.

Humankind today is challenged by numerous threats brought about by the speed and scope of global change dynamics. A concerted and informed approach to solutions is needed to face the severity and magnitude of current development problems. Generating shared knowledge is a key to addressing global challenges. This requires developing the ability to cross multiple borders wherever radically different understandings of issues such as health and environmental sanitation, governance and conflict, livelihood options and globalisation, and natural resources and development exist. This volume presents 36 peer-reviewed articles written by interdisciplinary teams of authors who reflected on results of development-oriented research conducted from 2001 to 2009 within the framework of a major ongoing international programme, the Swiss National Centre of Competence in Research (NCCR) North-South. Scientific activities were – and continue to be – carried out in partnerships involving people and institutions in the global North, South and East, guided by principles of sustainability. They seek to inform solutions for mitigating, or adapting to, the negative impacts of global change.

Global change as understood in the programme is much more than climate change; it embraces all aspects of global dynamics in the social, political, ecological, institutional and economic spheres. Research in the NCCR North-South is multidisciplinary; it frequently involves interdisciplinary cooperation and includes transdisciplinary phases where actors from society are invited to join the research process. This broad range of activities takes place in partnerships in nine regions worldwide. Readers can either dip into individual regions or themes, or explore the book as a whole and discover what holds it together: a common effort to make research more relevant to society, a commitment to conducting sound research while addressing difference and power on a daily basis, a willingness to cross disciplinary and other epistemological boundaries, and a commitment to mutual learning for sustainable development.