



International Conference on Research for Development (ICRD 2008)

Pre-conference Proceedings
University of Bern, Switzerland, 2-4 July 2008

NCCR North-South Dialogue, no. 21

2008

dialogue

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Left: View from the NCCR North-South Management Centre in Bern, Switzerland (Photo by Emilio Marti, NCCR North-South, 2008). Right: Sarytash, Kyrgyzstan (Photo by Ulrich Lutz, June 2008).

Distribution

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1 Introduction

Background and scope of the ICRD 2008

The International Conference on Research for Development (ICRD 2008) brings together more than 250 researchers, representatives from development agencies, civil society organisations and the private sector to share research results, concepts, methodologies, and pilot experiences. It was organised by the National Centre of Competence in Research (NCCR) North-South, an initiative of the Swiss Government.

Over the past seven years, the Swiss science landscape has made considerable investments in research partnerships with developing and transition countries. The NCCR North-South set out as a unique experiment in 2001 and helps to place Switzerland at the forefront of international efforts to introduce innovative methods and policies into development research and cooperation.

The purpose of the ICRD 2008 is to seek synergies between research partnership projects in the North and the South, and jointly identify entry points for and pathways to sustainable development. The emphasis is on the potentials and problems of developing and transition countries, with discussions on the role that industrialised countries can play.

The main objectives of the North-South Conference are:

- to promote North-South research partnerships and university education for sustainable development in developing and transition countries;
- to enhance general awareness of the need to specifically address the problems and potentials of developing and transition countries by targeting research and education in these areas in Switzerland, Europe and the partner countries involved;
- to provide a platform for discussion and exchange of information, bridging the gap between research and development, and involving researchers, science funding agencies, development specialists and concerned decision-makers.

Conference themes

The NCCR North-South programme is currently working on a special synthesis project consisting of major milestones and research outputs in the past seven years. Highlights of this research are presented and discussed in special sessions during the conference and exposed to insights gained in other programmes and projects.

The contributions are grouped around five major themes:

- Governance, statehood and conflict transformation
- Health, vulnerability, resilience, and environmental sanitation
- Livelihoods, globalisation and urban planning
- Natural resources in sustainable development
- Research approaches and methodologies for sustainable development

The conference programme includes keynote speeches, extended poster sessions and parallel thematic sessions and workshops, enabling an exchange of information between presenters and participants. The ICRD 2008 has an ambitious programme focusing on regional and global issues, tools and concepts for research and practice, as well as pathways to sustainable development. In this way, we hope to make a valuable contribution to bridging the gap between research and development.

Pre-conference proceedings

The present volume contains the abstracts of all opening speeches, keynote addresses and papers presented at the conference. They follow the order of the conference's five main themes and corresponding sessions. The posters presented by NCCR North-South researchers and institutions on the one hand, and by external participants on the other, are reproduced in the next larger section of this volume, revealing a very broad range of development-oriented research focusing on challenges of global change. Along with the conference programme, the author index is meant to help readers locate those abstracts and posters of particular interest to them.

The conference organisers thank all authors for their papers or posters. We hope that this volume will contribute to strengthening the network of researchers engaged in research for development, and look forward to a fruitful exchange on global change issues both during the conference and beyond.

Hans Hurni, Thomas Breu, Ruth Schaffner, Anne Zimmermann

2 Opening Speeches

The ICRD 2008 is honoured by the presence of important stakeholders and supporters of research for development in general, and the NCCR North-South in particular. The NCCR North-South represents an important step in the adaptation of Switzerland's institutions of higher education to the practical challenges in North-South research of the coming decades. At the same time – and no less important – it is the aim of the NCCR North-South to support its partnership regions in their efforts to build up their research capacities for meeting the challenges of sustainable development in a rapidly changing world. By engaging in partnerships with scientists, academics and policy-makers worldwide, the researchers of the NCCR North-South are providing a basis for lasting, mutually beneficial exchanges between Switzerland and its partners in the developing world.

The first four speakers opening the ICRD 2008 represent institutions instrumental in the establishment and running of the NCCR North-South. Prof Dr. Urs Würzler is Rector of the University of Bern, the “leading house” of the NCCR North-South. An important feature of the programme is that it receives funding from both the research and development sectors: it is jointly financed by the Swiss National Science Foundation (SNSF), the Swiss Agency for Cooperation and Development (SDC), and the participating Swiss academic institutions. From the research side we welcome Prof. Dr. Dieter Imboden, President of the SNSF, who from the start strongly supported the anchoring of development research in the Swiss academic landscape. From the development side the SDC, represented here by Dominique Simone Rychen on behalf of Assistant Director General Dr. Beate Wilhelm, made it possible to support researchers in the South, and for the NCCR North-South to become a truly partnership-based research endeavour. Dr. Jon-Andri Lys is Executive Secretary of the Commission for Research Partnerships with Developing Countries (KFPE), which was valuable in backing the launch of the NCCR North-South.

Among the opening speakers of the ICRD 2008 is Berhanu Debele, former vice agriculture minister of Ethiopia and currently Regional Coordination Officer of the NCCR North-South in the Horn of Africa. Finally, the Directors of the NCCR North-South, Prof. Dr. Hans Hurni and Prof. Dr. Urs Wiesmann, extend their warm welcome to all participants at the conference, which brings together more than 250 researchers, representatives from development agencies, civil society organisations and the private sector. The opening session of the ICRD 2008 is introduced and moderated by Dr. Thomas Brey, Coordinator of the NCCR North-South.

North–South Partnerships for Coping with Global Change: A New Marker Theme at the University of Bern

Urs Würgler¹

¹*Rector, University of Bern, Switzerland (urs.wuergler@rektorat.unibe.ch)*

Since 2001 the University of Bern has been the leading house for the National Centre of Competence in Research NCCR North-South. This international network of research partnerships with developing and transition countries has found a mode for working together with researchers from all over the world. Joint research is conducted on problems and processes of global change, and on potentials for sustainable development. Strong partnerships in Switzerland, as well as in nearly 40 developing and transition countries, have made it possible to address global issues and their manifestations at the regional and local levels. The programme is developing capacity at the post-graduate level, particularly by training PhD candidates to deal with development challenges in different regions of the world. In order to sustain the NCCR North-South beyond its life span, which is expected to end by mid-2013, the University of Bern plans to establish a Centre of Excellence in Research, which will be integrated into a Swiss network to help formalise inter-university training at the PhD level in a common Swiss graduate school. It will also continue supporting international partnerships and help develop knowledge for the benefit of people and their environments in the South as well as the North.

NCCR North–South: Research, People, Structures and Networks as Vital Components of Sustainable Development

Dieter Imboden¹

¹*President of the National Research Council, Swiss National Science Foundation, Bern, Switzerland (dimboden@snf.ch)*

The National Centres of Competence in Research (NCCR) contribute to an efficient structure for research in Switzerland and strengthen its competitiveness. They support domains of strategic importance by financing research of high quality by excellent scientists – especially people at the start of their careers. The NCCRs are designed to help universities to strengthen their positions by adjusting their structures and concentrating their means in fields in which they are competitive.

Among the 20 NCCRs presently supported by the SNSF, the NCCR North-South is unique, owing to its network of collaboration extending over the whole globe. Its architecture allows for the exchange of knowledge and experience related to sustainable development from North to South and vice versa. Close collaboration with the Swiss Agency for Development and Cooperation (SDC) reflects an important lesson learnt, i.e. that research must be an integral part of development. After nearly eight years of hard work, the concept behind the NCCR North-South has proven its soundness and success.

International Conference on Research for Development
(ICRD 2008), 2 – 4 July 2008, Bern

Dominique Simone Rychen¹ on behalf of Beate E. Wilhelm²

¹ *Thematic Service Knowledge and Research, Swiss Agency for Cooperation and Development (SDC), Bern, Switzerland (dominique-simone.rychen@deza.admin.ch);*

² *Assistant Director General, Swiss Agency for Cooperation and Development (SDC), Bern, Switzerland (beate.wilhelm@deza.admin.ch)*

In light of global issues and urgent problems that affect all societies in one way or another, institutions, and ultimately individual new ways of posing the problem, new ways of thinking, and collaboration are needed.

Disciplinary research, interdisciplinary collaboration, and continued exchange with all relevant stakeholders during the research and development process have been recognised for some time as an indispensable approach for tackling certain urgent global and complex problems. Yet crossing the borders of disciplines and sectors remains a challenge in many contexts.

Research partnerships between Northern and Southern institutions can be an effective tool to produce developmentally relevant research results but also a way to strengthen the scientific capacity of developing countries. In the future much more attention has to be given to the impact of development research.

The implementation of innovative products and processes that contribute to societal and economic benefits calls for advancing science and innovation for development in the South. This implies sustained investment in science and innovation systems as a basis for the creation, diffusion and application of scientific and technological knowledge in developing countries.

Promoting Research for Development: The Role of KFPE

Jon-Andri Lys¹

¹Executive Secretary, Swiss Commission for Research Partnerships with Developing Countries (KFPE), scnat, Bern, Switzerland (kfpe@scnat.ch)

The Swiss Commission for Research Partnerships with Developing Countries (KFPE) is dedicated to promoting research partnerships with developing and transition countries. In this way, it intends to contribute to sustainable development. KFPE is engaged in Swiss scientific policy-making and is committed to promoting the interests of researchers and their affiliated institutions at the national and international levels. It furthers development-oriented research and elaborates research-strategic concepts. In this context, it ensures that partnership principles are followed, that the quality of research is guaranteed, and that the interests of all partners are respected.

KFPE engages in the following activities:

- convincing the scientific community, politicians and the general public of the urgency and importance of carrying out research in partnerships with developing and transition countries;
- elaborating research-strategic concepts, and publishing criteria and basic principles for the implementation of projects in partnership;
- organising events and publications on partnerships in research, encouraging the interest of younger scientists, offering a forum for the exchange of information, and supporting members in their efforts to disseminate and consolidate the idea of research in partnership, and in practice;
- building bridges between North and South, and between research scientists and people working in development.

KFPE members have wide experience in scientific research partnerships with developing and transition countries. At present, the associate members include about 70 Swiss institutions active in scientific research or in the promotion of scientific research or in development, in departments of the Federal Government, and in foundations.

One of the current projects of the KFPE is to review the 11 Research Partnership Principles and update them, based on current trends and experience. This will also be the focus of Session 2.7 at this ICRD 2008 conference. In this session, we will collect first-hand informed views and reflections from Southern participants about the usefulness of the 11 principles and/or hints about missing elements. In addition, in your Conference documentation, you will find a questionnaire about the 11 principles. We would like you to fill it in so that together we gain an overall impression of the Principles' usefulness and applicability, and compile views about possible missing elements that require addition or improvement.

Opening the South for Research Partnerships

*Berhanu Debele*¹

¹*Regional Coordinator, Regional Coordination Office, NCCR North-South, Addis Abeba, Ethiopia (nccrhorn@ethionet.et)*

Involving partners and institutions from the South in programmes that aspire to global and equitable partnership is a challenge that is addressed differently not only by development cooperation in general, but in research cooperation in particular. The NCCR North-South Programme began in 2001 with a global vision, well-formulated objectives, and a sophisticated approach. From the perspective of a country in the South, in this case Ethiopia, a series of questions arose: how would the programme fulfil its intended aspirations? Would there be true partnership between people from the North and the South? An example of a personal experience is given, namely with the preparatory project at the beginning of the NCCR North-South, the ‘Syndrome Pre-Synthesis Project’ (‘SPSP’), which had to identify major core problems that hindered development in the Horn of Africa Region and the syndrome contexts under which these problems occurred. The SPSP was used to define, in a participatory manner involving multiple stakeholders, the future research projects of the NCCR North-South. In the meantime the latter has developed into a network of about 140 institutional partners in about 40 countries in the South and a consortium of 7 institutions in Switzerland. About 60% of the researchers are from the South. In the past 7 years, the programme has contributed immensely to research capacity development, institution building and data generation in the eight Partner Regions worldwide and hopefully also in Switzerland. The idea of partnership in research has thus been realised despite the imbalanced economic and power relations that persist between developing and industrialised countries.

Development-Oriented Research and Partnerships – Experiences and Perspectives

Urs Wiesmann¹

¹*Deputy Director, NCCR North-South, CDE, Institute of Geography, University of Bern, Switzerland (Urs.Wiesmann@cde.unibe.ch)*

Poverty and related problems of development still persist in many regions of the world and are augmented by the current global food crisis, the energy crisis, and the effects of climate change. In many developing economies these common development problems are superimposed by problems of increasing social, economic and spatial disparities and related challenges. In this situation a position often heard is that problems are well known, solutions are available, and action is urgently needed. This position gives rise to the question of why additional research is needed. The experiences of the NCCR North-South clearly show that development-oriented research can generate new generic solutions to specific problems, but that its main impact is to increase the quality and sustainability of solutions and the building of endogenous mitigation capacities. The long-standing experiences of the NCCR North-South network in nine major regions of the world make it possible to deduce success factors and respective perspectives for development- and solution-oriented research. Most crucial are (1) a focus on specific core issues and their embedment into integrative approaches, (2) acknowledgement of the spatial and socio-economic contextuality of approaches and solutions, (3) the iterative combination of disciplinary, multi-disciplinary and transdisciplinary approaches, (4) the issue-centered combination of research and capacity development, (5) research partnership approaches that go beyond single projects and include a global research alliance perspective.

Research Partnerships for Addressing Global Challenges

*Hans Hurni*¹

¹*Director, NCCR North-South, CDE, Institute of Geography, University of Bern, Switzerland (hans.hurni@cde.unibe.ch)*

Humankind today is challenged by numerous threats brought about by global change. Climate has been and is being modified by human activities, which calls for mitigation and adaptation measures at an unprecedented scale. Natural resources have been degraded by human development by means of land cover and land use changes, for which protective and restoration measures have to be taken by land users and governments in most countries of the North and South. Low levels of economic development and insufficient policies in most developing countries have led to widespread poverty, which affects nearly half of the world's population and directly threatens almost one billion people. Finally, uncontrolled economic growth has increased disparities between and within populations and has led to widespread environmental problems in many nations. Generating and sharing knowledge is a key to addressing such global challenges. Knowledge can be used to develop the best solutions and to avoid or repair threats. Research partnerships have proven to be suitable means to bridge the divides and disparities between knowledge societies and developing countries, thereby reducing gaps. Research partnerships are tools for further capacity development and thereby lead to societal empowerment. Institutional settings allowing for research partnerships are needed both in the North and the South, so that the different networks can work together in a long-term enabling environment.

3 Abstracts of Keynotes and Papers

The papers in this section are ordered thematically, according to the five overall themes dealt with during the conference. For each of these themes, abstracts of two keynote speeches are followed by a series of abstracts ordered by sub-themes that correspond to the sessions.

Theme 1: Governance, Statehood and Conflict Transformation

Keynotes: Richard Chase Smith, Frances Steward; moderation and synthesis:
Lothar Brock

Session 1.1: Business, conflict and peace from a sectoral perspective
(Chair: Ulrike Joras)

Session 2.1: Conflicts, resources and institutions (Chair: Didier Péclard)

Session 3.1: Governance, natural resources and sustainable development
(Chair: Manuel de la Fuente)

Theme 2: Livelihoods and Globalisation

Keynotes: Leo de Haan, R. Ramakumar; moderation and synthesis:
Roger Jeffery

Session 1.2: Migration and multilocal livelihoods (Chair: Susan Thieme;
Discussant: Anastasia Christou)

Session 2.2: Negotiating rural livelihoods (Chair: Ulrike Müller-Böker;
Discussant: Leo de Haan)

Session 3.2: Building inclusive cities (Chair: Luca Pattaroni;
Discussant: Marina Perez)

Theme 3: Health, Vulnerability, Resilience and Environmental Sanitation

Keynotes: Chongrak Polprasert, Susan Smith; moderation and synthesis:
David Bradley

Session 1.6: International Year of Sanitation (Chair: Roland Schertenleib)

Session 2.3: Creating value from sanitation (Chair: Christoph Lüthi)

Session 3.3: One health: bridging the gaps in health services delivery
(Chair: Bassirou Bonfoh)

Theme 4: Natural Resources in Sustainable Development

Keynotes: Peter Messerli, Anette Reenberg; moderation and synthesis:
Michael Stocking

Session 1.4: Enhancing the compatibility of ecology and development
(Chair: Berhanu Debele)

Session 2.4: Alleviating poverty in challenging environments
(Chair: Dietrich Schmidt-Vogt)

Session 3.4: Building knowledge with innovation in science
(Chair: Mira Arynova)

Session 3.6: Sustainable development in mountains
(Chair: Gregory Greenwood)

Theme 5: Research Approaches and Methodologies for Sustainable Development

Keynotes: Jill Jaeger, Jakob Zinsstag; moderation and synthesis:
Christian Pohl

Session 1.5: *Inspirations 1: Modernities and selling development*
(Chairs: Tobias Haller, Ghana Gurung & Stephan Rist)

Session 2.5: *Inspirations 2: Mobility shaping development spaces*
(Chairs: Claudia Zingerli & Susan Thieme)

Session 3.5: *Inspirations 3: Uncertainty and managing development*
(Chairs: Brigit Obrist & Sabin Bieri)

Session 2.6: Learning for sustainability (Chair: Dominique Simone Rychen)

Session 2.7: Research partnership principles: Critical views from the South
(Chair: Jon-Andri Lys)

Statebuilding, Intervention and Conflict Transformation: How to Cope with Regime Collisions

Lothar Brock¹ (moderation and synthesis of plenary session)

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In the 1990s, the transformation of conflict has become a central issue in research for development. Conflict transformation refers to the prevention or termination of collective violence in conflicts. One of the major sources of collective violence lies in bad governance resulting from weak statehood. Thus one of the answers to the problem would seem to be state-building. In Weberian terms, state-building refers to the creation of a monopoly on violence (usually in the form of security sector reform) accompanied by a hierarchical order of norms and rules which govern individual and collective behaviour. Yet the resulting regime for dealing with conflict may clash with traditional ways of handling it. Along the same line, the formation of international regimes to deal with domestic conflict may clash with the right to self-determination. Hence state-building and international regimes for dealing with violence may become new sources of violence. On the other hand, reliance on traditional forms of handling conflict and the mere affirmation of non-intervention may again contribute to the perpetuation of collective violence.

To what extent does the combination of traditional and “centrist” ways of dealing with conflict in the context of multilevel governance (including the international level) offer a more viable and effective approach to hedging violence? Hybridity is a concept around which innovation in different areas seems to converge (state and non-state sources of international law, public-private partnerships, civil-military cooperation, mixed regional-UN peace missions). Such hybrid approaches could, perhaps, provide better answers to complex issues than attempts to deal with them in formal hierarchies of competence. Furthermore, hybridity promises to mitigate the hegemonial aspirations of actors in the context of an uneven distribution of power. Yet it remains an open question whether this is more than wishful thinking. Even in complex constellations we are left with the question “who-who me?”

Good Governance Challenges in the Andean Amazon: People, Conservation, Extractive Industries and Sustainability

Richard Chase Smith¹

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This presentation focuses on four major challenges in establishing a regime of good governance practices in the Andean Amazon of Peru. This region houses some of the richest natural and cultural diversity in the world along with important oil, gas, mineral and timber reserves. This presentation is based on more than 35 years of research and practice among indigenous peoples and other local communities in this region.

It suggests that the first challenge is to integrate both the cultural and natural diversity of this area into our vision of and work towards a sustainable future for this region. The romantic concept of pristine wilderness has no place here where native civilisations have been living and managing resources for well over 7000 years.

The second challenge is to prevent and manage social conflict in the area, especially confrontations surrounding the relationship between local communities and activities to conserve the area's biodiversity, and to extract its timber, mineral wealth and petroleum. Here the major challenge is to deal with the underlying causes based in social hierarchies of discrimination and exclusion towards peoples of indigenous origin.

The third challenge is to work through the local social institutions in every endeavor—be it research, development work or private economic activities like oil extraction. Doing so can not only produce more solid and/or longer-lasting results, but can quickly reduce the levels of social conflict.

And the fourth challenge is to look beyond the boundaries of the particular micro-area where one is working to its broader context. It is suggested that this leads us to the urgent need to refocus research and development work on large and complex landscapes in which everyone lives.

The Impact of Horizontal Inequalities on Political Stability

*Frances Stewart*¹

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This presentation will define horizontal inequalities, indicating that they are multidimensional and include political, economic, social and cultural status aspects. It will argue that when severe, such inequalities can threaten political stability, especially if all dimensions go in the same direction. It will present some empirical evidence showing that horizontal inequalities do indeed raise the risk of instability. It will then discuss the policy implications of these findings.

Coffee Trade Impacts on Rural Livelihoods and Natural Resource Management in Ethiopia: A Case Study from Jimma Area

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Ethiopia is the largest producer and exporter of coffee (coffee Arabica) in Africa. The country's economy depends largely on coffee as a major earner of foreign currency. The coffee sector also supports the livelihood of millions of the country's population who variously participate in the production, processing and trade of coffee. However, about 90% of the coffee produced in the country is produced by smallholder subsistence farmers, raising doubts about the sustainability of coffee production in the country. Field research was conducted to explore the effects of global coffee price changes on the production and marketing of coffee, and the implications for the livelihood of smallholder coffee producers in Jimma area, one of the well-known coffee growing areas of the country. We employed the commodity value chain analysis and livelihoods approach to understand the dynamics in coffee farming and marketing, and household strategies to cope with changing coffee prices. The results are discussed in light of existing government policy, the role of various stakeholders in the coffee sector, and the global trends of coffee trade, with implications for the sustainability of the coffee sector in the country.

The Role of Tourism for Peace and Stability in the Middle East

*Susanne Fischer*¹

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The influence of corporate activities in zones of violent conflict has received widespread attention, though almost exclusively in regard to their negative consequences. However, researchers are currently discussing the opportunities and limits of corporate contributions to peace and stability in zones of conflict. Although this discourse has been backed by growing academic research and some in-depth case studies, further empirical research is needed to assess whether these expectations are justified.

Against this background, this presentation investigates the role of tourism for peace and stability in the Middle East. The sector was chosen for various reasons: First, tourism has been characterised as “a truly global industry with an obvious interest in peace” (Haufler, 2001). Second, tourism has been described as a sector relevant to both parties in the conflict, the Israelis as well as the Palestinians. Third, several types of tourism can be studied in Israel/the Palestinian Territories (e.g. mass tourism, religious tourism and cultural tourism) which allows for assessment of specific sector dynamics.

This presentation draws on several sources, including interviews with company representatives in company headquarters and information gained through interviews with members of institutions related to the respective business community (field research). Other sources, such as company reports, civil society reports, and media articles were also used.

The State of Corporate Governance in Arab Countries: Empirical Results

Najib Harabi¹

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The purpose of this paper is to assess the state of corporate governance as a major factor affecting growth performance in the private sector in MENA countries. For this purpose both country-specific assessments, carried out by World Bank-IMF teams (so-called ROSC's assessments) and focus-group discussions that took place in four regional conferences have been synthesised. Strengths and weaknesses of corporate governance in selected Arab countries have been highlighted. One major key finding is that the legal and regulatory frameworks of the Arab countries considered are largely compliant with the OECD Principles of corporate governance. However, practices are not. The difficulty of assessment is to reflect properly the discrepancies between the letter of the law and compliance. It should be emphasised that the World Bank-IMF assessments focus on listed companies. Non-listed firms, especially SME, family-owned firms and State-owned enterprises that make up to 98% of all firms, were not subjected to assessment.

Another key finding that emerged from our reviewing of the regional conferences on corporate governance is that corporate governance issues have not been ignored in public debates in the MENA region. Practitioners from capital markets, banks, public and private sector representatives, and other civil society groups have accepted the need to address corporate governance reforms as one of the crucial topics affecting the economic growth and development of firms, industries and whole economies in their region. Several meetings and conferences at the national and regional level have taken place. Appropriate and up-to-date recommendations regarding corporate governance reform in the MENA region have been adopted in these events. It is now up to the decision-makers at all levels to implement those recommendations.

The Potential of Fair Trade for Poverty Reduction and Conflict Prevention: A Case Study of Bolivian Coffee Producers

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This study addresses the question of whether fair trade – and in particular fair trade coffee – has the potential to be a tool for poverty reduction and whether it can have a positive impact on conflict prevention. We assess the effect of fair trade in a specific region in Bolivia, and examine small-scale fair trade coffee producers as well as producers not participating in fair trade. The main findings are:

(1) We posit that horizontal inequalities are biased against indigenous peoples in Bolivia and are particularly relevant for explaining political violence. We found that fair trade, through its poverty-reducing impact, may have a positive influence on conflict prevention by helping to reverse these inequalities.

(2) By providing competition at the level of intermediaries, fair trade has the potential to reduce poverty. One reason for low prices paid to small-scale coffee producers is the lack of competition amongst intermediaries. While creating a fair trade cooperative makes those joining it better off, the subsequent pro-competitive effect in the local market may also benefit non-fair trade producers.

(3) By enabling capacity-building, fair trade has a poverty-reducing impact. The cooperative is an ongoing learning centre where producers are encouraged to become small entrepreneurs.

(4) By having influenced trends in the non-fair trade market, fair trade may have indirectly reduced poverty for some non-fair trade producers. Our case study analysed a company that sells mostly in the non-fair trade market, but which adopts principles similar to fair trade. On a general level, greater consumer demand for certified coffee has led to multinational companies increasingly offering fair trade coffee and promoting various forms of bilateral or multilateral cooperation with farmers outside the FLO system. It seems that increased consumer demand for higher social and environmental standards has stemmed at least in part from the inroads made by fair trade into the market and the public debate.

(5) If fair trade's excess supply lowers the world market price of non-fair trade coffee, poverty levels of non-fair trade producers may increase. At present, fair trade seems too small relative to the world market to have much of a negative impact. Nevertheless, if fair trade is to grow and increase its relative proportion in the world market, the issue of excess supply will need to be addressed.

The Relationship Between Armed Conflict, Peace and Tourism in Nepal

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Tourism is normally perceived as contributing to economic growth, accelerating inter-cultural understanding and harmonious relationships, fostering goodwill and promoting peace. It is also said to be the bridge between the psychological and cultural distances that separate people of different races, religions, and economic backgrounds. Tourism is a mechanism for addressing the root causes of conflict and social tensions such as poverty, injustice, inequity, and marginalisation as well as a mechanism for accelerating peace and harmony. This paper examines the causes and consequences of armed conflict on tourism, and the role of tourism in escalating conflict and promoting peace in Nepal. It also assesses the strengths and weaknesses of tourism in Nepal.

The armed conflict waged by the Communist Party of Nepal – Maoist (CPN-M) for a decade (1996 - 2006) has had enormous impacts on the tourism sector in Nepal. Tourist visits to Nepal during the period of armed conflict fluctuated. The sector enjoyed healthy growth until 1999 and then quickly declined, with the lowest point in 2002. A number of conflict-related activities such as political strikes, curfews, intimidations, forceful shutdowns of big multinational and hotel companies, negative travel warnings issued by foreign affairs departments of tourist-generating countries and unrealistic international media coverage were compelling reasons behind the decline of Nepal's image from a peaceful tourist land to an insecure destination. The decreasing number of tourists consequently negatively affected the tourism industry and led to closure of many hotels, airlines and travel agencies, which aggravated unemployment and increased livelihood insecurity.

Though the tourist sector was affected by armed insurgency, national level marketing and promotional efforts such as Visit Nepal Year 1998, the Golden Jubilee Celebration of the ascent of Mountain Everest in 2003, the Destination Nepal Campaign of 2002-03 and a number of press conferences, meetings and briefings relating to tourism were adapted as coping strategies. Since the government of Nepal and the CPN – M signed the 'Comprehensive Peace Agreement (CPA)' on 21 November 2006, the situation in this sector has been changing. The tourism sector is one of the important contributors to Nepal's economy. Sustaining peace in Nepal is closely associated with the sustaining of tourism that is economically viable, environmentally friendly and socio-culturally acceptable to local communities in Nepal.

Issues, Challenges and Roles in Promoting Peace and Development in Darfur, Sudan

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This paper attempts to explore the multiple dimensions of Sudanese conflicts, focusing specifically on the Darfur crisis. It portrays the historical, socioeconomic, political and natural dimensions of environmental conflicts in Sudan. The prolonged civil war in the south, the Nuba Mountains, the Blue Nile, and Eastern Sudan has been quelled by various peace agreements. However, the ongoing conflict in Darfur reflects the incompatibility in interests, needs and perceptions among the different antagonised groups. The current situation, characterised by disputing groups and international interventions, reveals the challenges and opportunities of the United Nations and the African Union Mission in Darfur (UNAMID) in bringing or failing to achieve peace in the region.

The paper argues the importance of understanding the causes of the conflict and its escalation, and the importance of the lessons to be learnt from several failed peace agreements in Sudan. Accommodating the interests of disputing groups and developing an appropriate conflict management system requires changing the negative interaction between the national and traditional management systems. The CPA, however, reflects several weaknesses and challenges, especially conflict resolution and conflict transformation approaches. This accordingly leads to mistrust about whether the Darfur Peace Agreement (DPA) is sufficient to create lasting peace. Undoubtedly, building sustainable peace and development requires the participation of all stakeholders, transparency, and joint goals to get over the bumps on the road to current and future peace. Finally, crucial conclusions and recommendations will be presented that shed light on the important steps needed for sustainable peace and development in Sudan.

The State, Urban Banditry and Mob Justice: Mutations in State Capacity and Governance of Urban Violence in Cameroon

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Owing to the activities of a rapacious governing elite, the state in contemporary Cameroon has endured in a number of crises which Richard Joseph (2003) sums up as “catastrophic governance.” Notable among these crises are a persistent insistence on the part of regulatory institutions on their dwindling capacities to cope with the challenges of maintaining law and order on the one hand, and the paradoxical addiction of most Cameroonians to maintaining a culture of administration that is embedded in amoral values and practices of governance. How do these crises of institutional capacity and amoral governance feed the critical anxieties of populations coping with acute problems of livelihood, such as insecurity, on the one hand, and the state’s response to the threats of insecurity posed by armed banditry in Cameroon’s cities, on the other? This paper argues that the crises of amoral governance characterised by endemic administrative corruption, and the material incapacities of the state have constrained its abilities to cope with the challenge of providing security to urban residents, and have therefore pushed these residents to seek alternative means to ward off insecurity within urban neighborhoods. In an ethnographic account of anecdotes of urban violence in Cameroon flowing from spontaneous responses to armed banditry, this paper exposes the phenomenon of mob justice directed at urban criminals as a deeper response within the discursive register to the collapse of law and order and the theatrics of pre-bendal governance. Mob violence against bandits translates, then, into a politics of insecurity on the part of residents that expresses widespread dissatisfaction with the amoral and ineffective ways the state has sought to contain banditry and institutionalise law and order in Cameroon’s cities.

Disputing the Floodplains: Institutional Change, Common-Pool Resource Management and Conflicts in African Wetlands

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This paper presents the results of a comparative anthropological study in six African floodplains conducted by the African Floodplain Wetlands Project (AFWeP), led by the University of Zurich and the NCCR North-South. The case studies focused on six similar floodplains in semi-arid areas in Africa. These floodplains change seasonally and are therefore highly complex ecosystems very rich in common-pool resources (fisheries, wildlife, pasture, and water). The main focus of the study was to analyse historical changes in the institutional design of common property regimes crafted by local ethnic groups, in order to govern the multiple use of these resources and to assess the conflicts over access to these resources. Between 2002 and 2006 eight researchers from Swiss and African universities conducted fieldwork based on the same outline in Mali, Cameroon, Tanzania, Zambia and Botswana. The theoretical basis was provided by the New Institutionalism (North 1990), most elaborated in anthropology by Jean Ensminger (Ensminger 1992, Ensminger and Knight 1997) and the early work of Elinor Ostrom on institutional design (Ostrom 1990). The paper shows that external factors lead to changes in relative prices of goods and services, making common-pool resources from floodplains very attractive to outsiders and seriously affecting local-level bargaining power and institutional change. One finding is that the state that is now controlling the commons creates de facto open access constellations because it lacks the financial means to enforce laws and is not able to monitor or exclude immigrant users. At the same time, local institutions are eroded, weakened or transformed by powerful local people. But our results go far beyond this generally known finding: We argue that not all traditional institutions are eroded; those who pay rent to powerful people will remain. In addition, we argue that the open access situation created by the state leads to an increase in conflicts because access rights are being greatly disputed, using various forms of ideologies such as citizenship, in order to legitimise free access or privatisation. This process hinders local collective action for the crafting of robust institutional designs and fuels ethnic conflicts. Such conflicts intensify if state actors have an interest in conflict as a means to generate resources or are unable to react due to lack of financial means. The comparison shows that a more stable economic situation in a nation-state reduces pressure on floodplain resources and open conflicts over these resources. As a mitigation strategy in conflict situations, a process of collective and participatory institution building is proposed.

The Notion of Conflict and Its Contribution to Conflict Transformation: A Case Study in Ethiopian Lowland Areas

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Studies of violent conflicts in pastoralist areas in the Horn of Africa are very interdisciplinary. Despite the classic tendency to construe all forms of violent conflict using generalised grand theories, social science has recently made advances in understanding violent conflicts as phenomena that express diverse meaning and values and are constantly transformed in terms of these values and outcomes. This paper aims to contribute to newly diverse, developing perspectives on conflicts in pastoralist areas by means of a case study on pastoralists in the middle and upper rift valley of Ethiopia. It argues that interests, positions and hence conflicts over resources are being transformed as result of changing political, economic and social environments. Long-held perceptions of pastoralist conflicts as inherent to pastoralism and a culture of violence, expansionist tendencies, and resource scarcity are a partial but not a complete representation of conflicts in pastoral areas. This case study shows how new types of resources such as state resources, revitalisation of emphasis on primordial ties, state-building through decentralised polices, and urban-rural interactions are becoming more important arenas for actors involved in frequently changing strategic interactions that reflect changes in their interests and positions and that transform conflicts in contemporary pastoralist areas as a result.

The Environmental Governance of an Indigenous Territory in the Peruvian Amazon

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In 2002, indigenous communities living on both sides of the Madre de Dios River in Peru (Harakmbut, Yine and Matsigenka) created a communal reserve, with the support of different national and International NGOs and the Global Environment Facility. The communities aimed to stop the pressure linked to the extraction of natural resources on an ancestral territory. Traditional economic activities (hunting, fishing) coexist in the vicinity of the reserve, as well as non-traditional ones (gold, lumber), these latter generating tensions between local indigenous and non-indigenous actors. Trans-Amazonian mega projects (routes of communication) and petroleum exploration have introduced new tensions and show that the way Peruvian politics copes with the conservation of biodiversity and with the extraction of resources is not designed to deal with environmental degradation.

Water Governance: The Role of Institutions in Managing Water Resources in Mexico

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Water resources are one of the most important topics on the international agenda. Organisations such as the United Nations and the World Bank engage in activities in order to emphasise imperative issues that demand attention in social, environmental and development contexts. In Mexico, the government has created responsible institutions to formulate and enforce legal requirements and obligations to better manage the sustainability of water resources. The present study considers water management in the Mexican context.

In Mexico the National Waters Law (LAN) is the official document for creating, updating, and making sure the legislative framework for water is being considered and carried out according to the legal terms. Mexican policies tend to include targets set by international organisations that aim to compromise efficient water management in order to achieve sustainable water use, which suggests regarding water as an economic good and considering greater stakeholder involvement and private sector participation (Wilder and Romero, 2006).

The LAN establishes that water management should be directed by the National Water Commission (CNA). CNA is the main official institution that can grant or retire water management concessions; it has the responsibility for adequate care and distribution of the resource (Semarnat-CNA, 2003). CNA and dependent institutions interact on a top-down hierarchical constitutional basis where all are supposed to be in accordance with national standards, but at the same time, each one has independence in the decision making process. This fact has created a complex water management system which requires coordination among diverse institutions to deal with water resource issues and community livelihood conditions.

As part of the Mexican modernisation strategy in the National Development Plan 1988-1994, new water policy schemes were implemented. Water reform was one of them; therefore, it is necessary to implement a legislative framework in environmental, urban and agricultural matters in order to reduce the state's operational responsibilities (Wilder and Romero, 2006). Thus decentralisation and privatisation were considered as the basis of water reform. Nevertheless, this has failed to solve problems, which have continued to grow. Decentralisation has brought neither environmental profit nor efficiency. What is more, it requires a serious state commitment in order to create and support strong water institutions. It is necessary to integrate transparency and responsibility in the actions of both the public and the private sectors (ibid).

A Topology of Power: Local Forest Governance in Orissa's Scheduled Areas

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When it was passed in 1996, the provisions of the Panchayats (Extension to the Scheduled Areas) Act (PESA) were widely acclaimed as being the start of a new era of empowered local self-governance for India's Adivasis. The Act granted comprehensive powers to local participatory institutions (gram sabhas) to make decisions on a wide range of issues important to Adivasis' livelihoods. These include the competence to safeguard and preserve traditions and customs, cultural identity, community resources, and the customary mode of dispute resolution (Art 4d). According to PESA, therefore, the gram sabha should be the principle space in which local self-governance takes place, in particular the governance of community resources. However, PESA cannot be examined in isolation and, at the local level, other governance spaces overlap the gram sabha's authority in a number of fields, in particular with regard to natural resources. Thus, through the example of a specific community resource, this paper seeks to answer the following question: in Orissa's Scheduled Areas, how are forest resources governed? In other words, in what spaces can we situate forest governance and how are these spaces related? If topology can be defined as the study of spaces, the purpose of this paper is to make a sort of topological map of local forest governance. We have found that, in fact, PESA-mandated gram sabhas are not the only forest governance spaces in Orissa's Scheduled Areas: forest governance also takes place through Forest Department-sponsored forest users' groups, and in citizens' self-initiated groups. These three spaces exhibit inherent contradictions between constitutional provisions and state policies and practices with regard to Adivasis' rights to make decisions about local natural resources as they (1) seek to construct quite different kinds of local communities and community-forest-state relationships, and (2) have both overlapping and conflicting legal mandates for governing. We show that the result of this discord, in contrast to the objective of PESA, is to continue Adivasi forest dwellers' disempowerment with respect to the governance of a resource of fundamental importance.

Strengthening Governance Processes for Sustainable Development in Western Mexico

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This study analyses the experience of the Network for Sustainable Agricultural Alternatives (RASA), which can be considered an initiative of civil society integrated by different social actors who share a common aim to construct sustainable rural development strategies. The paper presents the historical development of the RASA, which is based on farmer training and fair trade practices, the insights gained, and the challenges that lie ahead in strengthening sustainable rural development. From a theoretical point of view, the RASA can be considered part of the so-called new social movements that have emerged in the context of public policy and institutional decentralisation. From a more practical point of view, the role of the RASA can be understood as a new social movement seeking an increased role in civil society, as well as in political decision-making regarding rural development in Mexico.

The Collective Dimension of Citizenship in Bolivia: An Ethnographic View of Legal Identity Documents, Formation of Public Spaces, and the Meanings of Citizenship

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For extensive sectors of Bolivian society, above all indigenes and peasants, citizenship is not solely individual but includes social affiliations. Many individuals conceive of themselves as citizens through sociability as members of grassroots organisations, where they forge and channel demands for rights and seek to influence and control policy decisions. The capacity of social organisations to intercede with the State and the State's replies to the demands formulated by collective actors are the topics through which we approach and conceptualise the formation of collective citizenship as a status and as participation in public spaces. We argue that the collective dimension of citizenship has deepened over the last twenty years and finds its maximum symbolic expression in the legal personality (*personería jurídica*, the legal recognition of community organisations).

Key words: citizenship, social rights, identity documents, second generation of state reforms, public space, indigenous peoples, Bolivia.

Livelihoods and Globalisation

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Globalisation is no longer considered as a process of internationalisation, but as a characteristic of the ‘global system’ in which each particular entity has to be understood within the framework of the world as a whole. Globalisation is often perceived as increased homogenisation and interdependency throughout the world in the cultural, social and economic spheres. However, the trend towards global markets and politics is usually accompanied by increased diversity and the increased importance of regionalism and community (‘glocalisation’). Cultural fragmentation, for example, with its reinvention of local traditions and identities, is seen as an answer to loss of identity through homogenisation.

With respect to livelihood strategies characterised by an actor-oriented perspective, globalisation has important consequences: because markets and social relations are becoming global, livelihoods will increasingly become multi-local. On the other hand, the regional/local (‘locality’) context will remain significant. This means that a one-sided local orientation, prominent in many livelihood studies, is outdated. Because natural resources tend to be place-specific, livelihood studies with a focus on the exploitation of natural resources suffer in particular from this bias. In addition, globalisation stimulates the decomposition of households and multi-tasking.

Livelihoods are not neutral social activities, but engender processes of inclusion and exclusion. Livelihoods are organised in arenas of conflicting or co-operating actors. Access to livelihood assets and opportunities depends on the performance of social relations, meaning that understanding the role of institutions is crucial, especially the way power relations are structured. However, analysis of power relations is another weakness of livelihood studies. The methodology of livelihood trajectories, focusing on failed and successful access to assets and opportunities, could clarify processes of inclusion and exclusion on global and local scales

Re–Politicising Livelihood Research

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The term “livelihood” and the area of “livelihood research” are rather new entrants in development literature. This presentation argues that the recent emergence of “livelihood research” in the developing countries has been associated with a concurrent process of depoliticisation. A major feature of this process of depoliticisation of research is a diminishing emphasis on structural inequalities in access to material resources. An additional feature of this depoliticisation is an uncritical acceptance of economic globalisation and the policy contours set by the Washington Consensus. Once the above elements are accepted as given, the focus then rests on a minimalist agenda: how to help people adapt to livelihood shocks, or “cope” with them. I would argue that this framework, which superficially celebrates the agency of people, is not only deeply limiting in what it offers to them, but also effectively forecloses broader possibilities for expansion of freedoms.

Session: Migration and Multilocal Livelihoods: Global Challenges for Sustainable Development

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A globalised economy clearly structures migration streams. Migration does not always seem an option but rather a necessity for sole survival or as the result of conflict in the form of displacement. In the case of labour migration, economies demand international labour. While labour is needed and money is welcomed, there is little attention paid to the lives of those who remit the money. Even as the economy demands flexibility from people, national laws and policies are becoming increasingly intransigent about all the people involved in this process. Despite these obvious hardships and imbalances, migrants manage to contribute to the economies of their countries.

This session aims to explore migration experiences of people from the developing world. It identifies commonalities such as the significant macro-economic role of migration and critiques popular themes in the discourse on migration, such as the focus on economic benefits of moving populations, the nation-state as a reference point, the legal status of migrants, or rigid applications of official categories such as “forced”, “volunteer”, “economic”, and “internal/international” migration which do not reflect migrant’s realities. The panel will also ask for policy recommendations to accommodate migrants and better secure their own and their family members’ way of life.

Legally Blind: The Predicament of Internally Displaced Persons in Legal Discourse in India

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Formally democratic countries in South Asia – such as India – have a disproportionately high number of people who are internally displaced within the political borders of the state. People thus displaced often find themselves at the margins of the legal and political system. This problem is even more acute when displacement occurs as the result of armed conflicts. Given the lack of access to legal recourse, displaced persons are often forced to leave for far-flung places in search of work and wages. This study looks at the reasons why people in parts of Northeast India have been displaced, the ways in which they are forced to adapt to the vagaries of life without proper rehabilitation policies, and the manner in which legal ambiguities force them into different kinds of relations of servitude. The hope is to shed more light on the manner in which forced migration has managed to coexist and evolve within processes of globalisation and demand for pliant labour in Twentieth century South Asia, especially in Northeast India.

International Migration on the Southern Border of Mexico: Guatemalan Women as Domestic Workers in Tapachula, Chiapas

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Migration on the southern border of Mexico is not a new phenomenon in the region, but it has been increasing in recent years owing to many factors such as the crisis in coffee production, natural disasters such as Hurricanes Mitch and Stan, and very limited work opportunities for men and women in the region. Revolutionary movements and new neoliberal policies have also played a role. In this context Chiapas and the City border of Tapachula are located in a strategic geographical zone because Tapachula has become a point of entry, destination and transit for Central American migration. The phenomenon of migration is assuming new forms and involving new actors as a result of its feminisation. This study looks at migration of women between Guatemala and Chiapas dedicated to domestic work and how this phenomenon is introducing new aspects and roles that transform or create new life strategies and social networks.

From Exclusion to International Migration: The Case of Latino Youths

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This study addresses structural trends reflected in the responses of excluded Latinos youths, ranging from street children to radical youths (gangs or not) and finally to international migrants. The latter face unusual challenges as a result of being undocumented, forcing them to pursue mobility within a formal system that blocks their progress. These trends are reviewed through a “positive” lens, focusing mainly on Latino youth who use different strategies to fight social exclusion. The aim is to address a paradoxical temporality, which indicates that as we learn and analyse more, we tend to move further away from the possibility of transforming pressing problems in society. The question is raised of how to intervene with greater knowledge in an alarming situation affecting one of the most excluded social groups, Latino youth, and also how to raise awareness about and visualise ways of integrating youth who migrate and become undocumented.

Osh – Bishkek – Almaty – Moscow and Back: Livelihoods in an Undocumented but Accepted World

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Russia and Kazakhstan are major destinations for labour migrants from rural places in southern Kyrgyzstan. The whole migration process is greatly facilitated by transnational kin networks, where relatives and friends facilitate travel, job and accommodation and remittance transfers. While elderly people take care of children, younger men and women migrate in search of livelihoods and a better income. Although Russia and Kazakhstan depend on a labour force from countries like Kyrgyzstan, they do not provide migrants a humane legal framework for work abroad. As a consequence migrants overwhelmingly work de facto illegally on territory where they would have had the same citizenship and rights only a few years ago, with all the vulnerability and stigmatisation that illegality implies. Despite resulting risks to their livelihood, it appears that under the current international migration regime, it is (for a majority of migrants) more costly to take part in legal contracts than to pay the social price of being undocumented.

This study asks: Why do people choose the path of illegal migration? And, how does it affect their livelihoods and those of their non-migrating family members back home in Kyrgyzstan? The results presented are derived from the author's own multi-local research, based on studies of individual migration trajectories considering family members as migrants and non-migrants in both receiving (Moscow, Russia; Almaty, Kazakhstan) and sending regions (Osh oblast, South Kyrgyzstan) in 2006 and 2007.

The Political Ecology of the Timber Trade in Meghalaya, India

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In Meghalaya state, located in the north-eastern part of India, a large proportion of the rural population is dependent on forests for a livelihood. Unlike other parts of the country, the majority of forests here are owned by the 'community' and not the government. Despite this, forest livelihoods are influenced by a complex set-up of customary and government-imposed regulations. Till 1996, the harvest and trade of timber was one of the major livelihood activities for a majority of the rural population. However, concerned with the increase in loss of forests in the country, the Supreme Court of India ruled in 1996 to ban unregulated timber felling in all parts of India including Meghalaya. This had a severe impact on the livelihoods of people dependent on the timber trade in Meghalaya.

Since the last decade, several efforts have been made by different groups to regulate and control the timber trade, in the name of protecting people's livelihoods and the environment. Despite this, the desired impacts have not been achieved. There are two main views about addressing this problem: one view posits that in the absence of effective alternatives, the customary system of governance needs to be strengthened. The other argues that the customary arrangements of forest management need to be replaced with a formal 'state supported system'.

The present paper argues that neither represents the actual problem and hence possible solutions to it. The current situation has resulted from absence of any management due to the interests of different actors who benefit from such arrangements. These actors, within the 'community' and in the 'government,' argue for continuation or replacement of existing institutional livelihood arrangements to suit their interests, which masks the actual issue of who controls and who benefits from forests.

The present paper provides details about how different actors influence the timber trade and how formal and informal regulations have resulted in a 'community-forestry elite' who control and benefit from forests. It also illustrates how the notion of 'community' is contested and how traditional institutions replicate the state when given similar power. It deals with some critical questions of access and control over natural resources by considering the case of forests and their impact on livelihoods. It concludes that initiatives like the Supreme Court order or other 'development programs' are highly unlikely to succeed. Supporting sustainable livelihoods requires grounded approaches that are attuned to the realities of access, power and entitlement of people in such contexts. This calls for better understanding of how different actors and structures impact the livelihoods of rural people in remote forested regions.

Bringing the State Back into Rural Development: Insights from South Asia

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In the post-World War II era, the nation-state has been perceived as the key agent for the uplift of rural people in developing countries. This paradigm entered a new phase in the late 1970s and 1980s with the introduction of sectoral or integrated rural development programs, which covered interventions from infrastructure provision to agricultural extension and guaranteed crop prices. From the late 1980s and early 1990s, there was a change in the discourse and practice of rural development – originating especially among international donors – away from the state, towards non-state actors. Initially, this focused on Non-Governmental Organisations (NGOs) who were perceived as being closer to people’s aspirations, and also less bureaucratic, thus more efficient in the delivery of development. From the early 1990s, following policies of globalisation and structural adjustment, more and more emphasis was given to the private sector as the “change agent” – corporate farming, investment zones, private company-based agricultural extension, to just mention a few expressions of this recent trend. All this implied a down-sizing (or, to use an expression from Pakistan: a “right-sizing”) of the state and its development-oriented agencies.

The present paper starts with a survey of these paradigm shifts, focusing on India and Pakistan. It then brings together the major contemporary critique of the downsizing of the state’s responsibility in rural development, specifically from an equity point of view. Based on this, it argues for the need to “bring the state back” as an important actor – which can be illustrated by recent initiatives in India (e.g. National Rural Employment Guarantee Scheme) and Pakistan.

Negotiating Access to Land in Nepal

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For many peasants in Nepal, land is a primary source of livelihood and security as well as a symbol of status. Land distribution in Nepal is skewed: 5% of landowners hold 37% of the total arable land (UNDP, 2004). The average holding is less than 1 ha, and 32.1% of households are totally landless; 25% of the 4.2 million Nepalese households are below the absolute poverty line, and they all are landless (CBS, 2002). The present paper, after giving a brief sketch of landlessness and its effects in the country, outlines the major attempts at land reform so far and examines the reasons for their failure, and discusses the importance of land for securing rural livelihoods and for socio-economic prosperity. The main objective of the paper is to retrace the process of how and by whom access to land is currently negotiated. It illustrates how the issue of land reform got onto the agenda of the government and of the major political parties, and in particular, how the various activities of peasants' land right organisations and NGOs (massive streets protests, rallies and sit-in programs) empowered the peasants to a certain extent to negotiate access to land with the state's representatives. Finally, we want to highlight the major benefits of a well thought-out land reform and to argue that land reform should come as a prerequisite to any other development programs in the country.

Adopting a Pro-Poor Approach in Community Forestry: Lessons from Nepal on Improving the Livelihoods of the Identified Poor

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Nepal's community forestry programme is widely seen as extremely successful, with roughly 25% of the entire forest area in the country now being managed by local communities organised into Community Forest User Groups (CFUGs). These groups are legally constituted self-governing grassroots institutions, responsible not only for decisions over forest management, but also over the management of funds generated from forest revenues. Comprising households of different castes and socio-economic backgrounds, they are expected to promote the equitable distribution of resources amongst their users. Some 14,000 such CFUGs are now legally registered in the country, their membership numbering over 1.6 million households.

In the past, community forestry has been criticised for failing to address the specific needs of the poor; indeed, the early focus on forest conservation (restricting forest use) often made life more difficult for the poorest users, who had no private tree resources to turn to. Since the turn of the century (and in accordance with the Millennium Development Goals), the challenge of reaching the poor through community forestry has been given increasing focus, and is specifically mentioned in Nepal's Poverty Reduction Strategy Plan (PRSP). This paper focuses specifically on how the Nepal Swiss Community Forestry Project (NSCFP) has taken up the challenge of reaching the poor, which is essentially done through coaching CFUGs to recognise and respond to the equal rights of all their members to a life of dignity and respect, and to the material needs necessary for this. Through well-being ranking, the CFUGs identify the poorest amongst their numbers (known as *bipanna*) and then decide upon specific actions that can be taken to benefit these households. Such actions are summarised in the acronym FREELIFE plus H2O; access to group Funds, Representation in leadership positions, training for Employment, scholarships for Education, access to community forest Land, Inclusion in decision making processes, equitable access to Forest products and Enterprises. The additional H2O refers to Health, Humanitarian aspects (particularly for victims of the former civil conflict) and support from Other organisations. In addition, the project seeks to support specific livelihood improvement activities. For these, *bipanna* households analyse their livelihood options, prepare a household plan based on what they perceive as best options for improvement, and receive a small grant for its implementation. Reaching the poor is not easy; the paper highlights some of the challenges involved in planning and implementing a pro-poor approach, and possible ways to address them.

The activities of the NSCFP are also compared with pro-poor community forestry activities in other parts of Nepal, most notably that of the DFID-supported Livelihoods Forestry Programme, LFP.

The Urban Transition Process and Its Impacts on the Livelihoods of the Urban Poor: A Case Study in Hanoi City, Vietnam

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Numerous empirical analyses have tried to shed light on the process of urban transition in Hanoi. However, this research has rarely gone beyond a simple description of urban change. Little attention has been paid to interaction among all the mechanisms that drive transformation in the livelihoods of the poor. Hence a number of significant questions can be raised, e.g.: What changes have been brought about in the livelihoods of the urban poor by urban transitions? What are the driving forces of these changes within the context of a transition city like Hanoi? How do these forces interact in driving overall changes in the livelihoods of the poor? What livelihood strategies do the poor have for responding to these changes? Answering these questions will help to reveal the impacts of urban transition processes on the livelihoods of the poor. Then policymakers should take into account the impacts of these changes on the poor if they hope to promote sustainable development and adopt adequate socio-economic development policies. The goal of this study is to focus on the urban transition process that is resulting in multi-dimensional changes and its impacts on the livelihoods of the urban poor in Hanoi, the capital of Vietnam.

Like many areas in developing countries facing high rates of urbanisation and economic growth, Hanoi has been in transition from a centrally planned to a market-driven economy since 1986. Gains from this transition have been recorded in both positive and negative ways. After nearly two decades of reform, a variety of changes have been observed in the city: changes in the built environment (physical spatial structure), in land use (functional spatial structure), and in socio-economic life. Observations also show that changes in the spatial structures of Hanoi are visible not only at city and district levels, but also at community/neighborhood and household levels. Consequently, livelihoods and living spaces of the poor in different parts of the city have been affected by those changes.

From this perspective, our study focuses on the main dimensions of the urban process at community and household levels. With five case studies in five communities where there are various problematic urban transformation processes (suburbanisation, commercialisation, industrial relocation, migration, and housing development), we aim to present a dynamic and comprehensive picture of how the livelihoods of the poor have been transformed and how the poor have transformed their livelihoods (diversification and individualisation) in response to various structural transformations of the market and territorial morphologies in the post-reform period. Questionnaires and focus group interviews are used to get different stakeholders' points of view on mechanisms behind the changes in the livelihood of the poor, the current living conditions of the local poor, how the poor respond to these changes, etc. In addition, secondary information will be collected on the past and current situation of the urban transition process at community and household level and related urban policies, regulations and future visions for the urban development of the city. Both secondary and primary data will be combined for research analysis.

Building Inclusive Historic Centres

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Since the 1980s, the promotion of heritage values has gradually become a relevant issue for urban planning. Together with the emergence of new peripheries, the inner-city areas and particularly the old historic centres, affected by deterioration due to the recession of the last decades, were the object of study and actions. For more than 20 years, there has been a steady increase in the number of projects to rehabilitate historic centres in various cities across the world, within the framework of a debate on heritage that has evolved from building preservation to a wider approach encompassing socio-cultural values, strongly influenced by the impact of specific rehabilitation policies at the international level.

As Novick (2007) shows, in the last decades of the 20th century, three different moments can be identified in urban planning with regard to heritage. A first moment involves ambitious comprehensive plans, according to the modernist principles of the Charter of Athens, while heritage-related actions were limited to specific buildings. In a second phase, heritage involved sectoral divisions and special bylaws supervised by an Expert Committee. Finally, a last period can be identified in which urban management included the protection of heritage as a collective resource, which must be the result of an established consensus. At the international level, several meetings and charters proposed measures to tackle the degradation of historic centres.

In addition to these tendencies, there are the challenges of promoting access to the city for underprivileged segments of the population, which accounted for the bulk of inhabitants in the degraded inner-city areas. Therefore, the need to turn the historic centres into areas of development for the market, through legislative measures and investments in infrastructure and services, and the re-evaluation of the heritage value of existing buildings, oscillated between policies which, linked to the mechanisms of economic and cultural globalisation, promoted tourism as a source of revenue while striving to avoid gentrification.

The renewed priority given to the development of inner-city areas, centred round the rehabilitation of their historic values and central nature, has generated innovative forms of intervention in the urban environment, assuming innovation as the practical application of new concepts (Ward, 2002; 396) and new approaches for the rehabilitation of existing cities, elaborated in an attempt to fulfill the aspirations to access to the city of individuals and groups (Pattaroni et al., 2008). As developed by Rabinovich (2008), it could be assumed that the character of innovation derives from a critical stance on pre-

vious, more traditional approaches to urban problems. However, over and above the dilemma of differentiating between “traditional” and “new”, since the late Twentieth Century, innovation appears to be adjusting to the need to link heterogeneous players, diverse scales and multiple dimensions.

The goal of our contribution is to gain a better understanding of the major challenges of the rehabilitation of historic centres. The analysis is based on an ongoing comparative and transdisciplinary research project, in which concrete interventions for the rehabilitation of inner-city areas with heritage value are being analysed in different cities of the world: (a) the Master Plan for the Rehabilitation of the Historic Centre of Havana, Cuba; (b) the Programme of Residential Consolidation of the Management Plan for the Historic Centre of Buenos Aires, Argentina; and (c) the Revitalization of the Tha Tian Historic Community in conjunction with the Conservation Master Plan for Bangkok, Thailand. The three projects aim to combine the preservation of heritage values and opportunities for the economic development of the area, while guarantying access to the habitat of the lower-income population. Therefore, the studied projects can be considered as paradigmatic for the development of inclusive historic centres within the framework of “innovative” approaches to urban planning, aiming at promoting sustainable living conditions.

Bibliography

- Bureau de l'historien de la ville de La Havane, 2001. *Desafío de una utopía. Una estrategia integral para la gestión de la salvaguarda de la Habana vieja*, La Havane.
- García Pleyán, C., 2004. « El centro histórico: entre la gestión y la gobernabilidad », in *Cultura y Desarrollo*, nº 3, UNESCO Regional Office of Culture for Latin America and the Caribbean, Habana.
- García Pleyán, C., 2006. *Consideraciones sobre el desarrollo sustentable en Cuba*. Working paper.
- Novick, A., 2006. *El Plan de Manejo del Casco Histórico en Buenos Aires. Primera puesta a punto de materiales*. Working paper.
- Novick, A., 2007. « City Planning in the history of the city », in Stifel B., Watson V., Acselrad H. (dir.). *Dialogues in Urban and Regional Planning*, vol. 2. London: Routledge.
- Novick, A. et al., 2007. *Actores y situaciones en la Manzana de San Francisco: presentación de materiales e hipótesis*. Working paper.
- Pattaroni, L., Kaufmann, V., Pedrazzini Y., Bolay J.-C., Rabinovich, A., 2008. *People and “Territories”: Urban Sociology Meets the Livelihood Approach in the South*. NCCR North-South Dialogue 20. Bern, Switzerland: NCCR North-South.
- Pimongsatean, Y., 2006. *Preliminary overview of content for the case study: The Development of Bangkok towards a Liveable City*. Working paper.
- Rabinovich A., 2008. « Innovation in urbanism thinking : spectrum and limits », in Pflieger, Pattaroni, Jemelin, Kaufmann (eds.), *The Social Fabric of the Networked City*, EPFL Press publisher, distributed by CRC Press, Taylor and Francis, chapter 7, pp. 131-155.
- Rodríguez, P. et al., 2007. *La rehabilitación del Centro Histórico de La Habana*. Working paper.
- Ward, S. 2002. *Planning the Twentieth-Century City. The advanced capitalist world*. Sussex: John Wiley & Sons.

Heritage, Sewage and Urbanization: Some Free Associations

David J. Bradley¹ (moderation and synthesis of plenary session)

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The NCCR North-South Programme has been one of extraordinary diversity and complexity. It has trained an array of graduate students, all of whom have broadened horizons. By having a matrix structure, which has also been kept in flux over time, the directorate has sought to encourage, or even to impose transdisciplinary projects, interdisciplinary linkages between projects, and integration of disciplines. The research work packages were amalgamated to half their previous number between the first and second phases of the programme, and a series of ‘transversal’ packages were supported to create further cross-linkages. There is continuing pressure to synthesize and integrate the findings, as the stated role of session chairmen in the meeting indicates. The External Review Committee members have had a uniquely privileged opportunity over the years to view efforts at diversity and integration without being immersed in the operational practicalities of running the Programme. I use this to consider the extent, benefits, costs, opportunities, limits and contextual determinants of synthesis and integration from observations of the programme on site visits in Asia and Africa. These have particularly involved the programme’s activities in health, sanitation, vulnerability, and planning the built environment. As the integrative attempts observed have been remarkably productive, I also consider how to make best use of them in building transdisciplinary research capacity.

Emerging Health and Sanitation Issues in Developing Countries

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Rapid population growth and industrialisation have caused serious environmental problems in many countries worldwide, especially those with less economic development. These problems originate mainly from human activities and industrial processes that have resulted in water and air pollution and health effects. Currently, more than half of the world's population still lacks adequate access to sanitation facilities, while one-fourth do not have access to safe water. Applying conventional technologies to respond to these challenges may not be adequate and timely to meet the Millennium Development Goals (MDG). Alternative approaches such as conversion of fecal sludge and organic solid wastes into methane gas, which could be used for electricity generation and heating purposes, are attractive options to pursue. In addition to effective pollution control, these approaches could bring financial returns through the sale of electricity, reduced consumption of fossil fuel, and mitigation of global warming effects through the Clean Development Mechanisms (CDM). Due to increased food prices, there will be greater demand for fertilisers used in agriculture. The recovery of phosphorus from urine and other animal wastewater through struvite formation should be seriously considered. Successful case studies on the above approaches will be presented.

Other emerging environmental issues deals with the distribution of some persistent organic pollutants (POPs) such as perfluorinated compounds and those originated from pharmaceutical and personal care products (PPCPs). These compounds have been found to be present in surface water sources at minute concentrations but were able to be accumulated in the food chain up to more than 50,000 times. Since they are carcinogenic, could disrupt endocrine activities in human and animals and might lead to other emerging health problems through genetic deformation and disease mutation, research to properly monitor their distribution and developing effective technologies to destroy these compounds are needed. There are advance technologies which could be applied to treat these wastewater including membrane separation, electrochemical precipitation and nanotechnology. Phytoremediation technology could be applied to remediate contaminated soils and water.

Reweaving a Life: Sanitation and Toxic Synergy in Tlamacazapa, Mexico

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In the mountains of central Mexico, the Nahua villagers of Tlamacazapa (population 6,100) earn a meager living by weaving palm baskets, an ancient art form preserved over centuries. The complex village context is characterised by acute poverty, crowding and malnutrition; multiple health problems and disabilities; inadequate water supply and sanitation with parasitic infestations. Local social-political difficulties include male alcoholism; a norm of violence; high illiteracy; an encroaching drug culture; and a rapid transition from relative isolation to increasing outsider influences. In 2005, 85% used open-air excretion with all the subsequent health problems while simultaneously attributing disease and illness to evil eye, fright and witchcraft. In the dry season, poor villagers wait hours for water that trickles into the four main village wells from cracks in the limestone bedrock. In the rainy season, these wells fill with a dirty runoff of garbage and excrement. Since 2001, three government built pumping stations have brought a limited amount of water to Tlamacazapa from a spring five kilometres away. This system provides water for sale, mostly via private taps, but the poorest families cannot buy it. Over the past decade, a conflictive water culture of insufficiency, non-accountability and unequal access has taken hold. Emerging gradually since 1997, CJ programs focus on four integrated sectors: Health and Healing; Income Generation for Women; Community Education and Literacy; and Environment, Water and Sanitation. Each program is based on principles of: people awakening to their potential; incorporation of investigation with action; and attention to environmental and economic sustainability. Since 2001, local CJ trainees have built comprehensive household water and sanitation units consisting of ecological dry toilets, greywater recycling, and harvesting and storing of rainwater in an adjacent 7800L tank. Family education and ownership, local training, and follow-up monitoring and repair have resulted in a 98% usage rate of the units. Personnel closely monitor water quality, and use an innovative family water calendar technique to understand household water quantity, effort and cost. In response to observations of villager health status, research revealed low but persistent levels of arsenic and lead in water and in soil as well as toxins in the palm dyes (cadmium, lead, mercury), hair and nail samples (lead and arsenic), and in glazed, low fire clay cooking pots (lead). Ongoing investigation indicates a human non-pylori *Helicobacter* infection with serious consequences. Among malnourished and vulnerable people, these harmful toxins interact synergistically, producing a silent crisis of slow poisoning.

Special Session: “The International Year of Sanitation, 2008”

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Each year 1.5 million deaths could be easily avoided

About 2.6 billion people lack sanitation worldwide. Of these, roughly 0.7 billion are in India, 0.7 billion in China, 0.7 billion in Africa, and the rest in other places. Progress in sanitation services cannot always keep pace with population growth; Africa is lagging the most.

In December 2006, the UN General Assembly declared 2008 the International Year of Sanitation (IYS). The IYS has two chief aims: to draw the world’s attention to the impact of sanitation on public health, economic and social development, and the environment; and to accelerate progress toward the achievement of the sanitation target of the Millennium Development Goals.

North-South partnerships in research and capacity development play an important role in the struggle for sanitation and health improvements. A focus on priority issues that respond to stakeholder priorities is indispensable. However, to achieve impact through research, practical problem-solving results and respective guidance on innovative approaches and technologies need to go hand in hand with outreach that extends far beyond academia to integrate practitioners and policymakers. The issue of transdisciplinary research is not a theoretical mind game but a basic requirement.

This special session on the International Year of Sanitation (IYS) will focus on the windows of opportunity that this global commitment to sanitation offers. What is the expected role of research and what can research offer? How can research support and promote evidence-based policymaking so that “Government” produces policies that really deal with problems, that tackle causes rather than symptoms, and that are forward-looking and shaped by evidence rather than a response to short-term pressures?

Innovations in Sanitation

Research in sanitation on one hand is about facilities and infrastructure that are lower-cost, easier to operate and maintain, protect the environment and facilitate resource recovery and reuse. On the other hand sanitation research is also about perceptions, acceptance, behavior, business models for management, governance and economics - all research spheres which necessitate a wide range of diverse competences and interdisciplinary collaboration. Results on people-centered planning approaches, improving effectiveness of hygiene promotion to change behavior and practice, attention to shared sanitation solutions and facilities, and emphasis on sustained use of services rather than simply on provision of facilities, are examples of important contributions by the research community to push forward the sanitation agenda.

Improving Health and Vulnerability Related to Water and Waste Management in Poor Settlements of Abidjan

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The health and vulnerability of any population depend greatly on environmental factors. Results of studies in precarious settlements in developing countries, in cities such as Abidjan, have rarely been effectively translated into public health and social action and hence many of difficult situations persist and are even being aggravated. This study aimed to (i) analyse environmental risk factors in deprived settlements in Yopougon (Abidjan), and (ii) investigate ways of improving the health status of the population.

The methodology entailed a transdisciplinary approach, involving cartography, sociology and epidemiology. Remote sensing and GIS investigations and a geographical survey were combined with semi-structured interviews with various actors and with information from household surveys (n=1800). Innovative strategies for mitigating environmental health risks were then determined through a participatory workshop involving all the stakeholders

Thematic risk maps that highlight areas with deficiencies in water supply and waste management could be linked to a series of environmental health risks. Uncontrolled deposits of solid and liquid waste in drainage channels, along the streets and/or in open areas represented the most striking health risks observed. Such deposits are sources of disease spread for those handling waste and the neighboring households exposed to the waste. These environmental risks add to the vulnerability of poor people living under difficult circumstances. The environmental risks dramatically increase during the rainy season, allowing a more rapid and broader spread of contaminated waste as well as the breeding of mosquitoes, among them malaria vectors. Consequently, the rainy season showed increased point prevalences for malaria (47.1% versus dry season 33%) and diarrhea (19.2% versus dry season 14 %). These data offered a concrete basis to design the approaches required in environmental management and were combined with the findings from a participatory workshop involving all stakeholders. This led to the design of a systemic decision-making model for the mitigation of health risks in the precarious settlements.

Keywords: Developing countries, environmental health risks, precarious settlements, vulnerability, water waste and management

A SPLASH ERA-Net e-conference: Towards Better Water Policies: How Can Increasing the Uptake of Research Findings Help?

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The aims of this paper are two-fold. Firstly, to introduce the SPLASH ERA-Net project, and secondly, to present the findings of a SPLASH electronic conference relating to the links between research findings and policy development. SPLASH is the name of the European Union Water Initiative European Research Area Network (EUWI Era-Net). It is a consortium of 15 ministries, funding agencies and national research and technological development authorities from 11 European countries. SPLASH aims to improve the effectiveness of European-funded research on water for development and to develop the capacity of local organisations to coordinate and communicate their research activities. The project focus is Africa and the Mekong region.

One of the key focus areas of SPLASH is the effective transfer of research knowledge into policy and practice, as it is assumed that when knowledge resulting from research is made available to decision- and policy-makers and is incorporated into decision-making processes, then better policies are developed and better decisions are made. The project has reviewed the influence of research on water for development on government strategies in the EU Member States. To develop understanding further, SPLASH conducted an e-conference on the topic “Towards Better Water Policies: How Can Increasing the Uptake of Research Findings Help?” The aim of the e-conference was to explore the linkages between research findings and the development of water sector policy through consulting widely with those who have relevant experience and views. The key findings of this e-conference inform the focus of a series of consultations currently being carried out in East and West Africa and the Mekong.

Potentials of Vertical-Flow Constructed Wetlands for Faecal Sludge Dewatering in Sub-Saharan Countries

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Vertical flow constructed wetlands are nowadays considered a low-cost and effective method to tackle the lack of faecal sludge (FS) treatment options in developing countries. Indeed, the vast majority of urban dwellers in these countries rely on on-site sanitation facilities for excreta disposal. A key requirement for sustainable management of FS is the development of efficient and low-cost methods for the separation of solid and liquid fractions. This step is essential in order to avoid hygienic problems and to permit the recovery of resources or energy. In cooperation with the Asian Institute of Technology (Bangkok), Eawag has previously demonstrated, especially in Thailand, that constructed wetlands represent a viable solution for FS treatment. However, the characteristics of sludge vary widely from one region to another, and appropriate indigenous plants need to be identified so as to ensure successful operation of these facilities.

After preliminary trials at the University of Yaoundé I (Cameroon) with four indigenous plants, *Echinochloa pyramidalis* (antelope grass) and *Cyperus papyrus* (papyrus) were retained as potential macrophytes and tested at yard-scale plant for FS dewatering. After 2 months of acclimatization with raw wastewater and 6 months of gradual increase of the FS solid loading rates (SLR), beds were fed weekly for another 6 months under constant SLR of 100, 200 and 300 kg TS/m²/yr solid loading rates. During this period, the performances of the system (expressed in terms of pollutant removal efficiencies, dewatering and clogging as well as macrophyte growth) were monitored weekly.

The studies showed that the papyrus and the antelope grass were suitable for FS dewatering at less than 100 and 200 kg TS/m²/yr, respectively. In the case of antelope grass, which is used as a forage plant worldwide, biomass production tripled, compared with natural habitats, to 100–150 tons of dry matter/ ha/yr. The biosolids accumulating on the top of the beds were found suitable for use as organic fertiliser (C/N: 11, N: 2%, P₂O₅: 2.3%). However, after the facility had been in operation for 6 months, the biosolids still contained a high concentration of parasites, particularly helminth eggs (79 eggs/g of total solids). Despite its frequent harvest, *E. pyramidalis* appeared to be a good common reed substitute for FS dewatering in an area where the latter is absent.

Assessment of Microbial Infectious Risks in Water-Related Peri-Urban Activities Posed by Domestic Wastes in Thailand

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Due to rapid urbanisation in recent decades, a number of peri-urban areas in Thailand are facing inadequate sanitation systems for management of domestic wastes such as solid waste, wastewater and faecal sludge, resulting in a widespread incidence of waterborne pathogens. The objective of this study is to estimate the potential infectious risks of water-related peri-urban activities due to contamination from water-borne pathogens. Klong Luang municipality, Pathumthani Province (a peri-urban community in Thailand) was selected as a study area. Presently, management practices for domestic wastes revealed in questionnaires indicated that 90% of wastewater in this area was directly or indirectly discharged into canals. *E. coli* was selected as a faecally contaminated indicator for waterborne pathogens. The Quantitative Microbial Risk Assessment (QMRA) method was employed to assess the infectious risks in water-related activities. Results from field observations showed that *E. coli* concentrations can range from 2.20E+04 to 2.60E+07 MPN/100 mL and 1.10E+06 to 3.50E+07 MPN/100 mL in domestic wastewater and faecal sludge, respectively. Likely due to the direct discharge of domestic wastewater and faecal sludge into irrigated canals, *E. coli* concentrations in canal water were found in the range of 9.00E+01 to 9.20E+04 MPN/100 mL. The contaminated canal water is typically used to irrigate vegetable farmland, resulting in *E. coli* concentrations on lettuce of 1.20E+01 to 6.65E+02 MPN/g. Based on the exposure doses obtained from field surveys, interviews and reviews, and a dose response model, the yearly risks from the presence of *E. coli* amounted to 6.20E-02, 6.18E-02, 4.50E-03, and 6.63E-03, resulting from several activities: swimming in the canal, fishing and vegetation in the canal, irrigation of farmland with canal water, and raw vegetable consumption, respectively. By comparison with the yearly acceptable risk of 1.0E-04 (USEPA, 1994), the infectious risks by *E. coli* due to these activities are higher, likely resulting in food and waterborne disease in this area. Results of health risk assessment by QMRA could help decision-makers to plan for the proper management practice or intervention in waste management practices in this specific area.

One Health: Bridging the Gaps in Health Services Delivery

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Arid and semi-arid regions include remote zones far from decision and planning centers. In these regions, the livelihood of the population (pastoralists) is based on extensive production systems with mobility as their main coping strategy. Considering their economic, institutional and political marginalisation, innovations are needed for their well-being. Health service provision to pastoralists is poor and women and children are particularly vulnerable to exclusion from primary social service – for example, owing to the fact that mobile pastoralist children and women are hardly reached by national immunization programmes. Pastoralist's needs in health service provision and the specific health hazards they face cannot be identified by biomedical rationality alone nor simply by taking a socio-cultural or ecological approach. Health determinants in remote rural zones depend on many factors such as mobility, the economy of livestock production systems, socio-cultural background, and political power. Thus interdisciplinary research approaches bringing together clinical, epidemiological, ecological, social and cultural disciplines are needed to launch a process of learning with all stakeholders. Joint human and animal vaccination campaigns in Chad have been successful in simultaneously delivering vaccines for children, women and livestock because this approach was proposed and accepted by all stakeholders. Health and veterinary professionals shared the same infrastructure to save costs through sharing or mutualisation. The 'one medicine' approach - combined human and animal health - is expanded towards a 'one health' approach by addressing pressing environmental issues. An overarching 'one health' framework offers good opportunities for operational research partnerships because it can provide evidence of the impact of strengthened health services among marginalised populations in terms of community development, local economy and environment sustainability. The challenge is to effectively involve decision- and policy-makers early in the process of intersectoral formulation of integrated strategies and policies to bridge the gaps in service delivery to hard-to-reach populations. We have good indications that the proposed approaches and tools are effective and provide evidence for the equity effectiveness of interventions. By using the "one health" approach for people and their livestock in a given environment, interventions are not only evaluated with regard to their performance with direct social-health impact indicators - e.g. reduction in mortality - but also with a holistic view that includes the effective impact on production and ecosystems using a combined impact assessment.

New Approaches in the Administration of Public Health in Pastoral Areas of West Africa

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In 1987, the Bamako Initiative was launched as a pragmatic strategy to implement primary health care in a sub-Saharan African context deeply affected by political and economic crisis. The aim was to help provide health care for all on the basis of self-promotion of community health. With this initiative, local communities would not only receive good quality services but could also play a leading role in managing their health units. However, some two decades after the launching of the Bamako initiative, the results are not satisfactory. Populations are even more vulnerable to many diseases. This is partly due to the fact that the health system based on communal health care centres is not suitable for everybody. It is well established and adapted to sedentary and high density populated zones but not to nomadic people.

The continuum of arid and semi-arid regions from Mauritania to Chad in Africa contains remote or hard-to-reach zones far away from decision and planning centres. In those areas, livelihoods are based on extensive production systems. Well-being is affected by remoteness, vulnerability to disease, and lack of services. Considering vulnerability and economic, institutional and political marginalisation, innovations are needed to secure livelihoods and well-being. This initiative was possible through inter- and transdisciplinary studies in the Sahel, and was validated through a series of multi level and multi-stakeholder workshops bringing together decision-makers and communities, helping to define intervention strategies according to particular contexts and policy options for social equity effectiveness.

Beside interventions such as joint human and animal programmes based on the “one medicine” concept, scientists, policymakers and pastoral populations increasingly agree on the need for more integrated approaches in provision of services in pastoral areas. Building on the conviction that health problems cannot be effectively tackled in isolation but in a cluster of activities, emphasis is now put on access to basic infrastructure such as markets and water.

Based on innovative examples from three Sahelian countries (Chad, Mali and Mauritania), the aim of this contribution is to demonstrate that the administration of public health in pastoral areas is taking new trajectories, focusing on the total well-being of the community. New strategies and policies are increasingly being implemented at the national and regional levels through intersectoral partnering (public and private service perspective) and integrated approaches that combine access to a peaceful environment, legal security on water and resources, infrastructures (water, market) and social services (health, education).

Joint Human and Animal Zoonoses Surveillance and Research in Kenya

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Zoonotic infections exert a dual burden on communities in developing countries, affecting both human health and animal productivity. The magnitude of this burden is unknown, as zoonotic infections in humans often present with non-specific clinical signs indistinguishable from malaria, without the aid of diagnostic tests. In animals, many zoonotic agents are abortigenic, causing loss of progeny and of milk production, but these adverse reproductive events are rarely quantified or diagnosed. In addition to providing an ideal environment for the transmission of endemic zoonoses, the close association between animals and humans in many developing country settings also provides opportunities for animal pathogens to ‘jump’ between species and emerge as novel human diseases.

Lack of integrated capacity and of institutional co-operation between entities responsible for animal and public health contribute to a lack of baseline data on the incidence and economic burden of these diseases, leading to low prioritisation in health care budgets and a spiral of decreased surveillance, diagnosis and emphasis. It is not surprising that endemic zoonoses are among the ‘neglected diseases of neglected populations’. Capacity for the surveillance and detection of disease emergence from animals is also lacking.

Within the research community, there is also a shortage of long-term integrated studies examining disease transmission and emergence within and between linked human and animal populations. The establishment of demographic surveillance systems (DSS), which follow and record the demographic and health outcomes for entire human populations in defined geographic areas, provides an ideal platform for conducting novel, integrated research in human and animal health. This paper describes the addition of an animal surveillance and zoonotic pathogen diagnostic component to an existing human morbidity and syndromic surveillance study in one such DSS area in western Kenya. The epidemiological study designs and research questions that such a platform is capable of supporting are presented and discussed.

Regional, Standardised, African Biobanks to Reduce Health Burdens and Promote North–South Partnerships

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The march toward personalised medicine is generating efforts aimed at optimising therapeutic compounds to take into account regional genomic and environmental traits. Protocols in pre-clinical and clinical studies are being harmonised into global standard operating procedures aimed at insuring optimal procurement, handling, processing and availability of high-quality assets for scientific and medical uses. Networks of standardised biobanks are a critical part of the toolbox of future medicine.

Although each biobank is developed for a specific purpose, many of the common activities will consist of procurement (prospective) of bio-specimens, processing and performance of associated assays, storage of specimens in controlled environments, and distribution, development and maintenance of secure, reliable and accessible databases, training of the user community, development of outreach programmes for the general public and medical establishment, and national and international collaborative scientific research.

Every single biological specimen is unique, even if taken from the same patient on consecutive days. Its contents are affected by the time and conditions under which it was obtained (and handled), as well as other factors such as lifestyle and diet. Its quality is not only reflected in its physical state/appearance but in how complete the attached information describing its entire life cycle is. The requirements are therefore clear: It is not enough to develop an appropriate infrastructure and capacity. Also needed is a robust quality management system (QMS) adhering to established international standards: Good Laboratory Practices (GLP), in a GMP compliant environment (Good Manufacturing Practices), and application of Good Clinical Protocols (GCP): This means complete and detailed traceability of a biological specimen from the moment it has been acquired until its time of use. In addition it must have been obtained with the patient's transparent consent while providing maximum privacy protection.

These efforts are supported by increasingly automated, electronically monitored processes. The resulting data (including images) are entered into relational databases hosted by redundant, highly secure servers, providing (appropriately restricted) access to biobank staff and authorised users from other stakeholders:

Specialty Teaching Hospitals, National Health Authority, Universities, Medical doctors, laboratory scientific staff as well as Pharmaceutical companies.

Health Perception and Healthcare of Tamasheq Women in Northern Mali

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At the mercy of a harsh ecological and economic environment, nomadic societies are repeatedly forced to migrate and relocate. Their mobility, their proximity to and dependence on their livestock, a traditionally dairy-rich diet and an arid habitat leave pastoral societies exposed to a variety of health risks reflected in one of the highest infant mortality rates in the world: up to 28% of children in the Azawad region of Northern Mali die before their fifth birthday.

Mali's community-based healthcare services are not geared to the nomads' mobile lifestyle, and the socio-cultural barriers in place mean that women and children in particular have virtually no access to external healthcare facilities. The present interdisciplinary case study on nomad women's general understanding of health issues and on diseases and their epidemiology not only serves to fill a knowledge gap. It is also fundamental to building socio-cultural awareness and defining local health strategies which could help concerned authorities and organisations to develop a reliable medical care system.

A society's needs and the indigenous risks it faces cannot be identified by biomedical rationality alone nor simply by taking a socio-cultural approach. For this reason, local health determinants in the nomadic milieu of the Tamasheq are ascertained and interpreted with the aid of interdisciplinary research methods, combining clinical and epidemiological studies with their cultural and linguistic counterpart.

Tamasheq women's interpretation of illness is that it is a means of testing and cleansing or that it is sent down as a divine punishment. They not only associate illness directly with divine creative power; they also believe in the miraculous nature of healing, which they do not believe can be explained by physiological factors alone. Religious attitudes about illness and healing are more important than choosing the right treatment. Tamasheq women regard their reproductive years as a time of the greatest risks and the most illnesses. They do not go for prenatal examination to a health centre, and childbirth always takes place without medical assistance in their tents. The high rate of infant mortality shows that infants and toddlers are extremely vulnerable, and the number of listed diseases does not begin to decline until a child is around five years of age. Immunisation programmes do not reach the nomadic population of the Azawad, and infectious diseases are regarded as the greatest health problems of Tamasheq children.

Natural Resources in Sustainable Development – Re-Arranging the Deck Chairs

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Renewable natural resources – land, water, air, soil, plants, animals and trees – are the natural capital assets that support the well-being and livelihoods of people, directly and indirectly. Some are treated as ‘free goods’ to be used at will; others have access controlled; yet others are privately owned. In any of these situations mismanagement may occur leading to natural resource degradation. There are no universal solutions for how best to position these deck chairs on the sustainable development ship. Yet, ultimately, all natural assets are part of the global environment. Through investments in improving natural resources, synergies and co-benefits potentially abound between scales from local to global and between development and environment. Somebody, often the rural poor, acts as guardians. But sustainable development benefits all. Amidst this complexity and uncertainty, how can the use and management of natural resources contribute to sustainable development? Science claims the answer.

Since the invention of ‘ecology’ in 1866, science has modeled nature in many ways. Starting from a focus on description of process and biophysical inter-linkages, we have now moved to more functional models that try to promote better use of natural resources. Agro-ecology was, for example, the fashion of the 1980s, promoting land use that more closely mimics nature. Functionality comes at a cost, however. The current vogue of ‘integration’ – environment with development; social with natural sciences; ‘syndrome context analysis’; and many other manifestations – are extremely difficult to organise and sustain. The proverbial deck chairs are being re-arranged faster and faster – into ‘integrated ecosystem management’, ‘community-based natural resource management’, ‘sustainable forest management’, ‘watershed management’, ‘landscape planning’. Is our Titanic to hit an iceberg, or will we sail onto a blue horizon of new opportunities guided by our ‘science’ pilot. Our speakers in this session will enlighten us.

Finding Homogeneity in Heterogeneity: Reconnecting Knowledge and Decision-Making for Human-Environmental Systems

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In mainland Southeast Asia, current regional economic differentials between less developed Laos and Cambodia and more highly developed nations such as Vietnam, Thailand, and Southern China, induce strong and rapid changes in economic, social, and environmental development. Current economic growth rates in Laos of 8% of the GDP offer undeniable opportunities but also great challenges for development. While investments in hydropower, agribusiness and mining are rapidly changing the Lao landscape, government and international agencies concerned with sustainable development are increasingly challenged to take decisions rapidly and shape policies for a country that is becoming increasingly heterogeneous in terms of development potentials and problems. At a time when a better understanding of processes and spaces would be crucial, there is a growing disconnection between knowledge and decision-making.

This paper presents the research initiative of the NCCR North-South in Laos, aiming to reconnect knowledge production with decision-making for coupled human environmental systems. It has developed an approach that makes it possible to characterise key indicators of sustainable development at meso-level in terms of the spatial coverage and in terms of balancing generalised and universal knowledge with highly contextualised and specific knowledge. Key indicators for spatial patterns that can be described at the highest possible resolution are: (a) landscape mosaics representing the trade-off between using land resources for agriculture and conserving the vegetative cover; (b) the density of poverty incidence at the level of each village; (c) the presence and interventions of different types of stakeholders and how their interests and activities influence the observed landscape mosaics and poverty outcomes.

Preliminary research results are presented for each key indicator, offering answers to often fundamental questions such as: how many people still live from shifting cultivation and how much area does this occupy? Are these people poorer than people practicing permanent agriculture? What part of the population is approximately within reach of government policies and new markets and what part is probably still completely autonomous?

Based on initial answers in these three fields, we search for recurring linkages between the key indicators. Using overlays, we try to describe a spatial typology of contexts that have similar potentials and problems with respect to sustainable development. This knowledge not only supports decision-making but also allows better valorisation of existing case studies and macro-level investigations.

Global Land Uses – Complex Processes of Change in Coupled Human–Environmental Systems

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Human-driven change in the terrestrial surface has a wide-ranging influence on the functioning of the Earth System. The intensity of land cover change has increased rapidly over the last three hundred years, driven by population growth and higher living standards. Expansion of agriculture and deforestation has significantly altered the environment and affected greenhouse gas emissions, biodiversity, and the ecological services provided by the terrestrial environment in more general terms.

Recent development in land cover data sources enables us to obtain a reasonable overview of global changes in land cover. Much less, however, is known about change in land use practices and agricultural and forest management that impact ecological services.

The complexity of causes, processes and impacts of land use change calls for a comprehensive framework to understand the human decisions that drive global changes. Specific challenges are related to factors such as the globalisation and ‘export’ of land use disconnecting places of consumption from production, and to the multiple (and changing) scales of economic, institutional and cultural structures that enable and constrain land use choices.

Challenges to the Uptake of the Ecosystem Service Rationale

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Ecosystem management emphasises ecosystem service concepts to improve land management and justify conservation. This approach rests on the assumption that conserving ecosystem services can deliver net benefits for human welfare, which at its most basic is measured in terms of economic development. To retain credibility, these arguments must recognise the constraints that may limit the reliability of this assumption, including trade-offs with other land-use benefits. The fact that ecosystem service concepts have not been well integrated into management implies that such initiatives have not been persuasive among land managers and agriculturalists. These ideas are illustrated by evaluating the current concerns over declining pollinators and the apparent loss of pollinator services, a crisis resulting from modern agricultural practices, habitat degradation, and introduced pests and diseases. It is argued that we should be careful in applying ecosystem service concepts without a full evaluation of the economic circumstances within which people find themselves.

Climate Change and the Prospects for Renewable Energy in East Africa

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Projected global climate changes as contained in the recently released Fourth Assessment Report of the IPCC (2007) reveal a very troubled future for energy production and consumption in many of the poorest developing countries of the world, such as those in East Africa. Most of these countries require even more intensive energy development to enable them to escape from their extreme vulnerability to the impacts of climate change which include, among other things, droughts and floods in addition to extreme water stress in some cases. In each of the three East African countries of Kenya, Uganda and Tanzania, biomass energy accounts for close to 90 percent of the energy consumed by the vast majority of the rural population. Efforts to increase the availability of electricity obtained from hydropower stations will be frustrated by uncertainty about the continued availability of river water in the next thirty to fifty years, as global warming begins to impact. Renewable energy offers the best hope in situations like this, and the potential for its development and expansion in the region is good. New initiatives could start from the well trodden path of biomass-based renewable energy, which could be upgraded using biomass energy conversion technologies. Other potential areas for development include wind energy, which is suitable for decentralised settlements, photovoltaic solar energy, which is already being used in Kenya and Uganda, hydropower-based energy, which is the current main source of installed electricity for urban centres, and geothermal energy, particularly in Kenya's Rift Valley. There are also opportunities for co-generation in sugar cane growing areas. As temperatures continue to rise, all these potential sources will have to be developed to provide energy alternatives for this needy sub-region of Africa.

Participatory Natural Resource Management – An Innovative Methodology for Sustainable Pasture Management

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While the sustainable management of natural resources is a common target of many large development projects frequently sponsored by international donors, concrete methods and tools for implementing the approach are lacking. This study elaborates on an innovative methodology for integrating biophysical, socio-economic and institutional elements into a participatory pasture management planning system. After an exploratory integrated survey meant to identify the appropriate planning unit(s), local herders are guided in selecting appropriate indicator species for pasture monitoring. Simultaneously, the current seasonal occupation and utilisation pattern is assessed for improved future management planning. The capacity of the strategically selected herders is built in order to evaluate grazing land conditions, and facilitated to devise a rehabilitation and/or sustainable management strategy. The main innovation consists in simplifying and modifying the classical conservation monitoring tools to a herder-monitoring tool based on participation. In this process, the trained herders assess the relative availability of key indicator species, the calculated stocking capacity of different management units, and current stocking. Ultimately, this enables the local pastoral institutions to monitor the pasture conditions and to eventually re-adjust the pasture occupation and utilisation strategy. The re-adjustment also requires integrating cropping, intensive feeding, livestock breeding, pastoral product marketing, livestock and herder health, institutional arrangements and occupation patterns as complementary elements of a trans-disciplinary understanding for effective participatory planning at village, valley or watershed level, as elements of pastoral production system. An essential pre-requisite of the method is the establishment - through herders and external support – of a baseline consisting of biophysical, socio-economic and institutional aspects.

The paper will present experience gained in two pilot projects where participatory pasture management (assessment, planning and monitoring) has been applied. The test valleys are located in the Hindukush mountain range in Pakistan with conditions comparable to those in parts of Central Asian's mountain territory.

The Contribution of Biotechnology to Problem-Solving in Africa: The Case of Cassava

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Even though cassava is amongst the most important staple crops in Africa, cassava research has been neglected in recent decades. It has left the cassava community with scarce information regarding cassava plant physiology, crop behaviour in stress conditions, and susceptibility to various pests and diseases. However, cassava production is facing increasing stress such as virus infection, drought, and post-harvest physiological deterioration. These factors all have a direct impact on cassava production and distribution. Therefore it is important to elaborate strategies for cassava improvement and generation of cassava cultivars that can cope with a challenging environment. Characterisation and understanding of cassava plant behaviour under stress conditions is the first steps towards sustainable crop improvement.

In our lab, we are using proteomics and transcriptomics technologies to evaluate cassava behaviour under stress conditions. Access to the latest technologies is of primary importance in implementing cassava crop improvement programs. We are currently generating transcriptome and proteome data that allow us to investigate stress resistance mechanisms. Additionally, our lab has long expertise in cassava transformation. Transgenesis represents a tool to validate the results obtained with the aforementioned techniques. This approach has also led to production of transgenic cassava lines with improved resistance to biotic and abiotic forms of stress.

Our multidisciplinary and multi-level approach also offers an opportunity to scientists from tropical countries to gain access to technologies that are currently not available for plant research in their home country. This is an important step for research capacity building in countries where cassava crop research and improvement is needed.

An Efficient Approach for Monitoring Land Resources at a Regional Scale

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Soil degradation processes are vicious circles triggered by land cover / land use changes. Assessing and monitoring land resources is important to improve our understanding of the effects of land use on soil resources, in order to support sustainable land management (SLM). As a basis for planning of SLM, datasets at the regional level are crucial. However, up-to-date data on land resources at the requested level is often rare in developing countries, as the example of Tajikistan shows. Especially challenging when elaborating regional datasets are (i) the low quality of readily available / low cost spatial data and (ii) heterogeneous landscapes. Thus, effective methods are needed, suitable for such conditions. The aim of this study was to adopt, adapt, combine and develop methods for efficient assessment and analysis of land degradation and conservation at a regional scale.

A data-driven, scientifically rigorous approach was adopted to conduct spatial land resource assessment and allow for impact assessment. Specific methods applied included, on the one hand, soil reflectance spectroscopy for prediction of soil properties for large numbers of soil samples. On the other hand, classification and regression tree modelling was chosen as a non-parametric approach for mapping. Furthermore, the hot/bright spot concept was adopted. For map information to be most useful for planning, it should provide a basis for prioritisation of SLM activities. Different levels of degradation and conservation, from hot spots of soil degradation to bright spots of soil conservation, were expected to fulfil this requirement. Additionally, by setting the focus not only on soil degradation but also on well-conserved soils, it was expected that crucial information for SLM planning would be obtained.

The results of the study showed that the elaborated soil spectral library for the loess hills of central Tajikistan allows for low-cost and rapid determination of soil organic carbon (SOC) content. Classification tree modeling not only allowed land resource mapping in heterogeneous areas, but also made it possible to derive rules to support SLM implementation. The hot-bright spot matrix developed proved to be a straightforward and flexible method, as it is applicable to semi-quantitative data as well as to field and raster data. The maps elaborated for erosion occurrence and “low” and “high” SOC content classes provide a baseline that enables future evaluation of the land conservation efforts currently being undertaken in the hills of central Tajikistan. Further, the hot/bright spot map is expected to be a valuable basis for planning of SLM, providing information on the state of soil resources at a suitable level of detail for regional assessments.

Livestock Systems in Support of Poor People

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Over the last three decades the agricultural sector has undergone severe changes, one of them being the so-called “livestock revolution”. Due to urbanisation and population and income growth in many developing countries, the demand for animal-source food has increased more than proportionately. Soon, the livestock sector will contribute 50% of global agricultural output in terms of value.

Livestock contribute to the livelihoods of an estimated 70% of the world’s rural poor, providing income, representing a valuable asset, improving nutrition, and creating employment opportunities. However, smallholders benefit less than proportionately from the growing livestock sector due to unfavorable policy frameworks and market forces.

By contrast with its economic and social benefits, the expanding livestock sector is putting the natural resources base under severe stress, e.g. as a result of overgrazing and deforestation for the production of animal feed as well as through air, soil and water pollution from intensive livestock production systems.

The North-South Centre at the ETH Zurich responds to these opportunities and challenges by focusing on livestock systems research to support poor people. It identified five interdisciplinary thematic programme components along the value chain: livestock and environment; fodder resources and feeding strategies; animal production and health; food quality and public health; livestock-based value chains and policy analysis.

Examples are the integration of canavalia, a legume cover crop in Nicaragua to improve soil quality and fodder production; improved sheep nutrition on non-conventional feeds, such as by-products of the food industry in Syria; and the treatment of camel milk for increased hygiene in Kenya.

The examples illustrate on the one hand the richness of knowledge, research approaches and partnerships, and on the other hand the challenges of programme research in a university environment.

The programme puts special emphasis on ensuring that projects combine scientific rigor and quality with participatory approaches and implementation measures in the partner countries.

The Role of Urban–Rural Linkages in Transforming Subsistence Agriculture and the Environment: The Case of Ethiopia

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Rural-urban interactions are important elements of livelihood strategies in both rural and urban communities, either in the form of flows of people (migration), natural resources, products, goods and services, information and money, or in the form of income diversification. However, general trends show that the development practices and policies of rural and urban systems are often treated in isolation. This has undermined the potential for improved linkages between the two spatial units in relation to social and economic transformation. In reality, however, rural and urban systems need each other to perform their function well and develop symbiotically. Urbanisation in Ethiopia, which is one of the key elements of transformation, is highly skewed. Assessments show that urbanisation in the country is on the rise but still in its infancy; only 15% of the total population is urban, by far lower than the average for Sub-Saharan Africa, which is between 37-40%. The capital city accounts for nearly one quarter of the total urban population, which is only 12 million, and the country has only eleven cities with a population of more than 100,000 inhabitants. This is a typical primary urban situation where secondary cities and small cities are less dynamic in terms of supporting urban functions. As a result, functional relations between smaller urban centers and their surrounding rural areas are poor. We therefore present a comprehensive framework for rural-urban-linkage with the aim of enhancing views, deepening insights, bringing together actors from all sides, and helping to improve the overall conducive climate for the provision of services and a more optimal mix of supply and demand between rural towns and rural hinterlands, thereby transforming smallholder farming and fueling overall economic growth.

Key words: rural-urban-linkage, smaller rural towns, transformation, smallholder farming

Mesoscale Approaches to Land Cover Change in the Lower Mekong Basin

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Unchecked economic and population growth over the last three decades has left scars on the landscapes of the Lower Mekong Basin (LMB). Widespread deforestation and rapid land cover changes have deprived structurally advanced Thailand and Vietnam of large parts of their original forests. The ongoing economic opening of Cambodia and Laos brought about by recent political trends, coupled with enormous economic growth in the entire region, puts the remaining forests in the centre of the Basin under ever-increasing pressure. As the riparian countries of the Lower Mekong Basin share a common resource pool, and consequently also the environmental impacts of land cover change in a watershed context, it is crucial that comprehensive and comparable information on land cover status and land cover change becomes available for the entire Basin on a mesoscale level.

The study argues that, while they are of major policy relevance, regional-level or mesoscale approaches offer a large potential for land cover research as well. The mesoscale is highly appropriate for amalgamating the contrasting concepts and methods of both locally oriented and large-scale research realms. Furthermore, the mesoscale allows the multiscale nature of land cover change processes to be taken into proper account: On this scale large-scale external driving forces may still be detectable before disappearing in the heterogeneity of the local context, and local conditions may not yet have been aggregated to a level where the respective processes or proxies forming them are no longer recognisable. It was, for example, possible to confirm the global tendency that logging paves the way for agricultural expansion for the LMB. In all riparian countries besides Thailand, the increase of permanent agricultural areas is largely attributable to prior logging. There are, however, signs that the enhanced integration of Laos and Cambodia into the regional and global economy is leading to increased direct conversion of secondary forests to cash cropping (e.g. rubber plantations). Secondary forests and shrubby vegetation types show in general by far the highest level of human interference of all types of woody biomasses. Considering the ecological value of these vegetation types, as well as their importance for the livelihoods of the rural population in the Basin, greater emphasis has to be placed on the sustainable management of the areas concerned.

Regional Development and Sustainable Resource Management in Ewaso Ng'iro Basin, Kenya

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The goals of regional development in Kenya have been pursued through a mixture of approaches since independence: from top-down to bottom-up, and at times a combination of the two. In each case, there have been corresponding strategies designed to guide implementation of the desired interventions.

Previously, the District Focus for Rural Development Strategy (DFRD) launched in 1985 was the top-down framework implemented through the Provincial Administration. And, although still in force, the DFRD strategy seems to be overshadowed by the recently introduced Constituency Development Fund (CDF), a highly politicised parliamentary outfit channelling development funds through sitting members of Parliament. Providing the springboard for these strategies are policies such as Sessional Paper No. 1 of 1986; No 1 of 1999; the National Poverty Reduction Strategy Paper 1999(?); Employment Creation and Wealth Generation Strategy 2003; and the Vision 2030, among others.

In spite of the recent reforms in the public sector, most of these policy frameworks are characterised by a range of contradictions with decision-making procedures and the principles of participatory development. Furthermore, there exist conspicuous differences between normative settings (Water Act, Forest Act etc) and actual practices in the relevant institutions. Nevertheless, their common denominator is in the areas they target for intervention, primarily improved rural livelihoods and reduced poverty levels through development of water, livestock, crop, and non-farm/non-pastoral income generating activities, among other sub-sectors. These are regional development sectors that are largely land-based and therefore dependent on natural resource endowment in the concerned areas. Therefore, pursuance of regional development goals based on these sectors, and in such a policy framework, has in most instances impacted negatively on the management of natural resources.

This paper critically examines Kenya's regional development policies (approaches and strategies) and how their implementation has affected sustainable resource management in the upper Ewaso Ng'iro basin in the north of Mt. Kenya.

International Payments for Ecosystem Services (IPES)

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Payments for ecosystem services (PES) have recently been gaining increasing attention as a promising new environmental policy instrument. With various programs and pilot projects underway around the world, the need for institutional support for PES at the global level is increasing. This is because the Millennium Ecosystem Assessment (UN 2005) found that 60% of global ecosystem services surveyed are currently being degraded or used unsustainably.

This is mainly due to the ecological consequences of the utilisation of natural resources to satisfy the growing worldwide consumption of goods and services in the private sector. The increasing intensity of resource extraction, land use and water use is having impacts on biodiversity and ecosystems and ecosystem services. Due to the globalised trade in commodities, such ecosystem damage not only occurs in the countries where consumption takes place, but also in countries from which commodities are sourced and land and water is intensely used for their production. For this reason there is a growing need to look at the international aspects of ecosystem services, either in terms of positive externality or negative impacts on ecosystem services. Domestic land and ecosystem accounts also need to be complemented with information about foreign land use flow and ecosystem service flow.

In such a new and fast-growing field, there still remain important challenges to overcome before PES are widely applied at the international level. Challenges to the development of international payments for ecosystem services (IPES) are present both on the supply and demand sides. Also, the institutional support necessary for joining these two main components together is still not in place at the international level. Indeed, policy-makers, practitioners, and researchers need to understand interference in the supply and demand for ecosystem services in relation to global changes in markets, land use and climate when addressing the future development of IPES.

The goal of the present study is to introduce the IPES concept, which is currently being developed by an expert group lead by UNEP, and to contrast it with international schemes for offsetting negative impacts on ecosystems and biodiversity.

Communicative Sustainability as a Prerequisite to Sustainable Development: The LAGSUS Experience

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As a result of extended field research in four countries of Africa and Asia sponsored by the Volkswagen Foundation under the title “Language, Gender and Sustainability” (LAGSUS, 2003-2007), Communicative Sustainability (CS), originally referring to the shift from exogenous to endogenous sources of innovative messages as a prerequisite to sustainability (Bearth 2000), was extended to denote the combined set of communicative factors that affect the adoption and implementation of development-related action. Its ramifications incorporate theorems such as correlation between the scope of negotiation and sustainability, and the inversion of language dominance relations as a factor in the empowerment of local populations.

The related “language as a meta-resource” concept grew out of an empirical fieldwork from 2004 to 2007, particularly among the Tura in rebel-held Western Ivory Coast. It claims in substance that the optimal use of natural and human resources, including those essential for implementing the MDGs, depends on strategies of optimisation of communicative resources, among which small-scale investment in local language figures prominently.

The konon protocol of the Tura (Bearth/Fan 2006) as a prototype of a communicative meta-resource is also a procedure for the collective appropriation of innovative content as illustrated by the renewal of local commitment to the ecological concept of the EU sponsored Mont Sangbe National Park, in the midst of crisis threatening its virtual destruction through reckless poaching and resettlement (Baya 2008a/b). Currently, the expected relaunch of the Park and its peripheral zone provides the experimental setting for a prototype of an inclusively negotiated concept defining the balance between economic needs and ecological imperatives in a context of extreme, war-induced poverty.

The institutional vacuum engendered by the crisis also provided the experimental context for testing the value of collaborative research whose catalytic effect meant that a prevailing victim mentality, apprehended as data, was subject to critical inquiry by local audiences themselves, and an eye-opener for regaining an actor perspective already during the pre-postcrisis phase, coupled with a conceptual shift from the French-plus-translation axiom to a local-language-plus-writing axiom as a basis for local development initiatives. Rather than drawing hasty generalizations from a single though pertinent case, the paper will end in proposing (i) a transdisciplinary tool for testing its relevance under varying conditions, (ii) an amendment to the relevant passage in the kfpe guidelines (p. 24), taking into account convergent working hypotheses from LAGSUS and similar research. (References: see www.lagsus.de/publications)

An Ethnoecological Approach to link Traditional Ecological Knowledge and Ecosystem Diversity in a Protected Area

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In the last two decades a new approach has emerged in the management of protected areas, which seeks to enhance both cultural and natural heritage, promoting reconciliation between the conservation of biodiversity, the use of resources and participation by the local population. The objective of this research was to analyse the links between traditional ecological knowledge (TEK), land use, and ecosystem diversity at local level in the case of the Tunari National Park (Bolivia). These links provide a basis for the promotion of sustainable development, understood as results emerging from the dialogue between scientific and traditional ecological knowledge. The study takes an extended ethnoecological approach, in the sense that it considers TEK used by peasants to plan land use practices and specific scientific ecological knowledge (SEK), used to assess ecosystem diversity, as representations of different forms of knowledge with their own fundamental principles. Results show that land use builds on the foundation of TEK: the lack of separation between the natural and the human world expressed in peasants' TEK implies an integral, extensive and diversified use of natural resources. Areas with extensive use also have the highest diversity of plant communities, suggesting that the "intermediate disturbance hypothesis" known for species may also apply to ecosystems. An analytical framework has been developed to compare the different dimensions of TEK and SEK, showing fundamental differences in the construction of knowledge, but converging values for ecosystems characterised by "intermediate disturbance". Main recommendations include supporting more cultural landscapes and extensively used ecosystems, broadening dialogue between forms of knowledge, to their foundations, and up-scaling the ethnoecological approach to the meso and national levels.

The Challenges of Accounting for Non-State Actors: The Case of Chile and Bolivia

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We will grapple with some of the challenges of accounting for the role of non-state – business and civil society – actors in the politics of development. We will take as our frame of reference the changing coordinates of trade and development in Latin America, and specifically the cases of Chile and Bolivia.

The Roles of Researchers in Co-producing Knowledge

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We postulate that sustainability research aims at more sustainable paths of development through co-production of knowledge between scientists and non-scientists. Because of the normative framework of sustainability, co-production of knowledge poses specific challenges for sustainability research: (a) advocating the co-existence of thought collectives and helping to make these explicit; (b) interrelating the perspectives of the different thought collectives on the issues at stake; (c) ensuring that the orientation towards sustainable development is maintained; and (d) making power issues explicit. A systematic comparison of four sustainability research projects in Kenya (vulnerability to drought), Switzerland (soil protection), Bolivia and Nepal (conservation vs. development) shows how the projects handled these challenges. The discussion considers the roles in which the challenges were addressed by researchers, i.e. the Sustainability Researcher, the Intermediary and the Facilitator of a Learning Process; it also focuses on the crucial issue of power that usually remains unreflected in sustainability research. The paper also positions itself within the conceptual debate on research for sustainable development and draws methodological conclusions on knowledge co-production.

Networked Research: An Innovative Approach to Bridge the North–South Gap

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Research is one of the strategic objectives of the International Forum for Rural Transport and Development (IFRTD), a global network with the overall goal of reducing poverty and isolation by improving access and mobility for the rural poor in developing countries. The IFRTD-pioneered networked research methodology has enabled the network to meet the challenge of ensuring that IFRTD's research is relevant to and used by poor people and/or the organisations working with them.

Networked Research focuses on the research 'process' as much as the 'outputs' and this begins with the setting of the research agenda. IFRTD is committed to a Southern-driven development agenda and recognises that the direction of development research is dictated by the interests of those able to fund it. As such IFRTD actively encourages its Southern constituency to use the IFRTD network as a means to gather a critical mass of stakeholders around an issue in order to advocate for its inclusion on the international research agenda.

Once the agenda for research is set IFRTD seeks to build ownership of the research programme and its communication into the research design itself. Networked Research brings together people from different countries or contexts that are, at some level, engaged with the research issue. These researchers are given the opportunity to work together face-to-face in workshops as well as virtually to develop a common analytical framework, to cross-fertilise one another's work, to complement each other's research capacities and to participate in the synthesis and bringing together of the key issues. This participatory approach of the research framework encourages ownership of research and findings and stimulates debate at local and national level. It also establishes a small international community of practice that strengthens the research capacity within countries by unearthing local knowledge and experience and building upon latent research skills.

The synthesis, communication and dissemination of networked research is viewed as an opportunity to widen the community of practice interested in and taking ownership of an issue. IFRTD does not assume any institutional ownership of the research and researchers are encouraged to take the issues forward either through further dissemination, advocacy or practical projects, with the ultimate goal to leverage change!

Mountain Communities of North Caucasus: Disappearance or New Stage of Development?

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An integrated study of North Caucasian rural mountain communities, in their socio-economic context, and an appraisal of options for sustainable development were carried out by a joint Swiss-Russian Project under the SCOPES program. The project includes research and applied components as mutually complementary activities. The main questions under consideration were: Is it possible to have a sustainable future in mountains? What kind of information should be analysed to answer this question? How can participatory tools be adapted to local features to promote sustainable development?

The downfall of collective farming and the transition to a market economy resulted in a renewed outflow of mountain populations and changes in land use and lifestyle. An ancient cattle-breeding Galiat Community, North Ossetia, was selected for a case study. Formerly wealthy and densely populated, Galiat has rapidly been losing population during the last 10 years. Despite an increase in private livestock, depopulation is a basic limiting factor for rational mountain animal husbandry. Lack of public solidarity and ignorance in legal matters hinder cooperation in solving market problems. These factors, along with a loss of environmental skills, can be considered as direct indications of crisis.

A small project as a tool for participatory definition of the crucial problems and for increasing population activity was tried out in Galiat, traditional social and gender behaviour being taken into consideration. Improvement of the village area was chosen by villagers as a first step to rural tourism development. Villagers realise that a new strategy of development is required; farming and tourism, supporting each other, would ensure steady income and maintain environmental conservation.

The current socio-economic situation in the mountain regions of North Ossetia can be defined as a “point of bifurcation”: what next? Crisis and depopulation, or a new stage of development based on private initiative and responsibility? The traditional mono-functional economy has no more development potentialities, and the local population is unable to expand economic functions independently. At the same time there is evidence that passive economic behaviour is giving way to adaptive behaviour, and economic activity is responding to infrastructure and power improvement. Elaboration of a special program of mountain development, including economic and human factors, is an urgent demand. A Local Agenda 21 elaborated at the local level would be a positive step. Initial experience has already been gained in the Caucasus (REC Caucasus - Russian REC, project “Sustainable Development of Mountain Regions of the Caucasus – Local Agenda 21”), and it has been taken into account in our work.

Ethnicity Displacement and Conflict

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The roots of ethnic conflict in the Chittagong Hill Tracts (CHT) might appear differently to different people depending on the nature of the perspectives involved: logical, humanitarian, sociological, anthropological, economic, political or otherwise. Nevertheless, this paper attempts to examine the displacement of the indigenous population of the CHT, a region in the southeastern part of Bangladesh that has only recently emerged from two decades of insurgency through the signing of a peace accord in 1997. The first phase of displacement occurred during Pakistan regime in 1960 through the establishment of Kaptai Dam. After the independence of Bangladesh in 1971, state sponsored population transfer (1979-1984) led to massive displacement of indigenous people from their ancestral land. Displacement from customarily owned and in some cases from recorded land has increased indigenous peoples' economic hardship and cultural and political insecurity. In many instances the dominant Bengali settlers, in collaboration with law enforcement agencies, are displacing the indigenous population from their land by using violence.

This study is oriented around open-ended in-depth interviews and also uses information from various secondary sources. The key findings show that displacement in particular has contributed to adverse impacts on the indigenous population. In terms of addressing the violence committed against these indigenous people by the Bengali settlers, the local indigenous leaders and the government seem to have done nothing to provide justice for the indigenous peoples. The CHT accord and the Regulation of 1900, which is the main legal instrument under which the region is administered, are yet to be effectively used to safeguard the interests of the indigenous population in the region.

The Impact of Climate Change on Human Settlements in Kenya: An Analysis of Vulnerability and Adaptation Strategies

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Kenya is a country of great disparities in natural and human landscape. These are the consequences of its location astride the equator and bio-physical, socio-cultural, economic and political factors. The objectives of this study are therefore to examine the impact of climate change on human settlements in selected regions of the country, and to identify the nature of vulnerability and adaptation strategies in such landscapes. The methodology used is library research supplemented with data collected from field surveys. Only three climatic hazard indicators, namely floods, droughts and landslides have been used to show the impact of climate change on settlements. Also, projected population up to 2010 has been statistically plotted against different climatic hazard change scenarios to produce expected spatial vulnerability changes. Features of traditional and modern adaptation strategies used are also discussed. The study shows that today 30% of the population lives on 70% of the total land area, which is arid and semi-arid. 69% of all households use firewood, 31% have access to piped water, 48% live in houses with mud/wood walls, and 46% earn less than a dollar per day. This human landscape indicates that Kenya is poorly adapted to climatic hazards. With 75% of the population dependent on agriculture, which also accounts for over 60% of GDP, the onset, amount, intensity and distribution of rainfall exacerbate vulnerability in livelihoods and human settlements. The major areas prone to floods are: Winam Gulf of Lake Victoria, parts of Western province, the Coastal region, and the floodplains in drylands. All these regions have experienced 6 major floods in the last 50 years. Floods also affect informal settlements in the major urban centres and are associated with the El Nino Phenomenon. Drought is more prevalent, affecting mostly provinces such as the Eastern, North-Eastern, the Coast and parts of the Rift Valley provinces. Drought has taken a 10-year cyclic pattern in the country since 1928. Between 1964 and 2004, 11 incidences of drought were recorded. Massive loss of human life and livestock were experienced. Landslides are common in areas with high population density over steep slopes in Nyanza, Western, Central and the north Rift Valley provinces. The El Nino rains of 1997/98 enhanced the risk of landslides in Central Province. There is evidence that increasing climatic hazard events will increase regions vulnerable to climate change. Traditional adaptation strategies include: nomadic life-styles, informal environmental education, engagement in non-agricultural activities, and migration to urban centres. Modern adaptation strategies mostly consist of government policies and establishment of new institutions, which are discussed at length.

Improved Soil and Water Conservation Technologies for Sustainable Agriculture

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Soil is the greatest gift of nature, the source of our well-being. Sustainable development depends on many factors, but the most important is enhancing soil quality. There is increasing evidence in Tajikistan that human activities are a leading cause of soil degradation, erosion, salinisation, pollution, and compaction. In this paper, we emphasise some soil conservation technologies in rainfed areas, and approaches to the reclamation of saline soils and for the sustainable use of soil resources in Central Asia.

This paper presents summary results of testing strategies for better on-farm management under conditions found in irrigated and rainfed areas. The strategies comprise testing of improved micro furrow irrigation for field crop irrigation (cotton) and an advanced drip system on persimmon orchards combined with intercropping practice, which aimed to optimise resources use and maximise economic returns. The research was conducted on heavy loamy soil in Hissar valley of Tajikistan during 2003-2005 for field crop irrigation using alternate furrow irrigation and gravity drip irrigation on a sloping area of Khuroson, during the 2001-2002 season. Both experimental sites are agroecologically representative of large irrigated areas in the region. The objective was to assess the influence of improved micro furrow irrigation on the efficiency of water use, evapotranspiration, soil water and salt balance, and yield of raw cotton. Micro furrow irrigation was highly efficient on heavy loamy soil and did not require additional investment. This technology improves conditions for conducting irrigation, reduces irrigation rates by about 30%, and reduces pressure on a drainage system by about 40%. The gravity drip system was tested for irrigation of young persimmon orchards and intercropped melons in a 1-ha area. The research data showed that growing intercropped vegetables between young persimmon plants permitted full recovery of expenses for capital installation of the gravity drip system during the first two years. The study indicated that free marketing of agricultural products becomes very important for wide dissemination of advanced irrigation technologies.

Low water-use efficiency and soil erosion are the main constraints on improved agricultural production in the sloping areas of Tajikistan. The soil degradation could be arrested by introducing water-saving and soil conservation technologies such as strip cropping, supplemental irrigation, and mulching. Strip cropping and mulching were tested in a semi-humid zone at Faizabad site. The objective of this research was to assess the influence of strip cropping on water harvest and combating of soil erosion. Using sloping areas for growing wheat has resulted in an increase in soil erosion of 50% compared to natural vegetation. Supplemental irrigation and different mulching technologies were practiced to grow trees on terraces in semi-arid zones at Fakhrrabad site.

Sustainability Assessment

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As a result of global change, in particular climatic change, loss of biodiversity and desertification and the corresponding and very real economic, ecological, social, political, and cultural problems, science is facing unprecedented challenges in working towards solutions. The need for reform and viable alternatives to the way science produces knowledge becomes particularly obvious in the context of development issues and in research partnerships between North and South. A different form of knowledge production for sustainable development - which, following the definition of Kates et al (2000) can be understood as “sustainability science” - needs to be developed.

“Sustainability science” seeks to understand the fundamental character of interactions between nature and society and harness science and technology in the quest to achieve transitions to sustainable development. Its approaches encompass the interaction of global processes with the ecological and social characteristics of particular places and sectors, and integrate the effects of key processes across the full range of scales from local to global.

A new approach for sustainability science was developed within the recently concluded EU MATISSE Project, which aimed to contribute to sustainability-oriented governance by providing innovative methods, tools and process-architecture for conducting Integrated Sustainability Assessment (ISA).

ISA is intended as a pro-active, strategic and potentially transformative process to give an explicit sustainability orientation to policymaking and other undertakings concerned with the development of social-ecological systems. Such undertakings would be expressly intended to address persistent complex problems of unsustainable development and to take up opportunities for more sustainable development.

The objectives of an ISA are to develop a shared interpretation among stakeholders of the dimensions of sustainability for a particular social-ecological system (scoping), transform these into a shared vision of a sustainable future (envisioning), and explore various solution paths for a transition towards sustainability through a range of innovative experiments (experimenting), as a basis for learning about key relationships and ways of reframing problems and solutions (learning/evaluating).

A Comparative Assessment of Research Approaches for Sustainable Development: Towards an Integrated Methodology

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The complexity of sustainable development cannot be approached by restricting approaches to individual scientific disciplines. Comprehensive assessments in the realms of natural resources, environmental sanitation, health and social development must address multiple external (professional) and multiple internal perspectives (concerned populations, stakeholders). Both perspectives relate to systems and institutional frameworks, which are addressed in different ways, depending on their respective epistemology. On one hand, development-oriented research faces century-old debates, rooted in the time of the Enlightenment. On the other hand, it is driven by the urgency of problem-solving, thereby adopting necessary (neo)-pragmatism characterised by the pluralist and syncretistic views of the respective disciplines. We analyse three examples of integrated research approaches within the NCCR North-South which combine natural science (geography, sanitation, health) with humanities and social sciences (cultural sciences, anthropology, sociology). In all case studies transdisciplinary methods were applied or developed, including participatory processes and local knowledge (indigenous knowledge). In this phenomenological analysis we inquire about practical approaches, how results from different disciplines are actually compared, what the added value of different disciplines addressing the same theme is, and what the minimal common denominator between disciplines avoiding conflicts of major epistemological divergences could be. Transdisciplinary approaches are common to all three examples, with differences in the structures of the processes. Outcomes are beyond what a purely scientific or even single discipline-driven approach could yield. Formal assessments of interfaces between disciplines require further methodological developments and are restricted mostly to sharing information and knowledge, cross validation, and triangulation or plausibility analysis. Research outcomes indicate clearly that there is added value from interdisciplinary collaboration in all examples. We recognise that development-oriented research requires basically all disciplinary dimensions to be considered in a holistic manner. These experiences contrast with the current fragmentation of scientific disciplines, which appear incongruent with current priorities of complex problem-solving in development research. Options for specific curricula which provide a firm rooting in a particular discipline but empower further studies to acquire competence in transdisciplinary dialogue and interdisciplinary research are discussed.

Inspirations: Modernities and Selling Development

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Development studies have shown that although Western paradigms of development have spread all over the world, instead of replacing ‘traditional non-Western’ societies with ‘modernisation’, Western culture itself has become increasingly enmeshed with other cultures. The supposedly universal process of ‘modernisation’ has led to highly diverse forms of ‘modernities’, which are defined by dynamic and culture-specific relations between ‘modern’ and ‘traditional’ aspects.

‘International cooperation’ therefore represents an arena in which different ‘modernities’ struggle to define the meaning of ‘development’, laying the grounds for the legitimising process involving the guiding principles of development policy and practice. Current strands of ‘development expertise’ mainly express rationalist, Western-based ‘scientific’ notions of development. In a context of encounters between ‘modernities,’ the ‘rational knowledge basis’ of development has lost its privileged position as a main reference. It has become what it actually always was: an ontologically defined cultural expression of nature-society dynamics that co-exist with many other ‘ontologies’.

One of the ontologies that has been taken up is ‘community-based development’. Since the beginning of the 1990s governments, GOs and different NGOs have realised that top-down approaches have to make way for the grassroots level and for participation in order to ‘sell development’ and receive funds from donors. However, what does participation in this respect mean and what is the meaning of development involving the local level? Different ideologies and discourses are used to legitimise this new approach: Conservation of nature and fair trade are said to be more related to local action and meaning by involving local stakeholders in decision-making processes. These approaches, however, mask the fact that powerful state and NGO actors try to sell their view of development by closely controlling what is meant by participation. Definitions of how local debates should take place and definitions of local rights and duties concerning development processes, property rights and access are sold as being the will of the local level. This is the case, for example, with protected areas and with fair trade schemes, which are sold to the Northern public as a new paradigm of development.

Analysis of the implications these insights have for knowledge production in research, policy and practice related to development cooperation is still incipient. Exploring the main features, dynamics and interrelations of ‘modernities’ and ways of selling development in the context of the NCCR North-South is therefore an urgent task that will be taken up in this session.

Inspirations 2: Mobility Shaping Development Spaces

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The session on “Inspirations: Mobility Shaping Development Spaces” will focus on the interface of two subject areas being investigated in the NCCR North-South, namely “mobility and migration” and “knowledge production.” ‘What are the effects of mobility as a global value?’, ‘How does bilateral development cooperation respond to transnational mobility?’, and ‘How does development research contribute to the mobility (or shifts) of development priorities and interventions?’ These are some of the questions which led us to invite participants to this session. The aim of this session is to explore the innovations of a mobility and knowledge production nexus and to set a research agenda for the possible interfaces.

We do not employ a formal definition of mobility, migration and knowledge production, but see the following trends: Mobility encompasses large-scale migration of people, movement of objects, capital, and information across the world, as well as more local processes of transport and movement from one place to another. Modern transportation, communication and analytical technologies lead to new social and cultural practices of mobility. Embedded in a high density of legislation nowadays, mobility ranges from being high-skilled to low-skilled, highly welcomed to unwanted, encouraged to restricted, legal to illegal, and from documented to undocumented. Research contributes to an understanding of the connections between these diverse mobilities. In combining research on migration and mobility with research on knowledge production, we can start to reflect critically on newly emerging spaces for development.

This is especially important in a research programme like the NCCR North-South, which encourages researchers to underline the applicability and policy relevance of their research, hence to communicate research results and exchange knowledge with representatives outside academia. In reality, only some research results ever enter the realms of development policy and practice. Rather, a combination of the political agenda of development cooperation and unpredictable political or environmental events determines the preference of regions as development-relevant spaces. Therefore, it continues to be especially challenging to exchange research results with policymakers and practitioners, thereby retaining visible notions of informality and uncertainty in processes of decision-making and implementation.

We wish to achieve the aim of the session by inviting speakers to present provocative statements within a maximum of two minutes, followed by a discussion involving the audience. In addition we encourage all conference participants to attend and spontaneously contribute to the “Inspirations” session.

Inspirations 3: Uncertainty and Managing Development

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At the beginning of the 21st Century, our globalised and interconnected world has become highly dynamic. Some of these dynamics involve risk, which means that the range of possible outcomes and probabilities amongst them are known. Others are marked by uncertainty: possible outcomes are known but there is no basis for assigning probabilities, which means the criteria for judgement remain unaccounted for. Critics argue that conventional, expert-led management approaches are well-attuned to handling risk but become inadequate in increasingly frequent situations of uncertainty. They postulate the idea of adaptive management, which views actions and policies as experiments and emphasises the need for “learning by doing” under social and institutional conditions that seek to facilitate the transfer of science into the decision-making process.

We invite development experts from different disciplinary and regional backgrounds to draw upon their experiences to assess the concept of adaptive management and to illustrate attempts to redress policies in that respect. In which areas of development practice have adaptive management approaches been developed and applied? Who is adapting to what and under which circumstances? How can questions of power be negotiated within the framework of adaptive management? What is the value added for sustainable development coming from this concept?

Infusing Strength in Local Coping Capacity: An Experiment in the Semi-Arid Region of India

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Climate change is a reality accelerating its pace. The emerging impacts on livelihood systems are yet to be felt by most farming communities in India. Farming communities, particularly in semiarid regions, have faced adversity associated with climate variability and have responded and adapted, in an ad hoc manner, for centuries. Endogenous knowledge served as the basis for decision-making regarding food security, human and animal health and natural resource management. The forces of globalisation in operation today, coupled with the increase in resource prices and climate-related stresses, challenge local coping strategies and have exposed the gaps in local adaptation strategies.

An attempt was made under an SDC-supported pilot ‘Vulnerability Assessment & Adaptation to Climate Change’ project implemented in two climate-affected states, namely, Andhra Pradesh and Rajasthan in India, to strengthen farmers’ decision processes and adaptation choices under adverse conditions in their farming practices. A variety of ‘best practices’ were documented through a multi-stakeholder consultative process and direct field verification, and some of these existing practices were fine tuned and tested to meet the increasing stress from climate variability and change. Based on this, a few selective practices such as (a) maintenance of small to medium water harvesting structures like check dams, (b) revival of native irrigation methods to provide life saving irrigation, (c) cultivation of drought tolerant and less water intensive crop varieties like sorghum, pearl millet, mustard and pulses to overcome drought challenges and promote more crop per drop technologies like System Rice Intensification (SRI), (d) conversion of village common lands into pasture lands supported by improved cultivars of fodder crops for livestock, and (e) use of energy efficient stoves have been implemented at the project sites by the local farming community.

Learning enhanced access to information for development. Besides taking stock of endogenous knowledge and technologies, the project has supported interaction through village-level institutions such as “Smart Farmers Clubs,” various aspects of weather prediction, risk management and crop advisories – specifically through the establishment of facilities like the mini agro-meteorology stations at the village level - and ‘Village Knowledge Centers.’ Farmers require local climate information and knowledge of how probabilistic forecasts might affect their risks if they use them for making decisions in addition to land capability advisories. Generation of social capital through networks of mutually supportive farmers and appropriate technology demonstration are found key to enhance coping capacity.

Sustainable Landscapes and Sustainable Livelihoods – A Transdisciplinary Approach

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People are increasingly concerned with landscape development and have opinions about the process. Although processes often involve landscapes as a whole, people – according to their livelihood context – focus on specific aspects, which they want to be enhanced or that should be avoided. Therefore, landscapes are a contested space that different stakeholders want to develop according to their interests. They are based on people's individual situation and social context and often are focused on specific issues (i.e. tourists want “beautiful” landscapes, farmers want to optimise their production, environmentalists are interested in biodiversity, and others are looking for a decent income, etc.). Sustainable landscape development that includes an intact environment, economic prosperity and social cohesion must involve negotiation of different interests if it is to be widely accepted. Participatory processes trying to achieve this often fail because different interests are irreconcilable, but also because stakeholders focus on different issues and aspects without realising that they do this. With a new landscape model, we intend to provide a tool to make differences transparent and to mitigate them. It consists of four poles of landscape perception: nature, culture, the individual, and the society. Stakeholders as well as scientists tend to gravitate to one of these poles and to disregard the others. With the field that is spanned by the poles, different positions can be made visible and therefore negotiable. However, our model goes further and identifies six dimensions of landscape perception that can be integrated into the pole model: the ecological, economic, political, aesthetic, identificatory, and corporeal-sensory dimensions. Consideration of these dimensions helps to conceive and plan landscape development in an integral way and is a base for successful participation processes for which recommendations are made.

Sustainable Solution Space: Assessing the Room for Sustainable Action

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We present the Sustainability Solution Space, an approach for assessing the sustainability of rural development in the region of Vereda la Hoya, Colombia. Current integrative and indicator-based assessment approaches in agriculture usually have three main shortcomings: (i) there is an overall focus on assessing the ecological aspects of agriculture, neglecting to some extent economic and social aspects; (ii) research has so far focused on filling important gaps in knowledge and technology, but has failed to include steps towards utilisation and implementation of this knowledge; and (iii) the assessment results themselves are difficult to implement in decision-making, as conflicting goals and the interaction between indicators have not been sufficiently considered. We propose that to fill this gap an approach is needed that fulfills systemic criteria, i.e., sufficient representation of the system, including functional interaction among indicators, which makes it possible to depict goal conflicts; normative criteria, i.e., considering the different value systems of stakeholders by including them in the process and designing sustainability ranges rather than threshold values; and procedural criteria, i.e. pursuing assessment in a truly transdisciplinary process. We present the SSP and its application to a simplified case in Vereda la Hoya, Colombia. The system is described with a set of 12 indicators, depicting the livelihood of farmers in the region. These indicators were derived from farmers' and experts' interviews. The interaction between the indicators was determined in a workshop together with experts and farmers. The sustainability ranges were obtained through research in the literature and stakeholder interviews. The SSP program takes a geometric approach to determine the intersection space corresponding to the satisfaction of the normative ranges while taking into account the functional interactions of the indicators. We present results of the sustainability solution space for the case of rural development in Colombia and discuss the prerequisites, advantages and shortcomings of the method.

Keywords: Sustainability, solution space, indicators, transdisciplinary process

Challenges for Linking Development and Bio-Cultural Diversity – Experiences from SDC

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Initially, biodiversity was a term invented by ecologists for ecologists. The Convention on Biological Diversity (CBD), however, explicitly recognises the importance of traditional knowledge for the use of biodiversity and, based on this, concepts for the sharing of profits from the use of biological diversity, e.g. for medical treatment, are derived. However, the link between cultural and biological diversity is rarely mentioned, although it is critical for the diversity of man-made or used habitats, species and genes. Specific community knowledge about the use of a plant is always embedded in a cultural and even spiritual context. It is for this reason that SDC has accepted and promoted the use of the term “bio-cultural” systems in programs which were previously known as biodiversity programs. The intention is to base project strategies explicitly on the link between the culture of rural societies and biodiversity and derive poverty alleviation- and food security-enhancing strategies from this link. The positive effects of such an approach can be twofold; 1) Communities strengthen their identity and self-esteem, and 2) Conservation of biological diversity is not imposed on a community but grows out of its own culture. From an operational perspective these two factors are relevant. In many biodiversity-related programs local communities have felt disempowered by the wish of outsiders to conserve habitats, species or genes. Once this feeling is created it is difficult to restore trust and build effective programs. Initial SDC experiences in Bolivia, for example, confirm the relevance of the approach but also show the difficulty of development workers in embracing such concepts. Many of them are still caught in their perception of bringing progress to rural communities by inducing technical and cultural change and may miss the chance of being more efficient by explicitly enhancing existing culture.

How Online Information Complements Agricultural Extension: Conveying Research Results to Small-Scale Farmers

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In the recent International Assessment of Agricultural Science and Technology for Development (IAASTD), more than 400 scientists and 30 governments stated that the global agriculture system will have to change radically if the world is to avoid future environmental and social problems. They concluded that efforts inter alia should focus on giving small-scale farmer communities better access to knowledge.

However, today this access is often very limited in many ways. One key challenge is to make the most recent scientific findings available to this critical group. Research results and new insights are often out of their reach. This situation is aggravated by the fact that large corporations in the agro sector provide biased information to promote the marketing of their products. Balanced information (including knowledge about sustainable farming) is lacking. Traditional dissemination channels for research results often do not reach their audience: printed material gets stuck along the way, farmer extension services are overwhelmed by the sheer number of farmers to be served, and bureaucracies prevent the efficient dissemination of information.

In the medium term new information and communication technologies could fill certain gaps and serve as complementary channels, reaching even – or in particular – remote and disadvantaged population groups currently underserved. However, today there is little information on the Internet which addresses this audience – many (often diminishable) obstacles prevent these groups from satisfying their needs: information is not tailored to their needs, situation and geographic conditions; the usability of platforms does not suit these users' abilities; their own experience is not reflected. It is at this point that the INFONET-BioVision steps in.

The INFONET-BioVision Platform aims to strengthen sustainable development of farmers and rural communities in Africa by making information on key topics available through an Internet platform and other dissemination strategies.

On the platform rural farmers find locally relevant information with contributions from farmer groups, local experts and international scientists on organic agriculture and crop husbandry, effective ecological prevention and control of plant-, human- and animal targeting pests and diseases, and simple and environmentally safe technologies and approaches to improve their life and generate income while at the same time protecting the environment.

The scientific quality of the information is assured through an extended peer-review process, which aims at combining recent research results with local knowledge.

The Work of WASWC and Its Special Unit – The Student's Forum of WASWC

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WASWC, the World Association of Soil and Water Conservation, is the world's leading international association of professionals and practitioners in soil and water conservation. The basic objective of WASWC is to promote the wise use of global soil and water resources. This international NGO was founded in 1982/83. WASWC currently has about 5000 participants/members of which about 1000 are active (others are mainly guest members). Some of the activities are as follows:

1. The WASWC Newsletter in 10 languages is posted on the website quarterly;
2. WASWC HOT NEWS announcing awards, funds, scholarships, training, appointments, jobs, tours, expositions and all important meetings all over the world, is sent to members 12 times a year;
3. A peer-reviewed journal (JWASWC) and non-peer reviewed Proceedings (PWASWC), with abstracts in 10 languages;
4. Special Publications;
5. A chance for interaction among members and opportunities to consult thousands of experts anywhere in the world through the Internet. There are around 120 WASWC officers worldwide who will assist in matters on which members request assistance;
6. Running the WOCAT programme, the main goal of the association;
7. Preparing regional programmes in SWC;
8. Dealing with SWC legal issues;
9. A special new unit: the Student's Forum of WASWC.

With regard to new units in the Decentralisation Programme, a WASWC Student's Forum was established at the Faculty of Forestry of Belgrade University. The idea then spread to the Skopje University in Macedonia, with the same opportunities offered at the universities in Timisoara/Romania, Istanbul/Turkey, Orisa/India, and Kathmandu/Nepal. The basic aim of these fora is to encourage young members, who will become future experts in SWC and ambassadors of the WASWC ethos. To realise these aims members of the Forum are involved in WASWC activities (such as the WOCAT Programme). The aims of the Forum are: advanced training in SWC with field and laboratory work/practice; promoting SWC approaches; raising SLM awareness in theory and in practice; disseminating the WASWC idea with students; strengthening membership; helping/supporting to establish similar forums in the Balkans and strengthening their networks in this region and further organising student meetings/seminars and excursions, and publishing brochures on work accomplished.

The 11 Research Partnership Principles: Views from the South

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The 11 Research Partnership Principles of the KFPE are widely used and recommended by many research programmes – also within the NCCR North-South. After 10 years of use, the KFPE has decided to review the Principles and update them based on current trends and experience. In this session, we will collect first informed views and reflections from Southern participants about the usefulness of the 11 principles and/or hints about missing elements, with a view to improving them. The panelists will provide an input of about 10-15 minutes on 1-2 principles of their choice or on another aspect concerning the 11 research partnership principles of the KFPE, and then reflect on them from their perspective: is the principle useful, applicable, what difficulties are there, is a principle too nebulous or unrealistic, is there something missing, etc.

The 11 principles of the KFPE are the following:

1. Decide on the objectives together
2. Build up mutual trust
3. Share information; develop networks
4. Share responsibility
5. Create transparency
6. Monitor and evaluate the collaboration
7. Disseminate the results
8. Apply the results
9. Share profits equitably
10. Increase research capacity
11. Build on the achievements

In addition, the KFPE will also carry out a survey about the Principles during the ICRD Conference. The questionnaire is included in the conference folder and can be handed in at the conference desk. We would like to thank all those who return the form!

4 Posters

All posters presented during the ICRD 2008 are reproduced in this chapter. The first section contains posters presenting findings by guest researchers. This is followed in three sections by an overview of research conducted within the NCCR North-South.

External Posters: Research for Development

Posters in alphabetical order of first author

General Overview of the NCCR North-South

Six posters presenting important components of the programme

Synthesis Themes in the Joint Areas of Case Studies (JACS)

West Africa
East Africa
Horn of Africa
Central Asia
South Asia
Southeast Asia
Caribbean and Central America
South America
Swiss Alps

PhD and Other Research in the NCCR North-South

Posters in alphabetical order of first author

Off-Site Erosion Damage and the Search for Solutions

Martin Affentranger, Flurina Schneider, Thomas Ledermann, Karl Herweg, Stephan Rist

Centre for Development and Environment (CDE), University of Berne, Switzerland

Off-site erosion damage affecting private and communal infrastructure, open water bodies and other ecosystems causes problems in arable areas of Switzerland. Despite existing knowledge about soil conservation measures, past efforts by responsible authorities to solve the problem of soil erosion have had only limited success.



Figure 1: Soil erosion and its off-site impacts.



Figure 2: Conflicts among actors and the search for solutions.

Research objective

This study aimed to reconstruct and analyse processes for finding solutions to complex soil erosion damage. Special attention was given to actors' perceptions of erosion events and social learning processes between actors.

Results

(1) Interviews revealed that different valuations of sustainability cause conflicts among actors. While representatives of soil protection agencies gave the highest priority to the ecological dimension, other actors, including farmers, emphasised the socio-cultural dimension (Fig. 3).

(2) Sketches made by the interviewees showed that the actors involved have different spatial focuses. While farmers and officials in cantonal soil protection agencies emphasised the situation on damaged plots (on-site), community representatives and civil society actors highlighted the situation in the village (off-site) (Fig. 4).

(3) Conflicts can be explained by the lack of social learning processes involving the actors, who often simply accused other actors without critically reflecting on their own actions, values and norms.

Conclusion

The analysis shows that the case studies were marked by various tensions due to different perspectives and valuations of erosion damage. Finding sound solutions to complex situations requires continuous dialogue between all actors involved.

Acknowledgements
The authors wish to thank the Swiss State Secretariat for Education and Research (SER) for financing the study, and the Federal Office for the Environment (FOEN), the Federal Office for Agriculture (FOAG), and the Swiss National Centre of Competence in Research (NCCR) North-South for financial contributions.

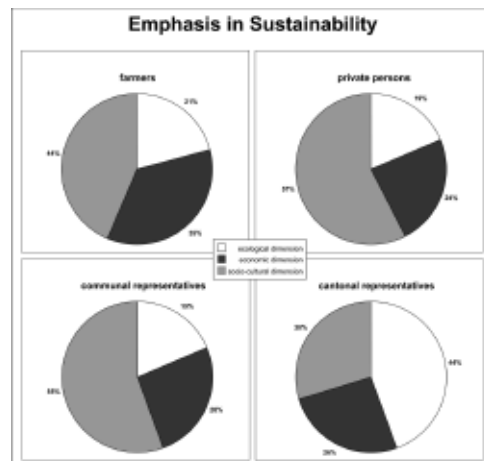


Figure 3: Perception and valuation of soil erosion events of four actor-groups related to the three dimensions of sustainability.

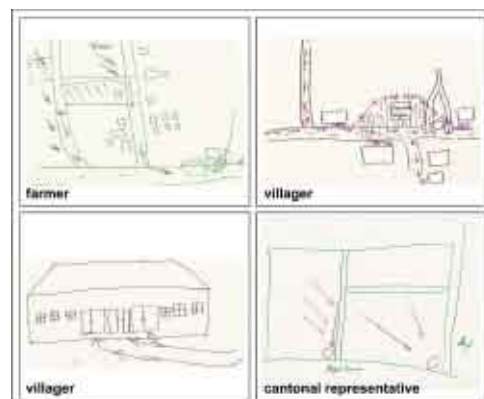


Figure 4: Sketches by interviewees showing their perception of the spatial characteristics of the erosion event.

Recycling wastewater in a school in order to grow trees for a better future. The case of "El Milagro", Trujillo, Perú.

Introduction

Behind the city of Trujillo (757,266 inhabitants) there is a human settlement called "El Milagro" where around 400 families live by working on a rubbish dump. An NGO has constructed a school to avoid children's work on the rubbish and also a popular restaurant for the workers.



Fig. 1 Water tank

Is located on a desertic zone. The water is supplied by a tanker (15 m³) every 15 days. The sanitation provision is an infiltration cesspit on a sand soil. A second phase is planned which will consist of a vocational training center.

They planted 300 trees to provide shade at the school courtyard. The head asked for a better solution to obtain water to irrigate trees.



Fig. 2 Small trees and the courtyard

Objectives

- To provide an onsite sanitation system with low cost technology
- To reuse the effluent for watering the 300 trees that could provide shade to the surroundings of the school
- Establish an operation and maintenance schedule
- To serve as an example to make a better use of water and to improve hygiene in the local community

Material and methods

We have evaluated the water consumption by through interviews and in-situ measurements. In cooperation with the local technicians and UAL's team we have chosen the appropriate technology checking an inventory of Peruan facilities so as to discern the advantages and disadvantages of each system.



Fig. 3 Measuring wastewater

Results and discussion

The water use evaluations shows that we are facing a real scarcity of water, because the daily quota per user is around 9 liters/user-day.

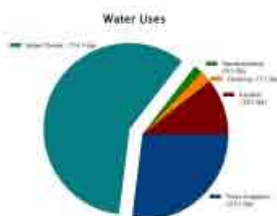


Fig. 4 Water consumption at the school

Most of the consumption is spread in the WC. The amount used to water trees is almost 25% of the total, and they are under-irrigated. By recycling all the waste-water the existing trees would grow faster and there would be a possibility to enlarge the planted area.

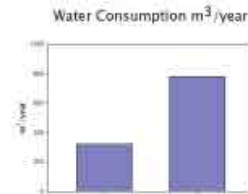


Fig. 5 Water consumption now and at the future

The project is building the second phase where the water consumption would be enlarged by shower installation and the provision of a raised that could increase the water pressure.

Design of wastewater treatment plant

The performance chosen is the vertical flow constructed wetland, because it shows the best performance to reuse water for trees irrigation (García, 1998). The parameter of operation are showed on the next table.

Inlet	Flow (m ³ /day)	2,15
Septic Tank	Volume (m ³)	16,7
	Retention Time (days)	2
Constructed Wetland	Area (m ²)	55
	Retention time (days)	5

Fig. 6 Design parameters



Fig. 7 Diagram of the project

The aquatic plant to use on the CW is the "totora" (*Scirpus californicus*) because it is found on the natural vegetation near Trujillo. In addition, it has a socio-economical value because is used to make traditional fishing boats.



Fig. 8 Growing totora with wastewater



Fig. 9 The natural habitat of the totora

Conclusions

- It is necessary to implement ecological sanitation principles in this educational project.
- The designed plant could provide enough water to enlarge the garden area without paying more for it.
- Constructed wetland used with *totora* could increase the value of the project.

References

- Juan José Salas Rodríguez, Il Pádre, E. Sánchez. *Manual de Tecnologías no Convencionales para la Depuración de Aguas Residuales: Humedales Artificiales (Vol IV)*. Sevilla, España. Centro de las Nuevas Tecnologías del Agua. CIMA, 2007.
- Thunholter, Manuel, Gaross, Martín et al. *Biofiltro: Una opción sostenible para el tratamiento de aguas residuales en pequeñas localidades*. Water and Sanitation Programme. Honduras 2006.
- WINDAHL, Uno; SIMPSON-HÉBERT, Mayling. *Ecological sanitation*. Stockholm Environment Institute, 2004.



Studying strategic interactions under hydrological uncertainty

A case study in the Kafue Flats

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Introduction

The management of large transboundary watersheds traditionally relies on deterministic hydrological models. The purpose of these models is to simulate physical processes on the supply side and optimize water use conditional on some predefined demand. Models for the demand side are still at an embryonic stage, even though any sophisticated optimization effort would seem to require the coupling of models for the supply and demand side. We develop an agent based resource management model to represent and assess different strategies of individual users in a catchment. Our focus is on the Kafue Basin in Zambia.

Kafue Basin

The Kafue is one of the most important tributaries of the Zambezi, which in turn is one of the largest international river systems in the world. The Kafue basin is the most productive agricultural and industrial area of Zambia.



Picture: Kafue and Zambezi Basin

The population of the Kafue basin is around six million, approx. 50% of Zambia's total population. Most of it depends directly on fishing, cattle herding, and small scale agriculture. In addition, mining, industrial, and large-scale farming activity make the Kafue basin one of the most important agricultural and economic regions of Zambia. The Kafue Flats wetlands also provide a unique habitat for rich biodiversity. To cover its growing energy needs, Zambia built the Itezhi-Tezhi and Kafue Gorge dams in the 1970s, upstream and downstream of the Kafue Flats. With the advent of hydropower production, the area gained substantial economic attraction, albeit at the price of a dramatically altered hydrological regime in the Kafue Flats. Backwater from the downstream dam and releases from upstream have created a permanently flooded area in the plains. Further upstream, below the Itezhi-Tezhi dam, seasonal flooding has been reduced. Such changes in hydrology have had negative effects on the ecosystem as well as the population depending on the wetlands' ecosystem services (e.g. flood recession farming and fisheries).



Picture: Spillway at Itezhi-Tezhi

Several attempts have been made to modify the operation rules for the two dams, so as to avoid negative impacts (SWECO operation rules 1978-1993, SADC operation rules 1994- present, and new rules proposed by the WWF in 2007). However, continuing degradation of environmental and socio-economic conditions is observable. Current plans to increase hydropower production at Itezhi-Tezhi are bound to increase the pressure on the environment in the near future.

Methodology

We develop a dynamic agent-based optimization model, in which various problem dimensions are represented in terms of agents (e.g., the environment, hydropower production, and rural livelihood conditions). This model is coupled to a rainfall-runoff hydrological model. Using reinforcement learning techniques we examine specific types of interventions and operation rules and assess their implications.

Learning in an uncertain environment

Reinforcement Learning (RL) is a process by which an agent improves its behavior via experience. It is a method for knowledge acquisition through direct experimentation. The agent starts by exploring possible actions in a dynamic system. For each action the agent obtains a payoff and increases its knowledge about the system step-by-step. Through increased knowledge, agents improve their ability to move from exploration to exploitation of the system.

The following figure illustrates a learning process over time in a toy model. It represents water discharge, storage and demand for a hydropower scheme with a river and one dam for hydropower production. The upper part shows the beginning of the learning process where a given agent learns how to allocate water for hydropower production ($a(t)$). After a learning phase the agent is able to allocate the water more efficiently (lower part of the figure) given the same runoff conditions ($r(t) + p(t)$) and demand ($d(t)$).

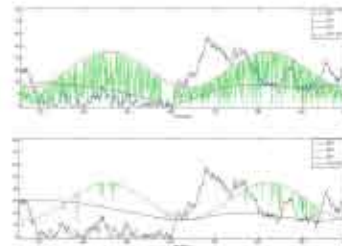


Figure: Illustration of a learning process in a hydrologic system with one dam. $d(t)$ water demand, $a(t)$ water allocated by the agent, $h(t)$ storage level of the reservoir, $r(t) + p(t)$ discharge of the river.

Learning, strategy and optimal solutions

RL enables agents to acquire new knowledge on how to maximize expected payoffs under specific hydrologic boundary conditions. It is an interdependent process whereby one agent's behavior affects the payoffs and behavior of other agents, and vice versa. Rather than trying to identify aggregate optimal solutions our simulation effort helps in identifying possible strategies and moves in the action space of our artificial environment. What the best solutions are depends on individual stakeholder preferences.

Next steps

After having tested the basic concepts with a toy model our work now focuses on developing more sophisticated supply and demand side models and connecting them. We will also conduct stakeholder surveys in the Kafue and Zambezi basin. The information from these surveys will inform our conceptualization of the agents and patterns of interaction between them; and it will be used to identify Pareto-improving solutions.



Geology, mineralogy and geochemistry of ochers (mineral pigments) in Rajasthan State (India)

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A precise and systematic knowledge of the materials used in the ancient and modern artistic objects represents the first step before projecting any conservation work. Earth sciences provide several analytical techniques that can provide a better understanding of the origin, composition and even provenance of the raw materials. The conservation sciences must understand the nature of the pigment used and obviously the technique and the characteristics as durability, stability, compatibility with organic and/or inorganic media; all these properties depend on the chemical/mineralogical purity of the raw material, the crystallization process and the environment of formation.

The mutual collaboration proposed in this study is aimed to enrich each other considering that the academic background of Swiss and Indian universities is the same and the research fields move parallel. The project intends to address the research problem of common interest through practical applications in fields not explored so far at the Indian partner institution.

Fig. 1

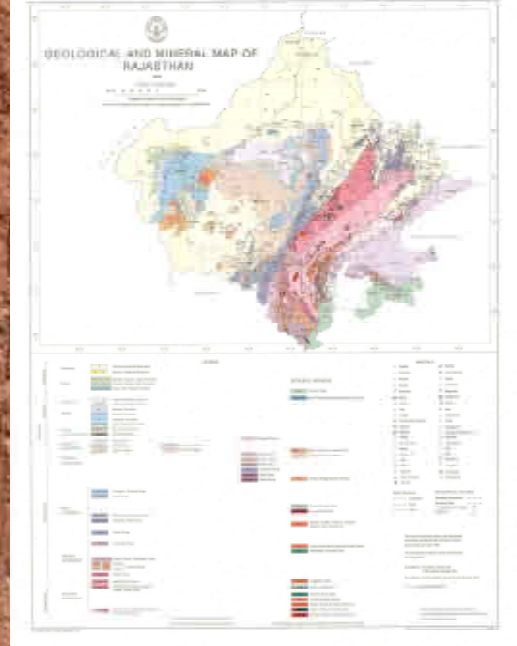


Fig. 2



Fig. 3



Fig. 4



Fig. 5

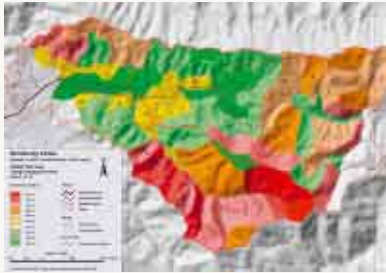


- Fig. 1. Geological map of Rajasthan
- Fig. 2. Iron-bearing materials associated to yellow ochers
- Fig. 3. Deposits of China clay associated to yellow ochers (Hawa-Tahsil Kotri, Bhilwara district)
- Fig. 4. Red ochers at Iswal (Udaipur district)
- Fig. 5. Red ochers mine at Sawa (Chittourgarh district)

Project funded by Rector's Conference of the Swiss Universities of Applied Sciences represented by the General Secretary's Office (KFH) Grant Number P-0710-04

Centre for Development and Environment

CDE's mission is to contribute to sustainable development in countries of the North, South, and East, through research partnerships, education and training, development of concepts and tools, and policy advice. Our activities focus on management of natural resources, integrated regional development, and interventions that mitigate syndromes of global change. The CDE is organised in the four sections presented below.



University Section: Education and Training

Lecturing, supervision and research in sustainable management of natural resources and sustainable regional development

Programmes

- BSc and MSc in Geography
- PhD within NCCR North-South and within other Programmes

- Further activities within university networks in Switzerland and abroad (teaching, supervision, curricula development)

Outreach Section: Regional Programmes

Programmes and projects concerned with a specific geographic region

Programmes

- Eastern and Southern Africa Partnership Programme (ESAPP)
- Sustainable Land Management Programme (SLM) Eritrea
- Simen Mountains Programme, Ethiopia

- Central Asian Mountain Partnership Programme (CAMP)
- BioAndes - Conservation and Valorisation of Biodiversity in the Andes
- Songwe River Transboundary Catchment Management (Tanzania, Malawi)



Research Section: Mitigating Syndromes of Global Change

Programmes and projects conducting mainly focused research, in partnership with institutions in other countries; these programmes and projects also have an educational aim at the academic level (theses and doctoral degrees)

Programmes

- NCCR North-South - National Centre of Competence in Research North-South
- Swiss Alpine Research - Jungfrau-Aletsch-Bietschhorn World Heritage Site

- DESIRE: Desertification Mitigation and Remediation of Land
- COST: Soil and Water Conservation in Switzerland

Policy Section: Global Networks and Mandates

Policy advice and awareness raising for implementing agencies carried out by CDE in the context of its own programmes and under mandates for partner institutions

Programmes and Mandates

- WOCAT - World Overview of Conservation Approaches and Technologies
- MRD - "Mountain Research and Development" (international peer-reviewed journal)

- LforS - Learning for Sustainability
- Backstopping mandate for environment and natural resources management
- Geoprocessing in development
- Information service - InfoResources



High-Resolution Maps of Soil Erosion Risk

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In Switzerland, the availability of high-resolution digital data sets makes it possible to compile detailed, large-scale soil erosion risk maps. These maps can be used for agricultural extension and for planning measures to protect against soil erosion.

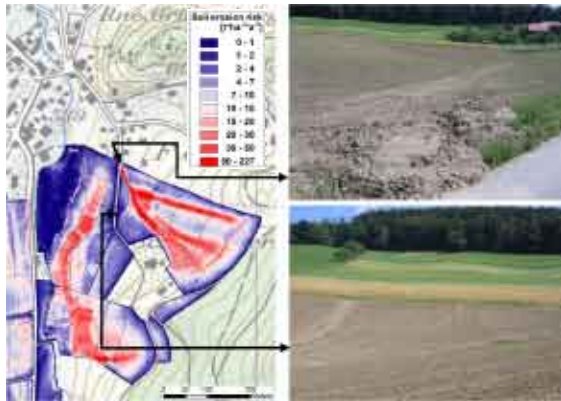


Fig. 2: AVerosion modeling using DEM2 and mapped erosion damage on a plot in the Oberaargau region.

Methodology

AVerosion is a GIS tool (ArcView) that can be downloaded free of charge from the Internet (<http://www.terracs.com/html/averosion1.html>). It is based on the Universal Soil Loss Equation (USLE). Its modified Version MUSLE87 offers the possibility to determine relief parameters (LS factor) by means of Multi-Flow Algorithms. Three available digital elevation models (DEM; 100m, 25m, 2m) were compared in three study areas. The R- (erosivity), K- (erodibility) and C- (cover) factors remained constant.

Results

Spatial distribution of areas threatened by erosion is significantly differentiated as spatial resolution becomes higher. Whereas with DEM100 only one area at high risk is displayed, numerous areas can be designated with DEM25 and DEM2 (Fig.1).

The calculated risk increases markedly as relief resolution becomes higher (Tab.1) – by a factor of 1.5 (for a gently sloping area in Frienisberg) to 2.7 (for a steep area in Oberaargau).

Visual assessment in the field and comparison with results from erosion damage mapping resulted in very good correlation (Fig. 2).

Tab. 1: Calculated soil loss values (median) for three study areas using DEM100, DEM25, DEM02.

A _{median} [t*ha ⁻¹ *a ⁻¹]	Estavayer	Oberaargau	Frienisberg
DEM100	2.57	1.83	1.65
DEM25	3.99	3.53	2.56
DEM02	4.90	5.00	2.57

Conclusion

AVerosion is a practical tool for efficiently predicting long-term soil loss rates. The different resolutions of DEM show the major impact of topography on erosion. The highest resolution maps enable excellent spatial identification of areas with a high risk of soil erosion (e.g. slope depressions). The maps therefore provide an ideal aid for agricultural planning and negotiation of interventions and/or enforcement by authorities.

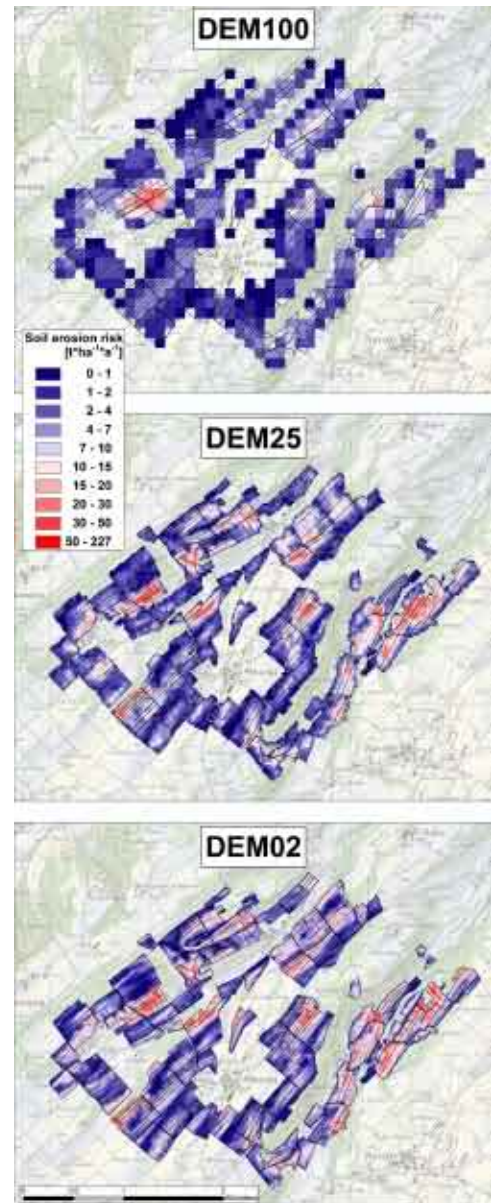


Fig. 1: Raster-level modeling of erosion risk using AVerosion with the digital elevation model DEM100 (above), DEM25 (centre) and DEM02 (below) for the study area in Estavayer.

Acknowledgements

The authors wish to thank the Swiss State Secretariat for Education and Research (SER) for financing the study, and the Federal Office for the Environment (FOEN), the Federal Office for Agriculture (FOAG), and the Swiss National Centre of Competence in Research (NCCR) North-South for financial contributions.

Youth in Russia: The Portrait of a Generation in Transition



Swiss Academy for Development (SAD)
Denis Dafflon



Introduction

Some 35 million young people currently live in the Russian Federation. They have been disproportionately affected by rapid social change since the fall of the Soviet Union. The past seventeen years in Russia have been characterised by radical economic, political and social transformation. Social norms and values have evolved too, and the structural framework enabling young people to make full use of their potential is fragile. In this context of rapid social change, traditional values and guiding norms may become confusing or even disappear. There is potential risk of young people becoming disillusioned and losing trust in themselves and in the future. To measure the risk of such an outcome in the Russian Federation, the Swiss Academy for Development conducted a nation-wide survey to investigate young Russians' living conditions, values, future opportunities and perspectives.



Objectives

- to analyse current living conditions, values and the future opportunities of young people in Russia
- to identify potential differences between the North Caucasus and the rest of Russia
- to identify young people's most acute problems in the North Caucasus and in the rest of the country
- to further develop SAD's early detection system, uncovering hidden structures and levels of anomie and to identify the most alarming anomie symptoms and outcomes among Russian youth
- to scientifically compile data as the empirical basis for coaching young Caucasian youth leaders and to support them in creating structures for other young people in the region
- to scientifically compile data as the evidence-base for new practical projects improving the situation of youth in Russia

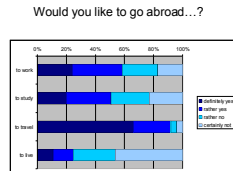
Method

- 2000 face-to-face interviews were conducted with young Russians between 15 and 29 years of age, balanced in terms of gender, age, ethnicity, socio-economic background and education
- Interviews were conducted in 120 urban and rural locations, covering more than 50 administrative regions
- 25% of all interviews were conducted in the North Caucasus
- 120 closed questions covering various aspects such as family, education, employment, migration, violence, trust in institutions, well-being etc.
- Local project partners: Moscow School of Social and Economic Sciences (MSSES), Levada Center (Moscow), Rosa-Luxemburg Foundation, International Organization for Migration (IOM), **Swiss Agency for Development and Cooperation**

Main Results

I. Economic situation

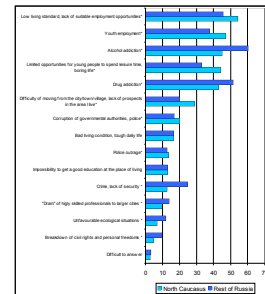
- 49.6% are confident that their standard of living will improve in the next three years; however, youth unemployment and lack of suitable work opportunities remain among the major concerns
- 54.7% claim their full potential on the labour market is not sufficiently used, which may create frustration
- 73.2% feel that the gap between the rich and the poor is steadily growing and 66.5% say that nowadays only money is important
- 68.3% are ready to work in the informal sector due to fewer opportunities within the formal economy
- 58.6% are ready to migrate from Russia to find work



IV. Future perspectives and main concerns

- 60% are confident in their personal future; 40% are confident in the future of the country
- alcohol and drug addiction is perceived as the most critical issue for youth nation-wide
- the lack of employment opportunities and declining leisure opportunities are the main concerns in the North Caucasus

Most critical issues for youth



V. Confusion, lack of orientation and guiding norms (anomie)

- feeling that most people cannot be trusted
- strong feelings of insecurity and widespread social instability
- depression symptoms among young people belonging to the lowest socio-economic category
- risk of compensating the lack of orientation with high alcohol consumption, drug abuse and/or political radicalism

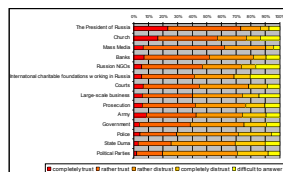
To what extent do you agree or disagree with the following statements?



II. Politics: Trust in Orientations, Mistrust in the System

- widespread rejection of and disillusion towards the political elite and state institutions
- disengagement with authorities as much as possible
- widespread feeling that a strong hand is needed to restore the country's power and pride
- feeling among 60.4% that Russia is surrounded by enemies

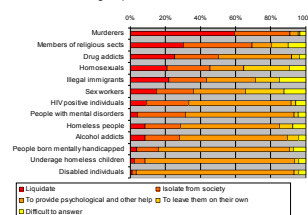
To what extent do you trust the following institutions?



III. Intersocietal relations

- strong stigmatisation of minority groups (homosexuals, drug addicts, HIV positive individuals)
- growing intolerance towards illegal immigrants and members of national minorities
- violence is considered by 53% as a normal state of affairs

How should the social problems associated with the following groups be resolved?



Conclusion

The research conducted by SAD in cooperation with local partners highlights worrying trends in terms of youth development and promotion. Despite an overall improvement of the economic situation in Russia, young Russians remain extremely concerned about their working perspectives and the growing economic imbalance in the country. They also feel particularly concerned with social issues and declining youth and leisure opportunities, especially in the North Caucasus. Furthermore, the loss of orientation and of guiding norms is striking among Russian youth. Based on these findings, SAD implemented practical activities aiming at empowering young Caucasian youth leaders and helping them to develop socio-cultural activities of benefit to other young people. SAD trained over 130 young people in project-cycle management in Russia and in Switzerland and supported local projects improving youth and leisure structures in the region.

For further information

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Enhancing the livelihood of the local population in a biodiversity hotspot in Central Menabe, Madagascar: scientific bases for a participatory forest landscape management

DIRAC RAMOHAVELO Clémence¹, ANDRIAMBELO Lanto Herilala², ANDRIAMAROSOA RATSIMBAZAFY Ny Riana Solomalala² and SORG Jean-Pierre³

How to bring together population needs and biodiversity conservation in Central Menabe?

Context



Research site



Farmer use of forest soils, products and services



Biodiversity hotspot



Landscape degradation

Methods



Questionnaires



Scoring exercises in group



Timber inventories



NTFPs inventories

First results

Local forest management committee	•Members have divergent opinions as on concept and objectives.
Payments for ecological services (PES)	• The majority of the farmers refuses to enter in PES systems (63% of the farmer's answers are negative). • Farmers living in sensitized villages are more open to PES systems.
Agroforestry	•Farmers are open to agroforestry techniques such as hedges against predators, introduction of trees in agricultural lands or in fallows.
Livestock (zebus and goats)	•The role of the livestock is social (indigenous ethnicity) or money-saver (immigrant ethnicity). But it poses two problems: 1. overgrazing of pasture lands in the dry season 2. breeding system economically and financially non profitable
Logging	•Timber harvesting is illegal but lucrative to the farmers.
Timber processing	•The number of the regional small wood processing units is increasing although no logging permit have been delivered since four years. •The demand of products in wood is strong.

Preliminary considerations on the natural resources management of the Central Menabe forested landscapes

1. For the farmers, the forest plays the role of a provisioning place even as a **safety net** during times of food shortage.
2. For the international nature conservation movement, the forest plays an essential role for maintaining **biodiversity**.
3. From a landscape point of view, the agriculture (**paddy** areas, **techniques** and **productivity**) should be improved in order to enhance the livelihood and to maintain biodiversity.
4. In all stages of landscape management activities, the **sensitization** and the **participation** of the local villagers as well as the **monitoring** are crucial.

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Post-disaster housing reconstruction Current trends and sustainable alternatives for tsunami-affected communities in coastal Tamil Nadu

Jennifer Duyne Barenstein¹, Daniel Pittet¹

Background

One of the most visible consequences of many disasters is the widespread devastation of houses. Many humanitarian agencies are increasingly focusing their recovery assistance on housing reconstruction. The complexity and cultural sensitivity in housing and the links between the built environment and sustainable development are still not fully appreciated. Most post-disaster housing reconstruction projects are agency-driven and have a narrowly technical approach. Organisations that in normal times are committed to sustainable development, in an emergency context often make technological choices without keeping into account socio-cultural, environmental and economic implications. This poster presents the main findings of a comparative analysis assessing the sustainability of 5 types of houses that were found in Tamil Nadu after the tsunami of December 2004.

The 5 types of houses considered for the comparative study

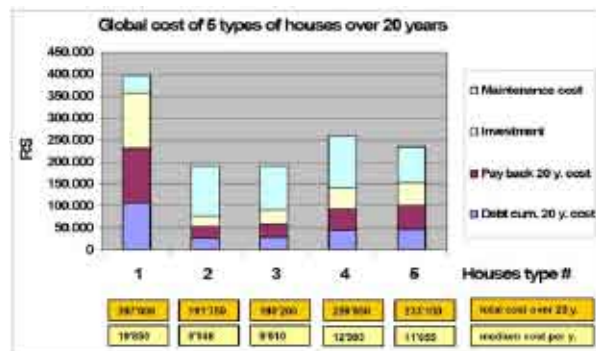


Type 1 – RCC flat roof Type 2 – coconut thatched roof Type 3 – straw thatched roof Type 4 – hand made tiles roof Type 5 – Mangalore tiles roof

House type 1 is representative for the type of houses built by NGOs after the tsunami. All other houses are part of the pre-tsunami built environment and represent the different type of houses that can be found in coastal Tamil Nadu. All houses are inhabited, have a comparable size, cement floors and cement plastered brick walls. All have comparable exposure to the sun.

Comparative analysis of construction and maintenance costs

The construction and maintenance costs were calculated with reference to the prices of July 2006 for a house with a standard size of 350-400 sq.ft. For all houses we considered a mortgage interest of 8%. The overall cost calculation in terms of capital investment, maintenance costs, interests and repayment was made over a period of 20 years. Our findings indicate that the RCC house in terms of capital investment is the most costly option, but in case of good construction quality requires relatively little maintenance. This may explain why many people, considering the fact that NGO houses are distributed for free, appreciate this technology, in spite of the lower level of comfort associated with it. Good construction quality, however, while common for owner-built houses, was rarely found in post-tsunami housing projects.



Comparative analysis of environmental impact

This is a qualitative analysis of the environmental impact of the building technologies focusing on the construction materials and their varying environmental impact. We recognise the importance of other factors such as land utilisation, energy sources and consumption and all impacts related to infrastructures. However, it was beyond the scope of this study to carry out a comprehensive environmental impact assessment.

House type	Criteria for environmental impacts			
	Local availability	Environmental impact	Pollution	Comfort
1- RCC	Low	High	Average	Low
2- Coconut thatched	Good	Low	Good	Good
3- Straw thatched	Good	Low	Good	Good
4- Hand made tiles	Good	Average	Good	Good
5- Mangalore tiles	Average	Average	Good	Good

Economic viability, environmental impact and level of comfort

The coconut and straw thatched houses may be considered the best option in terms of economic viability, environmental impact, and comfort. Tiled roof houses, though offering relatively good comfort, are slightly more expensive than thatched roof houses and also have a higher environmental impact. The RCC houses clearly represent the least viable option, are most expensive, offer the lowest level of comfort and have the highest environmental impact.

House type	ISSUES		
	Economic	Environmental	Comfort
1- RCC	Low	High	Average
2- Coconut thatched	Good	Low	Good
3- Straw thatched	Good	Low	Good
4- Hand made tiles	Average	Average	Good
5- Mangalore tiles	Average	Average	Good

Conclusions

Many vernacular houses that are being demolished and replaced with presumably multi hazard-resistant houses are of good quality, environmentally sustainable, affordable and more comfortable than the houses built by external agencies. Given the poor quality of construction that we have observed in many sites, the new houses may also be significantly less safe than traditional houses. There is no doubt many houses have been demolished by the tsunami. However, reconstruction agencies should have made an informed and contextually appropriate technological choice and pay more attention to preserve the design, materials and construction practices related to local housing.

This poster presents part of a research project on "Towards Sustainable Disaster Preparedness. The role of local, national and global responses in enhancing societal resilience to natural hazards in India and Nicaragua" funded by the Swiss National Science Foundation and the Swiss Agency for Development and Cooperation (SDC). For further information contact Dr. Jennifer Duyne Barenstein, or Eng. Daniel Pittet, jennifer.duyne@supsi.ch, daniel.pitet@supsi.ch - www.worldhabitat.supsi.ch
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Connecting science with practice

South - North - South

International cooperation in research and development where the leadership role might be in the south or the north, including Universities in Cuba, Nicaragua, Guatemala, Switzerland, Germany, Spain and Canada.



Connecting science with grassroots

Any new technology undergoes a set path of different steps from the laboratory to the implementation by network partners and finally to be released to the market. Know-how transfer at all levels is the ultimate task.



Disaster prevention & mitigation

Provisional shelters become permanent...it would be better to conceive them as such! EcoSouth research has developed a system to build solid ferro-cement emergency shelters as core units that later can be expanded with any material or style. With appropriate state of preparedness, the units can be produced and erected within days of a disaster.



Developing & sharing technologies Cleaner production

Technology transfer to micro-enterprises who operate in the formal or informal market

Micro concrete roofing tiles

600 production facilities
3000 jobs created
500'000 roofs



Alternative cement

Lime puzzolana cement to substitute portland cement, reducing embodied energy up to 50%



Fired clay bricks

The use of an organic flux, briquettes made from waste and improved kilns safe firewood.



Earthen buildings

Creating national standards for clay based structures in Namibia, Nicaragua and El Salvador



Floor slab system

Reinforced concrete beams and micro concrete vaults for an attractive and economical slab.



Formal apprenticeship program

Two year programs of supervised productive work and technical education with final exams and diploma.



Impact

It is possible to provide affordable housing with good architectural design by using an integral approach, lowering the environmental footprint.

EcoSouth partners have received international recognition through numerous awards and several „good“ and „best practice“ nominations by UN-habitat.



17 Years sharing across borders

Dynamic www.ecosur.org is the source of information; frequent updates integrate news from the field.

Website activity April 08
10'000 visits
200'000 hits

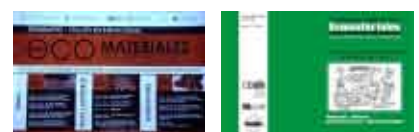
EcoSouth partners host young researchers and professionals for extended interchanges, they offer consultancies, guest lectures, seminars and training courses.



Seminars, conferences

Since 1998 we organize every four years the

**International EcoMaterials Conference
23-27 of November 2009 in Bayamo, Cuba**



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**International Conference on Research for Development (ICRD) in Bern
2.-4. July 2008, Presentation in Poster Session:
Metaphors in Akan Discourse on Development**

This presentation is taken from a chapter in Erika Eichholzer's Dissertation Project on: *From „Anibué“ to „Mpontúo“ – From Eye-opening to Progress: A linguistic analysis of Akan discourse on development in a diachronic perspective*, which is supervised by Prof. Dr. Thomas Bearth (University of Zurich).

This study analyses the parallel or „shadow“ discourse in Akan on socio-economic development – whereas the main discourse being in English – in a diachronic perspective, from its first documented beginning, the late 19th century, up to recent times, the beginning of the 21st century.



Ghana: Language Map from Nkansa-Kyeremateng (1996).

For an African language, Akan represents a rather unique case where texts on what can be classified as (socio-economic) development appeared already more than 100 years ago – due to the Basel Mission which promoted the major languages on the Gold Coast (Ghana).

African languages have not been regarded as being suitable tools to conceptualise and communicate national development but rather as being obstacles to it:

„Development theory and practice have failed to exploit local languages as media for research and development work“ (King'ei, 1999: 1).

Why bother to study metaphors?

As the use of metaphors is pervasive in everyday life, not just in poetic language (Lakoff and Johnson, 1980), it is important to undertake a

metaphor analysis in Akan, in order to arrive at a deeper understanding of the conceptual system of the Akan people.

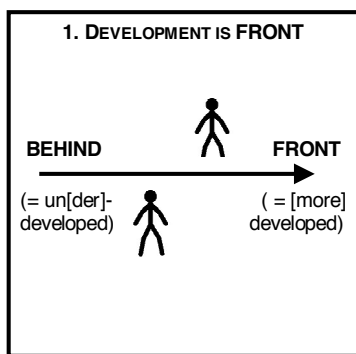
Moreover, the choice of metaphors helps us to understand the patterns of problem-solving strategies (cf. Kochis & Gillespie 2006) individuals resort to.

Examples of conceptual metaphors in Akan: Orientational metaphors

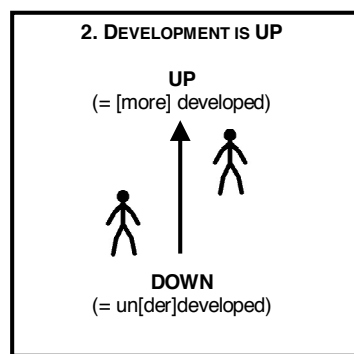
Very important in Akan are the following pairs of metaphors like: UP-DOWN, FRONT-BACK, IN(SIDE)-OUT(SIDE) and are probably the most

salient source domains for the Akan language as a whole. Entities, e.g. countries, regions, etc. that are UP, FRONT, and IN(SIDE) as regards

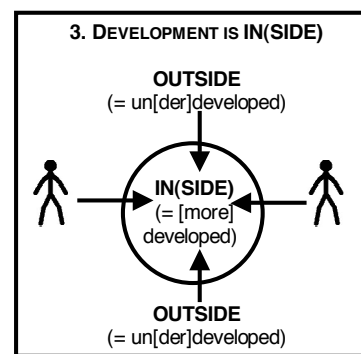
development are perceived to be more developed than others that are DOWN, BEHIND or even OUT(SIDE):



Other conceptual metaphors that are crucial in Akan discourse on development are: DEVELOPMENT IS



MOTION AND ACTION, DEVELOPMENT IS A BUILDING, DEVELOPMENT IS A COMMODITY, DEVELOPMENT IS A



JOURNEY. Metaphors of acceleration, however, quite unlike in English, are almost entirely absent in Akan.

Quoted works:

King'ei, Kitula (1999). „Language Development Research in 21st Century Africa“. *African Studies Quarterly, the Online Journal for African Studies* 3, 3.

Kochis, Bruce & Diane Gillespie (2006). „Interpretive Tools in Qualitative Research: A Re-Examination of College Students' Diversity Discussions“. *The Qualitative Report*, 11.3.: 566-585.

Lakoff, George & Mark Johnson (1980). *Metaphors We Live By*. Chicago: University of Chicago Press.

Nkansa Kyeremateng, K. (1996). *The Akans of Ghana. Their History and Culture*. Accra: Sebewie Publishers

Footnote: According to the Census 2000, the Ghanaian population was counted to be 18,8 Mio., of which 49,1% are of Akan origin and belong to one of the following ethnic subgroups: Ahanta, Akyem, Akuapem, Asante, Brong, Fante, Kwamu, Wasa, etc., and speak a variety of the Akan language. Another 20-30% speak Akan (Twi or Fante) as a 2nd and 3rd language, as especially the Twi variety is much used as a lingua franca throughout Ghana.

Modelling farmers' decision-making to explore transitions towards a more sustainable pesticide use. The case of La Hoya, Colombia

Giuseppe Feola and Prof. Dr. Claudia R. Binder

Social and Industrial Ecology, Department of Geography, University of Zurich, Switzerland

1. Problem

Pesticide misuse in agriculture is considered the cause of major health problems among smallholders in least developed countries, being inappropriate use of Personal Protective Equipment (PPE) an important issue.

In our study area of Vereda La Hoya, 69.5% of the farmers experienced pesticide-related adverse health effects. However, training programmes and interventions have had little effect in fostering a transition towards a more appropriate use of PPE.

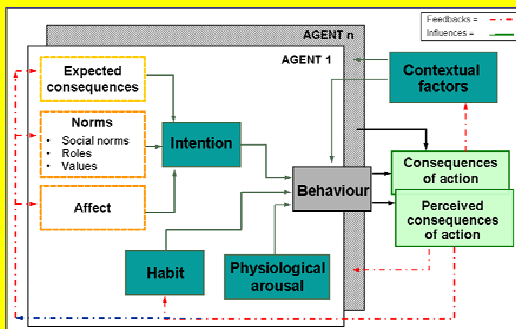
What are the factors locking the farmers into such an unsustainable behaviour?

2. Aim

to *investigate farmers' decisions* about the use of PPE, and to *identify the factors* preventing a transition towards a more sustainable pesticide use.

3. Theoretical background

The *Integrated Agent Centred (IAC) Framework* allows for comprehensively considering different kinds of potentially relevant behavioural drivers (internal, external; psychological, sociological, economic, environmental, technical) and to investigate the contribution of the micro-level decision-making to the aggregated dynamics of the system. Long- (e.g. social norms, habit) and short-term (e.g. expectations, affect) feedbacks are considered.



4. Study area

- Altitude: 2,800 m; Area: 840 ha
- Population: ~747 inhabitants (130 households)
- Smallholding farming (~6.6 ha)
- Main agricultural product: potato (also carrots and others)



5. Method

- A *survey* was conducted involving 197 smallholder potato growers in La Hoya and three comparative areas.
- Five *logistic regression models* were estimated to predict: the probability of using any item of PPE (Model 1), gloves (2), facial protection (3) and the frequency of use of gloves (4) and facial protection (5).

6. Results

Decision to use PPE

Table 1. Model 1: probability of using at least one item of PPE at least once in a productive cycle

Variable	beta	Exp (B)
Descriptive norm	1.338 *	3.810
Prescriptive norm partner	- .274	.760
Compliance to partner	- .552	.576
Prescriptive norm labels	- .804	.449
Compliance to labels	.375	1.455
Social consequences	.185	1.204
Hindrance	.152	1.164
Work organization	- 3.109 **	.041
Age	- .057 **	.944
Education	.091	1.095
Experience of health problems	- 1.138 **	.320

* Significant at p<0.001
** Significant at p<0.05

Older farmers (*age*), farmers sharing the pesticide application work (*work organization*), farmers not having experienced pesticide-related health problems in the past (*experience of health problems*), and farmers who believe other farmers do not use PPE (*descriptive norm*) are less likely to use PPE.

Frequency of use of gloves and facial protection

Models 2 to 5 show that farmers who find *gloves* hindering them (*hindrance*), are less likely to use them frequently. Farmers who have used a *facial protection* for a shorter time (*habit*) are less likely to use a facial protection. For both gloves and facial protection, the *descriptive norm* is the most relevant influencing factor.

The data suggest the existence of a *self-reinforcing feedback loop*, as the less farmers use PPE, the stronger is the social norm. This process of *conformity to the descriptive norm is the most relevant factor* locking the system into such an unsustainable behaviour.

7. Conclusions

- Different kinds of barriers to change exist, which differently influence the use of different PPE
- The barriers moving non-users to the use of PPE are different from those moving occasional users to a regular use
- Descriptive social norms are the most critical factor and no transition is likely to happen without a change in this respect



Missing population data for livestock breeds in developing countries - Do molecular methods offer new perspectives?

C. Flury¹, M. Tapio², H. Simianer³, O. Hanotte² and S. Rieder¹

¹ Swiss College of Agriculture, Zollikofen, Switzerland, ² International Livestock Research Institute (ILRI), Nairobi, Kenya, ³ University of Goettingen, Goettingen, Germany

INTRODUCTION

The majority of the world's livestock breeds are found in developing countries. It is estimated that about 70% of the world's rural poor depend on livestock as an important component of their livelihood (Rege and Drucker, 2006, Proc. 8th WCGALP). Therefore, conservation of Animal Genetic Resources is expected to play an important role in the context of poverty eradication. In developing countries description and characterization of local breeds is often not completed. The risk status of 60% of African mammalian livestock breeds is unknown (FAO, 2007, State of the World Report) which excludes populations from conservation activities and increases their risk of extinction. To overcome this lack the use of molecular information for the estimation of effective population size is investigated in an international project. First results are presented here.

MATERIAL AND METHODS

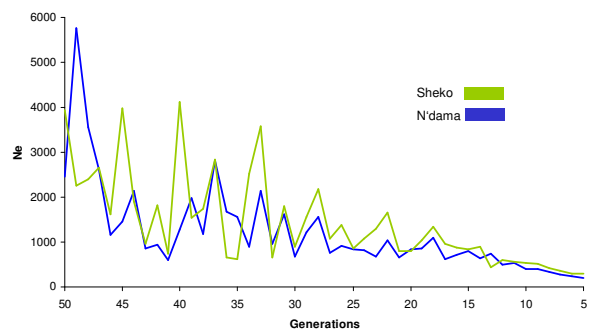
Samples : N'dama (N=22, Guinea); Sheko (N=17, Ethiopia).
Genotyped within the HapMap project
Genotypes of Chromosomes 2, 4 and 9 (3535 SNPs) analyzed with Haploview (Barrett et al. 2005, Bioinformatics), estimation of Ne according Hill (1981, Genetical Research).

RESULTS

Table: Evaluation of SNP-information for the 3535 SNPs.

	non-variable SNPs	MAF < 0.1	< 75% genotypes	informative SNPs
N'dama	43.4%	13.8%	0.3%	42.5% (1504)
Sheko	25.0%	18.1%	1.5%	55.4% (1957)

In the table above the loss of marker information due to non-variable SNPs, due to SNPs with a minor allele frequency (MAF) below 0.1 and due to SNPs with less than 75% informative genotypes is given. Finally 42.5% of the markers for the N'Dama sample and 55.4% for the Sheko sample were useful for analysis.



Picture: N'Dama herd in Guinea (O.Hanotte)

Figure: Development of Ne for the Sheko and the N'dama breed over the last 50 generations

CONCLUSIONS

- The available data allowed the estimation of effective population size and the derivation of its development over time.
- Both breeds show a decreasing population size over the last 50 generations, however with several fluctuations
- The inclusion of a reference breed (full pedigree available) is expected to allow further insights into the proposed method and its applicability for conservation activities of livestock breeds in developing countries.

Berner Fachhochschule BFH
Schweizerische Hochschule für Landwirtschaft SHL



GEORG-ALBERT-UNIVERSITÄT
GÖTTINGEN



What is GLP?

The Global Land Project (GLP) is a joint core project of both the International Geosphere Biosphere Programme (IGBP), and the International Human Dimensions Programme on Global Environmental Change (IHDP).

GLP is based on the conceptual framework of a "global coupled human-environmental system"; the Earth System. The Land System, including freshwater, is a critical component within the Earth System. Coupled socio-environmental systems provide a multiplicity of ecosystem services, such as clean water, air and flood control, that are vital to human wellbeing.

GLP will study the links between human transformations of land systems and the changing role of land systems in Earth System functioning. It builds on the valuable legacy of both the GCTE (Global Change and Terrestrial Ecosystems) and LUCC (Land-Use/Cover Change) Projects.

GLP seeks to merge existing research communities, and to attract other researchers from the social and natural sciences and the humanities.

How does GLP work?

GLP is a research program with a strong networking component. It brings together international scientists working in various fields within both the social and natural sciences. These scientists share an interest in interdisciplinary research on land-change, but have their specific areas of expertise, ranging from plant-ecology to economics and institutional research.

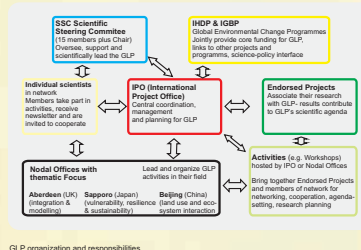
The **International Project Office (IPO)** coordinates the global network of GLP and is funded by the University of Copenhagen (Denmark), IHDP and IGBP provide additional core-funding for GLP.

Besides the IPO, GLP also has three **Nodal Offices**, which each have a thematic focus, and provide infrastructural, personnel, and scientific input and support in the process of implementing the GLP science plan.

The GLP Science Plan is implemented through regional studies with a global, comparative perspective. As GLP do not fund research, the IPO link and network existing research projects that are willing to add a global perspective to their work through a process called "endorsement".

Research projects (including PhD projects) can apply for endorsement if their research helps answering some of the questions from the GLP agenda, and if they are of high scientific standard. Currently (April 2008) more than 35 project and networks have been endorsed.

On a more practical level the GLP Science Plan is implemented by various activities such as workshops, conferences, and educational activities (e.g. summer schools).



GLP organization and responsibilities.

Objectives/Themes

GLP has developed a Science Plan around three objectives

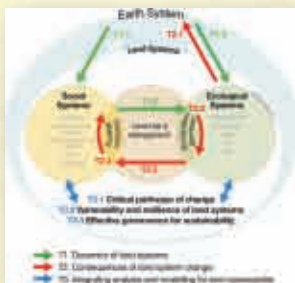
- (i) to identify the **agents, structures and nature of change** in coupled socio-environmental systems on land and quantify their effects on the coupled system;
- (ii) to assess how the **provision of ecosystem services** is affected by these changes; and
- (iii) to identify the **character and dynamics of vulnerable and sustainable coupled socio-environmental land systems** to interacting perturbations, including climate change.

Theme 1: Dynamics of land-systems

- Issue 1.1:** How do globalisation and population change affect regional and local land use decisions and practices?
- Issue 1.2:** How do changes in land management, decisions and practices affect biogeochemistry, biodiversity, biophysical properties, and disturbance regimes of terrestrial and aquatic ecosystems?
- Issue 1.3:** How do the atmospheric, biogeochemical and biophysical dimensions of global change affect ecosystem structure and function?

Theme 2: Consequences of land-system changes

- Issue 2.1:** What are the critical feedbacks from changes in ecosystems to the coupled Earth system?
- Issue 2.2:** How do changes in ecosystem structure and functioning affect the delivery of ecosystem services?
- Issue 2.3:** How are ecosystem services linked to human well-being?
- Issue 2.4:** How do people respond at various scales and in different contexts to changes in ecosystem service provision?



The EHP System. The arrows refer to the issues listed as part of the three main themes of GLP.

Theme 3: Integrating analysis and modelling for land sustainability

- Issue 3.1:** What are the critical pathways of change in land-systems?
- Issue 3.2:** How do the vulnerability and resilience of land-systems to hazards and disturbances vary in response to changes in human and environment interactions?
- Issue 3.3:** Which institutions enhance decision making and governance for the sustainability of land-systems?

GLP Science - Endorsed Projects

The two endorsed projects described here are all part of the GLP network, and can be seen as examples for the type of research that GLP is interested in.

The selected examples show different approaches to conduct "land-change science" at the challenging interface of coupled human and environmental (land-) systems. There are numerous approaches to conduct research due to the wide range of issues, the variety of available data-sources, quality, and possible spatial and temporal scales of analysis. One of the challenges for this type of research is the required high level of multidisciplinarity and integration of data sources, methodological approaches and cultures, in combining insights from the social and natural sciences.



Sampling sediments from Oveva Oveva Swamp, a Sphagnum and sedge dominated swamp on the grassland plateau of the Uguru (Photo: B. Mwanuzi)

York Institute for tropical Ecosystem Dynamics (KITE)

Principal investigator: Rob Marchant, Environment Department, University of York, UK.

The Eastern Arc Mountains of Tanzania and Kenya support great floral and faunal diversity and provide a range of ecosystem services like water, food and work to surrounding populations. The York Institute for Tropical Ecosystem Dynamics (KITE) is integrating past, present and future perspectives on ecosystem change by applying numerous disciplines and modelling methodologies to explore the relationship between Eastern Arc ecosystems, climate and human impacts. Research will determine why the Eastern Arc is so biodiverse, what role past human impacts and current management strategies have had, and how this may change under future climate change, land-use and economic scenarios.

Climate, Livelihoods and Production in the Southwest Pacific (CLIP)

Principal investigators: Ole Mertz and Kjeld Rasmussen, Department of Geography and Geology, University of Copenhagen, Denmark.

The CLIP project study the food production systems on small islands in the Southwest (SW) Pacific. The sustainability or collapse of production systems is the key to understanding the survival of the populations and civilizations of the islands in the past, present and future. In the past, some island systems collapsed either because of external forces such as climate change and/or internal forces such as conflict and food shortages, while other islands managed surprisingly well despite the isolation and limited resources. Today, the SW-Pacific islands face challenges related to 'classical' problems of sustaining growing populations, but also 'modern' problems of globalisation and human induced climate change.



Changing livelihoods - from shifting cultivation to increasing use of imported food; Bellona, Solomon Islands, CLIP Project. Photo: Turner Dröh-Thomsen

How to Get Involved

The GLP Science Plan will be implemented through a combination of detailed regional studies with a global, comparative perspective.

Although GLP can not directly fund research, the project invites and encourages interested scientists from various disciplines to join its network and consider submitting projects for endorsement that help implement GLP's agenda.

- The added value for endorsed projects can be:
- Access to an emerging network of integrated global environmental change (GEO) research on land systems including activities such as workshops, conferences and educational opportunities
 - Additional global perspective to local/regional studies including global or inter-regional comparisons
 - Publication opportunities

To join the GLP network and to find out more about how you can get involved, please visit our webpage www.globallandproject.org



Forest clearing for Oil-Palm plantations, Sarawak, Malaysia photo: Anette Reenberg



The Eastern Arc Mountains (dark green) and adjacent highland areas (light green)

GLP Offices/Contact

International Project Office

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University of Copenhagen, Øster Voldgade 10,
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www.globallandproject.org

Nodal Offices

GLP Nodal offices have a thematic focus and provide infrastructural, personnel and scientific input and support in the process of implementing the GLP science plan. At the moment (2008) three nodal offices are being established:

- **Sapporo**, Japan (vulnerability, resilience and sustainability of land systems)
- **Beijing**, China (land use and ecosystem interactions)
- **Aberdeen**, UK (integration and synthesis)

Global Land Project Scientific Steering Committee

The following 16 SSC members are internationally recognised scientists who steer the Global Land Project.

Anette **Reenberg** (Denmark), Chair; Richard **Aspinall** (UK); Andre **Batino** (Kenya); Gilberto **Cámara** (Brazil); Abha **Chhabra** (India); Sandra **Diaz** (Argentina); Helmut **Haberl** (Austria); Sandra **Lavorel** (France); Liu **Jiyuan** (China); Cheikh **Mbow** (Senegal); Dennis **Ojima** (US); Hideaki **Shibata** (Japan); Dawn **Parker** (US); John R. **Porter** (Denmark); Billie **Turner** (US); Tom **Veldkamp** (Netherlands)

IGBP and IHDP

GLP is a Joint Research Project of the International Geosphere-Biosphere Programme (IGBP) and the International Human Dimensions Programme on Global Environmental Change (IHDP). While the focus of IHDP is on the human dimensions of global environmental change, IGBP studies the interaction between biological, chemical and physical processes and interactions with human systems.



The GLP International Project Office is funded by the University of Copenhagen

Local Knowledge in Soil and Water Conservation in the Central Highlands of Eritrea

For centuries farmers have been cultivating the land in the Central Highlands and protecting it against soil erosion. This project endeavors to tap this valuable knowledge for future conservation programmes.

Mats Gurtner, Paul Roden, Thomas Kohler, CDE

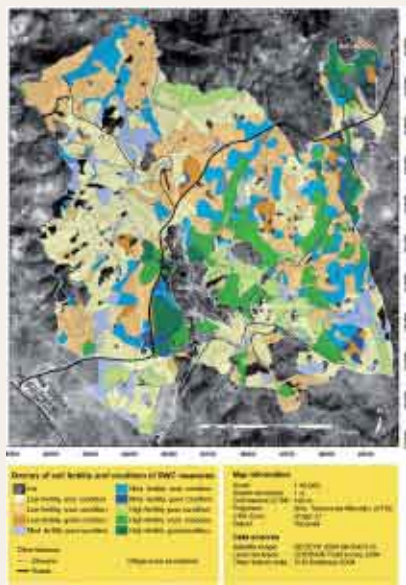
Soil and Water Conservation: A top priority in Eritrea

In the Central Highlands of Eritrea, the effect of erratic rainfall, steep slopes, and low vegetation cover combined with current land management practices lead to degradation of the land and its productive capacity. Soil and water conservation (SWC) measures are a way to counter the effects of land degradation.

Investments in soil and water conservation are dominated by physical structures. Government initiated mass food-for-work and cash-for-work campaigns are the primary means for the implementation of these structures. However, many of them have not been adopted and maintained by farmers.

A farmer participatory study, taking the Afdeyu catchment as a representation of the Central Highlands Zone, undertook to understand and generate information on traditional knowledge of SWC. This information was seen to contribute towards:

- more informed decision making by all stakeholders concerned
- the promotion of locally adapted and accepted technologies
- appropriate approaches for research and development activities



This map underlines the correlation between soil fertility and the condition of SWC measures. The limited resources of a small-scale farmers' household have to be concentrated on the high-potential areas. On marginal areas and on communal land, maintenance fails, implying serious knock-on effects further downstream.



Photo 1: Traces of conservation history in one picture: 1) traditional stone terraces used for generations, 2) a sisal fence introduced by the Italian colonial administration and 3) stone and earth bunds recently implemented by government initiated mass campaigns.

Wealth of local knowledge and challenge of maintenance

The study identified a high diversity of SWC technologies, i.e. 13 local and 10 introduced measures – and most of them applied in combinations. The area coverage of SWC measures was found to be high, but they lacked maintenance. This reduced their effectiveness.

What are the reasons behind the lack of maintenance?

- Human: lack of manpower (not least due to off-farm employment), lack of extension / farmer involvement (communication problems)
- Social: short term land use rights, religious norms, lack of community collaboration
- Physical: lack of farm implements and draught oxen
- Natural: shortage of productive land (structures consume land)
- Financial: lack of financial incentives

Preconditions for farmers to maintain SWC

- Consider local conditions and individual farmers' needs and capacities
- Ensure low (external) input
- Increase yield and minimise risk
- Integrate SWC measures into existing land management system

Lessons learnt for improved impact

Improve and institutionalise knowledge exchange between farmers, extension, and research.

The involvement of local knowledge in reducing land degradation and improving food security will:

- help to reduce high government expenditure for mass campaigns
- target limited financial and human resources more efficiently
- lead to a higher rate of acceptance, maintenance, and efficiency of SWC



Photo 2: A match between local knowledge and modern technology (remote sensing imagery): Allows for exchange and combined use of local and external knowledge.

In comparison to an untreated control plot, appropriate and well-maintained SWC measures not only reduce soil loss by 50–80%, but also efficiently conserve water, which is of particular importance in a semiarid area.

Source: Afdeyu Research Sub-station, 1985–1990



Photo 3: Terraces conserve moisture, which is clearly reflected in crop performance.

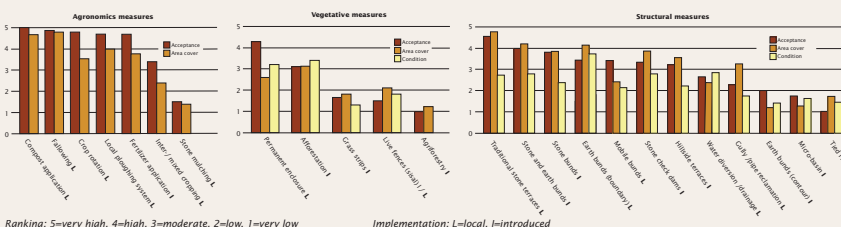


Figure 1: Acceptance, area coverage and condition of the examined SWC measures.

Using methods of environmental psychology to plan a campaign for disseminating solar water disinfection in high-density areas in Zimbabwe

S. Kraemer, H.-J. Mosler



SODIS is a pro-poor household based water treatment system: it can prevent diseases, reduce garbage and save money, time and resources.

But: slow uptake, no self-dissemination, partial / discontinued use, mistakes in use

How can future campaigns be more effective?



Method: N = 878 questionnaires in face-to-face household interviews for a baseline and after each intervention to plan the respective next intervention phase



Is water treatment needed?: Bad water quality (up to 420 total coliforms), high raw water consumption (80%), high diarrhea incidence (10-36% in clinics), high perceived need for water treatment



Outer limitations: Majority has difficulty obtaining bottles. Target behaviour not possible without bottles. → Intervention: bottle supply scheme



Existing preferences: perceived need for water treatment is high for 51%, but 75% do not treat their water. → Intervention: persuading people about SODIS with flyer presenting background knowledge and the benefits of SODIS



Situational support: Low values in remembering and social influence. → Intervention: sticker as memory aid in the house, outside: public commitment, model for social norms

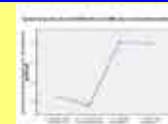
Variable	Very high	High	Low	Very low	Missing
Social influence: how often think about SODIS	8.4	18.5	27.2	19.2	28.7
Date of remembering	71.6	14.7	8.2	1.1	3.8



Diffusional method depends on group size: Project areas with more than 300.000 inhabitants, high-density areas with unofficial settlements. → Intervention: household visits from promoters, information events



Conclusion: with standardized and structured interventions that are addressing the actual existing needs, widespread and fast uptake of SODIS can be achieved



For more details see: Mosler, H.-J. & Tobias, R. (2007). Umweltpsychologische Interventionsformen neu gedacht. Umweltpsychologie, 11(1), 35-54.

Silvie Kraemer: silvie.kraemer@eawag.ch, Eawag, Switzerland
Eawag: Swiss Federal Institute for Aquatic Science and Technology

Reservoirs in the Zambezi River Basin: The biogeochemistry of Lake Kariba

Kunz M.J. *, Senn D., Wehrli B., Nyambe I., Dinkel C., Mwinga P., Wüest A.

Introduction

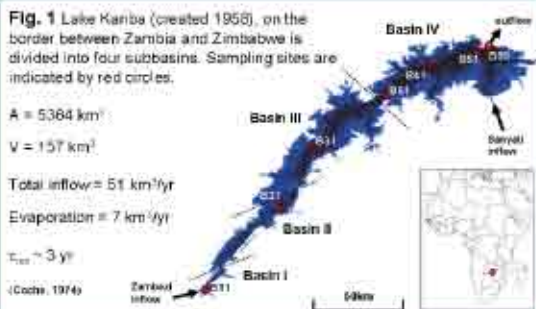
Large hydropower reservoirs provide vital resources in both developed and developing world contexts. However, reservoirs have major social impacts (e.g., relocation), and major environmental impacts, including

- altering important biogeochemical cycles, such as C, N, and P
- generally degrading water quality (low dissolved O_2 , H_2S production)
- enhanced CH_4 production, a potent greenhouse gas
- trapping particles (Friedl and Wüest, 2002; WCD, 2000)

The overarching goal of this project is to understand how reservoirs influence the cycling of P, C, N, and particles in the Zambezi River Basin, and determine whether different dam-operation scenarios could minimize dam impacts.

This poster presents initial data from Lake Kariba (Fig. 1), and discusses current interpretations and on-going work.

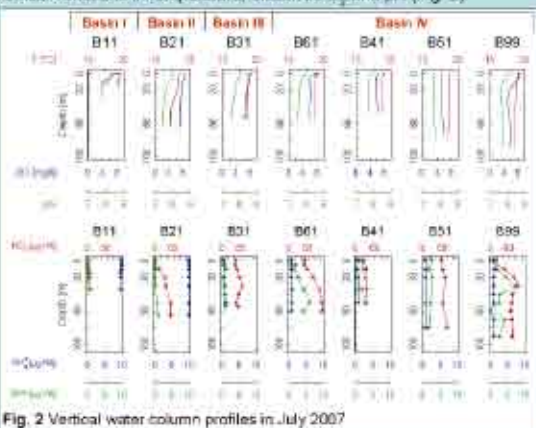
Study site and approach



Two field expeditions were carried out in 2007, one covering the entire reservoir (Fig. 1). Sampling included vertical profiling in the water column (T, dissolved O_2 , pH, dissolved nutrients, total N and P) and sediment coring to quantify particle trapping, sediment sinks for N and P, and characterize sediment sources (autochthonous vs. allochthonous) and diagenetic processes.

Vertical water column profiles

The July 2007 CTD profiles, taken during a lake-wide longitudinal transect shortly after turnover of the lacustrine Basins III and IV, exhibit small vertical variations in temperature, dissolved O_2 , and pH (Fig. 2).



In surface layers at stations B99 and B51 of Basin IV, increased pH and dissolved O_2 and depletion of dissolved nutrients suggests higher primary production rates (Fig. 2). Other stations in Basin IV (B51, B41) do not offer similar evidence of primary production, demonstrating that horizontal heterogeneity may be important in this system.

Basins I and II are more river-influenced. The Zambezi River appears to plunge (Fig. 2; vertical differences in dissolved O_2 , pH, and nutrients). The bottom water of Basin III may also be influenced by the Zambezi, based on decreased T, DO and pH values (Fig. 2).

References

Coché A.D., 1974. Biogeochemistry of a large reservoir in Lake Kariba. Thesis University of Geneva.
Friedl A., Wüest A., 2002. Diagenetic biogeochemical cycles in reservoirs. Aquatic Sciences 64: 99-106.
WCD, 2000. Large dam observations: a comprehensive assessment. The World Commission on Dams. London and Geneva, TN. <http://www.dam-projects.com/eng/obs.html>

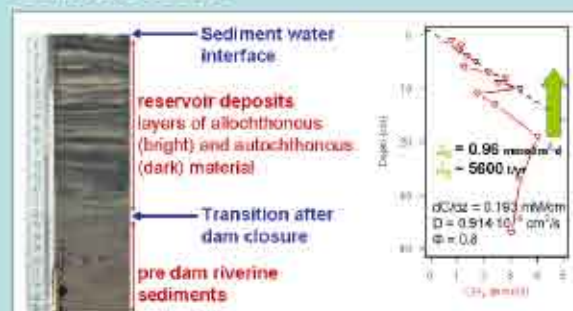
Total P budget for Basin IV



A preliminary budget of total P in Basin IV (Fig. 1) indicates that ~80% of total P inputs are retained in sediments (Fig. 3).

A similar budget is being developed for N, which is more complex due to potentially important additional sources (e.g. N fixation) and sinks (e.g. denitrification).

Sediment record



Sediment cores from Basin IV (Fig. 4a) indicate substantial particle trapping (accumulation rate ~0.4 cm/yr). Sedimentation may be largely event-driven, based on the varying thickness and color of the distinct sediment layers. We hypothesize that the thin dark layers contain a larger fraction of autochthonous organic-rich matter, relative to the thicker bright layers which we hypothesize consists primarily of allochthonous material from flood events.

CH_4 measurements in the porewater of sediment cores indicate a flux of <1 mmol CH_4 /m²/d, accounting for 5600 t/yr for Basin IV (Fig. 4b; data from B11). A similar flux of ~1.5 mmol CH_4 /m²/d was calculated for B51. This flux is substantial, however it is not clear so far what portion finally is emitted to the atmosphere.

Summary

- Data indicate large spatial heterogeneity in the biogeochemistry of Lake Kariba, which may imply a high degree of complexity of the model needed
- Lake Kariba appears to act as an important sink for P, and as a large source of CH_4 .

Ongoing work

- sediment analysis: elemental composition and sedimentation rates to evaluate C, N and P trapping efficiency of Lake Kariba and characterizing particle sources
- a thermistor string at station B99 (Fig. 1) continuously collects data and samples during a period of two years
- two intensive field expeditions in 2008 and 2009 and bi-monthly sampling of Basin IV during the hydrological year 2008/2009 to increase temporal resolution of biogeochemical data
- Collected data will be synthesized in a 2D numerical model. The model will be used for data interpretation and scenario modeling in order to assess dam management alternatives.

Acknowledgements

Financial support for this work was provided by the Swiss National Science Foundation (SNF) project 31-113000.00. We are grateful to the staff of the reservoirs of Lake Kariba, especially to the staff of the dam and the reservoirs of Lake Kariba, especially to the staff of the dam and the reservoirs of Lake Kariba, especially to the staff of the dam and the reservoirs of Lake Kariba.

'Where the Land is Greener'

Rewarding Investments in Documenting and Evaluating SLM Knowledge

Hanspeter Liniger, Gudrun Schwilch, Rima Mekdaschi Studer and Christine Hauert
Centre for Development and Environment (CDE), University of Berne, Switzerland



Coverpage

42 Technologies and 27 Approaches were selected from the WOCAT knowledge base and reviewed and updated in an intensive contributor-reviewer interaction process. This evaluation process was highly effective and rewarding for all stakeholders involved. The **book entitled 'Where the land is Greener'** presents these case studies together with analyses, conclusions and policy points.

Niger

Technology: Planting pits and stone lines - Rehabilitation of degraded land through manured planting pits, in combination with contour stone lines. The planting pits are used for millet and sorghum production on gentle slopes.

Approach: Participatory land rehabilitation - Planning and management of individual and village land, based on land users' participation, with simultaneous promotion of women's activities.



C. Belders



P. Bergwardt

The book is divided into part 1 and part 2.

Part 1 is the main analytical section searching for the common elements of success and implementing policy points.

Part 2 is a collection of 42 case studies from more than 20 countries.

Part 1: Analysis and policy implications

Analysis of SLM Technologies
Analysis of SLM Approaches
Conclusions and policy points

Part 2: Case studies with 9 SWC groups

- Conservation Agriculture
- Manuring/composting
- Vegetative strips
- Agroforestry
- Water harvesting
- Gully rehabilitation
- Terraces
- Grazing land management
- Other technologies

Tajikistan

Technology: Conversion of grazing land to fruit and fodder plots - Fencing-off part of an overgrazed hillside, combined with terracing, manuring and supplementary irrigation for grapes, fruit and grass production.

Approach: Farmer innovation and self-help group - Overcoming administrative and technical problems, an innovative land user, assisted by a self-help group, has established a fruit garden within degraded communal grazing land.



H.P. Liniger

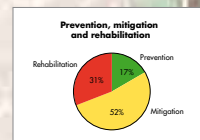


H.P. Liniger

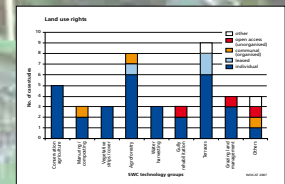
Example of policy point

Problems with water quantity and quality need to be seen in relation to land degradation and addressed through land management, especially in areas with water scarcity and conflicts.

Half of the case studies are located in arid or semi-arid environments and demonstrate achievements in **mitigating desertification**. Improvement in infiltration, and reduction of runoff and evaporation, are closely related to ground cover improvement, which was indicated in 70% of the cases.



Classification of the 42 case studies. Rehabilitation of degraded land may be the most visible form of SLM – but can be very costly. Prevention and mitigation offer the best payback.



Land use rights or the security of tenure can give confidence to carry out conservation measures. The most difficult situations are under open access regimes.

www.wocat.net

WOCAT
World Overview of Conservation Approaches and Technologies



Example of policy point

Continuous investment in rural areas and sustainable land management must be a local concern as well as a global obligation, as SWC/SLM is crucial not only to feed the world but to maintain ecosystem functions and environmental services.

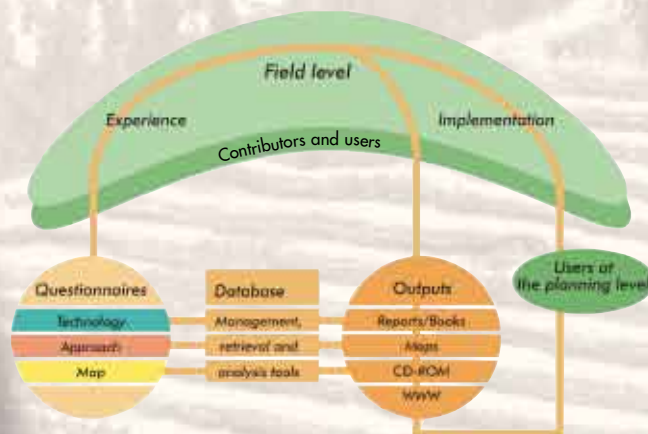
Investing in documentation and evaluation of SLM knowledge is rewarding for all stakeholders involved. It brings them together and stimulates mutual discussion, while the WOCAT questions challenge them. This enhances capacity and develops into a learning process.

WOCAT - Use of Knowledge

World Overview of Conservation Approaches and Technologies

Hanspeter Liniger, Gudrun Schwilch, Rima Mekdaschi Studer and Christine Hauert
Centre for Development and Environment (CDE), University of Berne, Switzerland

The WOCAT process and tools



Knowledge from the field for the field consisting of:

- questionnaires to document and evaluate local SLM experiences
- a database for storage and use of the wealth of SLM knowledge
- outputs of global knowledge in form of books, reports and maps, or via the internet to improve decision making
- Implementation - decision support and up-scaling of 'best-bet' practices

WOCAT's vision is that land and livelihoods are improved through sharing and enhancing knowledge about sustainable land management.

WOCAT's mission is to support innovation and decision-making in sustainable land management by:

- connecting stakeholders,
- analysing experiences and setting directions,
- enhancing capacity/ knowledge
- developing and applying standardized tools for documenting, monitoring, evaluating, sharing and using knowledge

WOCAT mainly addresses land users, advisors, SLM specialists, planners and decision-makers at field, national, and global level.

www.wocat.net

WOCAT
World Overview of Conservation Approaches and Technologies



Making local experience available at the global level - The four dimensions of knowledge

Knowledge about SWC/SLM



H.P. Liniger

Innovative methods and a network of SLM specialists documenting know-how in a rich database - a basis for addressing global issues such as poverty alleviation, water security, carbon sequestration, etc.

Tools and Methods



M. Guther

Tools and methods recognized as a world standard for documentation, evaluation and dissemination of SWC/SLM. Decision support tool for planning SLM and selection of 'best-bet' practices

Informationsharing and Networking



M. Guther

SLM specialists from over 50 partner institutions at the global (e.g. UN-organisations), regional (e.g. CGIAR centres) and national (e.g. ministries, NGO's) level sharing know-how.

Research, Training and Education



H.P. Liniger

Training workshops for capacity enhancement and SLM dissemination. Strong research coalitions to compile SWC/SLM knowledge and to identify and fill knowledge gaps.

LIVELIHOOD STRATEGIES OF PEOPLE ADJACENT TO TEMBE NATIONAL ELEPHANT PARK, SOUTH AFRICA

1. INTRODUCTION

The high unemployment rate (46%) in KwaZulu-Natal, and the fact that in the study area in particular the soil is sandy and therefore not very productive to crop farming means that the poor are in an economic predicament. To this end, natural resources play a significant role among the rural poor of Tembe. Maputaland, and therefore the land of the Tembe people, is located between the Lebombo mountains in the west, the Mozambique border in the north, the Indian ocean in the east and Mkuze river in the south. The Tembe Elephant Park is on the Tembe tribal land and is one of the many conservation areas in Maputaland. Tembe is on the flat coastal plain and has a mean altitude of only about 100m above sea level. The climate is tropical with summers being very hot and winters warm. Rainfall is relatively low at about 700 mm per year and though predominantly a summer rainfall area rain can be experienced throughout the year.

2. METHODS

This study used both qualitative and quantitative methods. The study aimed at investigating the livelihood strategies of the people adjacent to the Tembe Elephant National Park in Maputaland, northern KwaZulu-Natal, South Africa as they relate to natural resources. Semi-structured interviews were conducted with seventy-five households, two focus groups of mixed sexes, and a questionnaire was administered with eight crafters. Observations and informal discussions also formed part of data gathering for the study.

The area around Tembe Elephant National Park is a sand forest one and very fragile. Traveling around was also hindered by the lack of proper roads. To access communities along the border with Mozambique, further from the only main tarred road in the area, further the use of a 4x4. In fact, there were no roads, but only paths through the sand and bushes.

3. SELECTED BIBLIOGRAPHY

- Abul, M. and Bratka, P. 1986. Elephants, people, parks and development: the case of the Luangwa Valley, Zambia. *Environmental Management*, vol.10, No.6, pp. 745-751.
- Barrow, E., Babin, P., Infield, M. and Lambaya, P. 1993. Community conservation lessons from benefit sharing in East Africa. African Wildlife Foundation, Nairobi.
- Child, B. and Peterson, J.R. 1981. *Cambridge in rural development: the Baitbridge experience*. University of Zimbabwe, Harare.
- Clarke, J. and Grundy, M. 2004. The socio-economics of forest and woodland resource use: a hidden economy, in: Indigenous forests and woodlands in Southern Africa, edited by C. Fabricius and E. Koch, London: Earthscan.
- Fabricius, C. 2004. The fundamentals of community-based natural resource management. In: Rights, resources and rural development: community-based natural resource management in Southern Africa, edited by C. Fabricius and E. Koch, London: Earthscan.
- Kippers, R.J. 2003. The history and presentation of the history of the Kiboko-Tembe, MA Dissertation, Department of History, University of Stellenbosch.
- McKean, S.G. 2001. Resource management and harvesting of hyphane conoaca in Maputaland, KwaZulu-Natal, South Africa. Institute of Natural Resources, Pietermaritzburg.
- Mjoko, K., Mombongwana, N. and Stowell, Y. 1999. Promoting sustainable livelihoods for communities through the use and management of natural resources. *International Journal of Sustainable Development*, vol.2, No.3, pp. 205-216.
- *Unsustainable DP Rev.* 2005/06 and 2006/07.
- Zulu, P. 1997. South Africa's informal economy. Edited by, E. Preston-Nyile and C. Rogerson. Oxford: Cape Town.

3. RESULTS

Capital endowment in the Tembe area

Form of Capital	%	Financial:	%
Wages	34.6		
Remittances	28.6		
State grant	34.6		
Natural resources	36.0		
Other	16.0		
Physical:	%		
(a) Livestock		(b) Machinery	
Cattle	8.0	hoe	94.6
Goats	24.0	plough	1.3
Horses	1.3		
Fowls	52.0		
Natural: Access to land:			
Yes	66.6		
No	33.3		
Social:			
Stokvels	28.0		
Bonded schemes	4.0		
Saving clubs	9.3		
Other (eg. Relatives)	28.0		

The study found that 36% of the population relied on natural resources to earn their living. A further 34.6% relied on wages and state social grants while 28.6% relied on remittances. Very few people had financial income. 8% owned cattle and 24% owned goats. The overwhelming majority (94.6%) used the hoe to cultivate the soil. Natural resources therefore represented the highest source of a livelihood as a generator of financial incomes.

Some natural resources used for handicrafts

- Bala (Hyphantia) (cane)
- Incenza (Incenza) (cane)
- Umphahlanisi (Rottmannia) (fisher)
- Umphahlanisi (Spongia) (cane)
- Umphahlanisi (Spongia) (cane)
- Umphahlanisi (Spongia) (cane)
- Umphahlanisi (Spongia) (cane)

Education

The Umphahlanisi Municipality District of which the study area is part, is characterised by a relatively high functional literacy rate. According to the 2001 Census about 11387 people do not have any school education while 37870 have some primary education. Only 6770 have higher education.



4. CONCLUSION

Exploitation of the natural resources is essentially a survivalist strategy for the people adjacent to the Tembe Elephant National Park. With limited employment offered by the Park, the local people rely on natural resource to feed, clothe and send their children to school. The production of handicrafts plays a major role in the lives of these people. The obvious threat to sustainability of the natural resources suggests that growing these resources for commercial purposes would help curb the deteriorating situation and at the same time empower the people economically.



Perceptions of climate change and agricultural adaptation strategies in rural Sahel

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2. Institut des Sciences de l'Environnement, Faculté des Sciences et Technique, Université Cheikh Anta Diop de Dakar, Senegal

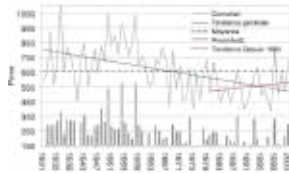


Introduction

Farmers in the Sahel have always been subject to climatic variability at intra- and inter-annual and decadal time scales. While coping and adaptation strategies have traditionally included crop diversification, mobility, livelihood diversification and migration, establishing climate as a direct driver of changes is complex. Using focus group interviews and a household survey, this study analyses the perceptions of climate change and the strategies for coping and adaptation by sedentary farmers in Kaffrine, eastern Saloum, the savanna zone of central Senegal.



Map of Senegal indicating field sites



Precipitation in the area since 1931.

Methods

The study was carried out in October 2006 and February-March 2007 and was a pilot study for developing a larger research approach. It comprised:

- 28 questionnaires in three communities: Boulélé, Sania and Toun
- 5 interviews with groups of men and women
- Interviews with 4 key informants

Results

Households are aware of climate variability and identify wind and occasional excess rainfall as the most destructive climate factors. Households attribute poor livestock health, reduced crop yields and a range of other impacts to climate factors, especially wind. However, when questions on land use and livelihood change are not asked in a climate context, households and groups assign economic, political and social rather than climate factors as the main reasons for change.

Household perceptions of climate change during the last 20 years.

Perceptions		Increased	Stable	Decreased	Do not know
No. of cases of the respondents		No.	%	No.	%
Precipitation	Increased	14	50	10	36
	Stable	14	50	10	36
	Decreased	10	36	10	36
	Length of dry spells, more extreme	10	36	10	36
	Extreme seasonal rains	12	43	10	36
Temperature	Increased	12	43	10	36
	Stable	12	43	10	36
	Decreased	10	36	10	36
	Length of hot periods	8	29	10	36
	Length of hot seasons	10	36	10	36
Wind	Increased	10	36	10	36
	Stable	10	36	10	36

* Percentages are rounded to 0 decimals, hence the sum is not always 100.

Climate impacts, causes and adaptation measures identified by households.

Category	Impact	No.	20th Century Causes	No.	Adaptation	No.
Livestock	Reduced yield	11	Wind	14	Dried crop residues	2
	Increased in range	10	Excessive rain	19	Other activities	0
	Loss of water	9	Reduction water	1	Shearings	0
Livelihood	Poor harvest	10	Wind	9	Switch to crop rotation	0
	Loss of soil	10	Lack of rain	1	Switch to arable	0
	Excessive rain	10	Excessive rain	10	Arrows in grain	0
	Loss of water	10	Changes	10	Changes in use of	0
Business	Loss of business	10	Wind	10	Market gardening	1
	Loss of business	10	Reduction water	1	Other activities	0
Living people	Loss of business	10	Loss of water	10	Other people with	11
	Loss of business	10	Loss of water	10	Other people with	11

Reasons for crop choice – climate factors are not mentioned.

Cultivated crop	No. of hh (%)	Reasons for selection of new crops/strategies, no. of households	Reasons for selection of new crops/strategies, no. of households											
			Increase in demand	More income	Good yield	Good price / easy to sell	High risk and/or consuming less	Early maturity, income in less season	Less risk of other crops	Less input	Less labor	Less pest/disease		
Millet	25 (100%)													
Cowpea	24 (95%)													
Moringa	18 (82%)													
Water melon	8 (33%)	11	1			1	1		1	1	1	1		
Cowpea	7 (29%)	5												
Corn	6 (24%)	1	1											
Peanut	6 (25%)													
Okra	6 (25%)													
Cassava	3 (12%)	3	3											
Bean	1 (4%)	1												
Cassava	1 (4%)	1												
Tomato	1 (4%)	1												
Groundnut, total	0	0	0	0	1	1	1	1	1	1	1	1	1	
TOTAL			11	3	1	1	1	1	1	1	1	1	1	



Focus group interview with women in Toun Mosque

Conclusion

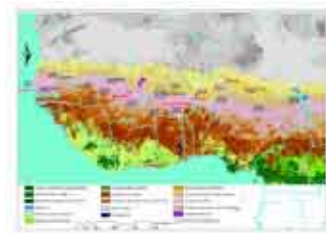
The communities studied have a high awareness of climate issues, but climate narratives are likely to influence responses when questions mention climate. Change in land use and livelihood strategies is driven by adaptation to a range of factors of which climate appears not to be the most important.

Next

Implementation of revised questionnaire and guides in sites across the West African AMMA Partner countries (about 1,500 hh questionnaires and 100 focus groups) during 2007-2008.

Remote sensing based land use change over the past 20 years for all sites (relationships between local climate parameters, land use change and livelihood strategies).

Scaling up to describe adaptation in the Sahel-Sudan region.



Field sites in West Africa for study in 2007-2008

This study was part of the African Monsoon Multidisciplinary Analysis (AMMA) project. Based on a French initiative, AMMA was built by an international scientific group and is currently funded by a large number of agencies, especially from France, UK, US and Africa. It has been the beneficiary of a major financial contribution from the European Community's Sixth Framework Research Programme. Detailed information on scientific coordination and funding is available on the AMMA international web site: <http://www.amma-international.org>

POVERTY AND FOOD SECURITY PROBLEMS IN KENYA: Determinants, Impacts and Vulnerability

PREPARED BY:

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COUNTRY PROFILE

Mainly classing with Figure 2 showing:

- Administrative Area
- Mean Annual Rainfall
- The Highlands and Arid and Semi-arid areas (Highlands are high food production areas, hence low poverty levels while Arid and Semi-arid areas are low food production areas)
- Population Density
- Households by Absolute Poverty

DEFINITIONS OF POVERTY

- Food security is defined as access by all people at all times to enough food for an active and health life
- Absolute poverty is viewed as a condition of life so characterized by malnutrition, illiteracy, and disease beneath any reasonable definition of human decency (World Bank, 1980)
- The poor in Kenya are those members of the society who are unable to afford minimum basic needs, composed of food and non-food items (Ministry of Finance and Planning in Kenya, 2000)
- The poor include the landless, the handicapped, female headed households, households headed by people without formal education, subsistence farmers, pastoralists in drought prone areas, unskilled and semi-skilled casual workers, AIDS orphans, street children and beggars

Figure 4: Population Density by District



Source: Author

DETERMINANTS OF POVERTY

There are three categories of Determinants of Poverty, namely:

- **Regional Determinants** (climate and related problems, accessibility to infrastructural services and increasing energy demands)
- **State Household Determinants** (a) Socio-economic factors- household land, labour and capital, (b) Demographic factors - Age, fertility and migration, and (c) Health issues - household morbidity and mortality
- **Individual Household Determinants** (gender, education, household energy needs and environmental degradation)

Figure 1: Administrative Areas



Figure 3

The Highlands and Arid and Semi-Arid regions of Kenya



Source: Author

Figure 6: Relationship between Poverty and Food security



Source: Author

POVERTY HOTSPOTS

Hotspots are defined as the highest number of people falling within absolute poverty (less than \$200 US/year) (UNEP, 2000)

Other districts with the incidence of poverty greater than 20% include: West Pokot, Marsabit and Isiyo (poor), Eldoret and Marsabit (poor) and Isiyo (poor).

REASONS FOR VULNERABILITY

- 1. **Geographical Vulnerability**, which encompasses the effects of natural hazards and climate change, which sometimes result in loss of life and property, such as drought, flood, famine, and disease. These hazards are often exacerbated by human activities. These hazards are often exacerbated by human activities. These hazards are often exacerbated by human activities.
- 2. **Demographic Vulnerability**, which encompasses the effects of population growth, which is often exacerbated by human activities. These hazards are often exacerbated by human activities. These hazards are often exacerbated by human activities.

Figure 2: The Mean Annual Rainfall



Source: Author

CAUSES OF POVERTY AND FOOD INSECURITY IN KENYA

Causes of poverty are similar to causes of food insecurity in Kenya such as low agricultural productivity and poor marketing situations, unemployment and low wages, corrupt and bad governance, landlessness and insecure land ownership systems, household infrastructural services, structural adjustment programmes, which resulted in cost sharing, (JMVMS and gender inequality)

Figure 5: Distribution of Households by Absolute Poverty



Source: Author

IMPACTS OF POVERTY

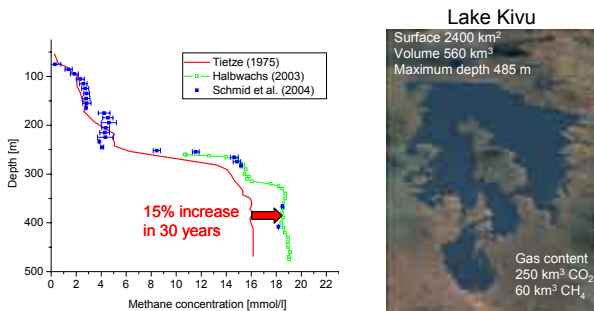
There are four major impacts of Poverty in Kenya, namely:

1. Poverty resulting into low productivity, frequent food shortages and stunted growth.
2. Environmental Degradation - arising from inadequate shelter, water and sanitation, and clean sources of energy, while the degraded resources in conjunction with the soil and water loss (due to soil erosion) environmental linkages.
3. High levels of unimproved urbanisation - whereby the poor live in over crowded areas characterised by water and sanitation problems, indoor air pollution, uncollected solid waste, poorly treated and untreated waste dumped into open water ways. Overcrowding in the slums and squatter settlements make it impossible to provide proper infrastructural services like roads, electricity, water and other services.
4. Low standards of education - The Kenya government has now introduced free primary education and free tuition secondary school, which still faces challenges of quality.

How does nutrient cycling influence methane production in Lake Kivu?

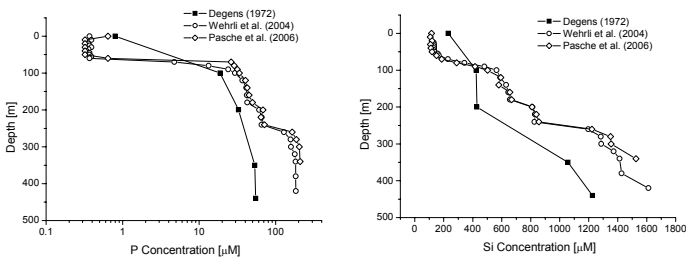
Increasing methane concentrations

A comparison of measurements made by K. Tietze in the 1970's and recent measurements shows that CH₄ concentrations and thus also gas pressure in the deep water have increased by about 15% within the last 30 years. As the CH₄ is biogenic, this indicates increased decomposition of organic material in the deep water.

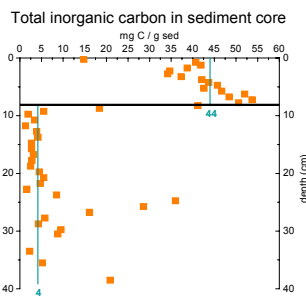


Did nutrient cycling change?

Increased nutrient concentrations in the deep water and decreased nutrient concentrations at the surface indicate higher nutrient export.



The top 8 cm of sediment cores have enhanced sedimentation rates and higher inorganic carbon, indicative of a change in nutrient cycling.



Publications

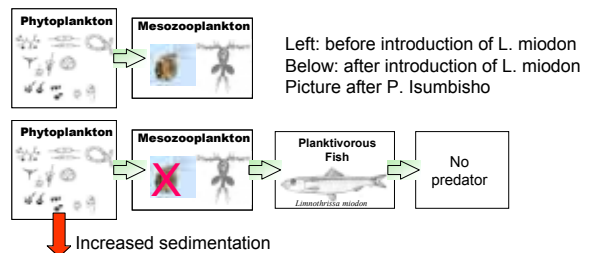
Schmid M, Tietze K, Halbwachs M, Lorke A, McGinnis D, Wüest A. How hazardous is the gas accumulation in Lake Kivu? Arguments for a risk assessment in light of the Nyiragongo Volcano eruption of 2002. Acta vulcanologica 14/15 (2002-2003): 115-121; 2004.

Schmid M, Halbwachs M, Wehrli B, Wüest A. Weak mixing in Lake Kivu: new insights indicate increasing risk of uncontrolled gas eruption. Geochemistry, Geophysics, and Geosystems 6: Q07009, doi:10.1029/2004GC000892; 2005.

Why is methane increasing?

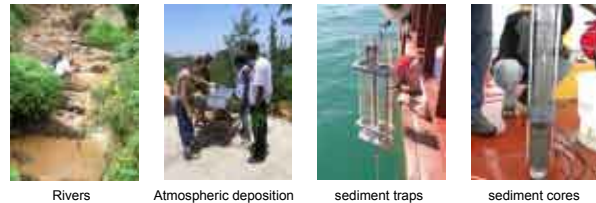
Two major hypothesis:

- Population density and agricultural production have strongly increased in the region within the past decades, leading to higher nutrient inputs, increased primary production and consequently higher nutrient exports to the deep water.
- The introduction of the Tanganyika sardine *Limnothrissa miodon* in the 1950's has changed the food web. Decreased top-down control of phytoplankton by zooplankton grazers could have led to increased export of organic material to the deep water.



Quantification of nutrient cycling

Nutrient cycling in Lake Kivu will be assessed by quantifying the three main processes of the cycle: external nutrient inputs, internal loading of nutrients, and sedimentation. Nutrient inputs from external sources will be evaluated in the main inflows, in the dry and wet deposition. The export production will be quantified by analyzing the nutrient concentration in the material collected in sediment traps



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Regionalized Life Cycle Assessment (LCA) for goods produced in "the South" as a basis for compensation schemes on the global market – a focus on water use

Lead text

Life cycle assessment (LCA) has been applied for decades and methods as well as available data bases are well developed to quantify most environmental impact providing results for comparison of different technologies or products. LCA has mainly been applied in Europe and other developed countries. However, growing production in emerging economies and developing countries have led to development of regionalized impact assessment methods. Additionally, impact on water resources has become more relevant on a global context. In our group, we developed a regionalized impact assessment method for water consumption quantifying related damages according to LCA practice.

Within a ETH-UNEP cooperation, we plan to apply this new methods not only for assessing damages but also for compensation activities of product-related damages quantified for the Areas of Protection (AoP): Human Health, Ecosystem Quality and Resources.

Main text

Life Cycle Assessment (LCA)

LCA is a powerful tool for assessing environmental impacts related to a product – “from cradle to grave”. It involves all stages in the “life” of a product, from resource extraction over production, use, recycling to final disposal. This “complete” view is required as often one product stage dominates the impact. Furthermore, LCA encompass a broad set of environmental impacts such as climate change, eutrophication, acidification, resource depletion, toxic emissions or land use.

Water use in LCA

Water use has recently become an issue as LCA has spread over the world including production and disposal in arid regions and developing countries, where different environmental impacts are expected. The regionalized method for impact assessment of water consumption is based on global datasets regarding

- Water stress (WaterGAP and other climate data)
- Biodiversity (Vascular plants, birds and vertebrates)
- Socio-economic data (HDI, access to water, agricultural water use)

The method allows quantifying impacts regarding the “areas of protection” in line with existing LCA-methods. Resulting impacts can be aggregated with other impact categories as e.g. climate change or be assessed individually

Compensation Scheme

Within the ETH-UNEP cooperation we will develop a method allowing compensation of damages caused by water use during production or disposal in developing countries related to products consumed in industrial countries.

LCA provides the required information allowing to track back the impacts from single processes in the production chain to derive the region where impact occurs. The second part is development of the compensation mechanism, which needs to quantify the compensation costs in each region for the relevant impact (Fig.1).

Finally, a label for products which compensate their environmental impacts from water consumption creates the input for the money pool to finance the compensation measures (Fig.2).

Example

We consider as example tomato sauce consumed in Switzerland consisting of onions and garlic produced in China and tomato produced in Morocco. LCA provides resulting total impact from water use (together with other impacts) for each production region. Regional studies will provide the information about costs for compensation of these effects which will be translated in a surcharge for the labeled product.

Conclusion

This approach is in line with current carbon footprint compensation scenarios where impact on climate change is assessed over the Life Cycle (LC) of a product. Current methods in Water Footprint are also covering whole LC but they don't consider the impact. Hence our approach fills the gap required to compensate another important environmental problem related to our consumption on a global scale.

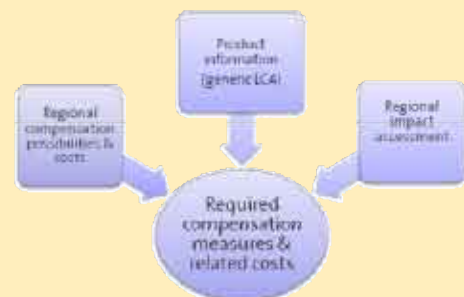


Fig.1: Information for evaluation of the proper compensation measure

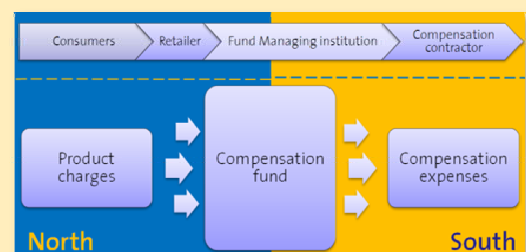


Fig.2: Actors (upper part) and Finance (lower part) in the compensation scheme. Impact of “Northern” consumption is compensated in the South through a fund. Compensation needs to be surveyed to ensure quality.

Framework for assessing 'Development Interventions' from an adaptation to climate change perspective

Bendapudi Ramkumar, Vishnu Sharma and Rupa Mukerji
Intercooperation

Abstract

This poster presents a **framework for analysis** that examines conventional development interventions supported by SDC for their impacts on resilience and coping abilities of households to climate change.

Context

The Swiss Agency for Development and Cooperation (SDC) and Intercooperation (IC) implement a number of development initiatives in the semi-arid regions of India encompassing sustainable land use, energy alternatives and livestock development with a focus on strengthening rural livelihoods. While the design of these projects did not take into account the dimension of vulnerability to climate change, the interventions are likely to have augmented the adaptive capacity of households to climate variability and change. It is equally likely that certain interventions may have made the communities more vulnerable.

Objective

To analyze the past development interventions from the standpoint of climate change (vulnerability and adaptation).

Framework for analysis

Selection of projects based on

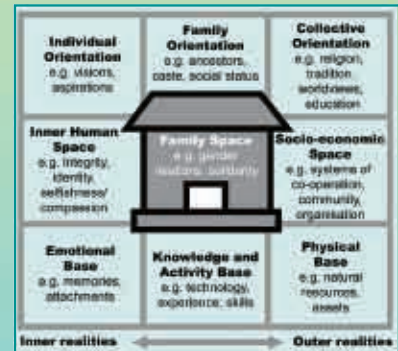
Agroecological zones → Identification of climate related risks → Climate sensitivity of project activities

Sustainable Livelihood approach (SLA)

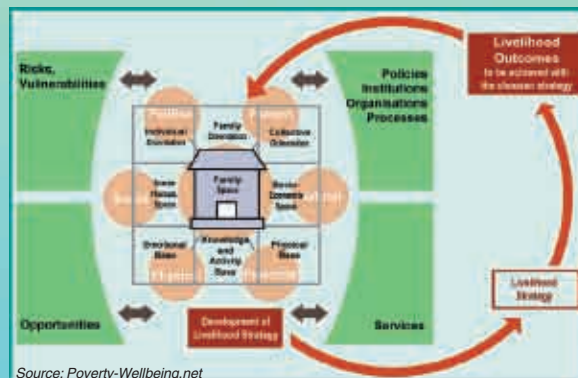
SLA includes analysis of six categories of assets: Natural, Social, Human, Physical Financial and Political and their interaction with transforming structures and processes for different livelihood outcomes. This provides insights into the changes due to stresses, shocks as also external development interventions.

SLA will be used to examine the influence of project interventions on livelihood systems of communities with specific emphasis on adaptation to climatic changes.

Nine Square Mandala Approach



The Nine Square Mandala framework offers a way of structuring the exploration of decision-making by individuals and groups and for tracing material and non-material livelihood outcomes towards which people aim.



Source: Poverty-Wellbeing.net

The results from such an analysis will provide insights into interventions that augment adaptive capacities and help in developing future strategies.

Summarize findings using the continuum approach

McGray et al. (2007) suggest a framework, which, rather than drawing sharp distinction between adaptation and development, places them on a continuum. The project-wise interventions will be analysed using the "continuum approach".





Event driven adaptation, land use and human coping strategies: Human-environment interaction in a smaller SW-Pacific island society

Anette Reenberg, Torben Birch-Thomsen and Bjarne Fog

Introduction

This presentation deals with the human-environment interaction that characterizes the dynamics of subsistence systems in the SW Pacific. It specifically aims at exploring the traditional coping mechanisms that have assisted the local population to deal with recurring hazards and thereby create a relatively resilient livelihood system.

Theoretical context

To provide a basis for the analysis of the event driven adaptation of human coping strategies on Bellona Island, we have: a) Characterized rural populations' livelihood strategies and adaptability and their vulnerability to exogenous and endogenous stressors; b) investigated land use-population relationships; and c) analyzed the coupled human-environmental system through the lenses of environmental and socio-political timelines.

Study site

The study area chosen for this work is Bellona Island, a small (approx. 1600 hectares) elevated atoll situated in the south-central part of the Solomon Islands (Figure 1). The island is an uplifted coral rim with steep cliffs of about 55 m towards the sea which surround a fertile central plain about 10 meters above sea level that constitute the former lagoon floor. The climate is tropical with high humidity and an annual precipitation of more than 3 meters. However, due to a low water retention capacity of the soils, even short periods without rain cause periods of drought. In addition to droughts the exposure to tropical cyclones is a major environmental hazard to people's livelihood.



Photo 1. A traditional Bellonese homestead with a sweet potato field in the front and coconut palms – used for copra production during the 1950s and 70s. (Photo: T. Birch-Thomsen).

The Bellonese agriculture is a garden type of cultivation. The traditional shifting cultivation system on Bellona depends on the use of a multitude of cultivated plants utilizing different types of niches in the soil environment. The most important food crops are tubers, i.e. different species, incl. several varieties, of yams (*Dioscorea*); taro (*Cocoyam*; *Colocasia* and *Alacasia*); and sweet potatoes (*Ipomoea batatas*). A number of other crops are cultivated of which bananas (*Musaceae*), and watermelon are some of the more important.

Data and Methods

Three main sources of data have been used:
- Secondary data, primarily from one major study from the mid-1960s (Christiansen 1975), and aerial photography (1966) and Quickbird satellite image (2006) for land use monitoring.
- A quantitative survey of 48 HH (23% of the total).
- In-depth group interviews and field walks.



Photo 2. A cleared plot with yam, taro and a few watermelons. (Photo: T. Birch-Thomsen)

Figure 1

Changes in land under cultivation on Bellona, 1966 and 2006 (excl. coconut plantations). Source: Aerial photographs (1966) and Quickbird satellite image (2006).

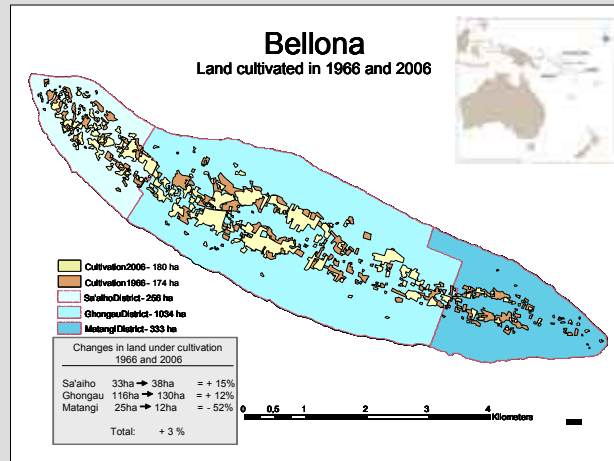
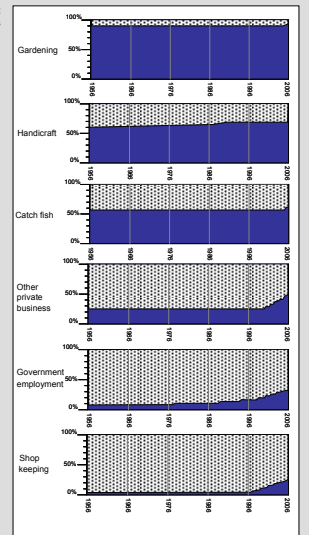


Figure 2

Timelines for selected activities (percent households involved). Source: CLIP Survey 2006.



Results

Population

Based on the estimated de facto-population of Bellona it is found that the population has on average increased by 51% (Table 1). The population pressure on Bellona as a whole has in other words increased and so has the local demand for food. When looking at the variation between the three administrative districts of Bellona, Ghongau, Matangi, and Sa'aiho, the relative growth varies between 29% and 59%.

'De facto' population	Sa'aiho	Ghongau	Matangi	Total
1966 ¹⁾	132	344	94	570
2006 ²⁾	193	546	121	860
Population increase	46%	59%	29%	51%

¹⁾ Christiansen, 1975; ²⁾ CLIP survey, 2006.

Table 1 Population data 1966 and 2006 – by district and Bellona in total ('de facto').

Land use - agriculture

In 2007, gardening (and fishing) is still actively pursued by almost all household and is considered to be a major activity. The amount of land under cultivation is more or less unaltered (Figure 1) which means that there is no indication of a possible break down of the shifting cultivation system because of reduction of the fallow period as a result of population growth. The cropping pattern has been slightly modified, emphasizing e.g. sweet potatoes more and taro and yams less, but again, the findings do not support a perception of a radical change.

On the other hand, the role and importance of agriculture as provider of the daily subsistence for the populations has changed dramatically. Although everybody is still engaged with agriculture, the contemporary daily food requirement of the Bellonese households is far from covered by garden products only, as it was the case forty years ago.

Food Preference	Food items	Eating daily (%)	Eating daily or weekly (%)	Never eat (%)
'Traditional food'	Sweet potato	79	100	0
	Yams	48	85	2
	Fresh fish	10	58	10
'Modern/new food'	Taro	4	33	33
	Rice	90	98	0
	Noodles	27	90	0
	Canned fish	15	56	21

Table 2 Food preference (sample size 48 households). Source: CLIP survey 2006.

Livelihood activities

The major components of the livelihood strategy on Bellona do not seem to have changed much since the mid-60s (Figure 2). Traditional activities such as 'gardening' (92%), 'handicraft' (66%) and 'fishing' (60%) are activities that a majority of households traditionally have been, and still are, engaged. Other components of the livelihood strategy have, however, undergone remarkable change: 'Private business' (48%), 'government employment' (27%) and 'shop keeping' (21%) existed on the island 50 years ago, but the contemporary importance indicated in these percentages is a significant shift from the low level forty years ago.

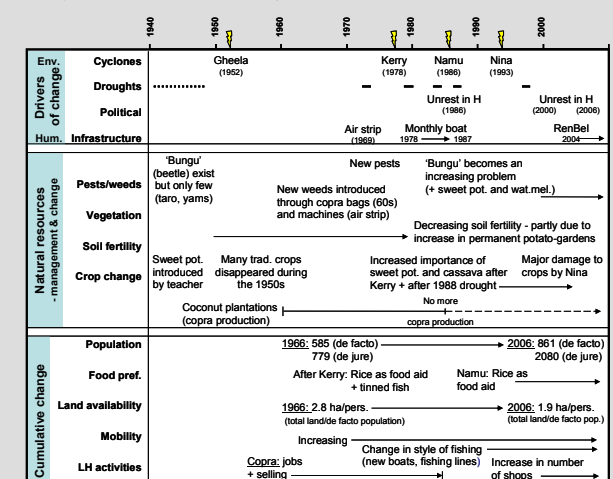


Photo 3. Canned fish and rice are some of the most common goods in the shops. (Photo: T. Birch-Thomsen).

Conclusions

The trajectory of the coupled human-environmental system on Bellona (Figure 3) can best be described as a combination of continuity and change. While the population has grown, local resource management practices are only marginally impacted by external stress and internal pressure from increasing population density. The importance of agriculture has been decreasing in relative terms, yet, it remains an important component of the livelihood and the cultural identity. The cultural identity, in turn, serves as a 'perceived long term insurance' for those that migrate, and continue to send remittances in order to preserve a possible vision of returning to a life on Bellona, if need occurs. Hence, culturally determined bonds become a main 'mechanism' to enable Bellonese people to cope with environmental or socio-economic stress that may occur either on the island or in the Bellonese community outside Bellona. Although the 'room for maneuver' for individual households varies (e.g. access to resources such as land and income opportunities), the general conclusion is that people on Bellona have been able to alter their activities and become less vulnerable to external shocks – especially environmental but also economic.

Figure 3 Coupled human-environmental timelines of Bellona, 1940s to 2006. The coupled human-environmental time line illustrates the temporal co-evolution of events, driving forces and resource management strategies. It shows the adaptive resource management strategies which have been employed in the face of climatic and socio-political changes in the recent past.



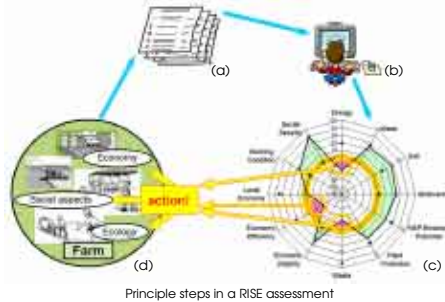


Prioritize and improve key sustainability issues in agriculture with RISE (Response-Inducing Sustainability Evaluation)



RISE

Putting sustainable agriculture into practice requires applicable yet scientifically sound, holistic monitoring tools. **Response-Inducing Sustainability Evaluation** stands for the application of a computer-based tool that allows assessing the sustainability of agricultural production at farm level (<http://rise.shl.bfh.ch>). The assessment starts with on-farm data collection (a). An analysis covering ecological, economic and social dimensions (b) delivers a detailed output including graphical visualization (c). RISE first and foremost aims at initiating reflection and measures to improve the sustainability of agricultural production (d).



Strengths and weaknesses regarding production practices are identified, and intervention points for improvements discussed with the farmer. RISE can also be used to assess groups of farms and provide information about general sustainability deficits under prevailing conditions. In large-scale studies, RISE unfolds one of its particular strengths: While information to answer research questions is collected, simultaneous assessment analysis and feedback to farmers raise awareness and stimulate improvements at farm level.

Project example:

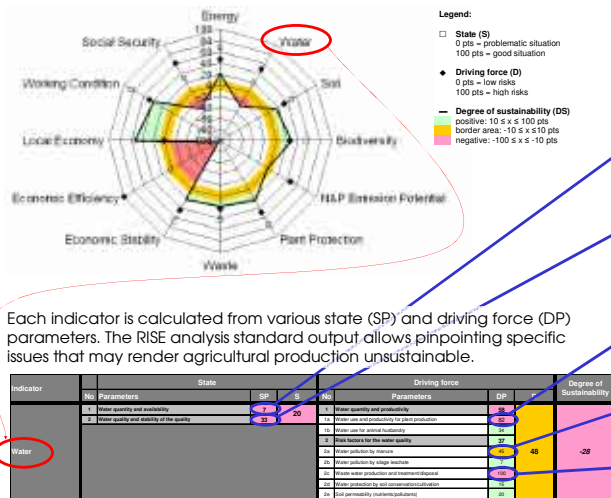
Identification of priority domains for extension and training to improve the sustainability of smallholder production in Kenya

In a collaborative project between SHL, CETRAD¹⁾ and Syngenta, key sustainability deficits in agricultural production of smallholders in the Laikipia area (Mt. Kenya region) were identified through RISE assessments. Major bottlenecks detected concerned water productivity, manure and soil fertility management, pesticide use and handling, social security, and -in particular- economic performance. This identification of priority domains for agricultural extension fostered the development of specific training modules and targeted consultancy for small-scale farmers. Record keeping, increasing production (through crop rotations, organic fertilizers, water conservation, etc.) and reducing costs may help in improving the economic situation.

Demonstration plots have been set up in fields of interested farmers and field visits of neighboring farmers organized. On-farm action research capitalizing on previous research activities carried out in the region allows introducing adapted approaches and technologies to overcome major problems the farmers are facing. Extension and training are anchored within existing organizational and social structures. A second round of RISE assessments after three years will investigate changes in farming practices (particularly in critical domains) in order to assess the impact of the training initiated on the sustainability of agricultural production.

Identification of sustainability deficits and options to improve the prevailing situation at the example of the RISE water indicator

Average indicator values of 30 farms assessed in Laikipia area



Each indicator is calculated from various state (SP) and driving force (DP) parameters. The RISE analysis standard output allows pinpointing specific issues that may render agricultural production unsustainable.

Based on expert knowledge options for improvements may be suggested and respective training/consultancy provided

Issues

- Unreliable rainfall, water abstraction by upstream farms
- Deteriorating water quality (erosion, pollution by pesticides and manure)
- Low water productivity (rainfed and irrigated)
- Water pollution by manure (inappropriate storage, livestock entering water bodies)
- Inappropriate disposal of waste water

Possible options

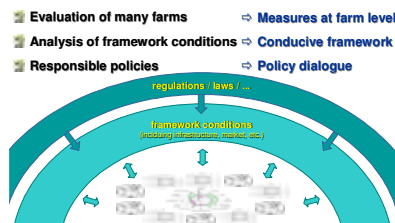
- Water harvesting (e.g. ponds), water conservation (mulches, windbreaks), water-efficient irrigation
- Upstream erosion control, proper manure and pesticide management, cover crops, buffer strips
- Intensification of production (use of (organic) fertilizers; pest, disease, weed management), water conservation (mulches, conservation agriculture)
- Proper manure management (covered sheds, storage facilities, composting, proper application), watering places for livestock
- Reduction of water use; reed bed systems, infrastructure development for greywater treatment

¹⁾ Centre for Training and Integrated Research in Arid and Semi-arid Lands Development, Kenya

RISE project in Armenia

Tackling key constraints to sustainable agricultural production in Armenia under transition

A project initiated in 2005 is systematically analyzing the sustainability of agricultural production in Armenia through large-scale RISE evaluations. By identifying strengths and weaknesses of many farms, a comprehensive picture of the sustainability of agricultural production is provided, allowing for an analysis of framework conditions in view of their effects on sustainability of agricultural production. The initiated policy dialogue aims at adapting the institutional framework to create more favorable conditions for sustainable production and to ease the transition period.



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Development and Adoption of Improved Pearl Millet Seed in Eritrea

The Pearl Millet Breeding Programme of the Ministry of Agriculture – National Agricultural Research Institute works towards the improvement and diversification of local landraces with a view to increasing production and food security. The Programme takes a participatory approach involving research, extension and farmers.

Paul Roden (CDE), Negusse Abraha (MoA NARI), A. G. Bhasker Raj (ICRISAT), F. R. Bidingir (ICRISAT), Thomas Kohler (CDE)



Pearl Millet: Eritrea's second most important staple crop

Pearl millet (*Pennisetum glaucum*) is grown mainly by small-scale subsistence farmers in the lowlands and midlands. It is predominantly grown in less favorable environments where rainfall is variable and low (250–300 mm). Farmers on an average produce only 6 months worth of their annual household grain requirements.



Photo 1: On-station breeding

Breeding efforts are geared towards improving household food security by increasing yields, reducing risks from diseases like downy mildew, and breeding for desirable traits such as early maturity.

Monetary gains in growing improved cultivars

In Hagaz area, an average 30% yield increase between 2002–2005 on the area planted in improved cultivars adds up to US\$ 252,172 of extra benefits for farmers.

Two improved varieties adopted by farmers

The programme has resulted in the introduction of an ICRISAT variety – ICMV 221, called Kona – and the release of a new locally bred variety, Hagaz. These are superior to the presently cultivated landraces in disease resistance and grain yield.

On-station results – a 40% yield increase: On-station trials showed that yields from the new varieties (Kona and Hagaz) were up to 40% higher than those of traditional landraces (Tokroray).

Entry Name	Time to flowering (d)	Plant height (cm)	Grain yield t/ha	Downy mildew susceptibility (%)
Kona	45	177	2.02	0.3
Hagaz	51	199	2.27	0.7
Tokroray	54	218	1.57	38.3

Table 1: Performance of varieties, Kona, Hagaz and local landrace (Tokroray) at the Hagaz Research Sub Station.

On-farm results – wide acceptance: Participatory on-farm appraisals have shown a wide acceptance of the improved varieties by farmers. Yields have increased by an average of 30%. Furthermore, the appraisals show a wide range of attributes where the improved varieties are superior.



Photo 2: Farmers' choice.

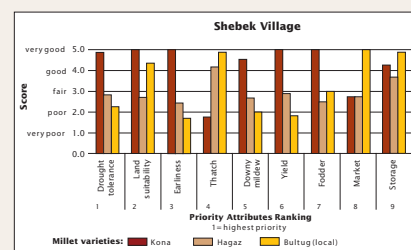


Figure 2: Attributes ranking – farmers distinguish between many different attributes that are important to them.

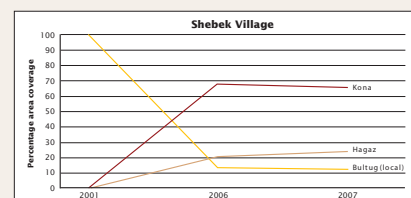


Figure 3: High adoption rates of improved varieties – farmers grow a range of different pearl millet varieties at a time. Not using local landraces may be a challenge in the future.

What are the impacts of the programme?

Improved food security and livelihoods: Farmers have increased their food security and other concerns important to them (Figure 2) by including improved varieties in their crop mix.

Income: Increased yields allow farmers to sell more grain in order to meet their growing cash demands.



Photo 3: Injera (local bread) produced from the Kona variety is culturally acceptable.

Adoption of a participatory approach in breeding activities and especially in monitoring of outcomes. A recent experience for farmers in Eritrea.

A farmer's viewpoint

During a farmer's day in 2006, farmer Frezghi Hamde from Libana Village said: *The local variety will produce 500kg/ha in our best soil, while Kona will produce the same amount on only ¼ of a hectare on our worst soil.*

Quality-oriented organisation of residential institutions & personal development of children at risk in their care

International Conference on
Research for Development,
Bern, 2 - 4 July 2008

An research initiative originating from the experiences of a Brazilian grassroots project, applying an organisational psychology approach to improve the quality of residential institutions for street children and other children at risk in Brazil and elsewhere

Anna Katharina Schmid

Background

- E.g. Brazil: > 50'000 street children in residential care. Grave deficits in institutions, violence, high re-incidence (Silva, 2004¹; OAB& CPF, 2006²).
- Quality of institutions is a direct result of their organisational structures and processes.
- Practitioners and policy makers want quality to improve but lack knowledge about specific organisational characteristics of such institutions.
- No empirical organisational analyses specific to this type of organisation available in Brazil or elsewhere in the world.
- Knowledge from other types of organisations (e.g. companies) cannot be applied 1:1 (Contingency theory, e.g. Rollinson, 2005³).

Objectives

To improve the quality of residential institutions for street children and other children at risk by producing:

1. knowledge on their specific organisational structures & processes
2. criteria and standards for organisational quality,
3. recommendations for quality-oriented organisation development.

Research Project 1

Organisation and quality of residential street children's projects in Brazil. An organisational psychology study based on the 'Chácara dos Meninos de Quatro Pinheiros'.

(completed, electronic publication (German) August 2008)

Goal

- Pioneer organisational psychology analysis of such an institution:
 - describing its characteristic structures and processes,
 - linking these to concepts of quality and sustainability.

Methodology

- case study of 'Chácara dos Meninos de Quatro Pinheiros':
 - grassroots project in Curitiba, Brazil, est. 1993 by former monk, shanty town inhabitants and street children
 - 'innovative, successful' (Unesco, 2001); 'best practice' (UNDP, 2007)
- participatory, practice- and knowledge-oriented, qualitative
- exploratory interviews, focussed group discussions, text analysis
- addressing youths in care, staff, board, other experts, neighbours
- approx. 20'000 lines of transcription/text
- information, narrative and discourse analysis, mostly inductive, some use of a general, 'content-free' model of organisation.

Results

New! Framework for describing/comparing such institutions

- **7 Dimensions of Organisation** (4 not present in organisation literature): action basis, beneficiaries (residents), goals, physical structure, social concepts, social structure, transformation process
- **logical order of construction**: creating group with children → joint analysis of needs/potentials of children & society → definition of goals → definition of physical and social structure → definition of transformation process and activities → constant evaluation
- traditional concepts of quality (relevance, effectiveness, efficiency, sustainability) applicable; measurement limited. **2 new dimensions of quality**: quality of life in institution as perceived by resident youths; organisational adaptability of institution.

Central organisational concept:



Former street boys explaining their institution's organisation

Research Project 2

Criteria and collaborative standards for quality and quality-oriented organisational development in residential institutions for children and adolescents at risk.

(planning: July – December 2008; project: January 2009 – June 2011)

Goals

- a comparative study of the organisational state and quality of a number of institutions
- further elaborate quality criteria and develop "good practice" quality standards collaboratively
- develop recommendations for implementation of quality-oriented organisational development collaboratively (incl. some questions of leadership)

Participants (in negotiation)

Residential institutions for children and adolescents at risk in Brazil, Switzerland, and possibly an international group of NGO institutions

Methodology

- comparative, applying framework from research 1
- participatory, practice- & knowledge-oriented, focussing on resources rather than just deficits
- qualitative and quantitative methods, depending on sub-question
- narrative interviews, questionnaires, focus groups / Delphi method

Some publications and products

- e-publication of research 1 / doctoral thesis (Aug 08)
- concise guide with recommendations of research 1 (Oct 08)
- articles in scientific and practitioners' journals (concurrent)
- practice handbook based on research 2
- self-assessment tool based on research 2
- website (research results, some interactive learning) (concurrent)
- network of institutions ("community of practice") from research 2

Contact for information, exchanging ideas and contributing finance:

Dr. des. Anna Schmid; annaschmid@ethz.ch, anna.k.schmid@gmail.com

- 1 Silva, E (2004). O direito à convivência familiar e comunitária: os abrigos para crianças e adolescentes no Brasil. Brasília: IPEA/CONANDA.
- 2 Ordem dos Advogados do Brasil & Conselho Federal de Psicologia (2006). Um retrato das unidades de internação de adolescentes em conflito com a lei. Brasília: author.
- 3 Rollinson, D (2005) Organisational behaviour and analysis. An integrated approach. Harlow: Prentice Hall/Pearson Education, 3rd ed.



COMPARING SYSTEM VISIONS OF FARMERS AND EXPERTS

R. Schöll, C. R. Binder
Department of Geography, Social and Industrial Ecology, University of Zurich

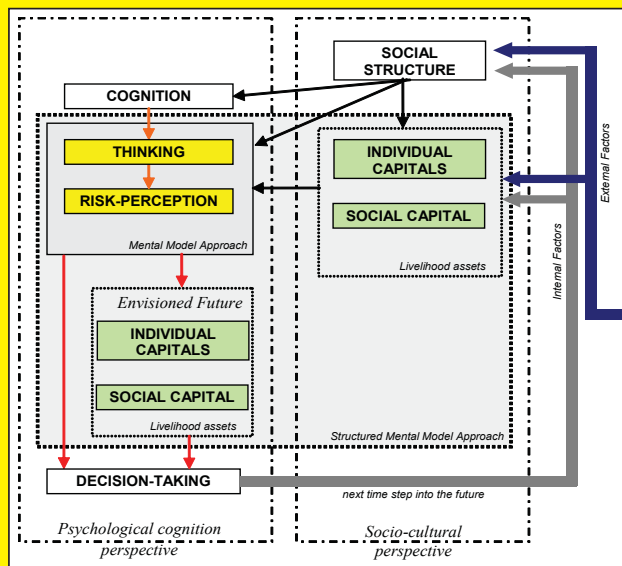
BACKGROUND AND RESEARCH AIMS

To secure agricultural food production in the future, pesticide application is increasing and, despite extensive educational programs, farmers continue to take high health and environmental risks when applying pesticides. The goal of this research is to analyse farmers' future visions concerning pesticide management for potato growing farmers in Vereda la Hoya (Boyacá, Colombia). To achieve this goal the authors applied the Future Structural Mental Model Approach (Future-SMMA) to:

- 1) investigate farmers' future visions in the context of their livelihoods
- 2) compare farmers' and experts' perceptions of external constraints on farmers' future
- 3) determine how farmers' livelihood assets and self-perception influence the build up of farmers' future visions

CONCEPTUAL FRAMEWORK

The SMMA combines the Mental Model Approach with the livelihood assets structure of the Livelihood Framework thereby combining the psychological cognition perspective with the socio-cultural perspective of risk related decisions. As presented in the graph of the conceptual framework the Future-SMMA investigates farmers' visions via farmers' perception of present and future livelihood assets (individual and social capital) and their influence on decision taking.



METHOD: THE FUTURE-SMMA

Future-SMMA	Farmers' model of their desired future livelihood	Experts' model of farmers' possible future livelihood
Part I	<ul style="list-style-type: none"> Construction of desired futures Discussion of feasibility of four previously constructed scenarios Preference ranking of the four scenarios 	<ul style="list-style-type: none"> Discussion of farmers' desired futures Discussion of expected preferences of farmers concerning the four scenarios Feasibility ranking of the four scenarios
Part II	<ul style="list-style-type: none"> Answering open-ended questions about the relations of the capital groups with respect to farmers' preferred future Naming whom they will turn to for help to achieve the desired future 	<ul style="list-style-type: none"> Elucidating how the key capital elements will develop in the future, by naming three expected stages of development for each element. The levels were: 1) best case, 2) an intermediate case and 3) worst case Naming own role/plans concerning agricultural development projects
Part III	<ul style="list-style-type: none"> Designing future agent network 	<ul style="list-style-type: none"> Discussing the future agent network of farmers to achieve farmers' future

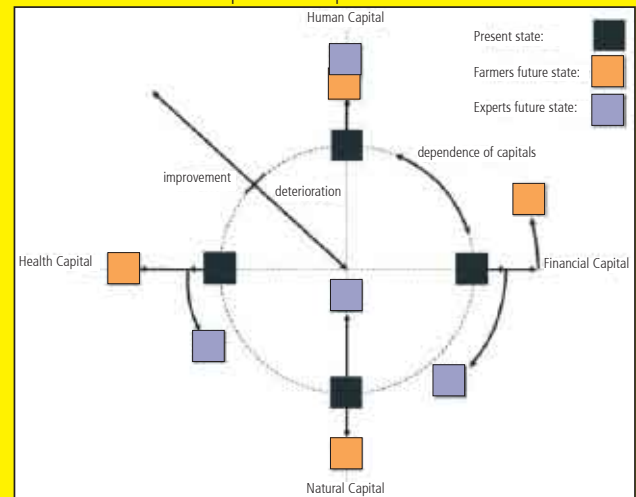
RESULTS

Part I: Different preference and feasibility rankings of farmers and experts concerning four previously defined scenarios.

Scenario	Characteristics	Farmers Ranking	Experts Ranking
Cooperative	Creating a farmers' cooperative. The cooperative could improve a) irrigation systems, b) seeds quality and c) bring unaffordable technology to the farmers (like a own washing station for carrots)	1	2
Technical Training	Training courses farmers could attend. Possible topics of the courses could be: how to handle pesticides, how to protect the personal health and the crop quality The courses could be taught in the form of lectures or farm field schools to a farmers' assembly and provided by known technicians, or sellers	2	1
IPM	Integrated Pest Management (IPM): try to move towards decreasing use of pesticides or even to do organic farming	3	4
Status quo	La Hoya stays like it is	4	3

Part II: Different future visions of farmers and experts for the future state of the individual capitals.

- **Farmers** expect an improvement of all their individual capitals. They expect all but the financial capital to maintain their state of dependence. They expect for the future that the financial capital will depend more on the human capital.
- **Experts** had a more pessimistic view on the future. They expect the natural capital to deteriorate significantly. The dependence of the health and the financial capital on the natural capital is expected to increase, even if their state is expected to improve.



CONCLUSIONS

Referring to our three research aims we found:

- 1) Farmers consider social and environmental threats when constructing their future visions and their visions are optimistic.
- 2) The investigated future visions of farmers and experts were found to be inconsistent. Experts are worried that farmers do not consider sufficiently external constraints.
- 3) The more a farmer differentiates the livelihood assets the more differentiated are the future visions of that farmer.

For designing agricultural development plans two aspects emerging of this study have to be considered. Experts and farmers have:

- **diverging attitudes** towards future scenarios
- **differing opinions** about who should take **responsibility** for the knowledge management of farmers

Appraising and Selecting SLM Strategies

A methodology based on stakeholder participation and global best practices

Gudrun Schwilch, Felicitas Bachmann, Ernst Gabathuler, Hanspeter Liniger,
Centre for Development and Environment, University of Bern, Switzerland; gudrun.schwilch@cde.unibe.ch

Imagine: You are an agricultural advisor and you need solutions to:



- improve water availability or
- prevent dam siltation or
- adapt to climate variability and change or
- combat desertification and land degradation.

- How and where can you find best practices, proven strategies, new ideas?
- How can you proceed in appraising and selecting strategies?

We have developed a **three-part procedure** for identification, assessment and selection of strategies

Part I - Identification

Identify existing and potential SLM strategies using a participatory learning approach (Stakeholder Workshop 1)



Identifying land degradation and conservation measures with the help of photographs and the water and biomass cycles

Learning together in the local context and selecting promising technologies and approaches for further assessment

This methodology was developed by the EU project DESIRE in collaboration with WOCAT

The complete methodology is being tested by DESIRE in 16 study sites around the world and will be used in various WOCAT initiatives.

Further testing and application is welcome!

DESIRE

Desertification mitigation and remediation of land – a global approach for local solutions (EU FP6; www.desire-project.eu)

WOCAT

World Overview of Conservation Approaches and Technologies (www.wocat.net)

Part II – Assessment

Evaluate, document and share strategies with standardised questionnaires



Interaction between land users and experts using WOCAT questionnaires which help to understand the reasons behind successful local experiences

Standardisation allows adding to and sharing of experiences worldwide through the WOCAT database

Part III – Selection

Select the most promising strategies with a decision support tool (Stakeholder Workshop 2)



Selection of options is based on a search of the WOCAT database, leading through a series of key questions.

Setting criteria, scoring, and the decision making process are supported by software for multi-objective decision support (MODSS).

Both tools are embedded into a stakeholder workshop, continuing the 'learning for sustainability' approach.

A coherent and comprehensive process

- from initial co-learning among main stakeholders
- to participatory appraisal of existing field experience and
- to the selection and decision-making for implementation.

With the approach proposed here, it can be hypothesised that selected measures are ecologically effective, socially acceptable, and financially viable, and thus have a high chance of successful implementation!



Swiss College of Agriculture - SHL

Research partnership with the South and the East



Through its Department for International Agriculture the Swiss College of Agriculture (SHL) offers BSc courses qualifying graduates for assignments in agriculture and socio-economic development in the South and the East. The students complete a five-month professional training in the South or East hosted by institutions from the private sector, public research and development cooperation. Besides its focus on education SHL is engaged in research and providing service mandates through SHLexpertise. Its international activities have resulted in various research partnerships all over the globe.

CAMEROON

Fonta project for improvement of agricultural sustainability

Partners: Fonta Rural Training Centre; Mission 21
Since: 1997



Developing context-specific extension contents for staple crops through farmer participatory research is crucial to assist farmers in intensifying production in a sustainable way.

NICARAGUA

Supplemental micro-irrigation of coffee

Partners: Ecom-Trading, IDE, MSD-consulting
Since: 2007



Supplementing the increasingly erratic rainfall at the beginning of the rainy season with low-cost drip irrigation systems is expected to enhance coffee yield and quality. SHL studies flowering physiology and monitors economic benefits and the sustainability of water use.

EASTERN EUROPE

(Ukraine, Moldova, Russia, Georgia) Sustainable agriculture

Partners: SDC; KFH; Agrar College Illinzi, Ukraine; Institute for Plant Protection and Ecological Agriculture, Chisinau, Moldova; University Balty, Moldova
Since: 2001



SCA collaborates in various projects throughout Eastern Europe in the domains of sustainable agricultural production, organic farming, processing and marketing, and agricultural education.

BHUTAN

Natural resource research

Partners: Natural Resource Research Centres (NRRC), Bhutan; Helvetas; SDC
Since: 1995



Four Bhutanese NRRC have taken the lead in looking at agriculture from a systems perspective. SHL has been involved in backstopping these centres, especially with regard to the research-extension interface and in research for organic farming.

KENYA

Promoting the sustainability of smallholder farming in Kenya

Partners: Syngenta International & East Africa Ltd.; Centre for Training and Integrated Research in Arid and Semi-arid Lands Development, Kenya
Since: 2006

Key bottlenecks with regard to the sustainability of agricultural production have been identified by a RISE (Response-Inducing Sustainability Evaluation) study and are now being tackled together with farmers. An impact assessment using the RISE tool is planned for 2009.



MEXICO, THAILAND, VIETNAM, CHINA

Combat pollution through integration of crop and livestock activities (LEI AWI)

Partners: LEAD; FAO; Various partner institutions in Thailand, Vietnam, China and Mexico
Since: 2000



Solutions to re-establish an area-wide collaboration between intensive livestock husbandry and crop farming regarding nutrient fluxes and manure management are urgently needed to prevent serious environmental pollution.

Focus of SHL's research

- Practically oriented, interdisciplinary research
- Systems perspective and systems research
- Natural resources management
- Rural and farm economics and credit systems
- Small-scale commercial and semi-commercial farming
- Participatory research with farmers

Strengths

- Wide range of disciplines and experience
- Impact orientation at field level through applied research
- Long tradition of focussing on problem solving
- Extensive network of contacts (professional training of students abroad; guest lecturers; links with CGIAR centres; service mandates; InfoAgrar)

Bern University of Applied Sciences
Swiss College of Agriculture SHL

Contact:
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Promotion of SODIS using psychological behavior change strategies

Andrea Tamas, Alexandra C. Huber & Hans-Joachim Mosler

Problem

Contaminated drinking water causes 1.1 Billion deaths in developing countries annually → treating water with solar water disinfection (SODIS) is an alternative. Unfortunately, SODIS use often does not become an habitual behavior. There exists a strong gap between the intention to do SODIS and SODIS use.



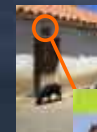
Behavioral change strategies

Promotion materials were developed based on a behavioral model that intends to close the intention-behavior gap.

The model factors are: habit, commitment, implementation intention, raw water consumption (alternative behavior).

The materials are: prompt (table card for inside use) and public commitment (poster to hang outside the house)

Prompt



Public commitment



Research question

Which behavioral factors can be influenced with prompts and public commitments, which in turn influence SODIS behavior?

Method

Longitudinal field study in Bolivia, 2 measurements with a time distance of 4 months, in between prompts and public commitments were distributed. Calculation of two models: Prompt vs. no Prompt and Public Commitment vs. no Public Commitment

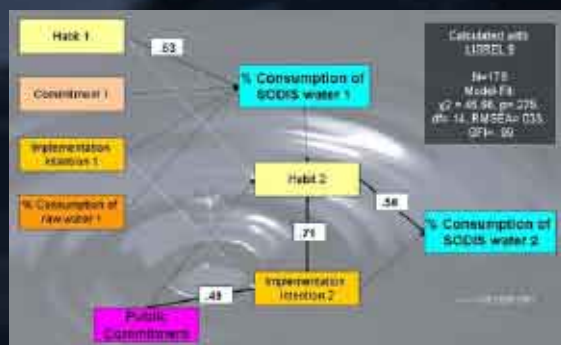
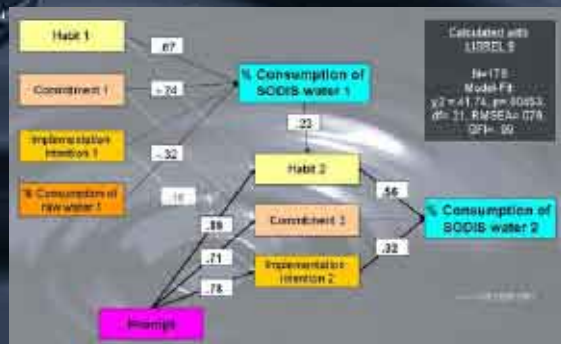
Discussion

Prompts have proven to influence strongly habit, commitment and implementation intention; habit and implementation intention in turn positively influence the percentage of SODIS water on the total water consumption of a family.

Public commitment contrarily to our hypothesis did not influence commitment, but the implementation intention. However, implementation intention has an indirect but strong influence on SODIS behavior – via habit. The factor commitment itself had to be removed from the model.

Summarizing, with prompts and public commitments it is possible to successfully influence SODIS behavior via habit, implementation intention and in the case of prompts also commitment.

Models



Andrea Tamas: andrea.tamas@eawag.ch, Eawag, Switzerland

Eawag: Swiss Federal Institute for Aquatic Science and Technology



MAPPING LAND DEGRADATION AND ITS REMEDIATION

WITHIN THE LADA AND DESIRE PROJECT

Godert van Lynden

INTRODUCTION

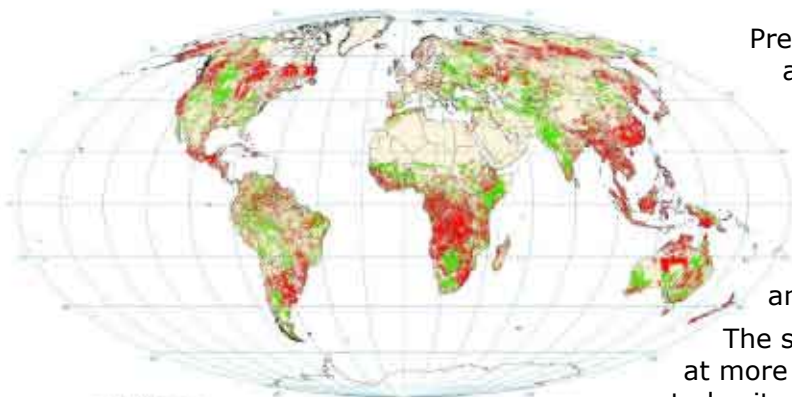
The only global overview of (soil) degradation so far is the GLASOD map (ISRIC / UNEP, 1991). Maps on the extent of sustainable land management are almost completely lacking. Thus policy makers and implementing institutions have no overview where their money was spent.

Two major projects are addressing this issue: Land Degradation in Dryland Areas (LADA) at global and national level, and a global initiative to combat desertification, DESIRE, at study site level. Both applying *two complementary mapping methods*.

METHODS

- GLADA:** "Top-down" (Remote Sensing): Identify possible "hot" and "bright" spots through assessing *changes in biomass* by NDVI analysis (NPP, RUE, RESTREND, EUE):
 - 8km resolution, global scale; proxy indicator, no distinction of degradation types
- WOCAT:** "Bottom-up" (Expert Opinion): inventory of degradation and conservation for individual Land Use Systems (LUS):
 - "scale independent"; linked to land use, detailed distinction of degradation and conservation types.

Global land degradation and improvement between 1981 and 2003



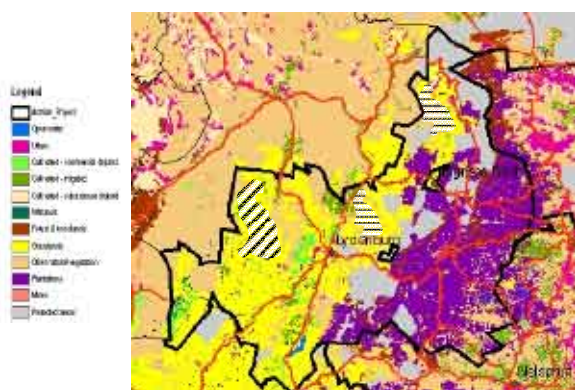
Country boundary
 Degrading land
 Stable
 Improving land

Figure 1

DISCUSSION

Preliminary results from GLADA are available at global level (see figure 1) and for 6 pilot countries. These will be validated through LANDSAT analysis and further specified through the WOCAT mapping method (see example in fig. 2 and data tables in figure 3).

The same procedure will be followed at more detailed scale for 18 DESIRE study sites.



V2 and M2 (20% of LUS) S6 and M1 (15% of LUS)

Figure 2: conservation measures within the Pasture LUS in the Lydenburg district (South Africa). In this case 20% of the LUS is covered by a combination of measures **V2** (reseeding of perennial grasses) and **M2** (change of the management from open to controlled grazing) and another 15% by **S6** (dams / pans) and **M1** (change of land use type).

FURTHER INFORMATION: Godert.vanlynden@wur.nl

Name: _____ 02
DATA ENTRY TABLE
 Please fill out one table for each mapping unit. Make copies of this table as required to fill in information for other mapping units.

Name: _____ Country: _____
 Mapping Unit ID: _____

Land Use System (Step 1)		
LUS	in Area (ha)	to Inventory (ha)

Figure 3

Land Degradation (Step 2)											
id	Type	id	Depth	id	State	id	Direct cause	id	Indirect cause	id	Impact on ESS
1		1		1		1		1		1	

Conservation (Step 3)																						
id	Name	id	Group	id	Measure	id	% of area	id	Elaboration addressed	id	Factors addressed	id	Method	id	Impact on ESS	id	Period	id	Listed in	id	UT	

PARTNERS

- WOCAT consortium, Bern: www.wocat.net
- LADA / FAO, Rome: <http://lprida.fao.org/lada/>
- ISRIC, Wageningen: www.isric.org
- DESIRE consortium, Wageningen: <http://www.desire-project.eu>



Farmers' Awareness about Socioeconomic Effects of Desertification

The Case of Kafu El-Shukh Governorate,
Delta of the Nile River, Egypt
Hala Youary
Desert Research Center
Ministry of Agriculture and Land Reclamation, Egypt

Objectives of the study:

1. To determine the degree of awareness of desertification phenomena
2. To identify the degree of awareness of the causes of the phenomena at the study area
3. To measure the degree of awareness of the economical and social effects of desertification in the study area
4. To recognize the wrong practices that causing desertification at the study area
5. To identify Sources of information for better land productivity.

Desertification measures affecting the soils of the Nile Delta:

- Sea water invasion into the cultivated lands
- The irrational utilization of agricultural lands
- The mismanagement of the agricultural lands which leads to the problems of water logging, salinization and alkalinization
- Soil pollution with chemical pesticide and fertilizers, medical waste and drainage housing



The study covered a sample of 120 farmers from 15 villages.



Main Results :

(1) Perceived reasons of desertification in the studied area :

- Over-usage of chemical fertilizers and pesticides
- Air temperature has an effect on land deterioration
- Excessive irrigation
- Building on agricultural land
- Over population
- Mismanagement on farms
- Land salinity problem
- Drainage may affect the crop quality production
- To leave it barren
- Improper crop pattern may deteriorate land productivity

(2) Economical effects of desertification:

- Lower land productivity
- Increase of poverty rates among farmers
- Less expenditure on the household
- Lower agricultural income
- Looking for new methods to eliminate land deterioration
- More expenditure on adding Gypsum to improve the soil characteristics
- More expenditure on open and tile drainage
- Transforming agriculture land to aqua-culture
- Land deterioration over years
- Tendency for better utilization for irrigated water
- Bad crop yield after Rice cultivation

(3) Social effects of desertification:

- Loss of production that affects household income
- Collective work that ends with good results
- Lack of security due to land deterioration,
- Low land productivity leads to have more children as a way of compaction
- Migration due to land deterioration,
- School droppings of children due to land sever deterioration.
- Possibility of changing profession in case of tremendous production loss.
- It's impossible to improve land conditions.
- In case of funds needed to improve land productivity and health issues, priority goes to land.
- The believe of independent efforts to improve land productivity

Needed actions:

1. Rural development should be the approach of solving problems and eliminating desertification effects.
2. Holistic approach should be taken in consideration when setting a plan or programs to combat desertification.
3. Regional participatory planning is the effective and realistic key to stop land deterioration, improve its characteristics and increase crop yield.
4. Better water quality should be provided to farmers for healthy foods, crops and fish wealth.
5. Conducting capacity building programs for better management are really needed to increase alertness about desertification and recommend other alternatives rather than the damaging methods.
6. More attention should be given to drainage as much as irrigation.
7. Filtering and recycling for all types of drainage and waste management should be given much attention from the local civil society's organizations.
8. Good recording system should be set for all farms in order to monitor all inputs and outputs and evaluate land productivity.

Mountain Research and Development (MRD) A journal surveys its constituency

Does MRD serve both the scientific and development communities? Does it bridge the gap between North and South? What disciplines and themes do the journal's readers consider most relevant for sustainable development in mountains?

Anne Zimmermann, Susanne Wymann von Dach, Theodore Wachs (CDE, Berne, Switzerland); Bishnu Katuwal (Mountain Forum, Kathmandu, Nepal); mrd-journal@cde.unibe.ch

Mountain Research and Development, a journal featuring peer-reviewed articles and development reports on mountain regions, conducted a survey of its global readership in 2006 to obtain feedback from MRD's constituency. Since 2000, the journal has addressed a mixed scientific and non-scientific audience in order to achieve its transdisciplinary mission.

MRD's readership in the South has increased since the journal was newly formatted with a Development section in 2000. Subscriptions are free of charge to institutions in developing countries.

In a spirit of North-South cooperation, an online questionnaire was devised by the journal's editorial staff in Switzerland and responses compiled and analyzed by experts at a partner organization, Mountain Forum in Kathmandu, Nepal, using statistics and disaggregated frequency analysis.

Both main groups of readers were asked to assess the 2 main sections of MRD (Figure 1). They overwhelmingly found that the journal bridged the gap between research and development.

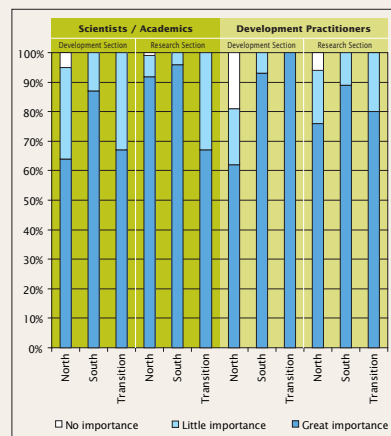


Figure 1: Assessment of the relevance of the 2 main types of articles in MRD; percentage of responses from scientists/academics and development practitioners, by region (n = 203). (© MRD 2008)

Scientific discipline	Type of respondent		
	Scientists (%)	Development practitioners (%)	Consultants (%)
Physical	21	10	19
Ecological	44	47	52
Social	39	50	48
Cultural	30	35	35
Political	16	18	12
Economic	21	29	22
Institutional	14	18	16
Interdisciplinary	42	44	56

- Highest percentage respondents considered discipline/theme "most important"
- Discipline/theme considered "fairly important"
- Discipline/theme considered "least important"

Table 1: Assessment of the importance of scientific disciplines for sustainable mountain development, in percentage of respondents. (© MRD 2008)

Theme	Type of respondent		
	Scientists (%)	Development practitioners (%)	Consultants (%)
Sustainable land management	67.5	64.7	73.7
Health	18.2	18.4	17.1
Natural hazards	28.4	14.3	25.6
Education	28.2	30.6	24.4
Climate change	37.1	26	41.9
Economic opportunities	34.5	46	31
Conflict	21.1	26	33.3
Energy	22.6	22	31
Infrastructure	18.7	20	31
Institutional development	24.7	26	33.3
Water	50	54	53.5
Forests	37.7	41.7	40.5
Biodiversity	43.45	49.0	47.7
Soils	25.5	23.5	38.6
Equity	26.9	34.8	38.1

Table 2: Assessment of the importance of themes for sustainable mountain development, in percentage of respondents; same color coding used as in Table 1. (© MRD 2008)

Since sustainable development is a normative framework, stakeholders' opinions about the relevance of scientific disciplines and themes need to be taken into account; this constitutes a challenge for the journal's Editorial Board. The survey showed:

- Agreement on the need for interdisciplinarity and ecological sciences, and for research on sustainable land management, water and biodiversity
- Disparity regarding physical and social sciences, and research on climate change, natural hazards and economic opportunities.

MRD's transdisciplinary dimension requires that articles be of relevance not only to researchers, but that they also influence policy, planning, implementation and education. The journal seems to have achieved this (Figure 3).

Designing and interpreting the questionnaire helped the Editorial Team to sharpen its understanding of the complex mission of the journal and how to go about achieving it.

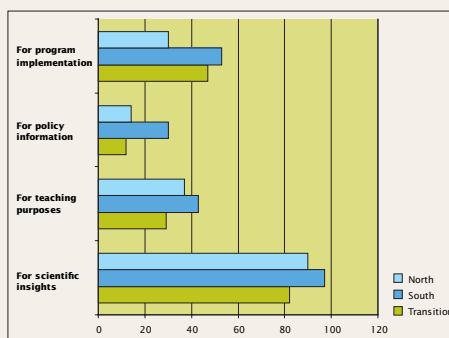


Figure 3: "How do you use MRD?" Percentage of responses by region. (© MRD 2008)

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NCCR North-South: Research Partnerships for Mitigating Syndromes of Global Change

Management Centre, NCCR North-South, Switzerland

Since its inception in 2001, the NCCR North-South research network has been dedicated to finding concrete solutions for the most pressing problems in countries of the South and East. The key to the success of this programme is a combination of inter- and transdisciplinary research with a firm partnership network in Switzerland and in nine research regions worldwide.



The NCCR North-South programme aims to find concrete solutions for the most pressing problems in countries of the South and East, based on high-quality scientific research. In addition to strengthening of the Swiss institutions of higher learning involved in the programme, special emphasis is given to developing research capacity in countries of the South and East. The federal government's mandate for education consists in supporting existing research and implementation capacity and establishing long-term structures for Swiss development research.

Research areas

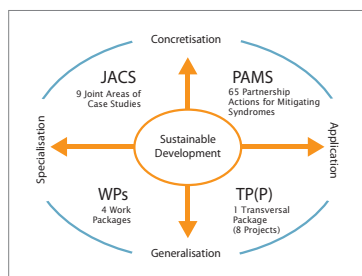
Four research areas form the core of NCCR North-South activities:

- Governance and Conflict (Work Package 1)
- Livelihood Options and Globalisation (Work Package 2)
- Health and Environmental Sanitation (Work Package 3)
- Natural Resources in Sustainable Development (Work Package 4)

The Transversal Package and its eight projects were established to integrate and synthesize research results at a programme level.

Research approach

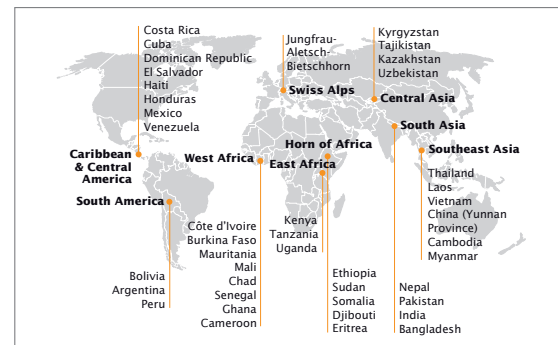
About 350 researchers from the social, natural and engineering sciences work together in interdisciplinary teams to address the complex issues of sustainable development. To master this challenge, the NCCR North-South promotes a transdisciplinary approach by also incorporating non-scientific knowledge from the very beginning. Research is based on case studies conducted within the framework of individual master's and PhD theses, as well as at the senior research level. A key feature of this research is the continuous interaction of scientists from Switzerland with their colleagues and partners in the South and East.



Partnership actions

Continuous exchange between research and implementation for development is a pre-condition for meaningful scientific results in the NCCR North-South. For this purpose, more than 60 so-called Partnership Actions for Mitigating Syndromes of Global Change (PAMS) have been implemented to date or are still ongoing. PAMS are small projects that apply and validate research findings and support knowledge sharing between academic and non-academic partners.

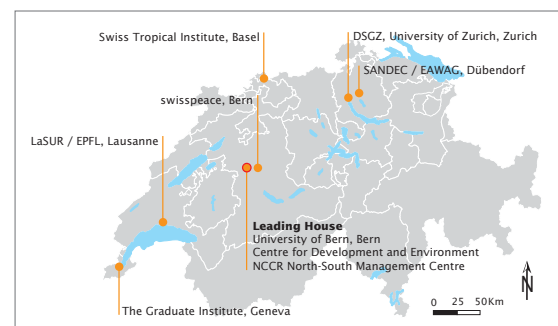
Partnership Regions



Education and training

A comprehensive training programme for master's students, PhD candidates and post-doctoral researchers constitutes an integral part of the NCCR North-South. It includes different forms of basic theoretical and methodological training modules and courses. Education and training efforts are supported by a web-based knowledge portal open to all team members.

Institutional Partners in Switzerland



Two Swiss Institutions (IP = institutional partner) always cooperate in a Work Package (WP):
WP1: SWISSPEACE and IHEID, **WP2:** DSGZ and LASUR, **WP3:** STI and SANDEC/EAWAG, **WP4:** CDE
 IP SWISSPEACE, Swiss Peace Foundation, Berne (CH)
 IP IHEID, Graduate Institute of International and Development Studies, Geneva (CH)
 IP DSGZ, Development Study Group, Department of Geography, University of Zurich (CH)
 IP LASUR, Laboratoire de Sociologie Urbaine, Swiss Federal Institute of Technology, Lausanne (CH)
 IP STI, Swiss Tropical Institute, Basel (CH)
 IP SANDEC/EAWAG, Department of Water and Sanitation in Development Countries, Dübendorf (CH)
 IP CDE, Centre for Development and Environment, University of Bern (CH)
 Management Centre, National Centre of Competence in Research North-South, Bern (CH)

Scientific Research for Sustainable Development and Syndrome Mitigation

Management Centre, NCCR North-South, Switzerland

The Transversal Package (TP) is a comprehensive component of the NCCR North-South. The TP aims to bridge and to complement research carried out within the thematic and geographical domains of Work Packages (WP) and Joint Areas of Case Studies (JACS).

The main focus is on the production of knowledge related to:

- **Scientific foundations of research for sustainable development.** Furthering the theoretical, conceptual, and methodological foundations of research for sustainable development by elaborating meta-concepts of sustainability, transdisciplinarity, participatory research and development.
- **Syndrome mitigation.** Identifying potentials and pathways for more sustainable development through innovative approaches, methods, tools and instruments, thus permitting the strengthening and up-scaling of successful development interventions.

Twelve interdisciplinary teams, eight Transversal Package Projects (TPPs) and four Transversal Package Mandates (TPMs) address **key issues of global change and sustainable development**. Optimal levels of complementarity and meso-level comparability are assured by explicitly focusing research on issues of cross-JACS and cross-WP importance (Table 1).

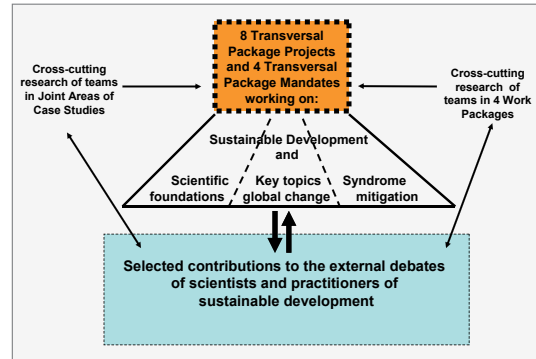


Figure 1: Conceptual and institutional approach of the Transversal Package

Transversal Package Projects (TPPs)	Work Packages involved				JACS involved
Extensive production systems in semi-arid regions. Project lead: Bassirou Bonfoh	WP1: Governance & Conflict Transformation	WP2: Livelihood Options & Globalisation	WP3: Health & Environmental Sanitation	WP4: Natural Resources in Sustainable Development	WAF, CAS, HOA
The effect of development intervention disparities on the poverty-environment nexus. Project lead: Peter Messerli					SEA, EAF, SAS
The political economy of coffee: Global markets, local production and options for sustainable development. Project lead: Eva Ludi					HOA, EAF
From vulnerability to resilience. Project lead: Brigit Obrist					EAF, WAF, SAS, SAM
Innovations in decision-making processes for sustainable urban projects. Project lead: Adriana Rabinovich					CCA, SAM, SEA
Operationalising human security for livelihood protection. Project lead: Albrecht Schnabel					HOA, CAS, CCA
Sustaining livelihoods in trans-local and trans-national settings. Project lead: Susan Thieme					SAS, CAS, CCA
Knowledge, power, politics. Project lead: Claudia Zingerli					SEA, SAM, ALP
Transversal Package Mandates (TPM)					
Gender and sustainable development					All JACS
People, protected areas and global change					EAF, HOA, WAF, SAS, SAM, ALP
New avenues for pastoral development in Sub-Saharan Africa					EAF, HOA, WAF
Growth, poverty and trade					SAS

Table 1: Transversal Package Projects and Mandates bridging research in Joint Areas of Case Studies (JACS) and Work Packages (WP). JACS abbreviations: WAF = West Africa; EAF = East Africa; HOA = Horn of Africa; CAS = Central Asia; SAS = South Asia; SEA = Southeast Asia; CCA = Caribbean and Central America; SAM = South America; ALP = Swiss Alps



Figure 2: The annual NCCR North-South weeks constitute a crucial space where members of the Transversal Package negotiate, coordinate and collaborate to achieve optimal levels of integration of their own projects with research done by WPs and JACS (Photo by Management Centre NCCR North-South)

A 'Transversal Package Core Group' composed of one representative from each Work Package, the TP Coordination, the Management Centre, and the group of TPP and TPM leaders are conceptualising and guiding the implementation of an NCCR North-South **synthesis project**. This will conclude by the end of 2008 with the elaboration and publication of 36 JACS synthesis papers, complemented by eleven papers summarising main insights gained with regard to eight transversal syntheses and three conceptual themes.

Transversal Package (TP), TP Projects (TPPs), and TP Mandates (TPMs)

Management Centre, NCCR North-South, Switzerland

The eight TPPs and four TPMs of the Transversal Package are producing innovative and empirically based conceptual, methodological and practical results. They bridge and complement research in the WPs and JACs, emphasising key issues in sustainable development. The following overview presents first insights.



Figure 1: A proud coffee grower in Moshi, Mt. Kilimanjaro area, Tanzania (Photo by E. Ludi)

<p>TPP Contextuality of Development Interventions (Peter Messerli)</p> <p>This TPP conceptualises the poverty-environment nexus in rural areas – supported by an actor-oriented ‘multi-level multi-stakeholder analysis’ that focuses on interactions and institutions, making explicit links to space and political-administrative levels.</p>	<p>TPP Human Security (Albrecht Schnabel)</p> <p>This TPP further operationalises human security for livelihood protection, by and for local communities, as an innovative contribution to make on-going security debates more comprehensive and actor-sensitive.</p>
<p>TPP Social Vulnerability and Resilience (Brigit Obrist)</p> <p>This TPP conceptualises social resilience as the active engagement of social actors in mobilising capacities and enabling factors operating at different levels of the environment and society – reactively by adjusting to adverse conditions and proactively by creating options and responses.</p>	<p>TPP Multi-local Livelihoods (Susan Thieme)</p> <p>This TPP formulates elements of a ‘theory of practice’ concerning people’s livelihoods and experiences resulting from mobility in a context of multi-locality and its embedding in societal power constellations at home and in new contexts.</p>
<p>TPP Pastoral Production Systems (Bassirou Bonfoh)</p> <p>This TPP develops and tests a ‘one-health’ concept, which by systematically linking human and animal health creates synergistic benefits through comprehensive cooperation between actors usually operating in terms of sector policies and strategies.</p>	<p>TPP Knowledge, Power, Politics (Claudia Zingerli)</p> <p>This TPP develops a deeper understanding of the global ‘knowledge economy of sustainable development’ and its implications for national policymaking.</p>
<p>TPP Urban Planning and Habitat (Adriana Rabinovich)</p> <p>This TPP develops a gender-sensitive framework for investigating decision-making in urban planning that analyses the decision-making process itself regarding a) different concrete and important situations (“nodal points”); and b) different operations undertaken by each actor in the decision-making process.</p>	<p>TPP Coffee Value Chains (Eva Ludi)</p> <p>This TPP further develops the Value Chain Approach (VCA) by emphasising macro-micro links. This allows evaluation of the effects of conventional and fair trade coffee and benefit-sharing for the poor.</p>



Figure 2: TPP researcher, entrepreneurs and practitioners explore rationales and knowledge dynamics in Bolivian organic agriculture (Photo by C. Zingerli)

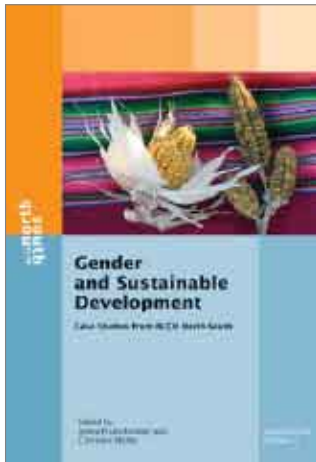


Figure 3: Mother and daughter from Kyrgyzstan, trading Chinese goods in Almaty, Kazakhstan (Photo by S. Thieme)

Transversal Package (TP), TP Projects (TPPs), and TP Mandates (TPMs)

Management Centre, NCCR North-South, Switzerland

The eight TPPs and four TPMs of the Transversal Package are producing innovative and empirically based conceptual, methodological and practical results. They bridge and complement research in the Work Packages (WPs) and Joint Areas of Case Studies (JACS), emphasising key issues in sustainable development. The following books encompass major results of the TP, TPPs and TPMs.

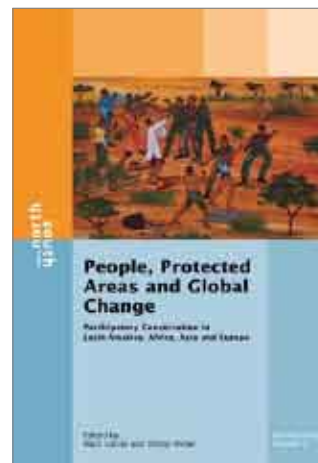


Gender and Sustainable Development (Perspectives Vol. 2)

The book demonstrates – on the basis of 13 case studies of researchers related to the NCCR North-South – that considering gender in research for sustainable development is part of its scientific foundations. This leads to more comprehensive understanding of complex socio-environmental dynamics than ‘genderless’ research.

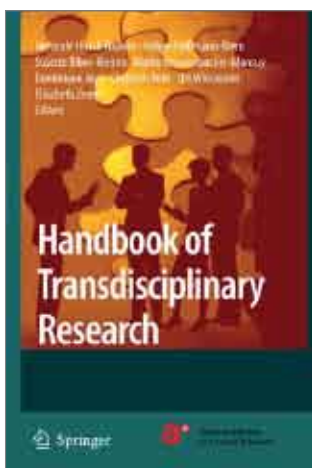
People, Protected Areas and Global Change (Perspective Vol. 3)

This book highlights the fact that the institutional and economic incentives and benefits of protected areas are generally greatly below the potential or effective benefits that people living in or near protected areas actually realise. The 13 case studies reveal that economic and political benefits, the development of a common constitutional ground, and the trust to be part of a common project are key elements in successful participatory conservation of cultural landscapes. This makes it possible to open new avenues for re-thinking participatory conservation of biodiversity in the international debate.



Handbook of Transdisciplinary Research

‘Fifteen propositions’ refer to concrete aspects concerned with the scope, process, outcomes, stumbling blocks and cornerstones of transdisciplinary research in sustainable development. Transdisciplinarity implies simultaneously considering epistemological plurality and power differences within and outside the academic communities involved in negotiating and collectively learning how to reorient research and action to promote sustainability.



Education and Training in the NCCR North-South

Management Centre, NCCR North-South, Switzerland

Institutional and individual capacity development in the North and the South is a major long-term goal of the NCCR North-South. Due to the broad-based nature of this research programme, special efforts are made to provide specific education and training programmes for master's students, PhD candidates, and post-doctoral researchers.

Challenges in Education and Training

Research issues such as syndromes of global change and pathways to sustainable development are of great societal relevance and therefore complex. They require intense interaction between many scientific disciplines and close partnership between scientific and non-academic actors (transdisciplinarity). The Education and Training (E&T) component of the NCCR North-South faces the following challenges:

- **Heterogeneity:** more than 20 scientific disciplines with different experience, agendas, motivations, and ways of thinking.
- **Cultural differences:** Asian, African, Latin American and European researchers start from different educational cultures.
- **Absence of blue-print solutions:** The innovative character of research and the disciplinary and cultural diversity of researchers require innovative training approaches.
- **Networking:** inter- and transdisciplinary research involves time-consuming networking that competes with the disciplinary demands of research and publishing.



Figure 1: Inter- and transdisciplinary work require teamwork and fine-tuning.

- **Transfer and communication:** Integration of different disciplines calls for specific management and communication skills.



Figure 2: Integrated Training Course 2004 – researchers and herders in the Kyrgyz Tien Shan mountains.

An Outline of Education & Training

To meet these challenges, E&T focuses on three levels:

- (1) **Basic training and regular supervision** ensure that students have the required disciplinary skills and the theoretical and methodological background in their fields of competence.
- (2) **Regional Training Courses (RTCs)** emphasise interdisciplinary group work on topics of regional relevance. They address aspects of transdisciplinarity by combining classroom learning and encounters with other actors in their socio-economic and biophysical environments.
- (3) **Integrated Training Courses / Capitalization on Experience (ITCs)** promote interdisciplinary work, presentation, and scientific writing in intense output-oriented group work, and invite researchers to make contributions to key issues of the NCCR North-South.

All training and education efforts are complemented by web-based knowledge sharing and distance learning tools open to all team members.

Graduate School

The political mandate and the long-term goal of the NCCR North-South is to establish the foundations for advanced North-South research in sustainable development.

In concrete terms, the aim is to strengthen existing research capacities and to anchor the structures of development-oriented research and training in Switzerland.

In view of the envisaged structural effects of the NCCR North-South, preparations are underway to initiate an 'Inter-university Graduate School on Global Change, Innovation and Sustainable Development' between the Universities of Bern, Basel and Zurich.

This school is intended to provide a permanent framework for research and training at the graduate and post-graduate levels, both in Switzerland and in partner regions around the world.

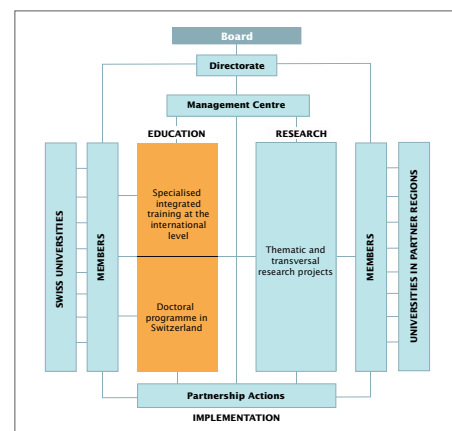


Figure 3: Components and organization of the proposed graduate school in sustainable research.

Partnership Actions for Mitigating Syndromes: A Bridge between Research and Society

Management Centre, NCCR North-South, Switzerland

Partnership Actions for Mitigating Syndromes (PAMS) are a vehicle for testing the applicability of development research results. Each project is designed to implement strategies developed jointly by researchers and local stakeholders. Based on a transdisciplinary approach to development research, PAMS are meant to promote mutual learning and knowledge-sharing between academic and non-academic partners in sustainable development.

PAMS – a practice-oriented component of the NCCR North-South

Partnership Actions are projects of limited financial scope and duration, implemented by local actors in partnership with scientific and non-scientific stakeholders. In close connection with research efforts, PAMS implement and test approaches, methods and tools developed in research, in order to identify promising strategies and potentials for sustainable development.

The conceptual framework

As they are linked to NCCR North-South research projects, PAMS provide concrete opportunities for transdisciplinary research and practice. The NCCR North-South's focus on transdisciplinarity is based on the assumption that merging scientific and non-scientific knowledge in a social learning process is the best way to move forward in the search for sustainable development strategies. Acknowledging the importance of social learning, the concept

of PAMS thus places these processes at the centre of the projects. PAMS projects – irrespective of their topic, objectives and planned activities – should enable social learning between all stakeholders concerned. The participatory approach ought to ensure that the project and its aims are supported by all stakeholders and benefit both the research and the target communities.

Information for migrants: a radio programme for rural areas in Nepal

Labour migration from Nepal to India has a long-standing history. An increasing number of young Nepalis migrate to India, the Gulf and other countries in search of labour to secure a livelihood. Nevertheless, neither a sound migration policy nor information mechanisms for migrants exist in Nepal to date.

Linked with research on labour migration from Far-West Nepal to India and other countries, a radio programme was set up which broadcasted news and information on migration related topics, such as remittances, labour rights, security and health issues. Listeners' clubs and special features of the programme that present feedback and questions from

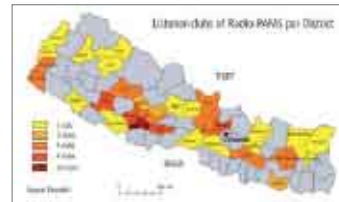


Figure 1: Listeners' clubs were established to collectively listen to the radio programme, collect feedback, and disseminate information on migration issues in their localities.



Figure 2: The POURAKHI radio programme broadcasts information on practical issues and the potentials and risks of labour migration from Nepal to India and other countries.

listeners as well as interviews with experts and migrant returnees, stimulated discussions and raised awareness of migration and related livelihood issues on the national level. The radio show revealed a demand for information on labour out-migration from Nepal, not only for migrants and their families, but also for policy makers. Due to the great

popularity of the programme, some issues were re-broadcast by regional radio stations. The project was continued in a second phase, linked to an NCCR North-South research project on trans-local livelihoods. The radio programme attracted various donors and was eventually institutionalised long-term.



Figure 3: After the participatory mapping exercise, data layers were processed and imported into a GIS-environment by the LUO project technical team.

A Local Urban Observatory (LUO) for urban development

In Kenya, rapid population growth in urban areas and weak public institutions pose severe problems for the provision of basic services, information management and sustainable urban development strategies.

Linked to a PhD study on Information Technology and Spatial Analysis in development research, a Local Urban Observatory (LUO) project was designed to provide a framework for sustainable urban development by building technical skills and improving participation by local stakeholders in decision-making processes. To achieve this goal, the project relied on the potentials of geo-processing tools to provide up-to-date information to local authorities and the community. In an inclusive project team consisting of members of various local stakeholder groups, data were collected and software was developed. The LUO promotes the active involvement of stakeholders in urban development and avails the local authorities of a tool and a database



Figure 4: The main element of the NakInfo interface is a digital map with a high-resolution satellite image in the background, onto which the user can display one or several layers of spatial information. A legend allows for the easier understanding of the symbology and a query tool provides tabular information on selected map elements.

that they can use for the formulation of policies adapted to the local context.

Vulnerability and Resilience Approach to Health Risks in West Africa

Ibrahima Sy, Institut National de Recherches en Santé Publique (INRSP), Mauritania and Swiss Tropical Institute (STI), Switzerland; Patricia Schwärzler, STI; Alain Serge Kouadio, Centre Suisse de Recherches Scientifiques (CSRS), Côte d'Ivoire; Cléopâtre Kablan, CSRS; Stefanie Granado, STI; Brigit Obrist, STI; Guéladio Cissé, CSRS and NCCR North-South, Côte d'Ivoire

Case studies on disease, environment, poverty, livelihoods and access to social services in urban areas of West Africa used a vulnerability and resilience approach to understand mechanisms of vulnerability and resilience among disadvantaged populations. Groups particularly vulnerable to infection and have limited options for response to health risks.



Figure 1: Illustration of population vulnerability (Photo by O. Niangado)

The vulnerability and resilience approach

An interdisciplinary approach was developed based on these two concepts and applied in cities facing environmental, demographic and socio-economic changes linked with health problems, in order to improve the effectiveness of interventions. Studies concentrated on disadvantaged zones in Abidjan (Côte d'Ivoire), N'Djamena (Chad), Nouakchott (Mauritania) and Ouagadougou (Burkina Faso) and examined the complex links between health problems and the density of multiple syndromes.

Approaches and methods

Various methods and approaches were used to define vulnerability and resilience with respect to health and socio-economic factors. Vulnerability is defined as a "combination between exposure to risk and lack of adequate means to manage it," and resilience as the "capacity to react to risk and shock". Research combined quantitative and qualitative methods.

Results

Results highlighted three trends. The marginalisation of women living with HIV/AIDS, the sexual practices of adolescents, and reproductive health difficulties showed links between health risks and social fragmentation. The preoccupations of daily existence, exposure to malaria and the economic burden of disease showed interaction between health risks, poverty, livelihoods and the environment. The effects of lagoon pollution, lack of water and sanitation, and difficulties accessing modern health care showed the links between health risks and access to urban services.

Conclusion

The pertinence and potentials of these concepts generated new research questions. Exposure to health risks was studied in an integrated way and the effectiveness of coping mechanisms analysed.



Figure 2: Image of population resilience (Photo by E. Gabathuler)

From Risk Management to Effective Environmental Sanitation and Health

Ives Magloire Kengne, University of Yaounde, Cameroon; Halidou Koanda, Centre Régional pour l'Eau Potable et l'Assainissement à faible coût (CREPA), Burkina Faso; Brama Koné, Centre Suisse de Recherches Scientifiques (CSRS), Côte d'Ivoire; Siméon Kenfack, CREPA; Blaise Koné, CSRS; Hung Nguyen Viet, Swiss Tropical Institute (STI), Switzerland; Béchir Mahamat, Centre de Support en Santé Internationale, Chad; Bétio Silué, CSRS; Sosthène Nguessan, CSRS; Jakob Zinsstag, STI; Bassirou Bonfoh, Institut du Sahel, Mali; Guéladio Cissé, NCCR North-South, Côte d'Ivoire

Achieving the Millenium Development Goals in water and sanitation and in food and nutrition in developing countries requires new strategies, implying among other things: good diagnosis of problems and their consequences; a variety of solutions adapted to the heterogeneity and complexity of the target context; revision of the process of implementing solutions. Research carried out in West and Central Africa aimed to develop innovative approaches and hypotheses for managing health and sanitation risk in an equitable way for neglected populations.

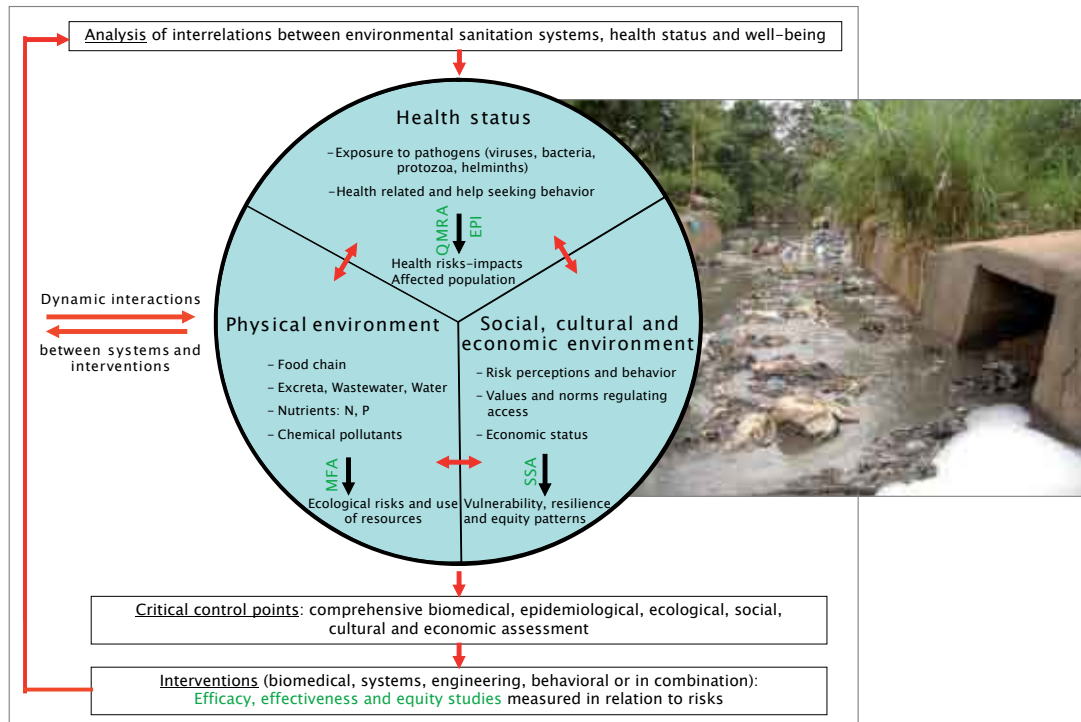


Figure 1: Graph: Conceptual framework of the combination of health and environmental risk assessment for health and environmental sanitation planning. Photo: Anarchic wastewater discharge in Abidjan (Photo by M. Kengne)

Methods and approaches used

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

Main results

Disease prevalence in most cities is associated with the level of sanitation and hygiene. Anarchic wastewater discharge (Figure 1) due to poor and inadequate infrastructure and peoples' knowledge and behaviour are the driving forces on which action can be taken to reduce vulnerability to risk.

The stakeholder planning approach appeared to be an efficient method for faecal sludge (FS) management in developing countries. Willingness to improve depends greatly on psycho-sociological factors such as attitude towards and belief in an improved neighbourhood environment, social pressure on households by the neighbourhood, and the subjective costs and benefits of improved faecal sludge management. Furthermore, new design guidelines for vertical flow constructed wetlands are now available for FS treatment in sub-Saharan countries.

In semi-arid contexts, improvements in milk production lead to increased income and pathogen load reduction. In this way, micro-finance and farmer organisation can play a significant role in fostering product quality improvement.

To understand the links between health and environmental sanitation better and to identify the most efficient and equity-effective interventions for reducing disease burden, the conceptual framework developed for the improvement of health and environmental sanitation in urban and peri-urban areas of developing countries used an approach combining health, ecological, social, economic and cultural assessments (Figure 1)

Conclusion and perspectives

The findings of the research carried offer promising results for increased mitigation of the syndromes of global change. These results could be scaled up to a larger scale within the urban and semi-arid context, either to the national or regional level.

Access to Natural Resources and Autochthony in West Africa

Gilbert Fokou, Institut du Sahel (INSAH), Mali; Henri Michel Yéré, University of Basel, Switzerland; Mathieu Gasparini, swisspeace, Switzerland; Jérôme Chenal, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland; Bassirou Bonfoh, INSAH

In contemporary West Africa the declining resource base and power relations are causes of conflict. Many outbreaks of violence are caused by “autochthons” or first comers to safeguard “ancestral lands” against “newcomers” accused of overusing resources. This is paradoxical at a time when official discourse invites national and regional integration.



Photo 2: Transformation of pastoral production systems: urban pastoralism in Nouakchott, Mauritania (Photo by G. Fokou)

In Africa, where borders are fluid due to weak state control and cross-border social organisations, mobility is a strategy for achieving livelihood goals. “Foreigners” are seen by local people as overusing resources. The autochthony discourse that emerges is rooted in the desire of local people to safeguard their assets and secure a livelihood.

Studies in West Africa (Côte d’Ivoire, Lake Chad basin) show that dichotomies between ‘locals’ and ‘non-locals’, ‘autochthons’ and ‘foreigners’, ‘in’ and ‘out’ are very flexible. Conflicts increasingly erupt over access to natural resources, commercial exchange, and access to political power. Autochthony is above all a social construct resulting from power struggles. It is often instrumentalised by powerful actors to serve their interests.

- Public space has become a shared and disputed space where poor and voiceless people can express themselves.
- Emerging youth movements try to show their patriotic ideologies through clear political positions.
- Management of natural resources has come to involve conflicting social relations with different actors deploying different strategies to benefit from surplus capital.

In the search for better living conditions, “frontiers do not matter” to many people in West Africa. To avoid conflict, there is a need to implement multilevel-institutional frameworks such as updated pastoral codes and norms for natural resource management that could directly improve livelihoods and indirectly improve access to basic social services and enhance social dialog.



Photo 1: Long distance migration of Fulani pastoralists in the Lake Chad basin (Photo by G. Fokou)

Climate Variability and Change Adaptation in the East African Drylands

Chinwe Ifejika Speranza, Centre for Development and Environment (CDE), University of Bern, Switzerland

Enhancing Climate Variability (CV) and Climate Change (CC) adaptation is crucial to sustainable development in Africa. Using data from Kenya and Tanzania, this study analyses agro-pastoralists' adaptation strategies, examines the roles of policies and institutions, and explores ways to strengthen adaptation at the livelihood, institutional and policy levels.



Figure 1: Group discussion of livelihood strategies in the context of climate variability and climate change (Photo by C. Ifejika Speranza)

Agro-pastoral adaptation strategies

- Maize-dominant mixed cropping
- Adaptive farming - inputs and planting dates
- Crop sales
- Livestock production and investment
- Preserving pastures and fodder
- Water harvesting
- Charcoal production
- Diversification
- Migration and multi-locality of livelihoods
- Education
- Social networking

How policies shape adaptation

- Policies target relevant issues but link sectors weakly from an agro-pastoral perspective
- Policy procedures delay action
- Cross-sectoral policies are diffuse
- Policy – Practice disconnect
- Multitude policies create duplication
- Unclear precedence between policies – policy conflicts
- International policies impoverish agro-pastoralists
- Inadequate CV and CC mainstreaming

How institutions shape adaptation

- Mismatch between social and ecological management units
- High focus on food relief distribution relative to productive activities
- Inadequate micro-credit and micro-insurance
- Duplication of duties
- Controls increase bureaucracy and delay action
- Customary laws limit women's access to resources
- Political interference

Strengthening policies, institutions and agro-pastoralists

- Address structural deficiencies, e.g. marketing
- Expand micro-credit and micro-insurance
- Improve cross-sectoral links
- De-politicise food relief
- Promote information exchange
- Mainstream CV and CC
- Improve extension services
- Incorporating action research, social learning and financing adaptation processes is an ideal way to continue studies in this field.



Figure 2: The Makueni and Same district study areas in Kenya and Tanzania, respectively (Map by C. Ifejika Speranza)

Managing Water Resources: Multi-Level and Multi-Stakeholder Approaches

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With rising water demand and increasingly insecure supply, informed decision-making is crucial for sustainable watershed management. Research in turn faces complex challenges to produce policy-relevant results. To help overcome these challenges, we propose a multi-level and multi-stakeholder perspective based on experience in two East African river basins.

The Upper Ewaso Ng'iro Basin in Kenya and the Pangani Basin in Tanzania exemplify the complex interrelations between climate change, environmental degradation, and the increasing demand for water, food, energy and other environmental services.

In both basins (Figure 1), mountains receive more rainfall than their semi-arid surroundings and provide constant flow in the main rivers. In-migration and economic development lead to rising water demand and conflicts between water users.

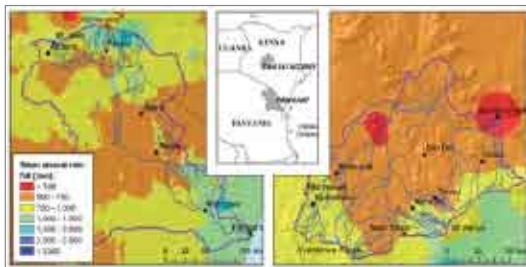


Figure 1: Overview of the two river basins.

Challenges to research

Research is expected to provide the basis for informed decision-making but faces two key challenges:

1. **Scale and level challenges** (Figure 2): Different processes and stakeholders are active at different levels on the temporal and spatial scale. Mismatches exist between the levels at which challenges prevail and the levels at which institutions and information necessary for solutions are available.

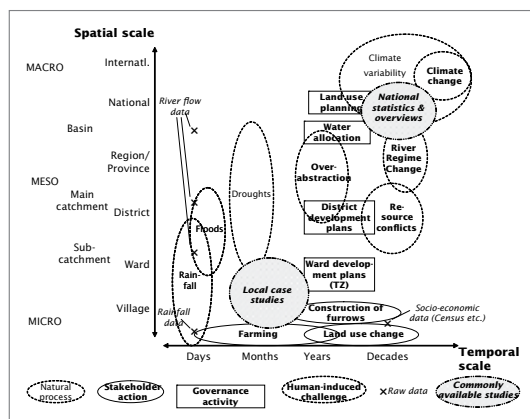


Figure 2: Visualisation of scale and level challenges in the Upper Ewaso Ng'iro and Pangani river basins. Processes and challenges, as well as institutions and information necessary for decision-making, are active at different levels of the spatial and temporal scales. Adapted from an original figure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

2. **The “conceptual traps of sustainability”**: The fact that sustainability is a normative concept that must emerge from negotiation among stakeholders leads to difficulties in delineating the “system“ assessed by research, the **systemic trap**, as well as in generalising findings, since every context is unique, the **ideographic trap**.

Three minimum principles

As a way to overcome these challenges, we propose three minimum principles research should adhere to, based on experiences in the two river basins.

1. **Transdisciplinary system delineation**: Stakeholder interests should define the core of the “system“ of interest; scientists' expertise is then used to delineate the system boundaries. Experience has shown that this approach can spur more relevant results, but implies project designs including stakeholders from the start, and forces reconciliation of the interests and world views of both stakeholders and scientists.
2. **Explicit reference to multiple levels and scales**: Issues of data availability and access to stakeholders often prevent the implementation of this widely recognised principle, especially at the basin level. Informal contacts with decision-makers, as well as the growing availability of public domain data, have proved crucial in overcoming these limitations.
3. **Bridging the gap between contextuality and generalisation**: In order to produce knowledge general enough to be transferrable between contexts but at the same time sufficiently detailed to be relevant, we propose integration of knowledge into conceptual and numerical models, and searching for patterns observable across different contexts in the sense of the Syndrome Mitigation Approach of the NCCR North-South (Figure 3).

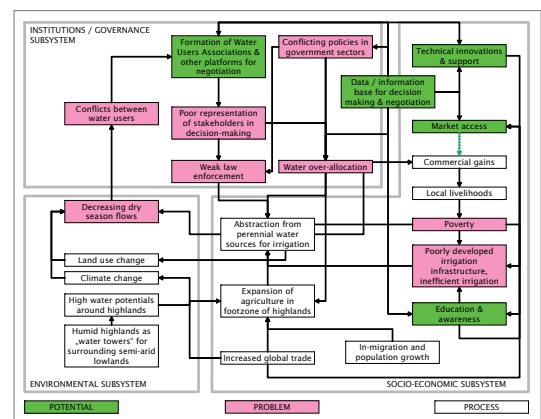


Figure 3: Processes, potentials and problems observable in both Upper Ewaso Ng'iro and Pangani Basins.

Participation in Syndrome Mitigation

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The Partnership Actions for Mitigating Syndromes (PAMS) are an NCCR North-South tool to promote societal empowerment. It supports the implementation of research innovations with the potential to mitigate syndromes in relevant regions. The PAMS therefore constitute a type of NCCR development intervention in the areas where they are implemented, including the partnership region, the Joint Area of Case Study (JACS) East Africa



PAMS Project 1: river water resources management and conflicts resolution in the upper Ewaso Ngiro North River basin. The picture shows a self regulating weir on Burguret River (Photo by B. Kiteme 2006)



PAMS Project 2: wheat production for improved food security in the semi-arid districts of Makueni and Machakos in Kenya. The picture shows a wheat field in Kathiani village, Machakos district (Photo by B. Kiteme 2006)



PAMS Project 3: local governance capacity development for Common Pool Resources in the Rufiji Floodplain, Tanzania. The picture shows training communities on formulation of by-laws during a capacity development session in Ngumburuni forest (Photo by U. Wiesmann 2005)

On the basis of three PAMS projects it was assessed whether the PAMS approach contributes significantly to the effectiveness of development interventions in the targeted areas. The contribution was measured in the context of i) syndrome mitigation; ii) participation and empowerment; and iii) vulnerability and resilience. Assessment was guided by four questions: i) what was the knowledge innovation on which the intervention(s) were based?; ii) what was the nature and characteristics of the problem(s) being addressed and how were the intervention activities implemented?; iii) did the interventions impact on

the targeted areas?; and iv) does the project have the potential for replication? The three projects in JACS East Africa were evaluated using a qualitative assessment based on knowledge gained through participants' observation (during implementation), available respective project documents and reports, and baseline information for the project areas. The results that reveal disparities in the levels of contribution (strong +++; medium ++; weak +) between the three projects are summarised in the matrix below:

Assessment Indicators Projects and form of knowledge innovation	Syndrome mitigation	Participation and empowerment	Vulnerability and resilience	Replicability
	1. River water resources management and conflict resolution <i>Knowledge innovation:</i> long-term hydrological monitoring and socioeconomic studies. <i>Intervention:</i> self-regulating flow abstraction device.	Ensured that only the flood flow water is abstracted and that low flow is guaranteed for downstream users. Potential to address over-utilisation of river water and related conflicts. ++	1. Stakeholder participation limited to only negotiating the project site. 2. Limited impact on empowerment. +	Broadens spheres of action – in a way to enhance resilience – for only a small segment of local population. Trickle-down effects further downstream depends on the scale of application; which is highly limited. +
2. Wheat production for food security in the semi-arid districts of eastern Kenya <i>Knowledge innovation:</i> agronomic and socioeconomic factors contributing to food insecurity; dominance of maize. <i>Intervention:</i> community-based seed bulking and smallholder wheat farming	Provides an alternative crop that reduces over-dependency on maize and could thereby improve food security as wheat is more productive, has better retail price, requires less moisture and matures early. +++	1. Extensive farmer involvement in trials for seed selection, seed bulking and mass production. 2. Training in basics of wheat farming, consumption and marketing empowered the farmers to make informed decisions in adopting wheat farming. +++	With diversified crop enterprises, households' vulnerability to the effects of crop failure is to a great extent checked. However, although wheat requires less moisture and matures early, its success is also subject to a given level of rainfall. ++	Highly replicable as seeds can easily be mobilised through local CBOs. Furthermore, the decision to take up the innovation or not can quickly be made at the household level and benefits are to the individual household. +++
3. Local governance capacity development for Common Pool Resources (CPRs) in Rufiji plains <i>Knowledge innovation:</i> Stakeholder analysis in traditional and modern institutional arrangements for management of CPRs. <i>Intervention:</i> capacity development through training, awareness creation and installation of grass roots institutions support instruments.	Developed local based institutions (VEMCs and VNRSCs) and instruments (VEMPs and village by-laws) that provide long-lasting mechanisms for participatory management of common property resources in the Rufiji floodplains. +++	1. Strong stakeholder participation through the outcome institutions and instruments, which provided the necessary platform to negotiate for and implement desired interventions. 2. The training empowered the local communities to understand basic legislative provisions for and take active part in the planning and implementation processes 3. Lack of direct benefits demotivates active participation. ++	No direct contribution to building immediate layers of resilience at the household or community level, but has the potential to realise the same in the long-term as the restored ecosystems start to contribute to their livelihood systems. ++	Although the approach to capacity building can be replicated elsewhere, its potential is to some extent limited by the cost involved given also the need for the external capacity for technical backstopping. ++

Table 1: Assessment Results Matrix

Conclusions

1. Integrative knowledge matters
2. Grassroots structures are indispensable
3. Costs and technologies are very sensitive
4. Short-term stand-alone interventions are shaky

Pastoral Conflicts and State-Building in the Ethiopian Lowlands

Tobias Hagmann, University of Zurich, Switzerland; Alemmaya Mulugeta, NCCR North-South, Ethiopia

Conflicts in Ethiopia's lowland regions must be viewed in light of current state-building processes. These processes strongly shape the rationality of inter-group conflicts by both integrating and excluding pastoral communities. Although violence between herders and agro-pastoralists is carried out in 'non-state spheres', it is directly related to the state, which mediates resource governance, peacemaking and group identity.



Figure 1: Cattle watering (Photo by Alemmaya Mulugeta)

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. However, pastoral conflicts must be understood in light of the historical and ongoing expansion of the Ethiopian state from its central highlands to the remoter parts of its peripheral lowlands, as well as from the vantage point of



Figure 2: Lowland region (Photo by T. Hagmann)

the gradual incorporation of peripheral pastoralist groups into the nation-state's centralised 'apparatus of control'.

In order to verify this, our analysis of the influence of state-building on pastoral conflicts looked at three interrelated levels:

- Past and present state interventions in the realms of land tenure and resource management have undermined communal resource use and altered land tenure arrangements.
- Involvement of the state in current peacemaking practices by co-opting customary authorities and conflict resolution practices is ambiguous. Since the legitimacy of Ethiopia's statutory law remains weak, officials not only endorse but at times encourage and implement conflict resolution agreements based on blood compensation.
- The Ethiopian government currently has rationalised ethnic federalism as a political project that accommodates ethnolinguistic diversity by generalising 'the right to self-determination' at all administrative scales. Since 1991 state-building in Ethiopia's lowland regions dramatically politicised and reconfigured kinship relations. Demographically bigger and more powerful groups had much better chances than smaller and minority clans to gain access to state resources, political office and representation in ethnic terms.

Land Degradation and Runoff Changes in the Highlands of Ethiopia

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The Ethiopian Highlands constitute 50% of the country and were once forested to a large extent. Nowadays, merely 20% are covered by trees (3% by closed forest), evidencing a high extent of agricultural activities in the historic past and up to today. The consequences are land degradation, and there is increased direct runoff in the highlands and to the lowlands.

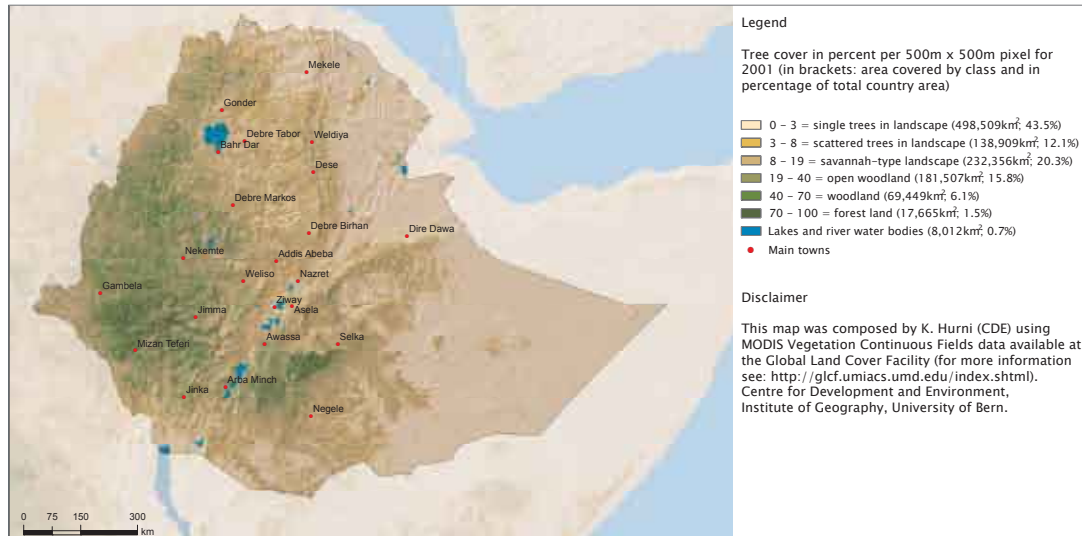


Figure 1: Present day tree and forest cover in Ethiopia as modified by agricultural activities during the last 5000 years (Hurni in prep.)

Deforestation

Deforestation in Ethiopia has been a major land degradation process induced by farmers who wanted to change forest land for use as grassland and cropland. Most areas that currently have more than 3% tree cover are assumed to have been forested about 5000 years ago. Especially in the past millennium, the north-central highlands were a focus of agricultural expansion, where currently a 3-19% tree cover can be observed (cf. Fig. 1). The zone with 19-40% canopy cover has been heavily deforested particularly in the past 50 years (cf. Fig. 3).

Soil degradation and runoff changes

Besides deforestation, soil erosion is a further process of land degradation. Agricultural activities and associated soil erosion have led to severe and widespread soil degradation. This is still threatening agricultural production despite a number of soil and water conservation measures introduced decades ago. Land use change and advanced land degradation have also increased direct surface runoff (cf. Fig. 2), thereby benefitting lowland areas such as those in Sudan and Egypt, to which water is drained. With runoff the sedimentation rates also increased, posing problems for the reservoirs in the lowlands.

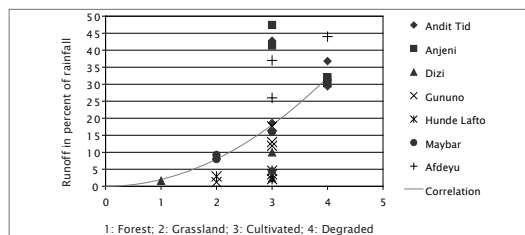


Figure 2: Long-term runoff coefficients measured from testplot experiments (2m by 15m) under natural rainfall and field conditions in seven research sites in the Ethiopian and Eritrean highlands between about 1981 and about 1996 (Hurni et al. 2005)

Conclusion

Land degradation remains a main threat to sustainable agricultural development, and the soils on slopes could be completely washed away within few generations. However, wise management of vegetation cover and soil structural measures have the potential to significantly reduce land degradation and improve agricultural production. Widespread application of these measures has been, and must still be supported by government and the rural society.

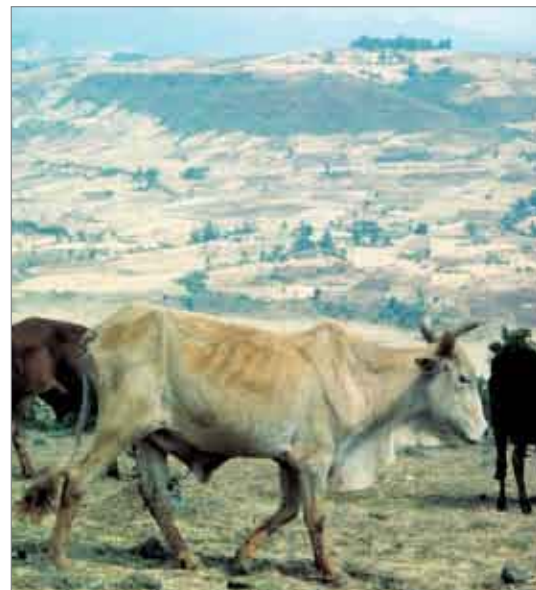


Figure 3: Intensive land cover and land use changes in Anjeni Research Site near Debre Markos mainly occurred between 1950 and 1980 according to Gete Zeleke (2000) (Photo by H. Hurni 1984)

Water, Conflict and Cooperation in the Horn of Africa

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Research conducted in the Joint Area of Case Studies Horn of Africa (JACS HOA) in the field of 'water management and conflict transformation' focused on issues of transboundary water sharing in the Nile Basin and local-level irrigation water property rights.

JACS HOA / WP1 approach

- Focus on patterns of interrelations between resources, resource users and the institutions influencing users' behavior – as opposed to unidirectional relationships linking 'causes' and the occurrence of (violent) conflict.
- Highlight the factors, institutions and interventions that foster the mitigation of such conflicts.

Hydropolitics in the Nile Basin

- Internationally incompatible positions are manifestations of more compatible national interests and needs.
- Political and institutional constraints at the domestic level are a major obstacle in transboundary cooperation if they prevent national authorities from designing effective and internationally agreeable water policies.
- Elements conducive to successful negotiations include efforts 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.

Irrigation water property rights

- The efficiency of agricultural production in the case study areas is not necessarily a function of the physical availability of water, but rather of the access to water and the security of water entitlements.
- Equitable distribution of essential bundles of regulative rights increases the productive efficiency and irrigation water use efficiency, and enhances the level of multilateral bargaining over 'the rules of the game'.



Figure 1: Studies on 'water management and conflict transformation' in the JACS HOA

Conclusions

- Malthusian narratives linking resources scarcity and violent conflict fail to explain the observed disputes.
- The mitigation of water-related conflicts requires a shift of focus away from water quantity allocation towards water users' interests and the institutions regulating their interactions.

Level Issue	Local (irrigation rights Ethiopia)	International (Nile Basin)
Water resources status	Generally abundant, but high variability	Physical scarcity in the downstream, high variability in the upstream parts
Challenges	Water insecurity, inefficient utilisation, no incentives for investment	Lacking framework for water sharing, water insecurity, limited access to donor funds
First order conflicts (over rights and / or access to water)	Between upstream and downstream farmers or communities over water allocation and quality	Ethiopian claims an equitable share Egypt demands protection of existing uses, 'historic rights'
Actors' positions	Farmers demand more water, reliable supply, acceptable quality	Ethiopian claims an equitable share Egypt demands protection of existing uses, 'historic rights'
Interests / needs	Reliable supply of good quality water for agricultural production	National economic growth, political stability, employment, access to funds
Institutions / regimes	Traditional/modern property right regimes, traditional/modern conflict resolution mechanisms	Weak international law, absence of basin wide agreement, transitory mechanism: Nile Basin Initiative, draft legal and institutional agreement
Interventions / conflict mitigation	Property right reform (also common: hydraulic infrastructure to increase water supply, agricultural inputs, livelihood diversification)	Transboundary negotiations, dialogue: legal and institutional agreements, joint river management planning, basin-wide economic integration
Second order conflicts (related to the implementation of policy reforms)	Potential beneficiaries vs. users losing their former privileges (upstream farmers, people affected by infrastructure projects)	Potential future vs. current beneficiaries of subsidised water services, people affected by jointly designed infrastructure projects
Linkages to other levels	Increased water use efficiency in Ethiopia supports the case for increased water abstraction from the Nile; need to re-evaluate trade-offs between water use in Egypt and different uses in Ethiopia	Transboundary cooperation produces momentum to improve domestic irrigation efficiency; could contribute resources to further improving institutions for irrigation water use
Mitigation effect of JACS research	Direct feedback of stakeholders at the local level (transdisciplinary research design), contributions to policy design at the regional state and national level	Nile Dialogue Workshops, capacity and confidence building workshops for young professionals, training workshop in the Egyptian water ministry, personal linkages to individuals involved in Nile negotiations
Conceptual / methodological innovations	Concept: bundles and associated qualities of rights	Dialogue workshop, tandem methodology, two-level game, network analysis applied on water policy and conflict issues

Table 1: Key findings from the 'water' studies conducted in the JACS HOA

Managing Water in a Dynamic Setting – Adapting to Change in Central Asia

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Climatic change and political, institutional and socio-economic transformation processes impact on natural resources and livelihoods. Rapid glacier retreat currently provides more water for agriculture while river flow modelling suggests a shift of main water discharge from the end of July to June in future, with possible negative effects for agriculture.

Global warming and river flow

During the past forty to fifty years glaciers in the Sokuluk River Basin in the Tien Shan have shown a clear trend of retreat (Niederer et al. 2008). The overall area loss of 28% observed for the period 1963-2000, with pronounced acceleration of wastage since the 1980s, translates into increased average annual river flow.



Figure 1: Sokuluk River (Photo by N. Ershova)

Infrastructure and payment attitude

In the Sokuluk District – with the largest irrigated agricultural surface (56,600 ha) – 60% of the 965.9 kilometers of earth canals are in bad condition and 55% of the 422.9 kilometers of concrete channels are in bad condition. It appears that only 23% of the initially abstracted water currently reaches its final destination (Askaraliev 2005). Losses are also due to the many earth canals where water naturally infiltrates. In the five villages investigated, out of 97.7 km of canals less than 9 km are made of concrete (national average 25%).

Institutional adaptations

Water management is further aggravated by fragmentation of former large-scale farms into small private farms, causing a proliferation of water users. One of the adaptive reactions promoted by the most important international actors in Central Asia, such as the World Bank, the Asian Development Bank and the UNDP, was the promotion of Water Users Associations (WUAs). In 2000 in Kyrgyzstan the newly created WUAs already managed about one quarter of the total irrigated area (232,800 ha). In 2003, an additional 300 WUAs raised this figure to 450,000 hectares, which corresponds to about 40% of the total irrigated area.

Class	Total		Area in km ²		Area change in %			
	1963	2000	1963	1986	2000	1963/1986	1986/2000	Total
Class I (<0.5)	61	53	7.652	6.953	4.067	-9.1	-41.5	-46.9
Class II (0.5-1.0)	7	7	5.779	5.102	4.465	-11.7	-12.5	-22.7
Class III (1.0-5.0)	9	9	18.293	15.435	14.265	-15.6	-7.6	-22.0
Total	77	69	31.724	27.490	22.796	-13.3	-17.1	-28.1

Table 1: Glacier surface change in the Sokuluk watershed (northern Tien Shan, Kyrgyzstan) for 77 glaciers from 1963 to 2000, based on four area classes (Niederer et al. 2008)

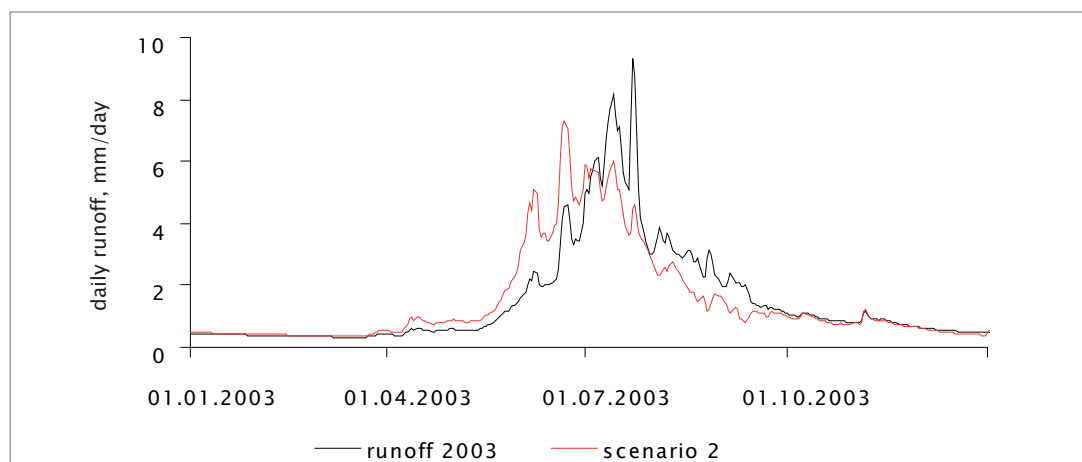


Figure 1: Comparison of measured river flow for 2003 (in black) and modeled river flow for 2050 based on 'Scenario 2' ($\Delta t=+2^{\circ}\text{C}$, $\Delta X=6\%$, glacier decrease by 13.7%) (Ershova et al. 2008)

Land Use in Transition: Opportunities for Kyrgyz and Tajik Farmers?

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Land use transformation in Central Asia has affected not only land resources but livelihoods. Many farmers responded with inappropriate land use practices, leading to widespread land degradation. But opportunities for sustainable land management (SLM) exist. Research in Kyrgyzstan and Tajikistan indicates options for improving decision-making for SLM.



Figure 1: Degraded pastures near a village in Sokuluk Basin, Kyrgyzstan (Photo by J. Shigaeva)

Status of land resources and land management

Large areas of Kyrgyzstan and Tajikistan are used as pastures (~ 40-60%). Easily accessible pastures are heavily affected by degradation processes. In the Sokuluk basin (Kyrgyzstan) forage productivity on pastures close to villages decreased between 1% and 34% between 1978 and 2005. In the loess hills of Tajikistan 24% of the area is affected by on-going soil degradation and 21% is already severely degraded.

Livelihoods and land use strategies

Land degradation is also taking place due to current livelihood strategies. In Kyrgyzstan three main strategies were identified, none of which can be considered ecologically sustainable: (1) the accumulation strategy leaches agricultural soils due to intensive utilisation; (2) the preserving strategy invests more in livestock and contributes to increased pressure on already degraded pastures; (3) poor households follow the coping strategy and are forced to abandon their plots due to lack of capital and labour resources.

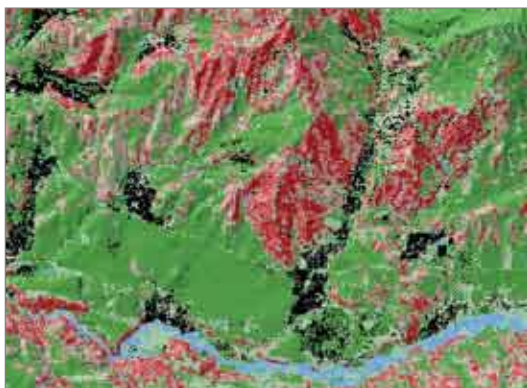


Figure 2: Conserved and stable areas (dark and light green), and degraded and degrading areas (dark and light red) in western Tajikistan (Wolfgramm 2007)

Opportunities for SLM

However, studies in Tajikistan showed that 33% of the area could be classified as well-conserved, with opportunities identified for SLM for subsistence farmers. Even degraded areas have a potential to be improved, e.g. when fenced for intensive fodder production. In such cases even highly degraded pastures can recover within within 5 years and soil properties slowly improve.

Implications for follow-up studies

Research has revealed a lack of knowledge regarding the role and impact of different institutions on land management. Incentives for optimised remote pasture use are still lacking, too. Further understanding of the impact of socio-economic transformation - such as labour migration – on land and on management is also required. Follow-up studies should be oriented in this direction. More joint efforts involving various stakeholder groups are needed to develop new and more cost-effective approaches and methods to assess and monitor land resources adjusted to farmers' needs.



Figure 3: Conservation spot on a degraded slope in Varsob Valley, Tajikistan (Photo by B. Wolfgramm)

Natural Resources in Kyrgyzstan: The Tragedy and Glory of the ‘Private’

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Two trends have characterised natural resource institutions in Kyrgyzstan since 1991. First, while natural resources were collective and state-owned during the Soviet period, they are being privatised for individual or group ownership. Second, as opposed to being centrally administered, natural resource management is being decentralised to communities.



Figure 1: Cultivation of the individually owned land plots after privatisation in Aksai (Photo by Ch. Bichsel 2004)

The emerging ‘private’

Decentralisation and privatisation are creating the new ‘private’ in natural resource institutions for irrigation water, agricultural land, and pastures. Clearly assigned property rights aim to counter the ‘tragedy of the commons’ (Hardin 1968) attributed to the socialist property regime. Individual or group ownership should not only redress Soviet collectivisation, but also form the basis of stable democratic politics and market economies. The outcomes of the new ‘private’ are twofold:

1. New property relations

Decentralisation and privatisation transform the nature of people who engage in social relations with respect to natural resources and redefine the constitution of natural resources themselves (see Table 1).

Changes in property relations	Processes
Emergence of the ‘peasant farmer’	<ul style="list-style-type: none"> • Concept of ‘peasant farmer’ as both means and end of privatisation and decentralisation • Actual practice lacks social identity and valuation
Monetisation 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 while others loose value
Natural resources become 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

Table 1: Property relations over natural resources in Kyrgyzstan (Source: by authors)

2. New governance

Decentralisation and privatisation reconfigure power and forms of authority that regularise the appropriation, distribution and value of natural resources in society (see Table 2).

Frameworks	Informed by
1. Formal law and policies	<ul style="list-style-type: none"> • Soviet law • Russian legal thought • Western legal concept • 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

Table 2: Governance of natural resources in Kyrgyzstan (Source: by authors)

Tragedy and glory of the ‘private’

Clearly assigned property rights have increased responsibility for protecting natural resources. At the same time, reconfigurations of value, slowly emerging markets, and growing inequalities have led to more exploitation and degradation of natural resources.

Private property, empowerment derived from it, and related freedom of choice are appreciated by the new owners. Yet this has so far not delivered the ‘bright future’ of democratic politics and stable market economies promised by market capitalism and liberal theory.

Migration Matters in South Asia

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Migration within and out of South Asia has been a practice steeped in historical processes. Patterns of migration vary across the sub-continent, with motivation ranging from aspirations for upward mobility to escape from socio-economic or political distress. Parallels and differences in this mobility are addressed by research within the NCCR North-South.

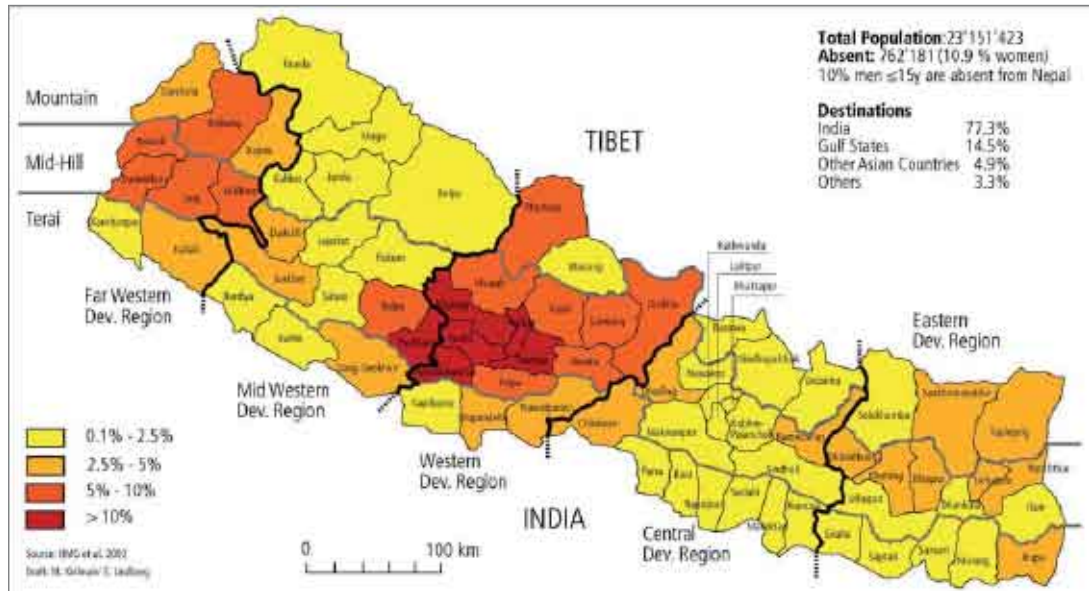


Figure 1: Origin and destinations of migrants from Nepal (map by M. Kollmair and E. Lindberg)

One South Asian commonality is the macro-economic importance of migration (Table 1) and similar major destinations for mobile populations within the region and those migrating to the Gulf (Figure 1). However, research at individual and household level reveals ambiguities. Migration can reduce poverty, food shortages and vulnerability to the effects of catastrophes (e.g. the earthquake in Pakistan). On the other hand, regions where land and employment are scarce and poverty abundant often become major exodus regions for labour migration. Distress migration leads to further distress. Migrants lack specific labour skills and secure working and living conditions, and they incur debts. Multi-

local householding, long distance parenting and caretaking enforce distress. An even darker side is the forced displacement of people. Propelled by poverty, political uncertainty and violence, refugees flee from conflicts in Sri Lanka (to India) and Afghanistan (to Pakistan); Nepali-speaking citizens flee from Bhutan (to Nepal); and ethnic minorities such as Nagas and Chins flee from Burma (to Northeast India).

We conclude that migration does not always generate upward social mobility and success, but has also led to stories of loss, violence and tragedy. The dignity of migrants and their economic contributions must be appreciated worldwide. Therefore, interventions at national and international level are required, in order to reduce threats to human security (poverty, marginalisation, conflict) that trigger migration flows, and to assure non-discriminatory laws protecting migrants' living and working conditions.



Figure 2 Nepalese women in Delhi, India running their credit association (Photo by S. Thieme 2005)

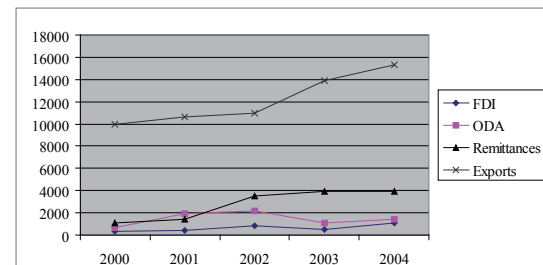


Table 1: Remittances, foreign direct investment (FDI), exports and official development aid (ODA) flows to Pakistan, 2000-2004 (million USD) (World Bank 2006)

Bargaining Power and Access to Livelihood Assets: Insights from South Asia

Babar Shahbaz, Sustainable Development Alternatives, Pakistan; Tahira Sadaf, Sustainable Development Policy Institute, Pakistan; C. P. Vinod, Kannur University, India; Lilith Schärer, Department of Geography, University of Zurich, Switzerland; Urs Geiser, Development Study Group Zurich (DSGZ), Switzerland; Ulrike Müller-Böker, DSGZ

Power relations involving the state are important; however, NCCR North-South research in South Asia reiterated the crucial role of customary practices (e.g. gender norms, caste, religion, etc.) in shaping the rules of who is excluded from and who is entitled to access to particular livelihood assets.

Lack of assets is a key explanatory factor in poverty, and thus 'building up assets' among the poor has become a main thrust of most development interventions. However, many social groups continue to find it extremely difficult to get access to assets required for sustainable livelihoods.

Here we bring together the findings of four empirical case studies in South Asia that provide explanations of the causes of unequal access, showing why an 'enabling' institutional support system, which should help the poor to enhance their asset base, was inaccessible for some social groups. The studies are:

- i. Women's access to health and education services in North-West Frontier Province (NWFP) of Pakistan
- ii. Access of poor households to primary schooling in rural Nepal
- iii. Access of low caste groups in Kerala, India to livestock extension schemes
- iv. Access of various social groups to forest resources in NWFP, Pakistan

The findings illustrated that poverty and insecurity are not (only) the result of lacking 'endowments' but also of 'entitlements,' as well as the result of actual working of power relations through state institutions and routinised social norms and customary practices (Table 1).

We conclude that the socio-economic and cultural diversity of the specific area should be taken into account much more closely, and that policies and interventions should be tailored according to specific local contexts.



Figure 1: The jirga (council of elders) in Pakistan solves local resource use problems, but excludes women (Photo by U. Geiser)



Figure 2: The patron-client system (jajmani) in Nepal has linked high-caste and Dalit households for generations (Photo by U. Müller-Böker)

Context			Explanation (Access and power relations)
Geographical	Institutional	Socio-economic and cultural	
Pakistan (NWFP)	Education and health	Gender norms Ethnic affiliation	Rigid gender norms of female seclusions, restricted mobility, gendered division of work, and <i>Purdah</i> were the main factors of poor female illiteracy and health. Gender differences in education and health were more pronounced among the <i>Pakhtun</i> tribes due to their conservative culture.
Nepal	Education	Religion and caste Livelihoods realities Gender discrimination	The informal rule of caste discrimination in the labour market disadvantage low-caste Hindu and Muslim boys. The practice of <i>Purdah</i> prohibits Muslim girls from attending co-educational schools. The number, age and sex of the household members and livelihood strategies are crucial factors relating to children's, and particularly girls' educational opportunities. Gendered labour division, poverty, co-education in government schools, the dowry system and girls' exclusion from the labour market constrain parents from giving their daughters the same schooling opportunities as sons.
India (Kerala)	Extension Programmes (livestock)	Caste Cultural bias	<i>Adivasi</i> communities were not allowed to milk the cows due to the practice of caste-based untouchability. A cultural bias against the <i>adivasis</i> on the basis of hygiene restricts them to adopt a livelihood option such as dairying.
Pakistan (NWFP)	Joint Forest Management (JFM)	Income disparity Livelihood realities	Richer and influential households have dominated the JFM related institutions, leaving minimal space for poor and marginal households. Most households depend on remittances for their livelihoods and use forest resources for subsistence only. Their priorities are income and easier institutional access to forests, while the state prioritized forest protection.

Table 1: Power relations and access to assets – insights from NCCR North-South studies in South Asia

The State, Participatory Resource Governance and Conflict in South Asia

Bishnu Upreti, NCCR North-South, Nepal; Babar Shahbaz, Sustainable Development Alternatives, Pakistan; Sagar Sharma, Human and Natural Resource Studies Center, Nepal; C.P. Vinod, Kannur University, India

Sustainable natural resource management depends on participation – but even more on the legitimacy of the state and its interaction with resource users. A controlling state provides the basis for conflict; providing supportive institutional arrangements fosters cooperation. Hence, expanding horizontal and vertical state legitimacy (Table 1) is essential.

Pakistan: NCCR North-South studies show that Joint Forest Management Committees (JFMCs) are often controlled by local elites, excluding women, and that Forest Department staffs maintain overall control (including the power to dissolve JFMCs). Thus many people do not feel bound to JFMC rules, and the system has failed to stop forest depletion.



Figure 1: Illegal timber harvesting in Pakistan despite joint forest management (Photo by U. Geiser)

Nepal: When the Koshi Tappu Wildlife Reserve authority applied rigid legal control, livelihood insecurity among poor people residing in or around the protected area increased, forcing them to secure livelihoods 'illegally'. By contrast, when the Kangchenjunga Conservation Area Project applied a people-orientated participatory approach and helped to enhance livelihoods, protection of biological diversity was not compromised.

Kerala (South India): Here too, JFMCs were introduced in the late 1990s, consisting of local people, state officials and NGOs. However, forest-dependent tribals (adivasi) were often excluded from having influence in JFMCs. NCCR North-South research found the cause for this in the powerful nexus between migrant agricultural residents and state officials, which marginalised the voices of adivasis.



Figure 2: Formalised involvement of women's groups in Kangchenjunga Conservation Area Project (Photo by U. Müller-Böker)

Conclusion: Our research supports the mainstream demand for people's participation in natural resource management. The state has to play a crucial role. But it must also replace a controlling approach with provision of adequate institutional arrangements, securing the involvement of poor/marginal groups as well.

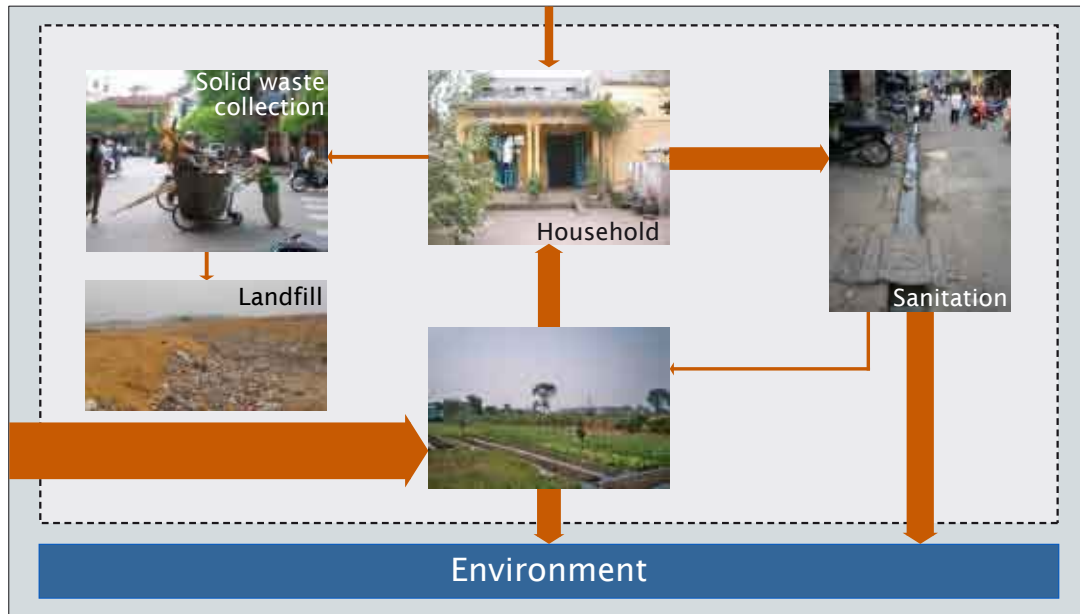
Vertical legitimacy (state structures, laws, etc.) →	<p>Controlling state (high vertical but low horizontal public legitimacy)</p> <ul style="list-style-type: none"> • Central control of power • Low level of sense of belongingness and of trust of people • Low level of ownership and accountability • Poor participation of people • Rigid legal control and legal domination • Assumption of state to control and people to obey as passive recipients 	<p>Facilitating state (high vertical and horizontal public legitimacy)</p> <ul style="list-style-type: none"> • High degree of interaction between state and people and higher trust on state • High level of participation and representation leading to higher ownership and accountability • Effective legal performance • Less number of conflict and win-win settlement • Conducive policy, responsive institutions
	<p>Dysfunctional state (low vertical and horizontal public legitimacy)</p> <ul style="list-style-type: none"> • State institutions and regulations not functioning • Corruption, nepotism, favouritism and redtapism massive • Law and order not respected • Impunity, lack of accountability and free-ride • Irrational exploitation of NR • Erosion of trust of people on state and anarchy • Smugglers, mafia and elite groups control NR • Increased conflict and tension in society 	<p>Weak state (low vertical but high horizontal public legitimacy)</p> <ul style="list-style-type: none"> • Imbalance of legal and social interaction, leading to weak enforcement of state policy and regulations related to NR • Weak state and very strong non-state actors, creating imbalance on decision making and policy and regulation enforcement • Poor decision making and poor governance of NR • Uncoordinated planning, implementation and duplication • Demoralised state administrative apparatus
	Horizontal public legitimacy →	

Table 1: State and its public legitimacy in managing natural resources (adapted from Baechler 2006)

Environmental Sanitation Planning: Putting the Households at the Centre

Agnès Montangero, Monika Schaffner, Antoine Morel, Christoph Lüthi, Roland Schertenleib (Eawag/Sandec); Hung Nguyen Viet (Swiss Tropical Institute); Narong Surinkul, Thammarat Koottatep (Asian Institute of Technology). JACS South-East Asia.

Conventional approaches addressing the problems related to urban environmental sanitation and water pollution control have rarely been appropriate in the developing country context. New approaches should strive towards responding to the consumer demand and promoting user ownership of services while also conserving resources and protecting the environment.

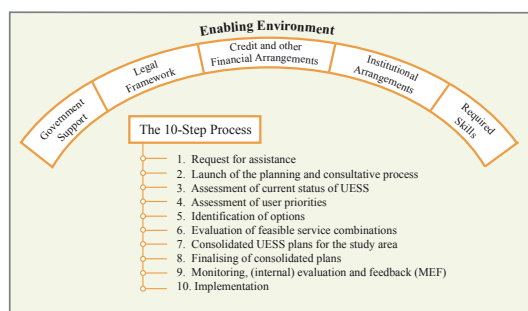


Main phosphorus flows in the environmental sanitation system of Hanoi province, Vietnam.

From supply-driven to demand-responsive planning

The Household-Centred Environmental Sanitation Planning (HCES) Approach places the household at the core of the planning process and thus responds directly to user's needs and demands. It is a multi-actor approach emphasizing the participation of all stakeholders in planning and implementing urban environmental sanitation services. It further targets resource conservation and reuse to reduce waste disposal. The approach is currently being tested in several countries.

iate to identify environmental sanitation systems promoting resource recovery, for example by reusing treated human waste in agriculture, and hence contributing to closing the nutrient cycle. A second tool - the Quantitative Microbial Risk Assessment (QMRA) - can be coupled to the MFA to assess environmental sanitation systems not only with regard to resource conservation and environmental protection but also to health risks.



The "enabling environment" and the 10-step process for developing urban environmental sanitation services (UES) using the HCES approach.



Community workshop in Vientiane, Laos: assessing urban environmental sanitation services (step 3 of the HCES process).

Closing the nutrient cycle

Various tools have been developed to support implementation of this approach. One of these is the Material Flow Analysis (MFA). It can be applied to assess the current environmental sanitation system and to simulate the impact of changes in the system on resource consumption and environmental pollution. It therefore supports the evaluation of potential future options developed in a multi-stakeholder process. It is particularly appropriate

Scientific basis for informed choices

The HCES process ensures that information obtained on the current and on potential future environmental sanitation systems by applying tools such as MFA and QMRA is effectively communicated to the households and other stakeholders. This facilitates the joint development of potential options and supports informed decision-making.

Innovative Wastewater Treatment: From Research to Regional Application

Antoine Morel, Asian Institute of Technology (AIT), Thailand; Yuttachai Sarathai, AIT; Thammarat Koottatep, AIT

While the technical feasibility of innovative wastewater treatment systems can be demonstrated, few systems are actually implemented in Southeast Asia (SEA). Which factors hinder region-wide application of such systems, and how can barriers be overcome?



Figures 1-3: Constructed wetland system treating domestic wastewater of hotels and households on Phi Phi Island, Thailand. The park-like system is frequently visited, thus supporting the acknowledgement and dissemination of the technology. (Photos by T. Koottatep)

Objective and Methodology

The suitability of two promising technologies for decentralised treatment of domestic wastewater (Figure 4) was assessed and barriers to their wider application in Southeast Asia identified. Eight NCCR North-South related research projects in SEA were reviewed in the process.

Technical solutions to pollution control measures at the source

The anaerobic baffled reactor (ABR) and constructed wetlands (CW) can treat domestic wastewater satisfactorily at reasonable costs. Wastewater discharge standards in most Southeast Asian countries can be met.

What hinders wider application of innovative systems?

Key stakeholders (government, engineers, communities) are reluctant to adopt innovative solutions to wastewater management owing to:

- Little legislative support for implementation of innovative solutions
- Lack of knowledge about and trust in technical innovations
- Lack of managerial capacity and technical skills
- Lack of success stories and guidance
- Ineffective transfer of knowledge from research institutions to decision-makers and practitioners

From research to wide-scale application

Trust must be increased and demand for innovative systems stimulated, along with the capacity to promote, disseminate, design, construct and operate them. Required measures include:

- Political advocacy and awareness-raising at community level

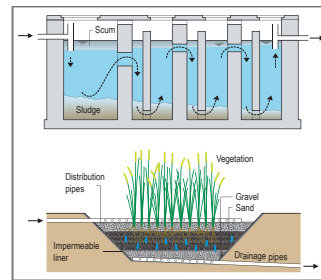


Figure 4: The two wastewater treatment technologies investigated - the anaerobic baffled reactor (ABR) and the vertical flow constructed wetland (CW)

	Anaerobic baffled reactor (ABR)	Constructed wetland (CW)
Efficiency	- COD = 72-90%; SS = 78-94%; - TP = 33%; TKN = 47%	- COD = 80 - 90%; SS = 80 - 95%; - TN = 40 - 60%
Costs	- 35-70 USD per person	- 60-120 USD per person
Strengths	- High treatment efficiency (BOD, SS) - High stability to organic and hydraulic shock loads - High-level academic qualifications not required for operation and maintenance	- High treatment efficiency (including nutrients, pathogens) - Discharge standards can be met - Pleasant landscaping possible - High-level academic qualifications not required for operation and maintenance
Limitations	- Limited nutrient and pathogen removal - Effluent standards cannot be reached	- High permanent space requirement - Great care required during construction and acclimatisation

Table 1: Performance, cost, strengths and limitations of ABR and CW for domestic wastewater treatment

- Development of appropriate standards and guidelines
- Pilot projects to stimulate wider interest and increase trust (Figures 1-3)
- Technical and managerial training of relevant stakeholders

The main question is the role of local research institutions in building capacities.



Accessibility, Environmental Dynamics and Socioeconomic Disparities

Michael Epprecht, Centre for Development and Environment (CDE), University of Bern, Switzerland; Andreas Heinemann, CDE; Peter Messerli, CDE; Dietrich Schmidt-Vogt, Asian Institute of Technology, Thailand; Urs Wiesmann, CDE

Poverty and environmental degradation are often thought to be causally connected. While access to natural resources is a determining factor for environmental dynamics and human well-being, social distances are a determining factor for whether accessibility leads to actual access, thereby impacting individual well-being and environmental dynamics.

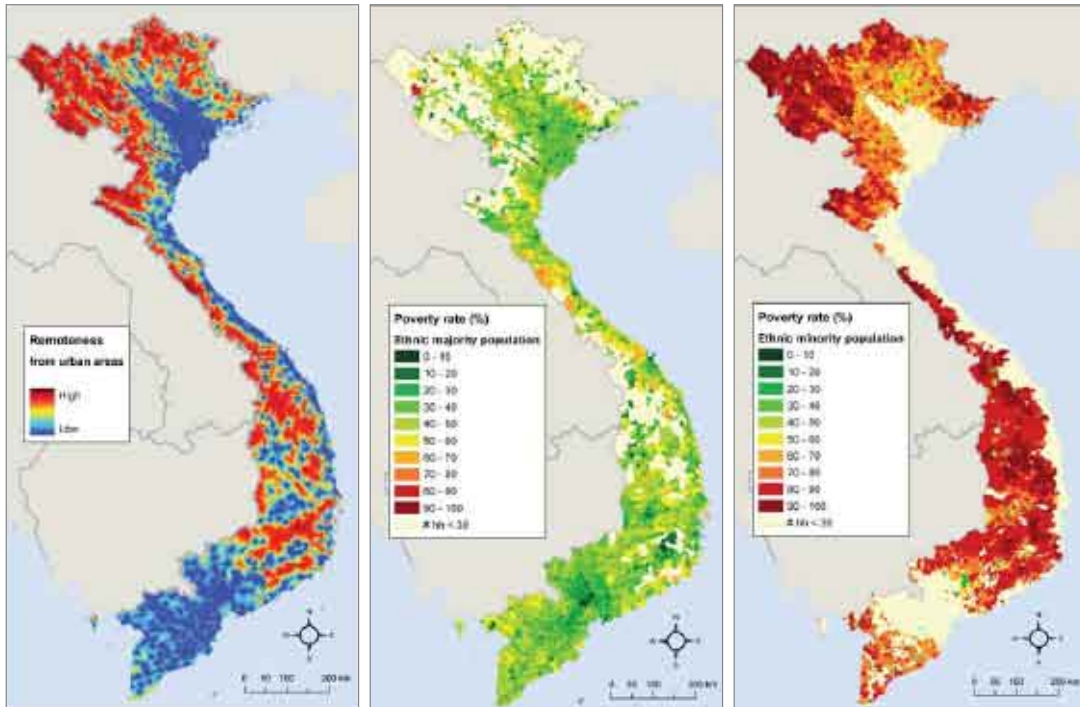


Figure 1: Determinants of poverty in Vietnam (M Epprecht, D Müller, N Minot. 2007, submitted to IFPRI DP series. How Remote Are Vietnam's Poor? - An Analysis of Spatial Patterns of Poverty and Inequality in Vietnam's Society, Discussion Paper. International Food Policy Research Institute, Washington, DC, USA)

While accessibility to local services is a determining factor for poverty incidence in Vietnam, actual access is only partly determined by physical distances, but more so by socio-cultural distances. Social distances therefore largely determine actual access.

Physical accessibility to forests on the other hand proved to be a strong determinant of forest cover changes. While local accessibility is a key prerequisite for deforestation in the Lower Mekong Basin, the deforestation capacity of cities is considerable. Being within reach of provincial, national, or even international actors has a strong influence on deforestation through the enhanced commercialisation of agricultural and forestry outputs.

Even if closely correlated by location, patterns of poverty and environmental degradation cannot necessarily be brought into direct causal relation. Rather, underlying drivers can be found in actual access of actors to markets, services and natural resources.

Although physically closer to natural resources and typically more directly dependent on them, the local poor often do not have the necessary access and rights to benefit from natural resources or protect them against frequent overexploitation by external actors.

Creating infrastructure often benefits external and better-off actors as they are able to quickly transform accessibility into access to services and resources. Poor actors will need time to adapt and may in the meantime be deprived from their environmental subsistence base.

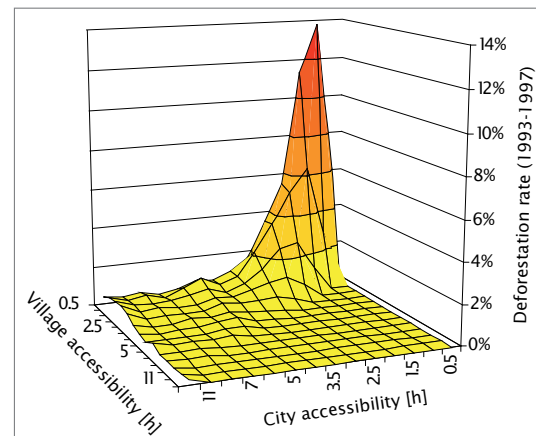


Figure 2: Deforestation in the Lower Mekong Basin in relation to village and city accessibility (A Heinemann. 2006. Patterns of Land Cover Change in the Lower Mekong Basin. The Relevance of Mesoscale Approaches, [PhD]. NCCR North-South, University of Bern, Switzerland.)

Social Exclusion, Inner Borders and Fragmentation

Lily Caballero, Universidad Nacional Autónoma de Honduras (UNAH), Honduras; Sonia Baires, Universidad Centroamericana José Simeón Cañas, El Salvador

The impact of globalisation in Caribbean and Central American cities has produced growing inequities, changes in livelihoods, enhanced consumption, and the private appropriation of public space, as well as increasing violence and insecurity. Inequities lead to fragmented cities, divided by new “inner borders” that impact the dimension of citizenship. The challenge is how to change these trends and build inclusive cities.

Research projects

Two dimensions of these “inner borders” must be understood: the one related to violence and insecurity, and the one related to habitat and urban segregation. Four research projects are being developed within the first dimension and three within the second.

Insecurity and inner borders

- Insecurity and transformation of urban public spaces: the case of Tegucigalpa and Comayagula, Honduras.
- Characterisation of gated neighbourhoods as an emergent residential phenomenon in Tegucigalpa City.
- Territory, youth and development. The case of young people in Ciudad Perdida #9.
- Social representations and insecurity practices in the post-war era. The case of three municipalities.

Habitat and urban segregation

- Popular habitat renewal and social mobilisation in the central neighbourhoods of Mexico City, 1985-2006.
- Citizens’ participation in the face of deterioration of the central neighbourhoods in Mexico City. Community plans for neighbourhood improvement in the Central delegations of the Federal District.
- Adequate urban articulation: Guidelines stemming from the application of a HCES manual. Case Study of La Europa, Curridabat, Costa Rica.

Preliminary results

Social exclusion relates to these new inner borders, with material dimensions that interfere with free circulation and non-material dimensions that regulate the use of certain urban territories. As there is no clear definition of inner borders, there is always potential conflict in their configuration. How to prevent these conflicts in urban environments is the challenge.



Development, Livelihoods and Migration: A Research Agenda

Abelardo Morales, Facultad Latinoamericana en Ciencias Sociales (FLACSO-CR), Costa Rica; Daniel Villafuerte, Centro de Estudios Superiores de México y Mesoamerica (CESMECA), Universidad de Ciencias y Artes de Chiapas, Mexico

Within the context of globalisation migration is central to livelihoods but it implies changes in family relationships and community life, violation of human rights, and risks to the lives of migrants. These implications require efforts to understand the nature of development, the nature of the State, and the social changes provoked by migration.



Figure 1: Advertisement for bus trips to the USA, a favourite migration destination (Photo by A. Morales)

Research questions

Two research projects at the Mexican-Guatemalan border, will concentrate on livelihoods and migration, focusing on:

- What is the social organisation of rural families, in which strategies of international migration are decided? And which are the effects on their relationships with the community.
- How are the social relationships that facilitate migration decisions constructed and how do they work?
- What are the main institutions in the local community, how are their inner changes expressed as a product of migration, and how do they organise to face such transformation processes?
- What new social practices has this process created, and how is the community and its relationships with its regional surroundings affected?

Preliminary results

Emigration has been one of the main consequences of the adjustment process in the economies of the region, and labor migration a direct manifestation of its effects in labor markets. Remittances compensated for the decline in the main export products and came to play a role as the main source of external transfers to the region. Thus remittances have become an immediate resource of containing poverty, particularly in countries where there is a lack of employment and public investment. The paradox is that migration not only offers employment for this excluded labor mass, it is also an answer for national and local economies lacking options for development and a palliative for failures in social distribution.

Final comments

The terms of participation of the Central American and Caribbean region in globalisation should be questioned – terms that, as a whole, delegate to the least protected individuals the responsibility for facing the risks and contradictions of a social system whose logic involves beliefs, standards and systems of action that make the individual the creator of all economic, social and political constructions.

The research agenda must locate development, livelihoods, and migration under stress within the concept of globalisation, to learn about the variables that affect vulnerability and risk among poor domestic groups.



Figure 2: Queuing up to send money home to Nicaragua (Photo by D. Villafuerte)

Governance, Environmental Problems and Local Responses

Peter R.W. Gerritsen, Instituto Manantlán de Ecología y Conservación de la Biodiversidad, Universidad de Guadalajara (UDG), Mexico; Horacio Chamizo, Universidad de Costa Rica, Costa Rica; Alejandra Guerrero de León, UDG; Sabine Masson, Graduate Institute of International and Development Studies, University of Geneva, Switzerland; Elizabeth Tilley, Water and Sanitation in Developing Countries (SANDEC), Swiss Federal Institute of Aquatic Science and Technology (EAWAG), Switzerland

Governance, environmental problems and local responses are a central part of research in the Joint Area of Case Studies Caribbean and Central America (JACS CCA). Research results indicate that the social processes in play in the region are highly differentiated and cannot be considered as mere mechanical processes. A great many (global and local) factors play a role, with impacts on both societies and the natural and constructed environment. This also provokes many responses by local actors. Ongoing JACS CCA research seeks to analyse the factors that delay or prevent solutions from being implemented or from being sustainable.



Figure 1: Sugar factory in El Grullo (Photo by B. Portner)

Research questions addressed

Research questions relate to the changes brought about by globalisation with respect to management of the environment, including socio-cultural and health dimensions. They also focus on the responses of social actors and institutions, and understanding of governance processes related to the management of the natural and the constructed environment.

Research design

Currently, two doctoral theses, one master's thesis and one post-doctoral research project are underway in order to generate data to strengthen the empirical bases of research. Due to the institutional affiliation of the researchers involved, different methodologies are being applied in each of these studies. However, central to each study are the themes of governance, environmental problems and local responses.

Preliminary results

In the JACS CCA, the environmental costs of globalisation will continue to be high and to increase unless social problems, economic stability and urban growth are dealt with. The search for a (new) democratic governance model is a key issue; one which implies the participation of collective actors within a supporting institutional framework that permits increased decision-making. Conflict resolution as part of this governance model demands the necessary interaction between multiple actors in order to guarantee human rights and the fulfillment of sustainable basic needs. Currently, both of these issues are pressing within the JACS CCA region. In this respect, special attention must be paid to gender issues, since gender-sensitive analyses will permit the mitigation of direct and indirect negative effects on women.

Final comments

JACS CCA research results show that governance models should necessarily include the search for sustainable development schemes that are locally constructed, thus permitting a more democratic society, including the ability to develop a healthy environment. The acceptance of such representative democracy depends on the participation of, and on trust between, the actors involved. In this respect, the JACS CCA is still barren ground.



Figure 2: Entrance gate to the scientific research station of the University of Guadalajara in the Biosphere Reserve Sierra de Manantlán (Photo by B. Portner)

Social Organisations and the State in Argentina and Bolivia

Alejandra Ramirez, *Centro de Estudios Superiores Universitarios, Universidad Mayor de San Simon, Bolivia*; Florencia Partenio, *Centro de Estudios e Investigaciones Laborales, Programa de Investigaciones Económicas sobre Tecnología, Trabajo y Empleo (CEIL-PIETTE), Argentina*; Ariel Wilkis, *CEIL-PIETTE*; Manuel De La Fuente, *NCCR North-South, Bolivia*

What processes have taken place in the reconstruction of relationships between social organisations and the State in Bolivia and Argentina since the 1990s? This question was the basis for this study – based upon shared characteristics – of the impact that public policies undertaken in both countries had upon new, interwoven relationships involving social and State agents.



Figure 1: A demonstration (march) in the war for water



Figures 2 and 3: The State and social movements



Figure 4: Gender and social movements

Bolivia and Argentina – countries that experienced strong processes to dismantle the State apparatus with structural adjustment, which subsequently gave way to processes of administrative and political decentralisation – are societies where social organisations have had, and continue to have, a very strong influence on the design and control of public policy.

In these two cases the relationships between the State and social organisations are marked by different forms of inter-penetration: from the State to the organisations (imposing normative, frameworks for demands, regulating social organisations) and from the social organisations to the State (creating specific agencies in order to attend to demands such as the participation of leaders in public functions, or social organisations that begin to plan and administrate public policy, citizenship exercises, etc.).

Within this process three comparable elements can be highlighted:

1. A process of construction of leaderships and political militancy, as well as the participation of members of social organisations in State agencies, took place in both countries;
2. There has been an important change in the gender issue within the redefinition of socio-political configurations, marked by a greater participation of women, despite all the obstacles they have to face;
3. The role of NGOs and international organisations as significant stakeholders whose incidence has not yet been fully analysed constitutes another important element within the framework of the re-configuration of the relationships between the State and social organisations in both countries.

Management and Perception of Risk in La Paz and Cusco

Luis Salamanca, Centro de Investigación para el Desarrollo (CIDES), Universidad Mayor de San Andrés (UMSA), Bolivia; Fabien Nathan, Graduate Institute of International and Development Studies (IHEID), Université de Genève, Switzerland; Esther Guzmán, Centro de Estudios Regionales Andinos Bartolomé de las Casas (CBC), Colegio Universitario Andino, Peru

Potential disasters in La Paz and Cusco are not only caused by threats but by other factors, such as low-quality housing, inadequate infrastructure, and gender, age and ethnic identity issues. Furthermore, there is no adequate training in preparedness and mitigation. Social inequalities and social exclusion exacerbate matters even further.

Migration, accelerated growth, and lack of planning have greatly increased the vulnerability of cities such as La Paz and Cusco, which have high levels of exposure to threats (floods, landslides, and earthquakes, especially in Cusco). The responses of local governments and of the population have not succeeded in placing risk management on the agenda of the central government as a way to mitigate disasters.

The solution should involve applying mitigation measures to permit the inclusion of risk management in the development process. This would allow the majority of people to improve their living conditions, engage in secure and stable economic activities, and generate greater and better income. Furthermore, land redistribution and the improvement of access to health and education should be proposed.

A Partnership Actions for Mitigating Syndromes (PAMS) support to local risk management in Bolivia has raised awareness among the population, and now opportunities can be created to lobby for the incorporation of prevention and mitigation in development processes within municipal policy. It is necessary to design a strategy to “oblige” both stakeholders to recognise their “deficiencies” or “concealment” of the issue. We have observed that populations quickly retract if their demands do not find echo or if they are burdened with taxes.

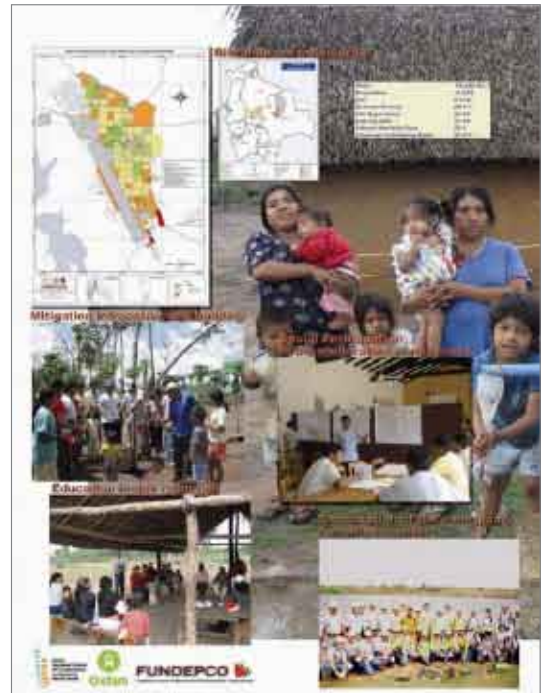


Figure 1: PAMS - Improving governance of human risk in Bolivia



Figures 2 and 3: Landslides in La Paz, left 1993 and right 1997 (Photos by L. Salamanca)

Joint Areas
of Case Studies:

- East Africa
- Horn of Africa
- West Africa
- South-East Asia
- South Asia
- Central Asia
- Central America and Caribbean
- South America
- Switzerland

Protected Areas and Indigenous Populations in Bolivia and Peru

Sébastien Boillat, Swiss Agency for Development and Cooperation (SDC), Switzerland; Jamil Alca Castillo, Centro de Estudios Regionales Andinos Bartolomé de las Casas (CBC), Colegio Universitario Andino, Peru; Alex Alvarez, CBC; Patrick Bottazi, Laboratoire de Sociologie Urbaine (LaSUR), Ecole Polytechnique Fédérale de Lausanne (EPFL); Dora Ponce, Agroecología Universidad Cochabamba (AGRUCO), Bolivia; Elvira Serrano, AGRUCO; Valerie Biffi, Bolivia; Sarah-Lan Mathez-Stiefel, Centre for Development and Environment (CDE), University of Bern, Switzerland; Peter Larsen, Graduate Institute of International and Development Studies (IHEID), Université de Genève, Switzerland; Stephan Rist, CDE

Since the 1980s, reconciliation of environmental conservation with human development and the participation of local populations in the management of protected areas have generated a change of paradigm in the world of conservation. This process has been reinforced by the emergence of the “bio-cultural diversity” concept which recognises the link between biological and cultural diversity (Posey 1999).



Figure 1: Protected areas and case study areas in Peru and Bolivia

Although conservation efforts increasingly include indigenous populations and peasant communities, and their contribution to sustaining biodiversity is recognised, the weak role of the State in the management of protected areas must be addressed. This situation generates uncertainty as to the efficiency of protected areas in integrating conservation with long-term local development.

Objective

We aim to show the processes, problems and potentialities that emerge from a bio-cultural and analytical study, based on four case studies of protected areas located in the area of transition between the Andean mountain ranges and the Amazon plains of Bolivia and Peru.

The analysis was based on four critical points:

1. The limitations of the normative frameworks which regulate the management of natural resources,
2. The difficulties of integrating conservation and economic activities,
3. The difficulty of establishing a dialogue between stakeholders with different visions of the relationship between society and nature, and
4. The ambiguous role of the State.

Case studies:

Bolivia

- Biosphere Reserve and Pilon Lajas Indigenous Territory (RPL)
- Tunari National Park (PNT)

Peru

- Amaraeri Communal Reserve (RCA)
- Sierra del Divisor Reserve Area (ZR-SDD)

Results

Adaptation of the regulatory framework

The change of paradigm to include indigenous populations in conservation efforts is officially expressed, although a tendency still exists to restrict local participation in management. With relation to resources, however, it can be observed that informal regulations prevail for access to land and resources. This reflects a lack of continuity between the state's legal framework and local practices.

Conservation and economic activities

In the case of the RCA, RPL and ZR-SDD, the involvement of indigenous communities in illegal extraction activities (lumber, gold and others) is linked to the growth of their relationship with the market economy.

This situation shows that protected areas have not brought true benefits to these social groups and economic integration of conservation has not been achieved.

From inter-relation to dialogue between stakeholders

A significant source of conflict in protected areas is varying visions of the relationship between society and nature among different stakeholders. So it is clear that the partnership between conservationists and indigenous peoples has been instrumental for both parties and not the result of intercultural dialogue.

Role of the State

All cases accentuated the ambiguous role of the State, which drives conservation policies on the one hand and those favoring the extraction of non-sustainable resources on the other.

Negotiating Conservation – Meaningful Spaces in a World Heritage Debate

Karina Liechti, Centre for Development and Environment (CDE), University of Bern, Switzerland; Urs Müller, Development Study Group Zurich, University of Zurich, Switzerland

In negotiations about a potential World Heritage Site, people construct individual ‘realities’, ascribing meanings to the issues under consideration. Hence they construct individual, meaningful spaces. These meaningful spaces frequently do not correlate with the ‘outstanding universal values’ that are the criteria for inscription as a World Heritage Site.

By exploring how the Jungfrau-Aletsch-Bietschhorn region was represented in the local press during the World Heritage decision-making process, we aimed to identify meanings ascribed to the potential World Heritage Site (WHS).

In visual representations (images), the WHS was largely presented as an unspoiled natural environment (Figure 1). This aesthetic portrait has no direct link to the population’s daily needs or questions and anxieties about the consequences of a WHS label and commitment to sustainable development.

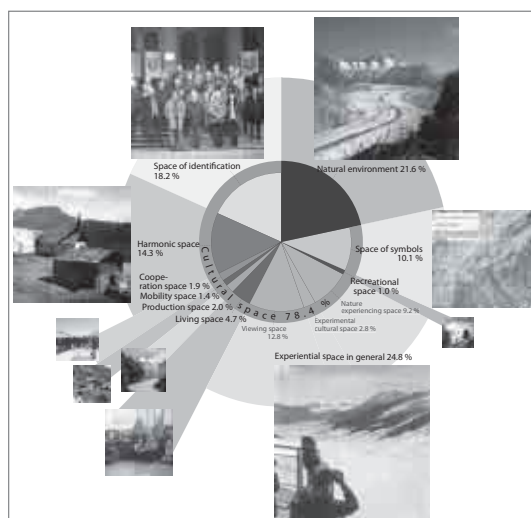


Figure 1: The image of the WHS Jungfrau-Aletsch-Bietschhorn as presented in the ‘Walliser Bote’ between 21 Feb. 1998 and 13 Dec. 2001 (graph by U. Müller, photos ‘Walliser Bote’)

This was apparent when considering verbal expressions (articles, letters-to-the-editor, comments) dominated by issues of regional economic development, fears of disappropriation, and different views of nature (Table 1).

Discussions referred to ways of dealing with the WHS’s ‘outstanding beauty’. It became obvious that reference only to scientific, aesthetic, or conservation-related ‘universal values’ (Figure 2) was unlikely to result in common agreement on how to proceed. These values are too abstract for the daily lives of local people, who construct individual ‘realities’, ascribing meanings to issues under consideration.

The Jungfrau-Aletsch-Bietschhorn region is the most glaciated part of the European Alps, containing Europe's largest glacier and a range of classic glacial features, and provides an outstanding record of the geological processes that formed the High Alps. A diverse flora and fauna is represented in a range of habitats, and plant colonization in the wake of retreating glaciers provides an outstanding example of plant succession. The area is globally recognised as one of the most spectacular mountain regions to visit and its aesthetics have attracted an international following.

Figure 2: Outstanding universal values in the Jungfrau-Aletsch-Bietschhorn World Heritage Site (World Heritage Committee 2001)

In a spatial sense, they thus construct individual meaningful spaces. Dealing with these different meaningful spaces is decisive when it comes to negotiating pathways to sustainable development in a WHS region. As multiple realities exist in a pluralistic world, they must be taken seriously and adequately addressed.

Important issues in the media debate	Citation example
Aesthetics (+)	"This unique landscape is formed by wind, coldness, 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, 09/03/2000).
Economic development (-)	"It is our uppermost duty to keep [infrastructural] extension possibilities open in order to provide future generations a secure livelihood" (Walliser Bote, general article, 02/04/1998).
Economic development (+)	"The unique landscape should not be sacrificed to short-term and short-sighted tourist considerations" (Walliser Bote, general article, 28/02/1998).
Economic development (+)	"The inscription of the region in the World Heritage list would be a big international marketing campaign that we could never pay by ourselves" (Walliser Bote, general article, 26/03/1998).
Economic development (-)	"Nature protection alone is not enough – our descendants also want to eat and to drink" (Walliser Bote, comment, 07/03/2000).
Fears of disappropriation (-)	"Never should we allow foreign organisations, people from Paris, Berne [...] to decide what we have to do and how we do things in our mountains" (Walliser Bote, letter to the editor, 07/03/2000).
Endangered nature (+)	"Whoever wants to grant and preserve a unique landscape for coming generations should take the opportunity to vote in favour of the WHS. Only by doing this do we have a guarantee that the Great Aletsch Glacier and the protected area will not degenerate to a Disneyland or a carousel" (Walliser Bote, letter to the editor, 06/08/1998).
Endangering nature (-)	"Under the catchword of 'sustainability', certain circles are planning to resettle wolves, snakes, and other animals" (Walliser Bote, letter to the editor, 03/11/1999).

Table 1: Important issues in the World Heritage media debate and citation example (Legend: + / - : In favour / against establishing a World Heritage Site)

Transdisciplinary Approaches in Managing a World Heritage Site

Astrid Wallner, Centre for Development and Environment (CDE), University of Bern, Switzerland; Ursula Schüpbach, CDE; Stephan Rist, CDE; Urs Wiesmann, CDE

Management of the Jungfrau-Aletsch-Bietschhorn World Heritage Site (WHS) in Switzerland faces a challenge from the interplay of conservation and economic development. Transdisciplinary approaches were used in order to elaborate basic conditions to preserve ecologic stability and inherent natural beauty without preventing sustainable regional development.



Figure 1: Stakeholder discussion in the Jungfrau-Aletsch-Bietschhorn World Heritage Site (Photo by Jungfrauzeitung 2005)

Transdisciplinarity

- Is the result of coordination and cooperation within the scientific community and a debate between research and society at large.
 - Acknowledges that there is not only scientific knowledge but that knowledge exists and is produced in societal fields other than science.
- Transdisciplinarity requires the involvement of all major stakeholders by participatory processes.

An in-depth study of the multi-stakeholder participatory process initiated in the Jungfrau-Aletsch-Bietschhorn WHS revealed **potentials and limitations of transdisciplinary approaches.**

Potentials

- Actively foster local initiatives for sustainable regional development and thereby enhance local people's sense of ownership of the region.
- Address contradictory expectations regarding the issue of conservation and economic development.

- Ascertain key concerns for all involved stakeholders.
- Facilitate debates on the role of key issues and thereby initiate social learning processes and contributing to mutual learning.

Limitations

- Legal norms and framework conditions defined by the state government cannot be negotiated in a regional / local context.
- Possibility of a shift in the existing balance of power between the involved stakeholders.
- Connected to the political and economic dynamics of the geographical and historical contexts.

Conclusion

Preserving global values is dependent on local development, local action, and local actors → transdisciplinary approaches foster management as mutual learning.

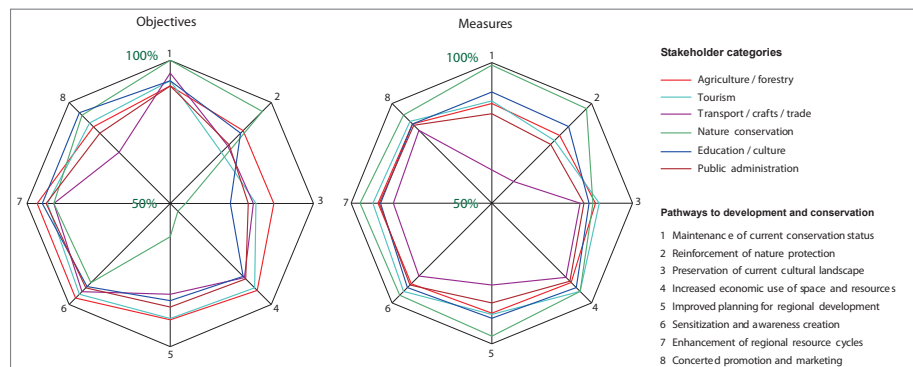


Figure 2: Acceptance of objectives and measures related to the basic orientation of pathways to development and conservation by different stakeholder categories in the case of the Jungfrau-Aletsch-Bietschhorn World Heritage Site (Wiesmann et al. 2005)

Sustainable Regional Development: Balancing Global and Local Stakes

Rosmarie Sommer, Centre for Development and Environment (CDE), University of Bern, Switzerland; Astrid Wallner, CDE; Urs Wiesmann, CDE

Various studies in the Jungfrau-Aletsch-Bietschhorn (Switzerland) and Mt. Kenya (Kenya) World Heritage Sites reveal that they provide an internationally acknowledged label for shared landscapes as a common asset for regional development. The decisive element in success is genuine participation in planning and shared access to the benefits of change.



Figure 1: Jungfrau-Aletsch-Bietschhorn region (courtesy of Management Centre Unesco World Heritage Site Jungfrau-Aletsch-Bietschhorn)

The studies confirm that global frame conditions can only be as effective as their local level of compliance and implementation and that the purpose of site protection differs between countries in the North and the South.

The North focuses on:

- counter-balancing peripherisation,
- preserving the cultural landscape,
- enhancing touristic attractiveness,
- strengthening regional identity and
- promoting more sustainable development.

The South focuses on:

- easing pressure on the sites by constraining natural resource exploitation, often without due compensation and by empowering local stakeholders to prevent resource conflicts.

This results in the following opportunities and success factors in sustainable regional development (see Table 1):



Figure 2: Panel of stakeholders (courtesy of Management Centre Unesco World Heritage Site Jungfrau-Aletsch-Bietschhorn)

Feature	Jungfrau Aletsch Bietschhorn WHS	Mt. Kenya WHS
Regulatory Framework	<ul style="list-style-type: none"> • well functioning • legally binding policy guide 	<ul style="list-style-type: none"> • weak regulating governance • local-level self regulation practices
Global WHS Label	<ul style="list-style-type: none"> • identity building over common concerns in heterogeneous spatial units 	<ul style="list-style-type: none"> • landscape protection but also inhibition of agriculture • risk of economic loss
Opportunities	<ul style="list-style-type: none"> • interconnectedness • economic/touristic landscape validation • decentralised employment 	<ul style="list-style-type: none"> • vehicle to address conflicts of interest • natural resource use regulation

Table 1: Overview of main features of Jungfrau-Aletsch-Bietschhorn and Mount Kenya regions



Figure 3: Mount Kenya region (Photo by U. Wiesmann)

What Drives Land Cover Change in Eastern Escarpment of Wello, Ethiopia?

Amare Bantider, Dilla University, Ethiopia; Hans Hurni, Centre for Development and Environment (CDE), University of Bern, Switzerland; Gete Zeleke, Global Mountain Program, Ethiopia

Multiple factors, many operating concomitantly and as a chain of logical causation, were found responsible for non-linear land cover changes along the Eastern Escarpment of Wello (EEW). Unlike elsewhere, population in this region did not turn out to be an important factor in driving land use and land cover change (LULCC); however, it made its own contribution to these changes.



Figure 1: Wirgessa and its environs – A picture depicting marks of several land cover changes (hill top deforestation, hillside area closure, expansion of foot slope ravine/wasteland, soil conservation terraces on cropland, foot slope settlement) (Photo by Amare Bantider 2004)

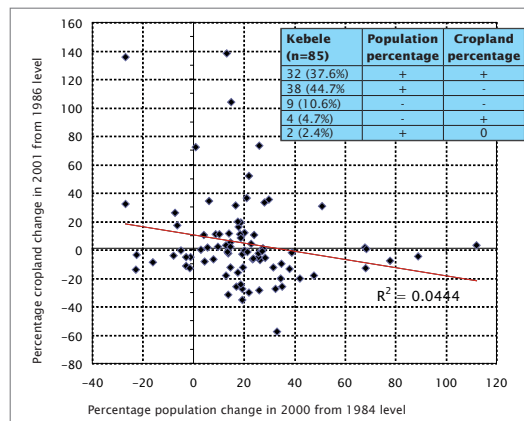


Figure 2: Correlation between percentage population change (1984-2000) and percentage cropland change in selected rural Kebeles of EEW ($r = -0.02$, total Kebeles = 85). The inset table in the figure shows that there is no simple association between population change and land cover change in the study area. In some Kebeles cropland and population change are positively correlated while in others not (Kebele is the official smallest administrative unit in Ethiopia having an area ranging between 16 km² to more than 50 km²) (Amare Bantider 2007).

Agricultural activity and land cover change due to human actions in North Wello have been occurring for more than 2000 years. Empirical land cover analyses from the 1930s to the present revealed three periods of rapid deforestation and a concomitant expansion of cultivated land, and two periods of improvement of woody vegetation cover and a concomitant decrease of cultivated land.

The deforestation phases were from the 1930s to the 1950s, from the mid 1970s to 1980, and from 1990 to the mid 1990s. The major driving forces were: land tenure insecurity and episodic factors (civil war, famine/drought, invasion and patriotic resistance, revolution and violent regime changes).

The two periods of improvement of woody vegetation cover were from 1980 to 1990 and the mid 1990s to the present. The

first period witnessed state-sponsored massive land rehabilitation programmes, backed by international donors and global-level environmental movements. Forced relocation of farmers from steep slopes in order to close/afforest them was also a factor. The second period was characterised by the consolidation of policies/institutions that collapsed during the civil war, the restoration of tree tenure security that was abolished during the Derg Government, the liberalisation of market forces, and the proximity of areas to roads.

Unlike elsewhere, population in EEW did not turn out to be an important factor; however, it made its own contribution to the changes. In general, many of the factors were operating concomitantly and as a chain of logical causation.

Period	Pre-1975	1975-1990	1990-1994	1994-2006
Major process (conversions)	<ul style="list-style-type: none"> Conversion of shrubland-treeland to cropland 	<ul style="list-style-type: none"> Conversion of steep slope croplands and grasslands (grazing lands) to plantation-forestry and shrubland ("closure"), Conversion of grasslands to cropland on gentle and flat slopes Rehabilitation works dominated on villages/Kebeles located near the highways /roads 	<ul style="list-style-type: none"> Deforestation of plantation-forests and encroachment of "closure" Commencement of private Tree-farming / woodlot 	<ul style="list-style-type: none"> Maintenance of "closure", protection of forest and expansion of private woodlot
Causes and Drivers	<ul style="list-style-type: none"> Complex land tenure policy Population increase (1-3% per annum) The demand for large agricultural produce (status symbol) Absence of new technology for intensification 	<ul style="list-style-type: none"> Land rehabilitation policy Environmental movement worldwide (external assistance) Availability of technology (SWC) and awareness of the danger of degradation at national level (experts and policy makers) Forced / planned resettlement / migration Land tenure (state ownership makes it easy to establish "closure" through top-down decision-making process) Accessibility 	<ul style="list-style-type: none"> Civil war Power vacuum/ weakness of formal institutions Immigration (returnees from resettlement and repatriation of ex-soldiers) "Piecemeal policy" Tree-tenure security Construction wood market in urban areas 	<ul style="list-style-type: none"> Restoration of institutions after civil war Policy change towards private woodlot holding Good market demand for Eucalyptus Crop yield decline on degraded farmlands Accessibility

Table 1: Summary of major driving forces /causes of land cover changes, aggregated at regional level on a time line

Nutrition in Nomadic and Settled Communities South-East of Lake Chad

Mahamat Bechir, Centre de Support en Santé Internationale, Chad; S Wade, Université Cheikh Anta Diop de Dakar (UCAD), Sénégal; Bassirou Bonfoh, Institut du Sahel, Mali; Esther Schelling, Swiss Tropical Institute (STI), Switzerland; M Seydi, UCAD; Jakob Zinsstag, STI

Malnutrition is a significant health problem in remote and vulnerable communities such as rural sedentary and nomadic pastoralist communities in Chad. Global acute malnutrition (GAM) is 13.5% in Chad and 17% in districts of the Sahelian zone. Information on nutrition in nomadic communities is scarce. Among Kenyan nomadic children, 8 to 18% were malnourished. In Nigeria, the body mass index (BMI) of nomadic women was lower than that of sedentary women (15.7 vs. 18 kg/m²).

This study aimed to estimate the prevalence of GAM among these communities, understand nutritional patterns and food security, and make recommendations for decision-makers.

Methods

All women and children in randomly selected households (on transects) were included until the necessary sample size was reached.

Anthropometric indicators were recorded. Z-scores (weight-for-height) were calculated and compared to NCHS data. Measures were classified for children as GAM (<-2 z-scores) and severe acute malnutrition (<-3 Z-scores). Non-pregnant women were malnourished if their BMI was < 18.5kg/m².

Preliminary results



Figure 1: Recording anthropometric indicators (Photo by M. Bechir)

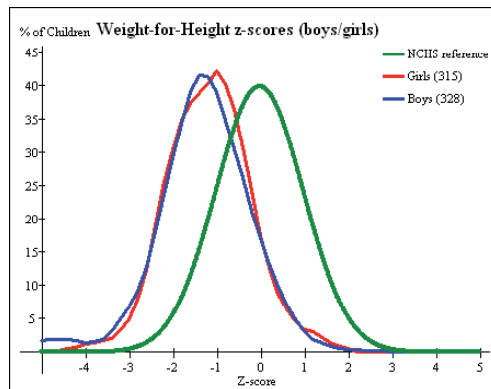


Figure 2: GAM based on weight-for-height z-scores and by sex in nomadic children.

A total of 643 and 377 nomadic as well as 565 and 371 sedentary children < 5 y.a. and women were assessed, respectively. The prevalence of GAM was 19% [95% CI: 15.9 - 22.0] and 17.7% [14.6 - 20.8] among nomadic and sedentary children, respectively, whereby severe malnutrition was found in 3.7 % [2.3 - 5.2] and 5.3 % [3.5 - 7.2]. There was no significant difference between the proportions of GAM between nomadic and sedentary children; however, both were high when compared to the national level (13%).

We observed a significant difference between categorised BMI values in nomadic and sedentary women as shown in Table 1. No nomadic women were classified as obese, but more than 50% were classified as gaunt. In contrast, more settled than nomadic women were stout or obese (Fisher's exact test $p < 0.001$).

Little food variation, hardships such as constant mobility,

Classified BMI values	<18.5	18.5-25	25-30	30-35	35-40	>=40	Total
Interpretation	Gauntness	Normal	Stoutness	Obesity 1	Obesity 2	Obesity 3	
Way of life	Increased	Weak	Increased	High	Very high	Extremely high	
Nomadic; n=330	52.10%	46.70%	1.20%	-	-	-	100%
Sedentary; n=310	17.70%	69.00%	8.70%	2.00%	0.30%	2.30%	100%
Total* ; n=640	35.00%	58.00%	4.80%	0.90%	0.20%	1.10%	100%

Table 1: Classified BMI values of non-pregnant nomadic and sedentary women



Figure 3: Malnourished pastoralist child (Photo by M. Bechir)

setting up and dismantling of camps, milking of animals and multiple household tasks can lead to generally lower BMI classes among nomadic women. Despite problems of food accessibility and availability, both communities need information about appropriate breast-feeding patterns and food complements for their young children.

Community Care for HIV/AIDS in Rebel-Occupied Areas, Côte d'Ivoire

Alain Nicolas Betsi, Centre Suisse de Recherches Scientifiques (CSRS), Côte d'Ivoire; C. Acka-Douabele, The United Nations Children's Fund (UNICEF), Côte d'Ivoire; Cléopâtre Kablan, Université Cocody, Côte d'Ivoire; Guéladio Cissé, CSRS

In contemporary West Africa the declining resource base and power relations are causes of conflict. Many outbreaks of violence are caused by "autochthons" or first comers to safeguard "ancestral lands" against "newcomers" accused of overusing resources. This is paradoxical at a time when official discourse invites national and regional integration.

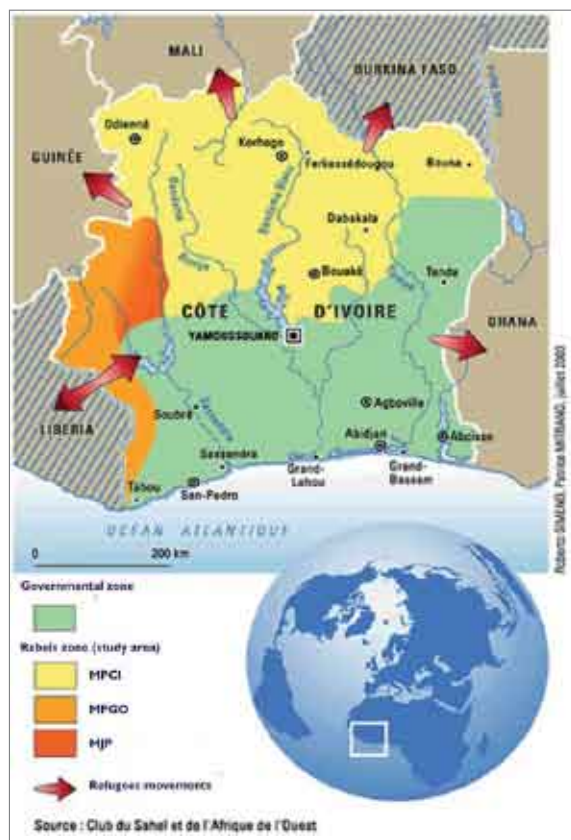


Figure 1: Overview of rebel zones in Côte d'Ivoire

Problem statement

In September 2002, an armed conflict erupted in Côte d'Ivoire, dividing the country into government- and rebel-controlled territory. Conflict-related breakdown of health systems could significantly increase the incidence of HIV and other sexually-transmitted infections, jeopardizing the country's ability to cope with the HIV/AIDS epidemic.

Local NGOs, Community-Based Organizations, and Faith-Based Organizations combating HIV/AIDS in concert with regional and international organizations and United Nations agencies initiated a community-based care program in 2003 to provide holistic care. The initial program phase focused on raising awareness among village leaders, religious institutions, community members and government officials, using participatory rural appraisal (PRA) and appreciation-influence-control.

Methods

A cross-sectional survey was undertaken in this area in 2006, using an interviewer-administered questionnaire and focus group discussion to assess the psychosocial and economic impact of services provided to people living with HIV/AIDS (PWAs).

Results

After 3 years of implementation, the community's AIDS awareness level increased to 78.4%; 97.2% of community members were willing to provide care to PWAs, and 65.7% had already done so. 68.2% of PWAs received holistic or social care. Nearly half became more positive about their lives and 41% learned how to live with the disease.

The program is financed by regional and international organizations and United Nations agencies (21%), NGO sponsorships (57%), the religious community (9.9%), and the community (12.1%). PWAs in the community have formed support groups dedicated to community prevention.

Conclusion

Community partnership is essential in providing holistic care to PWAs. Discrimination and stigmatization have diminished and preventive measures have been strengthened. As an expansion of antiretroviral treatment is planned in Côte d'Ivoire, the communities' role should be fully explored and clearly defined.

Pressure-State-Response in Land Resource Changes, Lake Tana Basin, Ethiopia

Birru Yitafuru, Amhara Regional Agricultural Research Institute, Ethiopia; Hans Hurni, Centre for Development and Environment (CDE), University of Bern, Switzerland; Gete Zeleke, Global Mountain Program, Ethiopia

Lake Tana Basin (LTB) is the uppermost part of the Blue Nile River Basin in Ethiopia. The 15,000 km² headwater is a main water source of the Blue Nile and a place of ancient agriculture and human settlement. Understanding problems related to land resource changes requires detailed examination of the factors in a pressure-state-response framework (see Birru Yitafuru 2007).



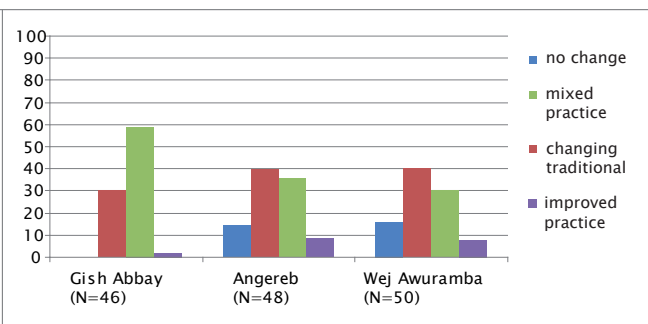
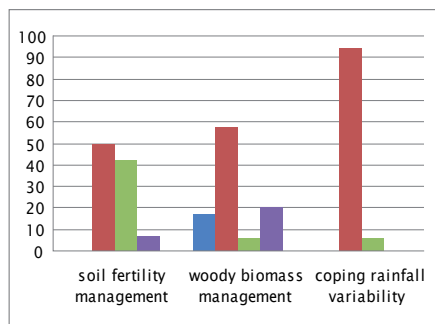
Figures 1 and 2: Mountains seen cleared of their vegetation cover and converted to crop cultivation (Angereb watershed, left), and farmers descended to riverine landscapes and lowlands where opportunities on alluvial soils and dry season irrigation are exploited (Gish Abbay, right) (Photos by Birru Yitafuru 2005)

Land degradation is serious in LTB and characterised by land use/cover change, loss of vegetation cover and biodiversity, uneven distribution of hydrological resources, and degradation of soil resources. Fragile lands such as steeply sloping mountains, wetlands and riverine systems were converted to intensive crop cultivation, particularly during the past 50 years; and runoff and soil loss in upstream areas were strongly accelerated. Pressure factors responsible for these changes were expansion of crop cultivation, loss of vegetation cover along sensitive places, and excessive removal of biomass from farmlands for non-farm uses. Overstocking of grasslands, poor management of lands such as intensive ploughing without soil conservation, and shortening fallow periods were intensified with time. These processes have shown strong association with land policies and institutional changes in the country in the 1970s and again in early 2000 in the region. Societal responses in the form of adoption of improved practices, policy and institutional adaptations, technological backups and training were also found to be inadequate compared to the deterioration of the land resources and the ever-intensifying pressure factors.

Thus, mitigation of the problems of land degradation in the LTB requires simultaneous consideration of severity of land degradation processes, intensifying pressure factors, and gaps created due to inadequate institutional and societal responses.

Variable considered	Periodical changes		
	<1970	1990	2005
Cropland expansion (%)	46	62	61
Population density (persons/km ²)	60	80	200
Biomass out-flux from farms (%)	<20	50-60	>80
Livestock density TLU/km ²	64	173	156
Livestock density TLU/ha grassland	2.67	9.11	12.00
Tillage frequency	2-4	3-7	3-10
Fallowing (fallow/cultivation ratio)	0.5-1.0	0.3-0.5	0.0-0.2

Table 1: Dynamics of pressure factors responsible for the land resource changes and/or land degradation in the LTB (Digital data analysis and field survey by Birru Yitafuru)



Figures 3 and 4: Societal responses to the problems of land degradation in the form of practices in soil fertility, woody biomass management and coping moisture problems (left, N=138) and of adoption of improved technologies (right, N=144), N= number of sample farmers (household survey by Birru Yitafuru)

SLM in the Tajik Pamirs: The Role of Knowledge for Sustainable Development

Thomas Brey, Centre for Development and Environment (CDE), University of Bern, Switzerland

A sound basis of knowledge is considered a prerequisite for sustainable land management (SLM) and regional development. So far, however, little is known regarding the scope and different types of knowledge needed on different stakeholder levels. An information system on the Pamirs has been set up as a basis for the development of land resource assessment models and analysis of stakeholder knowledge on SLM.

The transition process following the collapse of the Soviet Union has brought on profound changes with particularly heavy impacts on mountain areas such as the Tajik Pamirs. In addition to economic changes, a dramatic increase in pressure on natural resources has resulted in widespread signs of environmental degradation.

Research objectives

The overall goals of this research project are:

- to contribute to a better understanding of the role of knowledge at different stakeholder levels in the process of pursuing SLM objectives;
- to provide a comprehensive knowledge and information system;
- to develop land resource models based on Geographic Information Systems (GIS) in order to assess the status and dynamics of degradation.

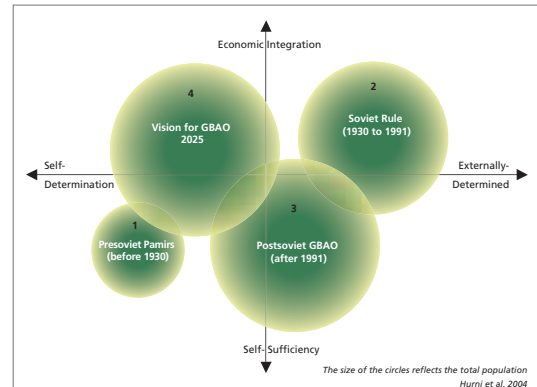


Figure 1: The Gorno Badakhshan Autonomous Oblast (GBAO) between self-determination and economic integration (Hurni and Brey 2005)

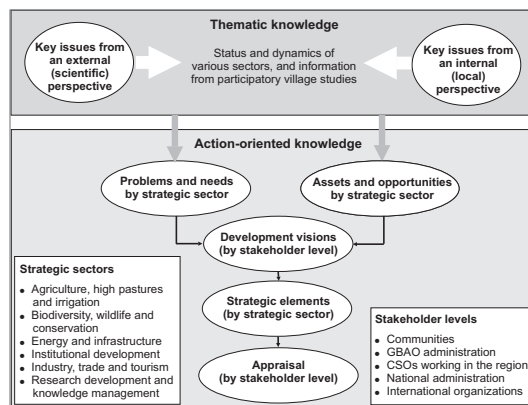


Figure 2: Sequence of elements dealt with in the Strategy Workshop for Sustainable Development of the Tajik Pamirs

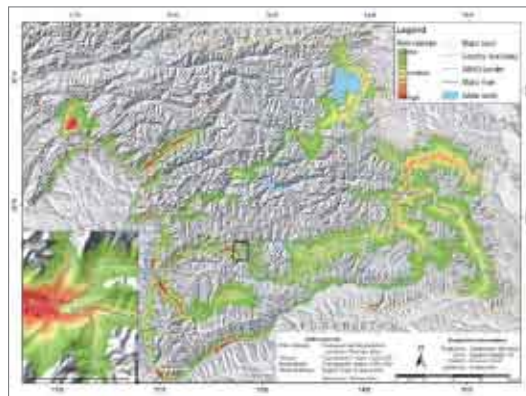


Figure 3: Spatial distribution model of teresken degradation risk

Methodological approach

The aim of this research project, which includes 8 Master's theses, is to establish an information and knowledge system including a GIS-based land resource assessment model. The conclusions of the knowledge system were validated and enhanced in a multi-level stakeholder negotiation workshop and by investigating the role of knowledge in SLM through semi-structured interviews.

Main results

The study shows that non-sustainable processes in the economic, social and ecological spheres are widespread in the GBAO (see Figure 1). At the same time concrete assets and opportunities for sustainable development could be identified in a transdisciplinary process by researchers from different disciplines and the society.

- **Negotiation:** The novel methodology developed for the multi-level stakeholder negotiation was found appropriate to initiate a broad reflection and negotiation process among various stakeholder groups, leading to a joint identification of possible measures to be taken (see Figure 2).
- **Knowledge:** In the Tajik Pamirs there seem to be no significant knowledge differences concerning land management at different stakeholder levels. Thus, classical knowledge and know-how transfer activities from higher levels such as development agencies or state authorities are not likely to contribute to better resource management.
- **Modelling:** A fuzzy logic based modelling approach on village level proved to be suitable for representing potential degradation risk areas through the combination of structurally different types of information (qualitative and quantitative data), with varying degrees of certainty (Figure 3).

Household-Centred Environmental Sanitation (HCES) and Policy in Costa Rica

Horacio Chamizo, University of Costa Rica, Costa Rica

The aim of this research is to analyse the institutional framework of environmental sanitation policy and its effects in HCES implementation. It will describe and explain the network of actors participating in policy, capacities, strategies, and forms of interaction aimed at understanding the influence of interrelations in the HCES experience.



Figure 1: Urban neighbourhood in Costa Rica (Photo by H. Chamizo)

Research questions

- How does the institutional framework of public environmental sanitation policies influence the perceptions, preferences, and collective and individual capacities of the actors responsible for the implementation of this policy?
- How can the network of actors involved in the implementation of environmental sanitation in human settlements be understood, and how does it affect the outcome of such policies?
- What adjustments are needed to implement new paradigms such as the HCES?

Theoretical framework

- The neo-institutional approach and its variants in the study of public policy (sociology, normative, rational choice)
- Agency Theory
- Theory of public policy networks

Methodology

Based on the implementation of four different HCES experiences in Costa Rica, research reflects on the analysis of cases and on cross-analysis. Qualitative analysis to compare cases contrasts the structure and operation of the networks identified for each case, by building typologies in order to understand the interrelations between actors.

Expected contribution

- To develop the institutional dimension relevant to the implementation of environmental sanitation public policies
- To contribute to discussions on governance problems related to environmental sanitation
- To develop proposals for an analytical model of relations between actors using the new institutional theory

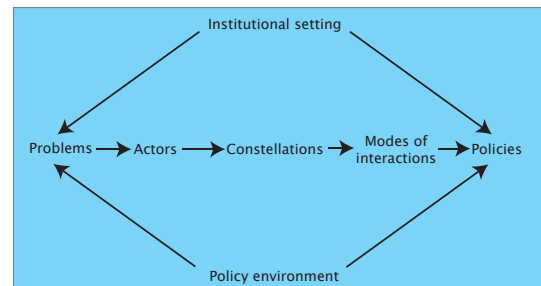


Figure 2: The basic explanatory framework (Sharif 1997 and Zurbriggen 2005)

Outputs

- PhD dissertation in Public Policy at the University of Costa Rica
- Five articles submitted for publication in scientific journals



Figure 3: Environmental sanitation workshop (Photo by H. Chamizo)

Urbanisation, City Design and the Urban Model in West Africa

Jérôme Chenal, Laboratory of Urban Sociology (LaSUR), Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland

Linkage between the urbanisation process, urban models, social practices, mutations of the public space, and management and planning approaches of cities in the South was studied. Critical understanding of traditional urban planning instruments and ways to create innovative tools for sustainable cities were sought.



Figure 1: Sandaga market, Dakar, Senegal (Photo by J. Chenal)

Main objectives

- Analysis of the ideologies underlying the creation of cities (patterns)
- Understanding of the stakes pertaining to public spaces and spatial and social practices
- Comparative assessment of macro and micro levels in the life of the City
- Production of an urban planning strategy inspired by the actual experience of city dwellers

A four-phase approach

- Urban planning, city design / archival research, interviews
- Public spaces / participant observation, newspaper review, photography-based research, interviews
- Between the micro and the macro levels – results of the first two phases
- Urban planning tools – as a consequence of the first three phases

Main results

- Urbanism, city design
- The three cities developed in a similar pattern, but at different times
- Nouakchott: a periphery around a centre
- A dichotomy: Dakar - Pikine (Centre versus banlieue)
- Abidjan: Multi-centred
- Public Spaces
- Considerable impact of local meteorological conditions
- Similar spatial strategies in all case studies, frequent alienation of public spaces by private citizens
- Environmental problems in all three cities
- The street as the main area of protest for the disenfranchised
- The street as a gendered space
- Different street temporalities
- Macro-Micro
- Disconnection between issues of public space(s) and urban planning
- Disconnection between spaces and practices
- No link between management and planning



Figure 2: Kebbe d'El Mina, City of Nouakchott, Mauritania (Photo by B. Vollmer)



Figure 3: Socogim Plage, Nouakchott, Mauritania (Photo by B. Vollmer)

Global Change Research for Sustainable Development in West Africa

Guéladio Cissé, Swiss Centre for Scientific Research (CSRS), Côte d'Ivoire

Since 2001, the NCCR North-South programme has fostered global change research for sustainable socio-economic development of societies in six countries in West Africa. The studies covered a wide range of approaches for “well-being” of people and ecosystems: from “transdisciplinarity and global change” to “ecosystem approaches and climate change”.

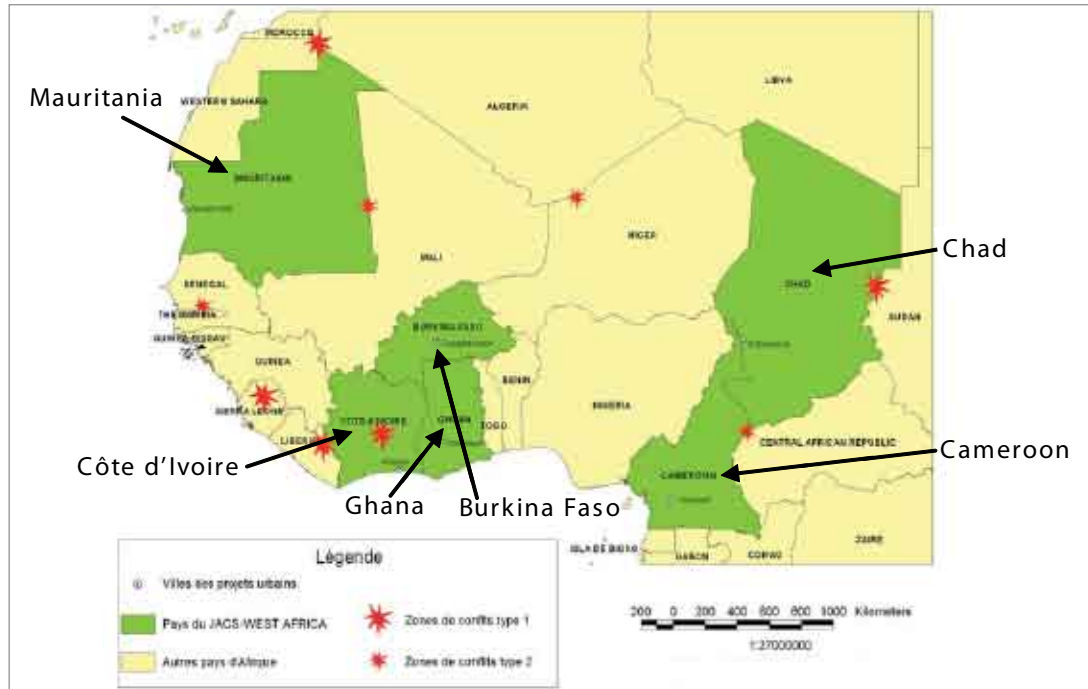


Figure 1: JACS West Africa: a region marked by conflicts, drought and floods, affecting specific vulnerable communities (poor urban groups and nomadic people) (NCCR North-South, CSRS, Côte d'Ivoire).

In 1970, West Africa had a population of 90 million people, 80% of whom were in rural areas. But between 1960 and 2002 the urban population went from an average of 15% to 45% of the total population. The region is also facing a series of conflicts, climate change hazards and disasters (such as droughts and floods) which exacerbate environmental threats, health issues and vulnerability of specific groups in both urban and semi-arid contexts.

Since 2001, the NCCR North-South programme has implemented research activities in West Africa under three regional themes:

- Risk management and equity effectiveness;
- Vulnerability and resilience;
- Institutions, conflicts and public spaces.

The Programme has been innovative in this region by involving researchers and various other actors (academic and non-academic) for a transdisciplinary approach focusing on concepts of well-being, global change, vulnerability, resilience, environment and health. Through its own means, the NCCR North-South has supported more than 40 researchers (MSc, PhD, postdocs, and senior researchers) and implemented 8 partnership actions (PAMS).

Furthermore, it has built bridges with other international institutions and major international networks. That made it possible to increase resources and widen the thematic scope as well as approaches and activities from “Transdisciplinarity and Global Change” to “Ecosystem Approach and Climate Change”. This has contributed a great deal to supporting institutions for research on sustainable development in the region.



Figure 2: Global change and climate change (conflicts, droughts, and floods): main high and heavy challenges to overcome with innovative approaches for sustaining development in Africa (Photo by G. Cissé 2007).

Urban Agriculture and Malaria Hazard in Dar es Salaam, Tanzania

Stefan Dongus, Swiss Tropical Institute and Freiburg University, Switzerland

This PhD project investigates correlations between urban agricultural land use and breeding sites of malaria vectors in Dar es Salaam, Tanzania. The research approach combines natural and social scientific perspectives, and is integrated into the operational Urban Malaria Control Programme of the Dar es Salaam City Council.

Background

- Urban agriculture is a common livelihood strategy in cities in developing countries
- Malaria transmission in Dar es Salaam is a significant problem, assumed to be closely linked to agricultural activities where farmers and mosquitoes share common water resources
- Breeding sites for malaria vectors are sometimes present in areas used for urban agricultural purposes
- It is not clear to what extent agricultural land use itself leads to the presence of breeding sites
- Hypothesis: other reasons such as underlying topography and hydrology are the actual determinants



Figure 1: Urban agricultural land use in 3 study wards of Dar es Salaam (Mapping by Dongus and Nyika 2005; Aerial imagery by Dar es Salaam City Council).

Research question

- Does urban agricultural land use in Dar es Salaam contribute to malaria hazard through breeding sites of malaria vector mosquitoes?

Methodology

- Geographical approach
- Theoretical framework: hazard, resilience, vulnerability and risk
- Participatory mapping in the field, basic remote sensing techniques
- Qualitative methods: focus group discussions and key informant interviews
- Elaboration of mitigation strategies
- Participatory and transdisciplinary research in close co-operation with the community-based Urban Malaria Control Project of the Dar es Salaam City Council and the Ifakara Health Research and Development Centre in Dar es Salaam



Figure 2: Example of mapped urban agricultural area with corresponding attribute data, digitised with MapInfo Professional® software (Mapping by Dongus and Nyika 2005).



Figure 3: Urban agriculture and malaria control in Dar es Salaam. 1) homegarden in informal settlement 2) open space farming in river valley (Buguruni) 3) ridge cultivation with breeding site for malaria vector mosquitoes 4) community-based urban malaria control by biological larviciding in Dar es Salaam (Pictures by Dongus 2005/2006).

Mapping Where and Who the Poor Are

Michael Epprecht, Centre for Development and Environment (CDE), University of Bern, Switzerland; Nicholas Minot, International Food Policy Research Institute, United States of America; Bob Baulch, Chronic Poverty Research Centre, United Kingdom; Daniel Müller, Humboldt University Berlin, Germany

Small-area estimated poverty statistics for Vietnam reveal clear spatial patterns in human well-being, with a strong upland-lowland disparity. Although the uplands are the poorest areas of the country, most poor live in the better-off lowlands. These spatial patterns have socio-demographic underpinnings that are relevant to pro-poor policy-making.

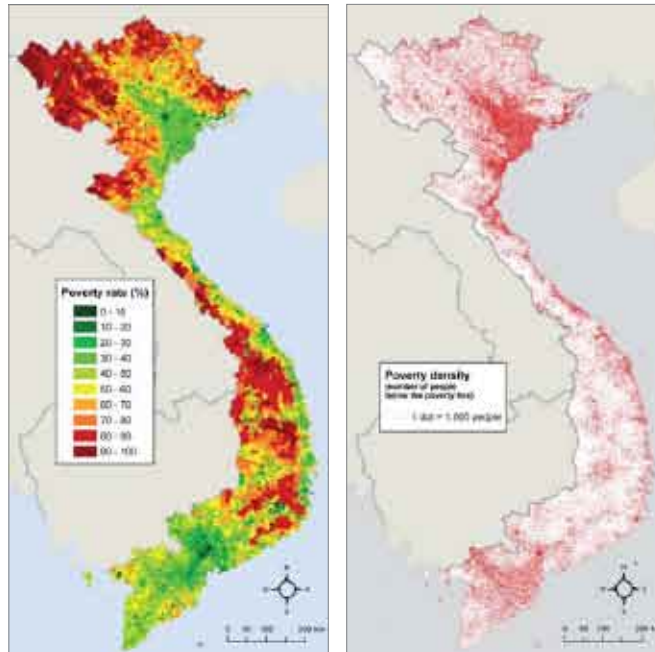


Figure 1: Poverty incidence and poverty density at commune level, 1999 (N Minot, B Baulch, M Epprecht. 2006. *Poverty and inequality in Vietnam: Spatial patterns and geographic determinants*, Research Report, International Food Policy Research Institute, Washington, DC, USA).

Poverty maps provide new insights to guide poverty reduction strategies, which often are geographically targeted. By showing the difference between areas where the incidence of poverty is high and areas where the density of poverty is high, the two maps highlight a key element to be considered in the targeting of such programs. An exclusive focus on areas with high poverty rates will exclude the majority of the poor, since they live predominantly in areas in which there are also many non-poor households.

Targeting entire high-incidence areas causes less leakage through assistance to non-poor households than in areas with lower poverty incidence, where a more resource-intensive identification of poor households appears appropriate.

The poverty mapping analysis highlights the limitations of pure geographic targeting. Although there is much to recommend geographic targeting, it is not sufficient in itself. Poor areas contain significant numbers of non-poor, too, where the importance of social differences, such as ethnicity, was highlighted.

Programs that treat all households or individuals within an area equally in terms of their welfare level will result in targeting errors by providing benefits to non-poor or by failing to provide benefits to the poor who live in less poor areas. Development policies aimed at balancing welfare levels across subpopulations require an increased emphasis on the targeting of specific population segments within an area.

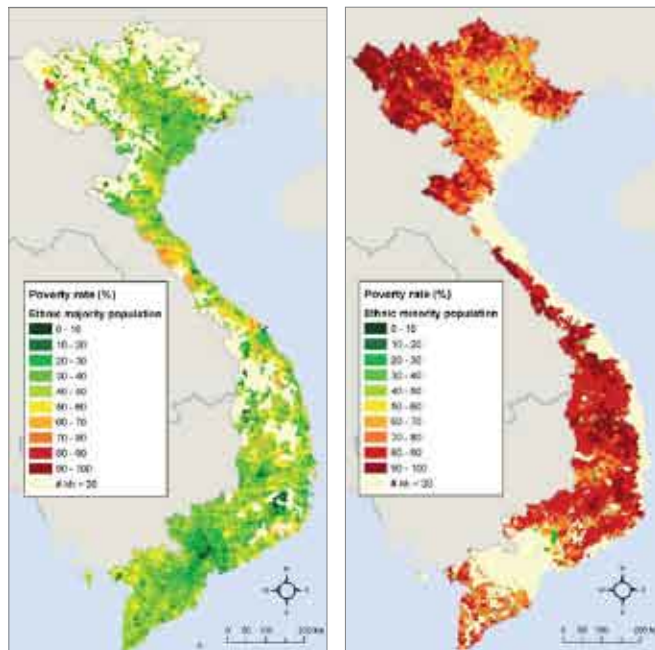


Figure 2: Poverty incidence of ethnic minorities and majorities at commune level, 1999 (M Epprecht, D Müller, N Minot. 2007, submitted to IFPRI DP series. *How Remote Are Vietnam's Poor? - An Analysis of Spatial Patterns of Poverty and Inequality in Vietnam's Society*, Discussion Paper, International Food Policy Research Institute, Washington, DC, USA).

Climate and River Flow in the Upper Sokuluk River Basin, Kyrgyzstan

Natalia Ershova, Kyrgyz-Russian Slavic University (KRSU), Kyrgyzstan; Eugenia Korobitsina, KRSU; Maria Galkina, KRSU

The main aim of this study was to quantify the impact of climate conditions and land use practices on river runoff in the Sokuluk River Basin (SRB), a tributary of the River Chui in Kyrgyzstan. These findings are important since river runoff patterns directly affect land use and influence sustainable water management.



Figure 1: Upper zone of Sokuluk River Basin (Photo by N. Ershova)

Changes in climate and river runoff

Analysis of climate data from the Baityk Meteorological Station (1570 m asl) from the last seventy-five years reveals an increase in air temperature of 0.43°C and an increase in precipitation of 28 mm (Figure 2). Data from eleven hydrological stations located on the northern slopes of the Kyrgyz Range was used to analyse the runoff dynamic. The runoff for all eleven rivers is increasing on average by 0.007 m³/s per year; it appears that the increase is more pronounced in rivers fed by larger glaciers.

The impact of climate change on runoff

Assessment of climate impact and land cover on Sokuluk River runoff was conducted according to the PREVAH model developed by Gurtz et al. (1997). The PREVAH model was specifically developed with the aim of taking into account as much as possible the physical relationships of complex alpine catchments. The calibration and validation of the PREVAH model allow a good reproduction of the runoff-generation dynamics (efficiency coefficients are above 0.86). The implementation and calibration of the PREVAH model enabled:

1. Determination of various water balance elements, runoff characteristics, and their spatial distribution.
2. Assessment of the sensitivity of runoff to climate and land use change.
3. Calculation of several climate scenarios for Kyrgyzstan by 2050.

Figure 3 shows the potential effects of one of the climate scenarios. According to this scenario (temperature increase of 2°C, precipitation increase of 6%, and a glacier area decrease of 13.7%), change in the River Sokuluk runoff is minimal. Due to redistribution of runoff components (a decrease in the amount of ice melt water and an increase in the amount of rain water) river flow peaks one month earlier. This could severely disrupt irrigation and could lead to a lack of water during the period of peak water consumption.

Conclusion

This study proved that runoff from alpine catchments is sensitive to climate and land use change. In summary the PREVAH model can be recommended to authorities as an efficient tool for current and future water management and the evaluation of climate change in mountainous areas of Central Asia.

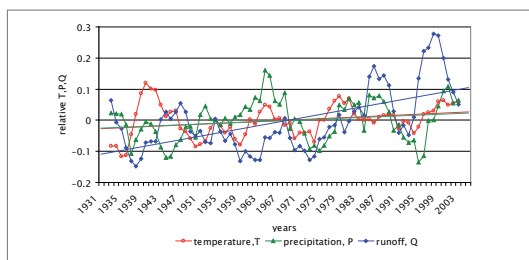


Figure 2: Shifted 5-year average and trends for temperature, precipitation (meteorological station Baityk) and runoff (hydrological station on Sokuluk River) for 1931-2005

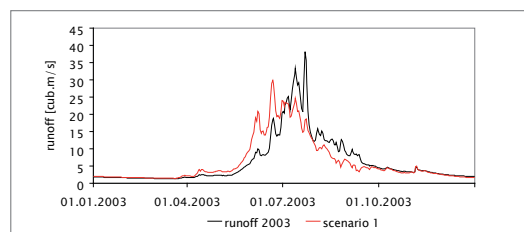


Figure 3: The River Sokuluk runoff change relatively runoff of 2003 according one of climate scenario by 2050 for Kyrgyzstan: increase temperature by +2°C, precipitation by 6%, decrease of glacier area by 13.7%

Institutional Frameworks for NRM and Access to Basic Services in the Sahel

Gilbert Fokou, Institut du Sahel (INSAH), Mali; Moustapha Ould Taleb, Centre National d'Hygiène, Mauritania; Bassirou Bonfoh, INSAH; Jakob Zinsstag, Swiss Tropical Institute, Switzerland

Pastoral livelihoods in the Sahel are threatened by ecosystem degradation, dismantling of pastoral management regimes, restricted access to natural resources and services, and cross-boundary migration constraints. Implementation of new institutional frameworks could sustain Natural Resource Management NRM and indirectly improve access to basic social services.



Figure 1: Stakeholders negotiating modalities of access to joint animal and human health services in North Mali (Photo by G. Fokou)

Research focus

Across Africa, management of natural resources is often based on several types of legal systems: statutory, customary and combinations of both coexist in the same territory, resulting in overlapping rights, contradictory rules and competing authorities. The complexity of the institutional setup and failure to comply with all levels of customs and laws creates conflict at local, national and regional levels. In this context, resources are increasingly under open access or privatisation and modalities for access to basic social services (health, markets, water, and education) are lacking. This research aims to help put in place organisational processes by designing multiple-level, inclusive, flexible and reciprocal legal and institutional frameworks for sustainable management of natural resources and access to basic social services.

Analyses at various levels showed that:

1. At the local level, creation of pastoral organisations and involvement of various social categories help to organise access to markets (dairy sector in Mali)
2. At the national level: i) integrated management of resources in a decentralised context helps to organise access of nomadic people to health facilities (North Mali); ii) multilevel stakeholder involvement and intersectoral partnering leads to the wellbeing of rural populations (Chad).
3. At the sub-regional level, international treaties and agreements help to facilitate cross-border migration of people and animals for pastures and market (southward migration of pastoralists from Sahel)

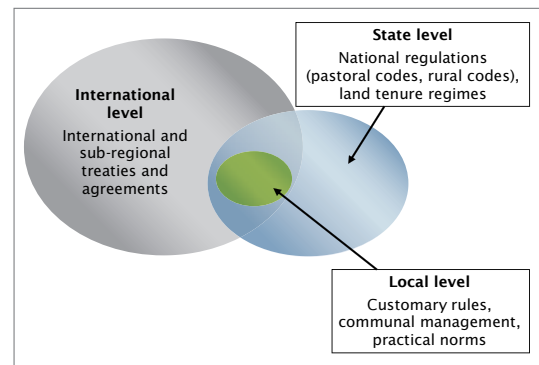


Figure 2: Multilevel institutional frameworks for the management of natural resources and access to basic services

Outlook

Prescriptive recommendations will be generated as a result of this study to help implement existing institutions at various levels, to put in place more integrative institutional frameworks, and to create basic services to facilitate pastoral mobility.

A System Dynamics Model for Collective Irrigation Management

Justus Gallati, Centre for Development and Environment (CDE), University of Bern, Switzerland

Collective irrigation systems are widespread, and potentially face problems of deteriorating infrastructure and unsuccessful co-operation. A system dynamics framework is proposed to better understand dynamic patterns of successful co-operation, and the potentials of system dynamics in transdisciplinary research for sustainability are elicited.

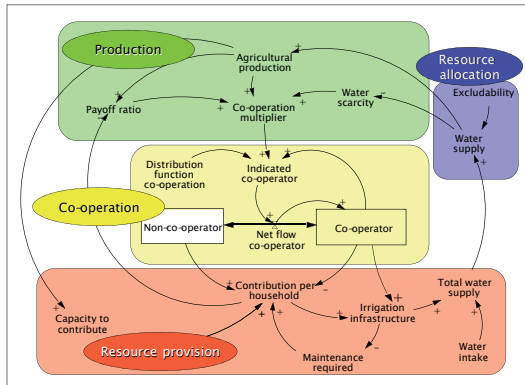


Figure 1: Feedback concept combining the rationale of a critical mass model (co-operation if enough others co-operate) with a feedback structure involving the effect of water supply, water scarcity, agricultural production and payoff on co-operation. Agricultural production also affects capacity to contribute, and in turn provision of irrigation infrastructure.

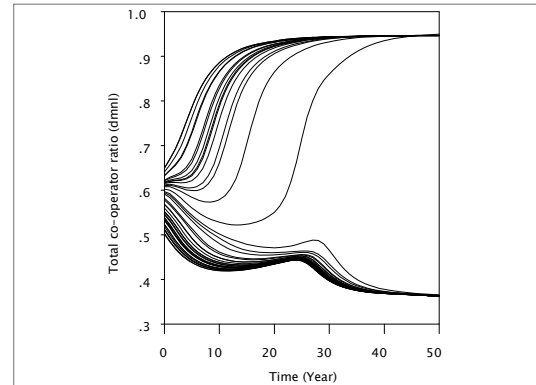


Figure 2: Bi-stable model with unsuccessful and successful co-operation. In the base run, where 50% of the users initially co-operate (=pay for water), the lower equilibrium is attained, and co-operation is unsuccessful. The sensitivity analysis shows that for initial co-operation above 60% the upper equilibrium is attained.

System dynamics approach

System dynamics relies on three constituents: feedback thinking, use of computer simulation, and participatory involvement of stakeholders.

Model structure

The model builds on a critical mass model for collective action (Granovetter 1978, Schelling 1978) and integrates findings on influence factors for collective irrigation and natural resource management (Agrawal 2001, Baland and Platteau 1996, Lam 1998, Ostrom 1992, Tang 1992) into a feedback concept (Figure 1).

Empirical background

Problems and driving forces (Table 1) identified by interviews with farmers and experts in two case study areas in Saz (Kyrgyzstan) and Burguret river (Kenya).

Results

The base run corresponds to the relatively frequent situation of deteriorating irrigation infrastructure and unsuccessful co-operation. By varying initial conditions of co-operation, as well as parameters related to agricultural production, the model also describes successful co-operation (Figure 2).

Potentials of system dynamics for integrative studies

- Representation and communication of complex problems
- Theory building and testing
- Dynamic analysis

References

Agrawal A. 2001. Common property institutions and sustainable governance of resources. *World Development* 29(10): 1649-1672.
 Baland JM, Platteau JP. 1996. Halting Degradation of Natural Resources. Is there a Role for Rural Communities? Oxford: Oxford University Press.
 Granovetter M. 1978. Threshold models for collective behaviour. *American Journal of Sociology* 83(6): 1420-1443.
 Lam WF. 1998. Governing Irrigation Systems in Nepal. Institutions, Infrastructure, and Collective Action. Oakland. ICS Press.
 Ostrom E. 1992. The Rudiments of a theory of the origins, survival, and performance of common property institutions. In: Bromley DW, editor. Making the Commons Work: Theory, Practice, and Policy. San Francisco: ICS Press, pp 293-318.

Generalisation

Three levels of generalisation and further development of a system dynamics approach for sustainable natural resource management are identified:

- From homogeneous to heterogeneous households (stratified model)
- From irrigation to natural resource management
- From natural resource management to a livelihood model.

	Kyrgyzstan (Saz village)	Kenya (Burguret River Basin)
Water availability (intake) per household in dry season	1 l/s per household	0.05 l/s per household
Average irrigated area per household	2 ha per household	0.2 ha (0.5 acre) per household
Problem pressure	+ (low)	+++ (high)
Variation of water flow	+ (low)	+++ (high)
Insufficient payment, maintenance	+++	+
Over-abstraction upstream	++	+++
Deterioration of infrastructure	+++	+
Rapid population growth	+	+++
Conflicts	+	+++
Dependence on irrigation	+++ (cash crop, livestock)	+++ (domestic use, livestock, cash crop)

Table 1: Comparison of problem pressure and main driving forces related to irrigation in Saz (Kyrgyzstan) and Burguret River Basin (Kenya).

Schelling T. 1978. *Micromotives and Macrobehaviour*. New York: London.

Tang SY. 1992. *Institutions and Collective Action. Self-Governance in Irrigation*. San Francisco: ICD Press.

Acknowledgements

This study was conducted within the framework of Work Package 4 (Natural Resources in Sustainable Development) of the Swiss National Centre of Competence in Research (NCCR) North-South: Research Partnerships for Mitigating Syndromes of Global Change. The NCCR North-South is co-funded by the Swiss National Science Foundation (SNF) and the Swiss Agency for Development and Cooperation (SDC).

Natural Resource Management for Sustainable Livelihoods

Aida Gareeva, Central Asian Mountain Partnership (CAMP), Kyrgyzstan; Daniel Maselli, Centre for Development and Environment (CDE), University of Bern, Switzerland

Central Asia's mountains have always played a central role in providing natural resources for people's livelihoods. It is a real challenge to survey, understand and analyse all extremes in a search for ways to achieve more harmonious coexistence, allowing different paths of development. Moreover, the effects of globalisation – including climate change – are likely to add more challenges in this already dynamic region.

Purpose of the CAMP brochure

- To provide an easily readable and well illustrated overview of the current understanding and state of Central Asia's mountain regions.
- To capitalise on the experiences gained by members of the successor organisations of the Central Asian Mountain Partnership (CAMP) Programme, which was launched in Central Asia in 2000 by CDE, Switzerland. CAMP put considerable efforts into developing relevant approaches and tools focusing on livelihood improvement and natural resource management.
- To effectively disseminate good practices while helping to avoid repeating past mistakes.

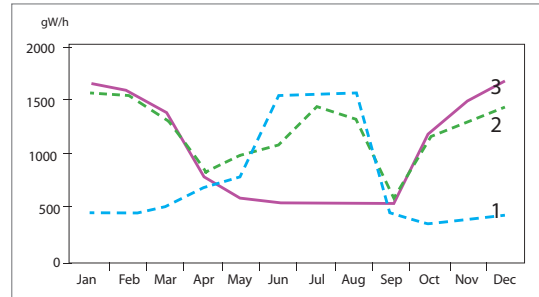


Figure 3: Power consumption by Kyrgyzstan and power production at the Toktogul hydro power plant:

1. Regime for irrigation before 1991
2. Regime for energy
3. Power consumption



Figure 1: Cover page and contents of brochure

New tools for a better future

The principle of cooperation through partnerships among actors at all levels and integrated understanding of livelihoods and natural resources in mountain regions have brought forward a range of concrete practical tools. They have been applied, tested, adapted and further developed in the Kyrgyz, Tajik and Kazakh rural mountain context.

Water for food or water for electricity? – one typical issue of antagonistic facets of Central Asia



Figure 2: Stored water can be used for energy and agriculture, provided it is managed in time



Figure 4: Six stages of the CAMP Energy Efficiency Program (EEP)

Synthesis and perspectives

While some challenges lie mainly in the hands of political and economic leaders, as well as in each individual household and person living in the region, others with a broader scope are not completely representative of Central Asia alone. As a consequence, outside actors have to help share the burden and must also take some responsibility as well.

Building on complementarities and increasing cooperation may be a better way to find solutions to persisting problems. In this, future leaders in all domains will be expected and requested to act as models.

Development Interventions and Livelihood Realities in Rural Pakistan

Julia Grünenfelder, Development Study Group Zurich, University of Zurich, Switzerland

Pakistan has designed and implemented a series of policies to fight poverty, also for people living in remote areas of its North-West Frontier Province (NWFP). Despite these initiatives, many people still do not benefit from these programmes. A closer look at how development is practised on the ground indicates reasons for this.



Figure 1: The lowest level project employees are the ones who are responsible for the last translation of policy writings into actions. How they interact with villagers and superior project staff is crucial for a development intervention (Photo by J. Grünenfelder).

This study analyses the linkages between governmental development interventions and people's lives in the rural NWFP – focusing on the discrepancy between the density of state interventions and peoples' access to these schemes. Classical project evaluations are not in a position to highlight the underlying causes of this discrepancy. Research must „step outside“ development project logics, e.g. by using a “social practice approach”. Here, the focus is on studying interactions and power relations between people linked to development interventions (e.g. project staff, beneficiaries, target groups) at a local level (district and sub-district).

Initial insights suggest that aspects such as the following decisively shape interactions:



Figure 2: Self-conception and personal mission influence not only social practices between project representatives and villagers but also between villagers belonging to different groups or among household members (Photo by J. Grünenfelder).

1. *Administrative organisation of “development” in the Province and in specific programmes*
This reflects the “technical side” of development interventions such as financial flows, responsibilities, and reporting procedures.
2. *Self-perception and personal mission of the different actors*
This reflects how people see their own role in society, in development, or on the job (Figures 1 and 2).
3. *Perception and production of “the other”*
This reflects how people legitimise their right to develop or to be developed (Figure 3).



Figure 3: The perception and production of “the other” is closely interlinked with the self-conception and personal mission. Both aspects shape people's relation to development interventions (Photo by S. Manandhar).

Some verbal statements seem to be controversial when compared with others or with physical situations (Figure 4). But certain topics, e.g. a concept of rural backwardness, appear throughout the discussions and highlight powerful mechanisms for inclusion and exclusion in the case of development.



Figure 4: What does it mean when people talk about “remote places” (see Figures 1-3)? Social practices cannot be understood by analysing verbalised data only. The materiality of a practice has to be taken into account as well (e.g. physical interactions between people or between people and objects) (Photo by J. Grünenfelder).

Major Illnesses and Related Risk Factors in Abidjan, Côte d'Ivoire

Brama Koné, Swiss Centre for Scientific Research Côte d'Ivoire

Malaria, diarrhoeal diseases and Acute Respiratory Infections (ARI) represent a major burden of ill-health for some 7 million people per year worldwide and account alone for more than 25% of the total causes of death in Africa. This study investigated the related risk factors in a peri-urban area of the commune of Yopougon in Abidjan, in October 2003

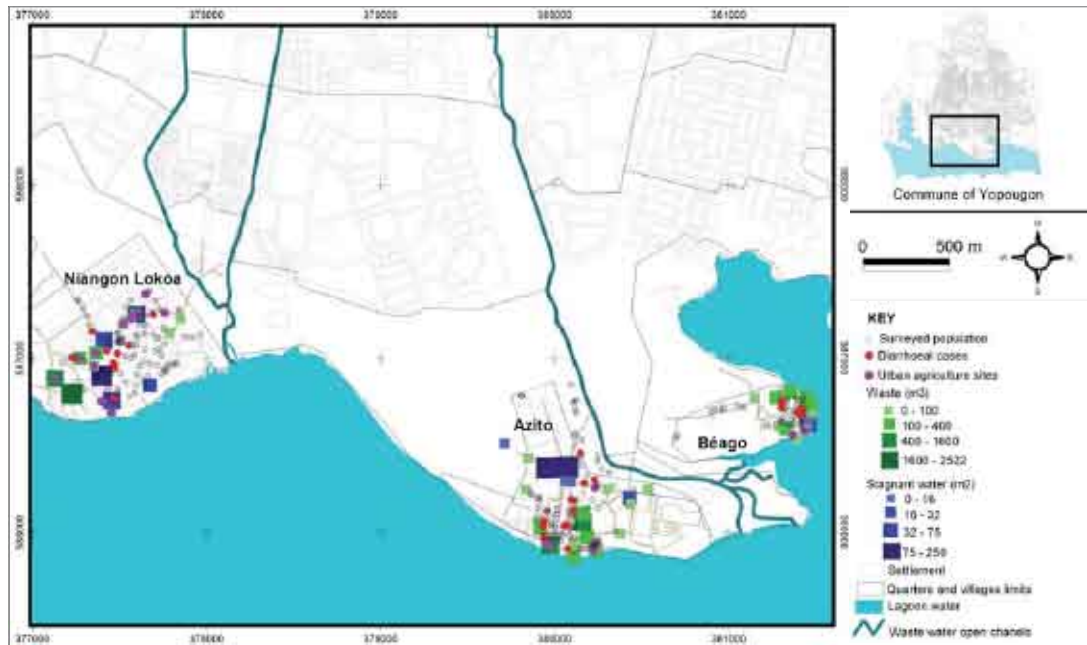


Figure 1: Spatial distribution of diarrhoeal cases, stagnant water, waste and urban agriculture sites in three peri-urban villages of the Commune of Yopougon, Abidjan, Côte d'Ivoire, October 2003 (B. Koné 2008)

A cross-sectional, exploratory questionnaire-based survey was undertaken among 275 households in three peri-urban villages located near a lagoon, followed by a geographical survey. Multiple logistic regressions with EpiInfo 2004 and mapping with ArcView 3.2 were done.

Results

The period prevalences, based on two weekly recalls of febrile illnesses, also including malaria episodes as perceived by the people, diarrhoeal diseases, and ARI were 5%, 3% and 2%, respectively, within the whole population and 10%, 5% and 4%, respectively, for children under 5 years of age.

With respect to explanatory variables for febrile illnesses, children under 5 years of age were more vulnerable to these

illnesses (WHO 2002; Wierzbza et al. 2006), which were also predominant among persons regularly in contact with the lagoon (Akogbeto 2000). Water conservation was a risk factor for febrile illnesses. Some diarrhoeal diseases could have caused fever and were perceived as malaria cases (Wang et al. 2006).

In diarrhoeal diseases, conservation of drinking water for long periods and the presence of garbage in courtyards were risk factors. High levels of schooling decreased the prevalence of diarrhoea. Water quality and quantity, hygiene and sanitation are important for diarrhoea prevention (WHO 2002; Cairncross 2003; Clasen et al. 2005; Schwartz et al. 2006). There was no significant relation to age, due probably to bacterial diarrhoeas. The distribution of diarrhoea cases appeared similar to the distribution of some spatial risk factors in the study area (Figure 2).

Bad housing conditions and rainwater stagnation in courtyards were risks for ARI. Good hygiene and sanitation is important for ARI prevention.

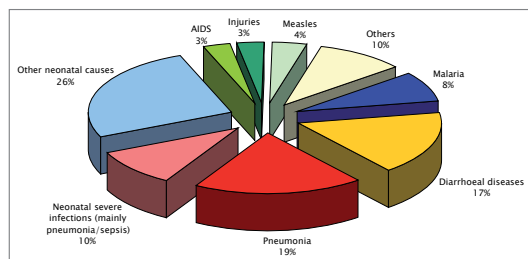


Figure 2: Major causes of global under-five mortality. Diarrhoeal diseases, malaria and ARI (Pneumonia and others) >55% (WHO World Health Statistics 2007)

Conclusion

The study assisted in the planning of interventions for these communities, entailing individual protection against mosquito bites with insecticide-treated bed nets, personal hygiene behaviour, and improvement of the quantity and quality of drinking water and broader approaches to environmental sanitation.

Mapping the Spatial Extent of No-Till Farming in Switzerland

Thomas Ledermann, Centre for Development and Environment (CDE), University of Bern, Switzerland; Volker Prasuhn, FAL Reckenholz – Swiss Federal Research Station for Agroecology and Agriculture, Zurich, Switzerland; Hanspeter Liniger, CDE; Flurina Schneider, CDE

Current and past research activities show that soil erosion by water is among the major environmental threats on arable farmland in Switzerland. In response to this, various maps of soil erosion risk have been generated at national or regional level. Yet maps on the extent of sustainable land management are lacking.

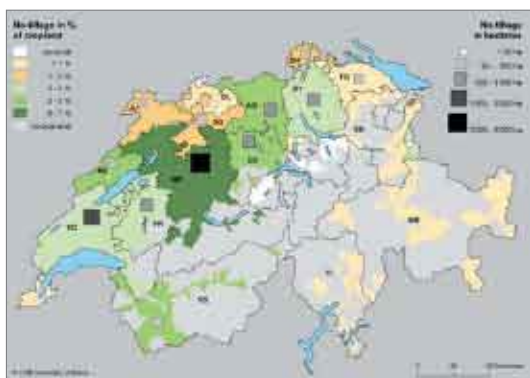


Figure 1: No-tillage at cantonal level (CDE 2008).



Figure 3: No-tillage at municipality level (CDE 2008).

Methodology

To compile the necessary surface data, a written survey was undertaken in collaboration with the Swiss Soil Conservation Association, involving all 121 farmers and contractors who own no-till machinery in Switzerland. The questionnaire surveyed the total area cultivated with no-till in 2006 and its location by municipality. Information was received from 108 farmers (90%).

Results

1. In 2006, about 12,000 ha were under no-till – about 3 % of the total arable land in Switzerland. By evaluating the maps for different administrative units, four specific high-adoption regions can be identified. Analyses suggest various factors that influence the spread of no-till:
2. The technology is limited to arable areas, dependent on natural conditions (climate, relief, soil);

3. Differences in the cantonal system of incentives for the adoption of conservation tillage techniques (e.g. programme duration, financial scope, area of focus, contract period, philosophy, commitment by involved actors);
4. Existing agricultural networks may also heavily determine the spread of the technology;
5. Farmers take decisions for or against no-till against the background of their entire life-world.

Conclusion

In the case of no-till in Switzerland, a good spatial overview of ongoing activities has been obtained. The present work shows that the maps generated – combined with associated research – provide added value for ongoing discussions on policy formulation and implementation at regional and national level.



Figure 2: No-tillage at district level (CDE 2008).



Figure 4: No-tillage (left) and conventional tillage (right) of sugar beets (Photo by W. G. Stürny 2007).

Acknowledgements

The authors wish to thank the Swiss State Secretariat for Education and Research (SER) for financing the study, and the Federal Office for the Environment (FOEN), the Federal Office for Agriculture (FOAG), and the Swiss National Centre of Competence in Research (NCCR) North-South for financial support.



Negotiating Development: Meaningful Spaces in Times of Change

Karina Liechti, Centre Development and Environment (CDE), University of Bern, Switzerland

This research aimed to improve understanding of how the ecological dimension is manifested in the negotiation of sustainable regional development. It dealt with questions of how humans relate to their natural environment, how the meanings of an issue under negotiation are constructed, and whose ascribed meanings are decisive in concretising a way forward.



Figure 1 and Figure 2: Two case studies were selected, the Jungfrau-Aletsch-Bietschhorn region in Switzerland (Figure 1: photo courtesy of 'Jungfrau Zeitung' 2005) and the Sokuluk region in Kyrgyzstan (Figure 2: photo by K. Liechti 2006). Both cases involved people in a time of change, as well as negotiations on sustainable regional development

Research perspectives and methodology

An actor-oriented perspective was adopted that places actors, their actions, and their way of making the world meaningful at the centre of scientific interest. It draws on social constructivism – advancing the view that meaning is not inherent to objects but ascribed to them – and political ecology that sees resource use as embedded in a contradictory context of actors and their interests. The empirical work is to a large extent based on qualitative data.

Results

The negotiation of sustainable regional development is underlain by different meanings that actors ascribe to the physical space under negotiation. Negotiation processes can thus be conceptualised as processes of encountering, negotiating and reconstructing different actors' meaningful spaces. Meaningful spaces are mental appropriations, i.e. outcomes of a process of making a physical space meaningful. They are constructed within the dynamic interdependency of meaning and action, and while they can be mere individual constructions, most frequently they are collectively shared among the members of certain social groups.

Several distinct, but interrelated dimensions contribute to the construction of meaningful spaces: the process dimension, the historical dimension, the identity dimension, the existential dimension, and the power dimension. Consideration of these dimensions has the potential to foster improved understanding of actor perspectives in interactions and can prove useful in understanding, setting up or supporting negotiation processes on sustainable regional development (Table 1).

Poster content source: Liechti, Karina. 2008. Negotiating sustainable regional development – the relevance of meaningful spaces in times of change. PhD thesis, University of Bern.

Dimensions of meaningful spaces...	...and their implications for improved understanding of actor perspectives and the setting up of negotiation processes
Process dimension	Particularly in times of change, redefinition of the position of humans in a certain physical space takes time, as it necessitates long-term processes of social interaction and time for individual interpretation. Societal negotiation processes thus require adequate timeframes, continuity in negotiation, and a focus on social learning.
Historical dimension	Actors relate their view of the current situation to interpretations of previous experience and future perspectives. Inclusion of the historical dimension and thus reflection of the past in debates on the future can enhance people's abilities to focus on the well-being of coming generations and to make decisions in their endeavours to advance sustainable development.
Existential dimension	The physical distance of a person to a physical space under negotiation is decisive in the construction of meaningful spaces. Local actors, for instance, due to their locally rooted livelihoods, are necessarily bound to highly complex and integrated conceptions of this particular physical space. Negotiation of sustainable regional development must therefore go beyond debating 'ideologies', and place more emphasis on the discussion of concrete measures and development pathways.
Identity dimension	Actions and ascribed meanings are related to the actor's personal biography in a certain physical space. Consequently, times of change and their negotiation not only represent a challenge in a thematic sense, but challenge the actor's self-conception as a person and his or her relation to a certain group. Negotiation processes must not underestimate this aspect of self-reflection.
Power dimension	One characteristic of negotiation processes can be the quest of some actors – frequently local – for more normative power and of other actors – frequently external – for more spatial impact. An indicator of success in negotiation processes and for their potential to enhance more sustainable regional development might therefore in many cases be the ability of these negotiations to engender an approximation between different actors with regard to these quests.

Table 1: Interrelated dimensions contributing to the construction of meaningful spaces and their implications for improved understanding of actor perspectives and the setting up or supporting of negotiation processes on sustainable regional development (Liechti 2008)

International Migration in Mexico: Guatemalan Women in Chiapas

Susana Martínez, Centro de Estudios Superiores de México y Mesoamérica, Universidad de Ciencias y Artes de Chiapas (CESMECA-UNICACH), Mexico

The aim of this research is to study the process of women's migration on the south border of Chiapas, especially the non-authorized migration of Guatemalan women working as domestic workers in the City of Tapachula, Chiapas. It also focuses on how women in this context are becoming visible through new processes and new social spaces.



Figure 1: Map of the State of Chiapas and the borderline of Guatemala and the City of Tapachula (GoogleEarth 2008)

Mexico's south border is a concept used by researchers over the last twenty years to refer to and define the border between Mexico and its neighbours in Central America. This border extends for 1,149 km, 956 km of which are shared with Guatemala and Belize. The city of Tapachula is located in the south-east of Chiapas and is part of the Soconusco region. It shares a border with Guatemala along the Suchiate River. Tapachula is the second largest city in the state and the economic heart of Chiapas, with an area of 93,615 ha and 300,000 inhabitants. It is a city of origin and transit, as well as a destination of migration.



Figure 2: Guatemalan women in Tapachula (Photo by S. Martínez)

Research questions

- In the regional context, which aspects of the migration phenomenon are new and which could transform or create new life strategies?
- What is the role of migration in the livelihood strategies of migrant women in the city of destination?
- What forms of integration exist among Guatemalan women?
- What is the labour situation of Guatemalan women in Tapachula, Chiapas?



Figures 3 and 4: Guatemalan women and children in Mexico (Photos by S. Martínez)

Expected results

- Contribution to knowledge about women's migration in the south border region between Mexico and Guatemala.
- Highlights of the processes of creating social networks and spaces in which these women are involved.
- Highlights of the labour conditions of these women and their legal status.

Outputs

- MSc thesis at CESMECA-UNICACH
- One article published

Popular Habitat in the Central Neighbourhoods of Mexico City, 1985–2006

Anavel Monterrubio, Autonomous Metropolitan University, Mexico

The aim of this research is to analyse the various elements and processes enabling low-income populations to remain in the historic center districts of Mexico City, particularly those that are the focus of “renovation” or “rehabilitation” programs.



Figure 1: Zócalo with Mexican Flag



Figure 3: Social organisation

The study setting

The study is being carried out in the area that urban specialists called the Horseshoe of Slums in the 1960s, as they were the first areas of expansion that grew around the centre of Mexico City to the north, east and southeast where the new urban class lived between 1860 and 1910. Given their cultural, economic and political significance, these areas constitute an urban space of great value (Figures 1, 2).

The study area

The areas are characterised by loss of population and housing, high rates of breakdown of the social fabric, and loss of central functions. Housing access for the poor has been heavily determined by government policies of urban renovation, real estate interests, and spontaneous or organised opposition of the inhabitants (Figures 3, 4).

Research questions

- Is it feasible for the low-income population to continue residing in Mexico City’s historic centre?

- How did the various territorial, housing and urban development policies contribute to the way popular habitat is produced and managed in the central neighborhoods of Mexico?
- What conditions have helped, or impeded, the initiatives taken by poor residents to maintain and improve their housing?
- Who are the inhabitants of these central neighbourhoods and how do they live?

Expected results

- Proposals for the elaboration of strategies to revitalise central neighbourhoods that will protect the interests of the resident population. The proposals will be presented to government institutions.



Figure 2: San Jerónimo Street in Mexico City



Figure 4: Locals attending a show in Tepito

Integrated Framework for Improving Environmental Sanitation and Health

Hung Nguyen-Viet, Swiss Tropical Institute (STI), Switzerland; Jakob Zinsstag, STI; Roland Schertenleib, Swiss Federal Institute of Aquatic Science and Technology (EAWAG), Switzerland; Christian Zurbrugg, EAWAG; Brigit Obrist, STI; Agnes Montangero, EAWAG; Narong Surinkul, Asian Institute of Technology (AIT), Thailand; Doulaye Koné, EAWAG; Antoine Morel, AIT; Gueladio Cissé, Centre Suisse de Recherches Scientifiques (CSRS), Côte d'Ivoire; Thammarat Kootatep, AIT; Bassirou Bonfoh, Institut du Sahel (INSAH), Mali; Marcel Tanner, STI

Health is influenced by sanitation. Resource use must be minimised and resources recovered from wastes and reused, while considering health safety and effectiveness. We developed a conceptual framework for the improvement of health and environmental sanitation (ES) using an approach combining health, ecological, social, economic and cultural assessments.

Framework for combined assessment and integral interventions

The framework starts with a rapid analysis of health status and the status of the physical, social, cultural and economic environment using the selected methods in an individual or combined way (Figure 1). This provides the basis for understanding key issues in improving health and environment in a given area.

Physical environment: This describes the status of the environmental sanitation system (water supply, management of liquid and solid wastes drainage, of storm water) (Table 1).

Health status: Classical and cultural epidemiology and QMRA are the key methodologies for assessing health and identifying the determinants of disease. Pathogen Flow Analysis (PFA, Table 1) is used to quantify pathogen concentrations and pathogen flows at different points in the environmental sanitation systems.

Socio-economic and cultural environment: Approaches of medical anthropology, cultural epidemiology and social economics, grouped as social science analyses (SSA) are used (Table 1). Vulnerability and resilience of the populations and their perceptions of risk were a focus. Economic appraisal methodology is used to assess the costs and cost-effectiveness of the interventions.

Comprehensive Critical Control Points (CCP) identification: The present CCPs result from analyses of the three components described above. Therefore, integrated CCPs are taken into account and identified from comprehensive perspectives through biomedical, epidemiological (health), socio-economic, cultural and economic (social sciences) and ecological assessments (physical environment).

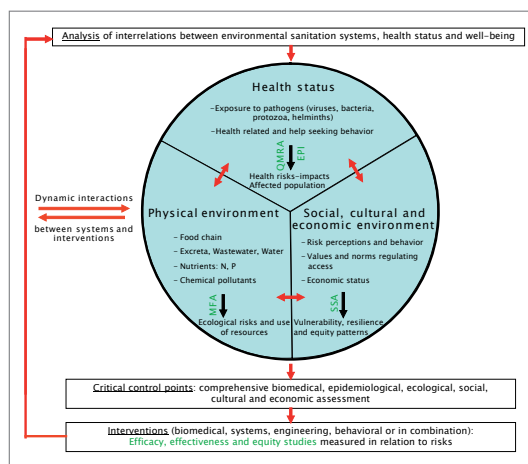


Figure 1: Conceptual framework for improving Health and ES. EPI: Epidemiology, QMRA: Quantitative Microbial Risk Assessment, MFA: Material Flow Analysis, SSA: Social Science Analysis.

Interventions: Potential interventions are comparatively assessed with a view to the best contributions to better health and minimisation of impacts on the environment and resource use in a given area. Interventions established against this background will be integrated, as they take into account the professionally defined needs and demands of the populations concerned.

Outlook

Initially, the framework was conceptualised and validated for the context of urban and peri-urban settings in developing countries focusing on waste, such as excreta, wastewater, and solid waste, and their influence on food quality, as well as their related pathogens, nutrients and chemical pollutants.

Domain	Disciplinary methods	Measures	Outcomes	Combination of methods	
				Combined methods/approaches	Special contribution of the framework
Physical environment	MFA	System structure Mass flows Material concentration Material balance	Material balance in a system, Prediction of material flow, Ecological risks, Use of resources, CCP identification, Planning	Physical environment and Health	
				Extended environmental impact assessment: Combination of MFA and QMRA; combination of QMRA and HACCP Epidemiological assessment of potential environmental risk factors	Identification and characterisation (level of contamination and type of pathogen) of CCPs in MFA systems. Quantification of risk at CCPs
Health status	QMRA	Pathogen identification Dose-response assessment Exposure analysis Risk characterisation	Risk of infection Comparison with acceptable risk CCP identification	Health and Socio-economic and cultural environment	
	Epidemiology (descriptive, analytical, interventions)	Morbidity, Mortality, Fertility, Nutritional status, Risk odds, relative risk, Efficacy of interventions	Agent specific incidence, prevalence, Burden of disease, Causes and effects of risk and disease CCP identification, Reduction of morbidity and mortality	Environment-related vulnerability Analysis of risk perception Health related behaviour analysis Analysis of means people have to cope	Extension of CCP concept by a behavioural and cultural component. Risk related cultural dimension determines behaviour towards observed risk and help seeking
	PFA	Pathogen identification Pathogen concentration	Pathogen concentration Flows of pathogens		
Socioeconomic and cultural environment	Medical anthropology	Understanding, experiences of illnesses, health-related and help-seeking behaviour of people in a specific culture and social group	Perception of risk Vulnerability Resilience Equity		
	Cultural epidemiology	Illness perception, meaning and behaviour	Culturally adapted assessment of illness perception		
	Socio-economic assessment	Cost of disease Assessment of interventions Assessment of equitable access to resources and services	Cost-effectiveness and equity effectiveness of interventions Equity effectiveness of interventions and access to resources and services		
Physical environment (see above)				Socio-economic and cultural environment Physical environment	
				Combination of MFA and behaviour analysis towards environment and resource	Put in advantage natural resource and reuse of waste (wastewater, excreta, and food chain and management)

Table 1: Proposed available methodologies to combine health status, physical and socioeconomic and cultural environment assessment in the framework. Grey part shows the combination of methods and approaches of the three disciplines.

Water-Related Environmental Services in Pangani Basin, East Africa

Benedikt Notter, Centre for Development and Environment (CDE), University of Bern, Switzerland

The concept of environmental services is regarded as a promising way to mitigate problems of non-existing markets and unsustainable resource use. However, how water-related environmental services can be defined and quantified in time and space is the subject of debate and research. The present study explores these questions for Pangani Basin in East Africa.

The conceptual framework of the study (Figure 1) distinguishes between “environmental functions” and “environmental services”. The latter are perceived and valued by local or external stakeholders for the benefits they yield, and must fulfil criteria in terms of quantity, quality, and time and place of availability. This requires a spatially and temporally sensitive assessment using GIS and hydrologic modelling. The sensitivity of environmental service availability to human-induced changes in underlying environmental functions is evaluated through scenarios.

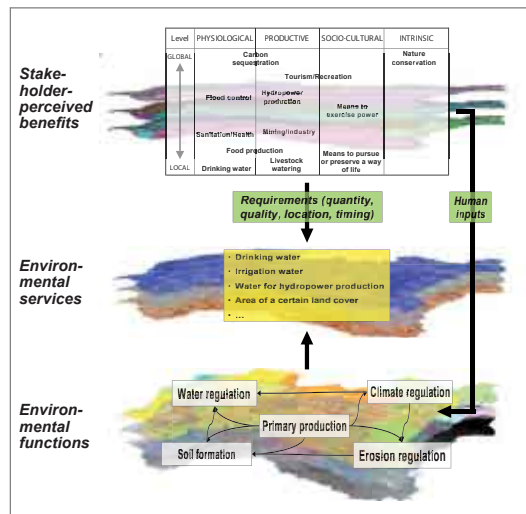


Figure 1: Conceptual framework of the study.

The study area

Pangani Basin is located between Kilimanjaro and the Indian Ocean and drains humid highlands to semi-arid lowlands (Figure 2). Stakeholder claims on environmental services – ranging from drinking water, agriculture, or hydropower production to tourism and biodiversity conservation – lead to potential and actual conflicts.

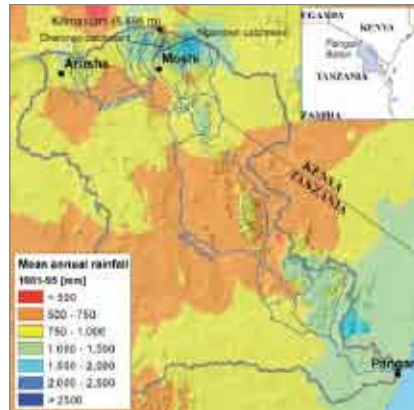


Figure 2: Overview of the study area.

Quantifying environmental services

Since data on the state of the environment are available only from a few discrete points in time and space, tools to inter- and extrapolate this information play a pivotal role. The SWAT model (Soil and Water Assessment Tool), a hydrological model in use since the early 1990s, simulates most processes governing the availability of water-related environmental services. SWAT2005 had to be slightly modified to work in the Pangani context. Calibration results with the version SWAT-P_V1.0 in the Charongo and Ngomberri catchments are satisfactory (Figure 3).

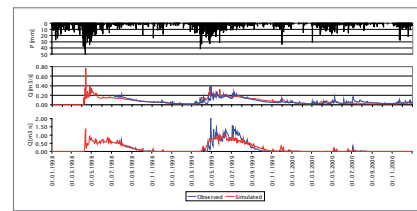


Figure 3: Calibration results from the Charongo and Ngomberri catchments (18 and 42 km², respectively). Top: Daily catchment rainfall depth; middle: simulated and observed discharge at Charongo; bottom: simulated and observed discharge at Ngomberri. Model performance is satisfactory with Nash-Sutcliffe Efficiency Scores (NSE) of 0.65 at Charongo and 0.75 at Ngomberri at the daily time step. At the monthly time step, NSE values of 0.74 are reached at Charongo and 0.95 at Ngomberri.

GIS tools for elevation-dependent interpolation of meteorological variables under scarce data conditions, for the derivation of a stream network and DEM from Landsat and radar data, or for the delineation of subbasins for the SWAT model, were developed as well. Further, quality control functions had to be built into the databases holding the information collected from all relevant institutions in the study area.

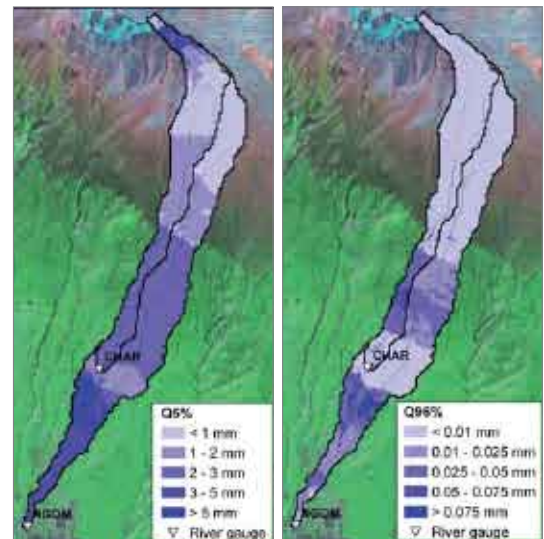


Figure 4: Spatial distribution of the contributions to high (Q5%, left) and low flows (Q96%, right) in Charongo and Ngomberri catchments. Qx% is the discharge exceeded during x percent of the time. Visualisations of this kind can reveal the relevant areas for the “production” of environmental services for different benefits.

Estimating Emissions in Latin America: An Alternative to Traffic Models

Margarita Ossés de Eicker, Swiss Federal Laboratories for Materials Testing and Research (Empa), Switzerland; Rainer Zah, Empa; Hans Hurni, Centre for Development and Environment (CDE), University of Bern, Switzerland

Emissions from traffic are a serious pollution problem in Latin American cities. Traffic models at street level allow precise estimations of these emissions but are too expensive for a broad application. A simplified approach for estimating traffic emissions at city level proved to be a reasonable alternative for Latin American mid-sized cities.



Figure 1: Air pollution and related traffic emissions in Bogotá, Colombia (C. Misteli, left, and M. Ossés, right).

Current situation

Many Latin American cities have serious pollution problems due to traffic emissions (Figure 1). These emissions can be most accurately estimated at street level with traffic models. However, most Latin American cities cannot afford such a sophisticated approach.

Proposed solution

A simplified approach was developed for estimating traffic emissions at city level. This approach applies the same emission factors as traffic models, but uses a more simplified procedure for mileage estimation (Figure 2). The method was tested on 16 mid-sized Chilean cities. The resulting emission estimates were compared with reference values from traffic models.

Results and conclusions

In all cities evaluated, the estimated emissions of HC, NOx, NH₃, N₂O and CH₄ were within ±30% of the reference value and in most cities the accuracy was even higher (Figure 3). For PM10 and CO, the estimates were less accurate.

The uncertainties of the estimated emissions (calculated with a Monte Carlo simulation) were about ±80% to about ±120%, depending on the pollutant. The main source of uncertainty in the simplified approach for emission estimation lies in the emission factors and to a lesser extent in the mileage. Moreover, the models apply the same emission factors. Thus their results also show great uncertainties.

Therefore we conclude that the simplified approach is a useful option for a first screening of traffic emissions in Latin American mid-sized cities similar to those evaluated here.

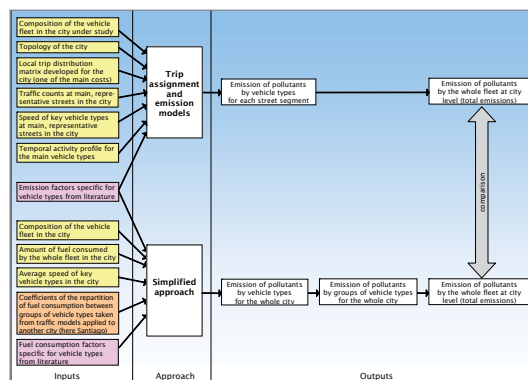


Figure 2: Schematic representation of the estimation of traffic emissions with traffic models and with the proposed simplified approach. The inputs required for both approaches are presented, as are the outputs applied for comparison. Local data is presented in yellow, generic data in pink and data taken from another city in orange.

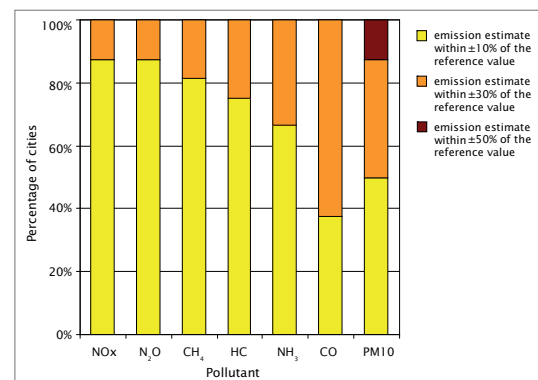


Figure 3: Accuracy of emissions estimated with the simplified approach. The percentages indicated refer to cities where the estimates fulfilled accuracy criteria. These accuracy criteria are based on relative difference with respect to the reference values delivered by traffic models.

Nitrogen Transformation in Constructed Wetlands Treating Faecal Sludge

Atitaya Panuvatvanich, Asian Institute of Technology (AIT), Thailand

Constructed wetlands (CWs) are a promising solution for faecal sludge treatment due to simplicity of operation, low-cost operation, maintenance, and treatment efficiencies. This research describes nitrogen transformation within vertical flow constructed wetland systems (VFCW) to enhance removal efficiencies or recover nitrogen from faecal sludge.

Experimental set-up

Five laboratory-scale VFCW units were established at the Environmental Research Station of the Environmental Engineering and Management Program, AIT Thailand. Each unit consisted of a square plastic tank planted with cattails (*Typha augustifolia*). The effluent port was divided into two groups (Figures 1a and 1b), with and without constant water levels. With regard to water level, the PVC pipe was connected at the effluent point for three laboratory-scale VFCW units to maintain water level within the system (Figure 1b).

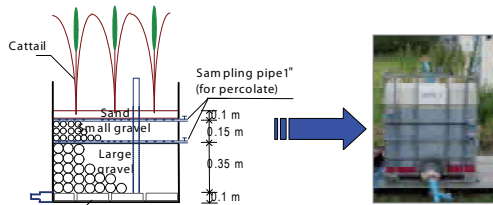


Figure 1a: Without percolate retained in large gravel layer

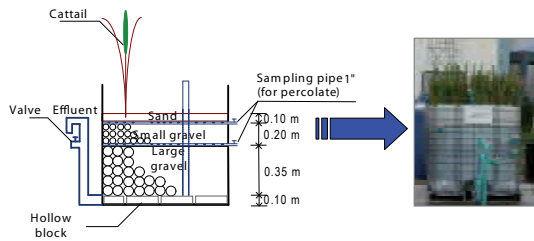


Figure 1b: With percolate retained in large gravel layer

Unit	Drainage type	Depth of accumulated sludge (cm)
1	Without percolate retained	0
2	in large gravel layer	10
3	Without percolate retained	0
4	With percolate retained in large gravel layer	10
5	With percolate retained in large gravel layer	20

Table 1: Operating condition

Preliminary findings

The influent total nitrogen loading ranged from 60–70 g N/m²/week. Figure 2 shows the profiles of influent and effluent TN loading as NH₄-N, NO₂-N, NO₃-N and Org-N. It was shown that about 90% of influent N loading was presented in the form of NH₄-N.

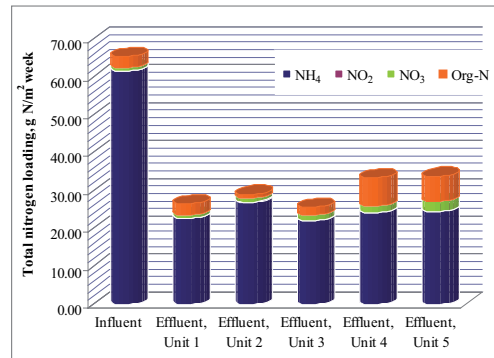


Figure 2: N species of influent and effluent from each unit

Effluent N transformation, according to time intervals from all VFCW units (Figure 3), resulted in about 25–35% of TN disappearing on the first day of the ponding period (passing the sand layer). During this period about 40% of NH₄-N mass was converted, Org-N concentrations were increased, and NO₂-N and NO₃-N in all experiments also increased about 70% from the influent. This probably indicates that NH₄-N can be converted by nitrification reaction to NO₂-N and NO₃-N after passing the sand layer. After that, about 20% of TN gradually decreased during the ponding period in small and large gravel layers in all VFCW units.

Conclusion

Almost all NH₄-N was converted in the sand layer for all VFCW units. Different accumulated sludge levels and different drainage types were not significantly affected by nitrogen transformation.

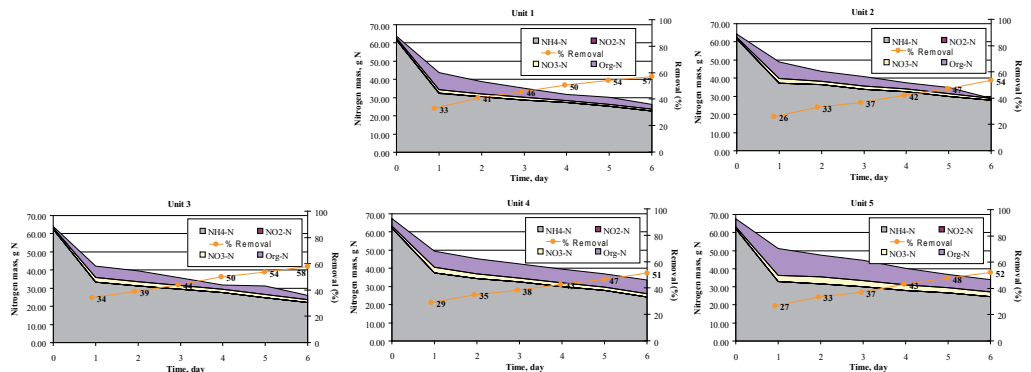


Figure 3: Profiles of effluent nitrogen concentration for lab-scale VFCW units

Impacts on Livelihoods of the Urban Poor: A Case Study of Hanoi

Hoang Pham Duc, University of Melbourne, Australia

This study aimed to investigate the impacts of the urban transition process on the livelihoods of the urban poor in several communities around Hanoi. Based on the research findings, some policy recommendations and livelihood strategies will be proposed to improve the quality of life of the poor.



Figure 1: Farming nearby imperial buildings

Research Objective

The overall objective was to reveal how the urban transition process has changed the livelihoods of urban poor in Hanoi city and how poor communities have responded to this process

Research Questions

- What changes has the urban transition process brought in the livelihood of poor communities?
- What are the driving forces behind these changes? How have they interacted to bring change in the poor community?
- How have poor communities been responding to the urban transition process?
- What policies and livelihood strategies are recommended to remediate the negative impacts of the urban transition process on the livelihoods of the urban poor?

Methodology

Five local communities with different characteristics around Hanoi will be selected for investigation. Data collection and analysis will be guided by a qualitative approach, in which both primary and secondary data are collected and combined for analysis. Semi-structured questionnaires and focus group discussions will be used to collect primary data. Secondary data sources include planning documents, annual reports, statistical year books, etc.



Figure 2: High-rise residential development projects and its impacts on local housing

Expected outcomes

- Sound policies and livelihood strategies will be proposed to mitigate the vulnerability of the poor in the urban transitional context
- Research findings will be shared with other countries having the same urban context
- Mutual learning and knowledge-sharing processes will be enhanced (PAMS framework)

Outlook

- Community-level analysis to be finished in Oct 2008
- Household survey to be carried out from Nov 2008-Feb 2009
- Data synthesis and major research findings to be completed in mid 2009



Figure 3: The location of the case study sites in Hanoi Municipality



Figure 4: Local livestock under pressure of urbanization

Negotiating Statehood in South Sudan

Martina Santschi, Swisspeace, Bern, Switzerland

After years of violent conflict South Sudan is undergoing a delicate process of conflict transformation and state-building. In 2005 the main parties in conflict signed a comprehensive peace agreement which is being implemented in a very tense context. This has opened up new avenues for negotiating state power and authority.

Research context

In South Sudan, non-state institutions such as networks based on clans along with traditional leaders are crucial in governing and providing services. At the same time South Sudanese actors take up “Western” ideas in order to construct new concepts and institutions through bricolage.

Statehood at the periphery of the State

In rural Aweil East County for instance, the process of state building brought administrators physically into villages. However, administration at the grassroots level is characterised by lack of funds to pay salaries or to provide infrastructure and services. Health services and access to clean water are either not available or provided by international donors. In this context, citizens refer to hakuma (government) as a faraway institution in the state capital.

This tends to reinforce parallel networks based on ethnicity, clan, family and civil society which overlap and are interlinked with the state, since it is through these networks that private and public resources are distributed. In Aweil East, politicians and members of the diaspora build primary schools and support the education of relatives. The same networks allow politicians to mobilize followers and thus secure influence in competition for power, posts and access to resources.

It is by studying power plays at the interface between these various networks that this project provides new insights about the emerging State in post-war South Sudan.



Figure 1: Elders, politicians, women groups, youth and other Dinka Malual of Baac Payam (Aweil East County) meet to elect members of the local council of the SPLM (Sudan Peoples' Liberation Movement) party (Photo by Santschi)

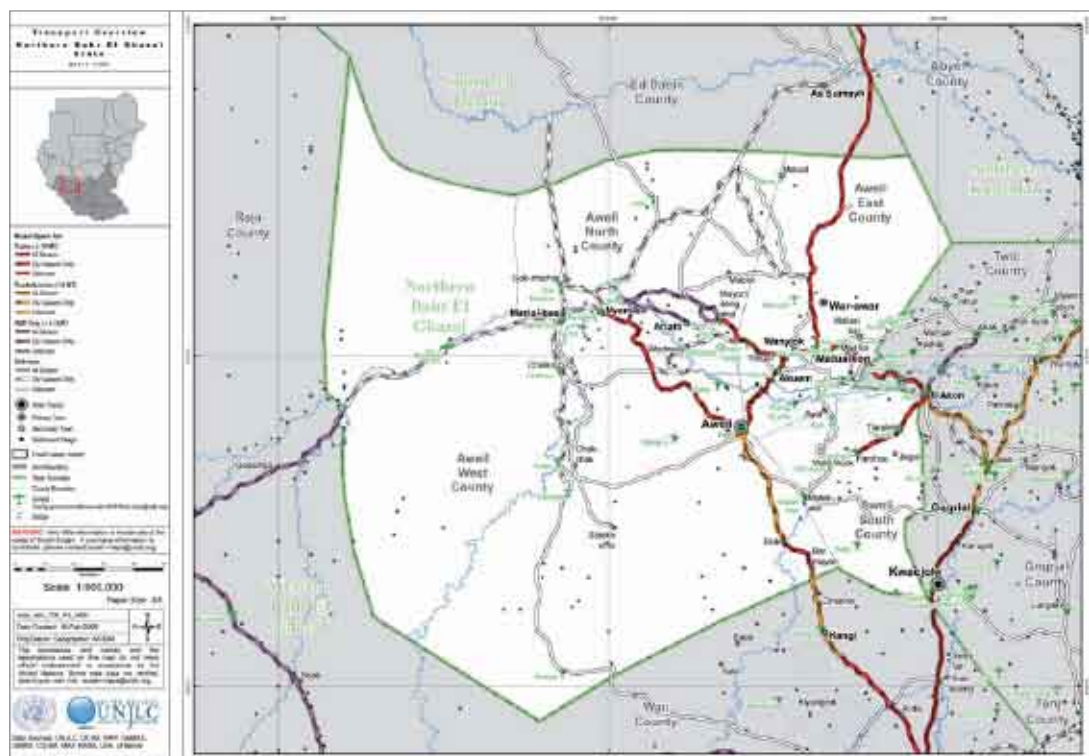


Figure 2: Transport overview Northern Bahr El Ghazal State

Anaerobic Baffled Reactor (ABR) for Household Wastewater Treatment

Yuttachai Sarathai, Asian Institute of Technology (AIT), Thailand; Antoine Morel, AIT; Thammarat Koottatep, AIT

The anaerobic baffled reactor (ABR) was successfully applied to treat various types of wastewater, but knowledge about its applicability to domestic wastewater with high quantitative and qualitative fluctuations is limited. This study aimed to investigate and model the hydraulic characteristics and treatment performance of the ABR in treating domestic wastewater.

Methodology

Research was conducted at laboratory scale ABR (Figure 1). Hydraulic behaviour was investigated by determining RTD curves (Residence Time Distribution) at different wastewater peak flow factors (PFF) and hydraulic retention times (HRT). Treatment performance in terms of COD and SS removal and methane gas production were determined. Ultimately, an N-tank-in-series model (NTS) was established to predict treatment performance of the ABR.

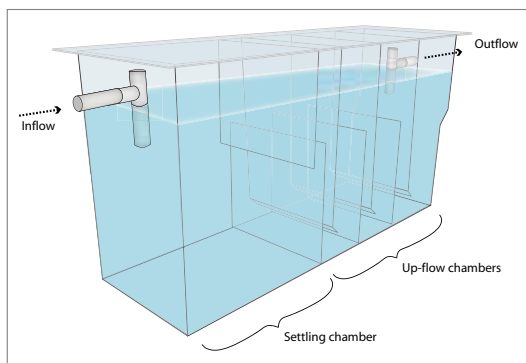


Figure 1: Experimental unit of the ABR

Hydraulic behaviour and treatment performance of the ABR

- At constant flow (PFF=1), hydraulic behaviour was not affected by the HRT (range 24–48h).
- Dead space in the reactor did not exceed 10% at PFF < 4, but increased to > 20% at PFF > 4.
- Methane gas production did not affect the hydraulic behaviour of the ABR at average gas velocities of 0.5–3 cm/h.
- Under steady flow (PFF=1), COD removal reached 95% (HRT = 48h). Efficiency dropped to 52% at HRT = 6h.
- Under non-steady flow (PFF=2–4), COD and SS removal amounted to 90% (HRT = 48h). Organic matter was mainly removed in the settling and the first two up-flow chambers.

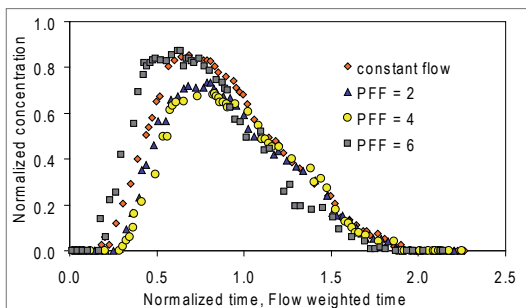


Figure 2: Residence Time Distribution (RTD) of wastewater at different PFF (HRT = 48h)

Mathematical modelling - NTS

The N-Tank-in-Series (NTS) model was used to mathematically describe the hydraulic behaviour of the ABR.

$$C_n = \frac{C_0}{[1 + (k/n\tau)]^n}$$

Where:

- C_0 : influent concentration (mg/L)
 n : number of tank in series (N=4 at 48-h HRT)
 k : kCOD = 1.721 day⁻¹
 τ : HRT (day)

Four completely mixed tanks in series (N=4) best fit the experimental data at HRT = 48h. A k-value of 1.721 day⁻¹ best describes COD treatment performance of the ABR.

Methanogenic organisms

The fluorescent in-situ hybridisation (FISH) method confirmed the presence of *Methanosaeta*- and *Methanosarcina*-like methanogenic bacteria in the upflow chambers. *Methanosarcina* provide resistance to shock loadings at the front of the ABR, whilst the scavenging capacity of *Methanosaeta* towards the rear of the reactor results in low effluent COD concentrations.

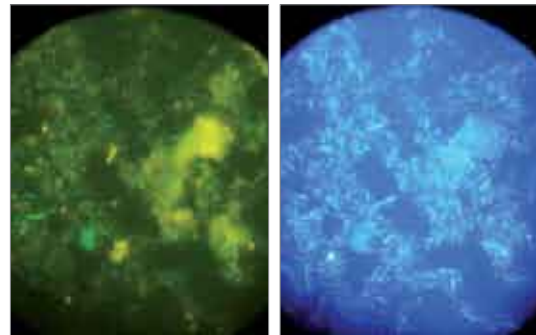


Figure 3: Methanosarcina (cocci) and Methanosaeta (rod shape) were detected in the front and rear of the ABR, respectively (FISH method)

Conclusions

The ABR has great potential as an onsite treatment system. High COD and SS treatment efficiencies can be achieved at relatively low HRT.

“Nowadays they do what they want”: Sexual Stereotyping of Young Urban Women

Patricia Schwärzler, Swiss Tropical Institute (STI), Switzerland; Brigit Obrist, STI

In the age of AIDS, sexual stereotyping of young women in Ouagadougou is an expression of uncertainty induced by rapid and uncontrolled urbanisation accompanied by drastic economic, social and gender transformations. Despite being one of the most vulnerable groups, young women are accused of spreading HIV through their social and sexual practices.



Figure 1: Street scenery in a peri-urban neighbourhood in Ouagadougou (Photo by P. Schwärzler)

Rapid urban growth and its ecological, economic, social and political consequences are major issues in Africa. From 1980-2000 the urbanisation rate more than doubled in Ouagadougou. Today nearly 10% of the national population lives in this capital city and more than 50% of the inhabitants are below 20 years of age. Youths are especially affected by the economic consequences of urbanisation, as more than 65% of the unemployed are under 24 years old.

This rapid urban growth also affects the health of the people who live in these cities. From the perspective of older city dwellers, the newly developing social and sexual practices of the young are interpreted as a corollary of the urbanisation and modernisation process. They especially blame young women

for spreading HIV/AIDS through uncontrolled and multiple sexual relations, even with married men.

For young women, transactional sexual relations with older and wealthier men relate to the cultural notion of reciprocal gifts in the sexual domain. They adopt this strategy to cope with economic hardship, to gain access to prestigious consumer goods, and to construct a more independent gender identity than they are culturally assigned. There is evidence that their practices make them especially vulnerable to HIV, for they present the highest prevalence rates of all age and gender groups (1.4%), though this is relatively low in the African context. Socially, they risk losing their reputation and their chances on the matrimonial market.



Figure 2: Women selling edibles on the market (Photo by P. Schwärzler)

Land and Livelihood Strategies in a Changed Socio-Economic Environment

Jyldyz Shigaeva, International University of Kyrgyzstan, Kyrgyzstan

This interdisciplinary research examines land use transformation processes, implications for land resources, and the formation of new livelihood strategies in a post-Soviet environment (case study in the Sokuluk basin of northern Kyrgyzstan).



Figure 1: Recovery of high mountain pastures (Photo by J. Shigaeva)

Changes in land status over 25 years

Comparative analysis of the status of land in the past (1980) and in the present (2005) has revealed the following changes:

- The biggest transformation of plant communities and their structure has taken place in pre-mountain and mountain belts;
- Forage productivity on pre-mountain and mountain pastures close to villages has decreased on different types of pastures by between 1% and 34% (Shigaeva et al. 2007);
- Forage productivity on remote high mountain pastures has increased on different types of pastures by between 5% and 22%;
- Humus has decreased on arable land by between 36.5% and 55.1%.



Figure 2: Degradation of pre-mountain pastures (Photo by J. Shigaeva)

Current livelihood strategies

Unsustainable land use at household level is due to current livelihood strategies.

The accumulation strategy: Households expand land plots and increase livestock whilst investing little in maintaining soil fertility.

The preservation strategy: Households either rent risky rainfed plots to wealthy households or allow them to become unproductive grassland by abandoning them, and invest in livestock without proper management, thus contributing to pasture degradation in pastures near villages.

The coping strategy: Lack of labour power and capital forces households employing this strategy to abandon their plots. These households are heavily dependent on allowances or piecework for mere survival.

Support measures must be carried out to avoid or reduce the monopolisation of land ownership, improve sustainable land management, and support innovative ideas for income diversification.

Contested Notions of Agricultural Property in Postsocialist Kyrgyzstan

Bernd Steimann, University of Zurich, Switzerland

Since the privatisation of the Kyrgyz agricultural sector in the early 1990s, socioeconomic disparities in rural areas have deepened. As the fundamental redefinition of property rights with respect to natural resources has not yet developed into a consensus, access to pastures has been increasingly governed by financial means.



Figure 1: More and more barns and shelters are being built on easily accessible spring pastures (Photo by the author)

Newly endowed with private arable land and livestock, but deprived of state support and market access, a majority of rural Kyrgyz households were forced to revert to subsistence production after 1994/5. While privatisation privileged those with farming/herding skills, others could not capitalise on their new property. In addition, many former elites profited from non-transparent privatisation. This resulted in two parallel processes:

- Since privatisation, many households have tried new livelihood strategies by combining rural and urban, farm and non-farm income sources. Yet not all were able to profit from re-emerging produce and labour markets. As a result, socioeconomic disparities have increased over the last 15 years (Figure 2).
- Unlike arable land, pastures remained state-owned, to be leased by herders for a given period of time. But with few human and financial resources, the Kyrgyz state can hardly enforce the new rules designed for this purpose. Therefore, different notions of property exist among pastoralists, often resulting in open access regimes.

As a consequence, wealthier households invest in shelter and transport, ensuring long-term access to pastures. The current trend of building barns on spring pastures indicates these 'informal' access claims (Figure 1). Though outright conflicts have not yet emerged, competition over good pastures is likely to increase as flock sizes grow. From this perspective, recent donor initiatives promoting common property regimes instead of state control are a promising approach.

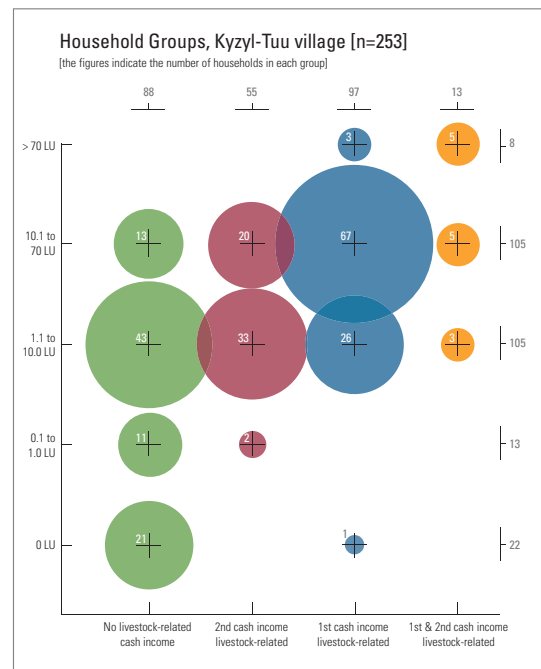


Figure 2: The amount of privately owned livestock, a common wealth indicator in these areas, and the role of livestock-related income sources, illustrate significant socioeconomic disparities in one of the study villages (own data) [LU = livestock unit]

Microbial Risks Posed by Activities in Klong Luang Municipality

Narong Surinkul, Asian Institute of Technology, Thailand

Due to rapid urbanisation in recent decades, a number of peri-urban areas in Thailand have sanitation systems inadequate for management of domestic waste. Results of Quantitative Microbiological Risk Assessment (QMRA) revealed high infection risk due to activities such as swimming in the canal, fishing, canal vegetation, irrigation using canal water on farmland, and raw vegetable consumption.



Figure 1: Map of Thailand

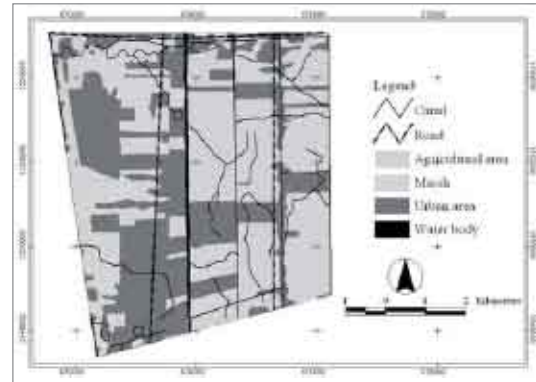


Figure 2: Map of Klong Luang Municipality

Introduction

Environmental sanitation services (faecal sludge, wastewater and solid waste management) in most peri-urban areas in Thailand are inadequate. Untreated wastes increase health risks. The number of reported diarrhoeal episodes in Klong Luang exceeds 2% of the inhabitants. The objective of this study was to estimate the potential microbial risk posed by *E. coli* in water-related activities in Klong Luang municipality.

Methodology

- 100 out of a total of 10,800 households in Klong Luang were interviewed in-depth using questionnaires on basic environmental sanitation services.
- Samples were taken from pathogen pathways such as canal water and raw vegetables (lettuce), and analysed for concentration of *E. coli*.
- QMRA was used as method to quantify health risks.

Activity	Volume of ingestion or contacts (ref.)	Frequency/year	Population	Population group
Swimming in canal	10 - 100 mL/time (Steyn et al., 2004)	20 - 50 times (from interviews)	200 - 250 (calculated from questionnaires)	Children
Fishing and vegetation in canal	1 - 10 mL/time (Steyn et al., 2004)	300 - 365 times (from interviews)	50 - 100 (calculated from questionnaires)	Farmer
Irrigation of farmland with canal water	1 - 10 mL/time (Steyn et al., 2004)	300 - 365 times (from interviews)	500 - 600 (calculated from questionnaires)	Farmer
Raw vegetable consumption	10 - 100 g/time (WHO, 2006)	50 - 100 times (from interviews)	30,000 - 40,000 (calculated from questionnaires)	Consumer

Table 1: Exposure dose for each activity

Results

Exposure doses (Table 1)

- Approximately 90% of wastewater from sewer line was discharged into canals.
- Ingestion doses and frequency of exposure were estimated based on a review of literature and questionnaires.

Risk assessments (Table 2)

- All yearly risks exceeded the acceptable risk ($1.0E-04$) as described by USEPA (1994).
- The highest yearly risk was due to swimming in canal.
- The greatest health impact was from the consumption of raw vegetables (265 cases per year) due to the high number of people exposed to this transmission route.

Conclusion

The applied QMRA methodology is suitable to quantify risk of infection at specific exposure points. Higher than acceptable infection risks were apparent in some water-related activities such as swimming and fishing in the canal, and in canal vegetation, irrigation on farmland using canal water, and raw vegetable consumption.

Activity	<i>E. coli</i> concentration (MPN/100mL)	Reduction through washing	Mean of single infection risk	Infection cases per year
Swimming in canal	$9.0E+01 - 9.2E+04$	None	$2.48E-03$	16
Fishing and vegetation in canal	$9.0E+01 - 9.2E+04$	None	$2.57E-04$	6
Irrigation of farmland with canal water	$9.0E+01 - 9.2E+04$	1-2 log	$1.41E-05$	3
Raw vegetable consumptions	$1.2E+01 - 6.65E+02$ (MPN/g)	1-3 log	$9.28E-05$	26.5

Table 2: *E. coli* concentrations and probability of infectious risk

GIS and Biometrics for Population Monitoring of Nomadic People in Chad

Daniel Weibel, Swiss Tropical Institute, Switzerland

Nomadic pastoralists rarely access static health services. The STI conducted human and animal vaccination campaigns for nomadic pastoralists in Chad between 2000 and 2007. Baseline demographic denominators of the target population are crucial to plan, validate and implement health services.



Figure 1: Scanning of a fingerprint of a Fulani woman near Lake Chad (Photo by D. Weibel)

In an area of 4,275 km² south of Lake Chad in Chad, we randomly contacted Arabic, Fulani and Gourane pastoralists, the target population for the vaccination campaigns. The Chadian Ministry of Health and the ethics committee of Basel have approved this research. During 4 sampling rounds in March, April (dry season), July (end of dry season) and November (end of rainy season) 2007 fingerprints of nomadic women who were encountered on random transects were scanned. Health and demographic data from them and their children (aged 1 day to 12 years), as well as GPS coordinates, were registered. Women were automatically recognised by a biometric information system (BIS) at a consecutive encounter. **Figure 2** shows the concept of the combination of different tools and methods. In 104 nomadic camps we registered 915 women and 2287 children; 21 women we encountered twice. **Map 1** shows the distribution of encounters with women from the three ethnic groups for each of the 4 rounds. **Map 2** shows the locations of women encountered twice. The arrows illustrate the distance between two encounters.

We show the feasibility of the use of a biometric fingerprint identification system in a highly mobile pastoralist context and

propose a combination of BIS, Geographic information system (GIS), epidemiological and population modeling methods to contribute to a health and demographic surveillance system of highly mobile people.

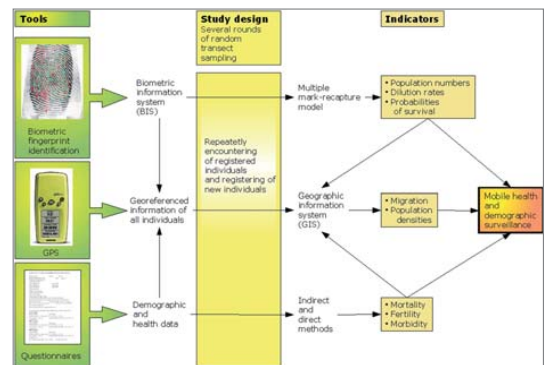
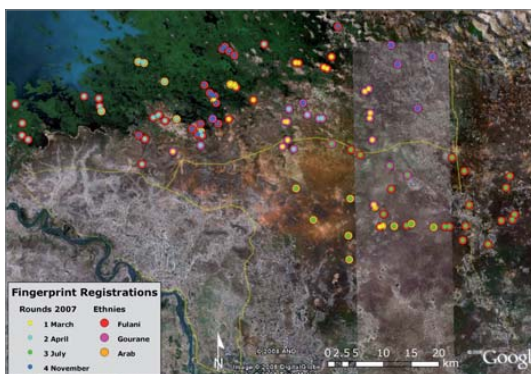
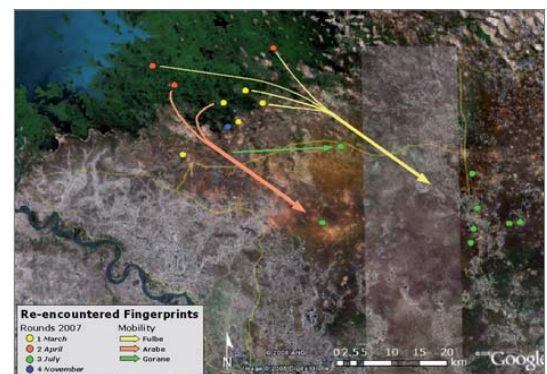


Figure 2: Overview of tools and methods applied (Weibel 2008)



Map 1: Distribution of fingerprint registrations (Weibel 2008)



Map 2: Distribution of re-encountered fingerprints (Weibel 2008)

Citizenship and Nationhood in 20th Century Côte d'Ivoire

Henri-Michel Yéré, University of Basel, Switzerland

In March 2007, the Ouagadougou Agreements signed between the Government of President Laurent Gbagbo and the Forces Nouvelles led by Guillaume Soro put an end to the most violent conflict in the history of independent Côte d'Ivoire. Begun in September 2002, the war resulted in the division of the country into two antagonistic blocks. Among the many reasons for this unfortunate state of affairs were different understandings of what it means to be an Ivorian.



Figure 1: Map showing Côte d'Ivoire in 1935 as colony during the autochthony debate



Figure 2: A newspaper's headline in December 1964 during the nationality debate

A Historical Inquiry

This research project aims to shed light on debates over the contentious question of what it has meant and still means to be an Ivorian, by providing a documented understanding of the political history of citizenship and nationhood in Twentieth-Century Côte d'Ivoire. Going back to the 1930s, its main objective is to trace the evolution of the feeling of belonging to the Ivorian ensemble.

The analysis is centred on *moments* that have marked important stages in the thinking and the practice of nationhood and citizenship in Côte d'Ivoire:

1930-1945: The Autochthony Debate

Marked by the birth of the first *associations d'originaires* (UFOCI, ADIACI), which defended the rights of "Côtivoiriens" in the heyday of colonial supremacy.

1956-1966: The Nationality Debate

After the granting of autonomy (1956) and Independence (1960), an Ivorian nationality appeared in the international legal system. In 1966, an attempt to create a supra-nationality (*Double Nationalité*) between Francophone West African States was defeated by the Ivorian elite.

1993-1999: The *Ivoirité* Debate

After the death of the country's first president Houphouët-Boigny in 1993, his successor created the concept of *Ivoirité*. For some this was a cultural synthesis of the "Ivorian Personality", for others *Ivoirité* was synonymous with the exclusion of some Ivorians (from the North as well as naturalised Ivorians) from the political process. A military coup opened the gates to political uncertainty in December 1999.

It is by going to the roots of the making of the national idea in Côte d'Ivoire that this project offers valuable insights into possible ways to achieve a consensus on nationhood.

International Conference on Research for Development, 2-4 July 2008

Programme

Conference venue: University of Bern, Main building, Hochschulstrasse 4, CH-3012 Bern, Switzerland

Wednesday 2 July 2008

From 9:00	Registration / coffee and tea				
10:30 – 12:00	Opening session				
12:00	Standing lunch				
13:00	JACS posters presentation / movies				
14:00 – 15:30	Parallel session 1.1 Business, conflict and peace from a sectoral perspective	Parallel session 1.2 Migration and multilocal livelihoods	Parallel session 1.4 Enhancing the compatibility of ecology and development	Parallel session 1.5 Inspirations 1: Modernities and selling development	Parallel session 1.6 International Year of Sanitation
15:30	Coffee and tea break / JACS posters				
16:00 – 17:30	Plenary session: Health, vulnerability, resilience, and environmental sanitation Moderation and synthesis: David Bradley, London School of Hygiene and Tropical Medicine Keynote speakers: Chongrak Polprasert, Asian Institute of Technology; Susan Smith, Caminamos Juntos				
Evening	Reception				

Thursday 3 July 2008

08:30 – 10:00	<p>Plenary session: Livelihoods and globalization Moderation and synthesis: Roger Jeffery, University of Edinburgh Keynote speakers: Leo de Haan, Leiden University; R. Ramakumar, Tata Institute of Social Sciences</p>					
10:00	Coffee and tea break / external posters					
10:30 – 12:00	Parallel session 2.1 Conflicts, resources and institutions	Parallel session 2.2 Negotiating rural livelihoods	Parallel session 2.3 Creating value from sanitation	Parallel session 2.4 Alleviating poverty in challenging environments	Parallel session 2.5 Inspirations 2: Mobility shaping development spaces	Parallel session 2.6 Learning for sustainability
12:00	Standing lunch					
13:00	External posters presentation / movies					
14:00 – 15:30	Parallel session 3.1 Governance, natural resources and sustainable development	Parallel session 3.2 Building inclusive cities	Parallel session 3.3 One health: Bridging the gaps in health services delivery	Parallel session 3.4 Building knowledge with innovation in science	Parallel session 3.5 Inspirations 3: Uncertainty and managing development	Parallel session 3.6 Sustainable development in mountains
15:30	Coffee and tea break / external posters					
16:00 – 17:30	<p>Plenary session: Governance, statehood and conflict transformation Moderation and synthesis: Lothar Brock, Johann Wolfgang Goethe-Universität Frankfurt Keynote speakers: Richard Chase Smith, Instituto del Bien Comun; Frances Stewart, University of Oxford (CRISE)</p>					
Evening	Special event					

Friday 4 July 2008

08:30 – 10:00	<p>Plenary session: Natural resources in sustainable development Moderation and synthesis: Michael Stocking, University of East Anglia Keynote speakers: Peter Messerli, University of Bern; Anette Reenberg, University of Copenhagen</p>					
10:00	Coffee and tea break / NCCR posters					
10:30 – 12:00	<p>Plenary session: Research approaches and methodologies for sustainable development Moderation and synthesis: Christian Pohl, Swiss Academy of Sciences Keynote speakers: Jill Jaeger, Independent Scholar, former Executive Director of IHDP; Jakob Zinsstag, Swiss Tropical Institute</p>					
12:00	Standing lunch					
13:00	NCCR posters presentation / movies					
14:00 – 15:30	<p>Panel on Research for Development Moderation: Ulrike Müller-Böker, Head of Human Geography Unit, University of Zurich Panelists: Salome Misana, Dar es Salaam University College of Education; Susan Thieme, NCCR North-South, University of Zurich; Manuel Flury, Swiss Agency for Development and Cooperation (SDC); Narasimha Reddy Duvuru, University of Hyderabad; Bernhard Wehrli, ETH Zurich and EAWAG</p>					

Conclusion of Conference
Hans Hurni

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About the NCCR North–South

The NCCR North-South is one of twenty National Centres of Competence in Research currently supported by the Swiss National Science Foundation (SNSF). It was created in the understanding that development research and cooperation are matters of primary concern to Switzerland. The purpose of the NCCR North-South is to create an institutional structure for sustainable development studies in Switzerland. Additional substantial funding for research and cooperation projects in developing and transition countries is provided by the Swiss Agency for Development and Cooperation (SDC).

Since its inception in 2001, the NCCR North-South has established a worldwide research network including seven institutional partners in Switzerland and some 140 research centres, universities and development organisations in Africa, Asia, Latin America and Europe. Approximately 350 researchers worldwide contribute to the activities of the NCCR North-South.

The NCCR North-South supports research on issues relating to sustainable development, particularly in developing and transition countries, but also in Switzerland. The most salient features of the program are:

- North-South partnerships for scientific research
- Integration of disciplinary, interdisciplinary and transdisciplinary research
- Interactive exchange of development research and practice
- Research on problems and potentials of global change

Research conducted under the auspices of the NCCR North-South is coordinated so as to allow for policy-oriented comparative analysis of pathways and potentials for mitigating the effects of global change that hinder sustainable development.

As a contribution toward the strengthening of research capacities in partner regions, the NCCR North-South also conducts a programme of regional and interregional education and training workshops.

NCCR North–South Dialogues Series

- 1 *Human and Animal Health in Nomadic Pastoralist Communities of Chad: Zoonoses, Morbidity and Health Services.* Esther Schelling. 2002¹, rev. 2007²
- 2 *Understanding Institutions and Their Links to Resource Management from a New Institutionalism Perspective.* Tobias Haller. 2002¹, rev. 2007²
- 3 *Dialogue Workshop Methodology: Adapting the Interactive Problem–Solving Method to an Environmental Conflict.* Simon A. Mason. 2003¹, rev. 2007²
- 4 *The Globalisation Discourse.* Norman Backhaus. 2003¹, rev. 2007²
- 5 *Reforming Agriculture in a Globalising World – The Road Ahead for Kerala.* K.N. Nair, Vineetha Menon. 2004¹, rev. 2007²
- 6 *Simen Mountains Study 2004.* Eva Ludi. 2005¹, rev. 2007²
- 7 *“Should I Buy a Cow or a TV?” Reflections on the Conceptual Framework of the NCCR North–South.* Christine Bichsel, Silvia Hostettler, Balz Strasser. 2005¹, rev. 2007²
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“In view of the increasing role the sciences have to play in dealing with the issues of environment and development, it is necessary to build up scientific capacity [...] – particularly in developing countries – to enable them to participate fully in the generation and application of the results of scientific research and development concerning sustainable development.”

From the UN Agenda 21

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