



International Conference on Research for Development (ICRD 2012)

Research for Global Transformation

Pre-conference Proceedings
University of Bern, Switzerland
20-22 August 2012

NCCR North-South Dialogue, no. 44
2012

dialogue

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The NCCR North-South (Research Partnerships for Mitigating Syndromes of Global Change) is one of 27 National Centres of Competence in Research established by the Swiss National Science Foundation (SNSF). It is implemented by the SNSF and co-funded by the Swiss Agency for Development and Cooperation (SDC), and the participating institutions. The NCCR North-South carries out disciplinary, interdisciplinary and transdisciplinary research on issues relating to sustainable development in developing and transition countries as well as in Switzerland.

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Citation

NCCR North-South. 2012. *International Conference on Research for Development (ICRD 2012): Research for Global Transformation*. Pre-conference Proceedings. University of Bern, Switzerland, 20–22 August 2012. NCCR North-South Dialogue 44. Bern, Switzerland: NCCR North-South.

Series Editing

Anne B. Zimmermann, NCCR North-South

Acknowledgements

This volume of Conference Pre-proceedings was conceptualized and prepared by the ICRD conference secretariat: Natalie Schäfer, Andrea Landolt, Thomas Breu, Hans Hurni, and Urs Wiesmann. We would like to thank all authors of abstracts and posters for their contributions to this volume. Our thanks also go to Marlène Thibault, Anu Lannen, Stephan Zach, and Anne B. Zimmermann for editing the abstracts; to Moritz Schönbacher for his careful compilation of the volume; and to Mirjam Lazzini for processing and printing the posters.

Cover photo

Traditional farmhouses coexist with high-rise buildings constructed in the early 1970s on the outskirts of Bern, Switzerland. (Photo by Natalie Schäfer)

Distribution

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1 Introduction

Background and scope of the ICRD 2012

In order to make global transformation a reality, societies in the global North and South will need to agree to work towards sustainable development together. This requires mutual understanding of one another's values and norms, adequate political tools, more cooperation, mutual respect for cultural diversity, and sustainable use of natural resources. Among the tools that have proved adequate to achieve these goals are inter- and transdisciplinary approaches and North–South research partnerships.

The International Conference on Research for Development (ICRD 2012) is organised by the Swiss National Centre of Competence in Research (NCCR) North-South. The NCCR North-South involves over 350 individuals at more than 150 institutions in over 40 countries worldwide. These individuals and institutions are eager to learn from other programmes' experiences, to share their own insights, and to help shape research policy for the future.

The 3rd ICRD on Research for Global Transformation is the NCCR North-South's last major event, and, as such, will be a showcase for what the 12-year programme has achieved since it was launched in 2001.

The conference will bring together more than 300 researchers and representatives from development agencies, civil-society organisations, and the private sector to discuss experiences with research partnerships and with inter- and transdisciplinary approaches.

The ICRD 2012's main objectives are to:

- Share and discuss the most recent insights on development-oriented research conducted in North–South partnerships;
- Outline an agenda for research partnerships with developing and transition countries in support of more equitable and sustainable global transformation.

Conference themes

The conference programme includes keynote speeches, plenary sessions, poster presentations, and parallel workshop sessions on specific topics, offering presenters and participants an opportunity for productive exchange. Contributions are grouped around four major themes:

1. Tackling global change: enhancing positive and minimising negative effects

Never in history has human development altered the Earth's bio-physical setting and social contexts more than at present. On the one hand, the resilience of natural resources is diminishing, and changes in climate, land use and land cover, water use, and biodiversity have been mostly negative. Given global trends for the coming 40 years, the resilience of the entire Earth's life support systems are at stake. On the other hand,

many processes of global change that relate to human development have been positive, despite persisting demographic growth and an absolute increase of the number of people affected by poverty. These processes are agents of change that can be used for furthering global transformation.

2. Reducing disparity: narrowing regional, social, and individual inequalities

Poverty and social disparity are major global problems that begin in local settings, and become more pronounced up-scale. Closing social gaps, supporting people in migration, working on gender imbalances, and developing multi-scale and multi-level approaches are important fields for research for global transformation.

3. Enhancing diversity: fostering cultural and natural heritage

Globalisation is often seen as a process where “global” rules and conventions override local cultural or religious norms and practices, and where natural resources are commodified and lose their intrinsic value and other functions. Maintaining cultural as well as natural diversity is of high significance for global sustainability; research partnerships are particularly suitable to address such values. An agenda for global transformation must take diversity into account.

4. Enabling research in global transformation: learning from current experiences

Since 2001 the National Centre of Competence in Research (NCCR) North-South has been conducting research in partnerships between Switzerland and developing and transition countries. Besides building individual capacity, the 12-year programme has been using disciplinary, interdisciplinary, and transdisciplinary approaches. These experiences can be compared with other programmes worldwide and pursued in the past, active at present, or planned for the future.

Pre-conference proceedings

The present volume contains abstracts of all keynote speeches and papers to be presented at the conference. They follow the order of the conference’s four main themes and corresponding sessions, and can be found in section two. Section three contains session-related posters and the posters presented by current NCCR North-South PhD candidates. At the end of the volume, the conference programme and an author index are meant to help readers locate abstracts and posters that are of particular interest to them.

The conference organisers thank all authors for their abstracts and 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 transformation issues both during the conference and beyond.

2 Abstracts of keynotes and parallel sessions

The papers in this section are ordered thematically, according to the four overall themes dealt with during the conference. For each theme, abstracts of the two keynote speeches are followed by the abstracts of the corresponding thematic parallel sessions in alphabetic order by authors.

Theme 1

Tackling global change: enhancing positive and minimising negative effects

Keynotes: Allen Lavell and Peter Verburg
Sessions: parallel sessions 1–9

Theme 2

Reducing disparity: narrowing regional, social, and individual inequalities

Keynotes: Abid Suleri and Shahra Razavi
Sessions: parallel sessions 10–18

Theme 3

Enhancing diversity: fostering cultural and natural heritage

Keynotes: Peter Edwards and Luis Tapia
Sessions: parallel sessions 19–21

Theme 4

Enabling research in global transformation: learning from current experiences

Keynotes: John Young and Hassan Mshinda
Sessions: parallel session 23–29

Information: On page 276 you will find a more detailed programme (including time and location). The full programme has been prepared as a separate booklet.

If you are looking for a specific presentation, please consult the index on pages 279–292, which lists the first authors of all abstracts alphabetically.

Theme 1, Keynote 1 Transformation of Landscapes at the Interface of Global and Local Processes of Environmental Change

Peter H. Verburg¹

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Global environmental change is driven by changes in human–environment interactions resulting from demographic and socioeconomic changes. At the same time, development and societal change can be largely influenced by changes in the local and global environment. Strong spatial variation in the impacts of global change processes not only depends on the nature and strength of these impacts, but also on the spatial variation in vulnerability of places and people affected by these changes.

Land system change is key to global environmental change and a direct reflection of human–environment interactions across multiple spatial and temporal scales. Variations in land use history and cultural and environmental conditions have resulted in spatial and temporal differences in decision making and governance structures; this, in turn, has led to regional and spatial variability of impacts of global processes on local development and sustainability.

The driving factors of global change operate across different scales: localised changes in consumption patterns or the state of the environment have impacts at distant locations through the flow of water, the climate system, migrations of people, and trade of commodities. The concept of *teleconnection* in atmospheric science has been used to describe changes in one location that have an impact on the climate hundreds and even thousands of kilometres away.

Conversely, social scientists have long studied economic globalisation, which involves socioeconomic interactions between distant human systems. *Telecoupling* refers to both socioeconomic and environmental interactions between coupled human–environment systems across borders and distances, a notable example being large-scale international land acquisitions. Such global telecoupling affects human well-being through changes in the provisioning of ecosystem services.

New methods in land science aim to investigate the respective roles of global processes and the influence of local contexts as determinants of land system change, combining local case studies, multi-agent models, and global assessments.

This presentation will aim at introducing a number of these new research methods and discussing the role of variation in human–environment interactions, including adaptation to global change, in land system research. An important direction is the representation of land change by the changes in land systems. Land systems represent the composition, management, and ecosystem service provision of landscapes. Therefore, land systems go beyond the traditional focus on land cover change. Such integrated, multi-scale land change research will better help design alternative pathways of governing the Earth system and sustainable development.

Theme 1, Keynote 2

Climate Change: Disaster Risk Management and Adaptation for Enhancing Sustainability and Reducing Negative Impacts

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Climate change is real and is likely to alter the prevailing patterns of climate variability over time in different parts of the world. From a baseline of changing climate averages, both extreme events and other events lower on the intensity scale are likely to also change with regard to their intensity and recurrence, and some areas of the world not previously affected may be affected in the future. Along with increased hazardousness of some places and vulnerability of associated economies and societies, climate change will also bring benefits to certain areas. Although certainty as to the probability of future change is high, great uncertainty exists regarding the what, where, when, how much, and with what periods of return climate extremes and non-routine events will occur. This goes far beyond uncertainty regarding climate patterns under stationary climate and experienced historically.

Patterns of change in climate averages and climate extremes, anomalies, and non-routine events will demand new research formats and questions, planning, methodologies, and strategic approaches, and a different management of uncertainties in order to contribute to human and environmental sustainability, and thereby reduce the negative impacts of climate change, stabilising or increasing the overall resource base of society. Amongst the most salient and relevant planning formats those associated with disaster risk management (DRM) and climate change adaptation are likely to be of particular importance. The fact that both changing norms or averages and changing extremes or non-routine events will possibly now contribute to increased stress and risk in society signifies the need for a widening of the basis of disaster risk management in the future. In the present paper we hope to elucidate or polemicise the principle challenges to be faced in instrumenting adequate future DRM and adaptation to promote sustainability. These challenges are of a research-action and policy-instrumentalisation type, where definition of needs and opportunities can only be successful if they are supported by an adequate conceptual framework for considering change, stress, and risk. The principle aspects of such a framework will also be developed in this paper.

Theme 1, Session 1 Key Global Challenges in Water and Sanitation from the Perspective of the NCCR North–South

**Guéladio Cissé¹, Thammarat Koottatep², Ibrahima Sy³, Christian Zurbrügg⁴,
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Lack of safe drinking water and sanitation facilities is among the root causes of hunger, disease, mortality and poverty throughout the developing world. For this reason, two of the targets set under the Millennium Development Goals to be achieved by 2015 are to reduce by half the proportion of people without sustainable access to safe drinking water and without basic sanitation.

The use of improved drinking water sources in developing countries does not guarantee that people have access to safe drinking water; from the different water sources to transportation means and household storage facilities, the water can be affected by various forms of contamination. The Joint Monitoring Programme (JMP) for water and sanitation of the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) is still seeking a feasible way to monitor the effective quality of water at all water points from source to use. Moreover, in developing countries wastewaters and excreta from different sources are rarely discharged into a functioning sewage system, nor do they reach an adequate treatment plant. Instead, they are often discharged directly into the natural environment, such as surface waters (e.g. rivers, lakes, lagoons, and the sea), forests, and open fields. In poor, densely populated urban slum areas, wastewater frequently remains on site and in close proximity to the inhabitants. Wastewater is increasingly re-used, particularly for agriculture and aquaculture at the urban–rural interface. Safe use of wastewater and the general needs of health protection pose many challenges to health and wellbeing.

This session will focus on two major global water challenges – drinking water quality monitoring and wastewater management – as well as their respective cumulative links with health. The session will consist of contributions from the NCCR North South, of which two will focus on drinking water issues and two on concerns related to wastewater. Following the presentations, two invited discussants will relate this NCCR North-South research to the process of setting the Joint Monitoring Programme's post-2015 agenda.

Theme 1, Session 1 Determining and Evaluating Behaviour Change Techniques in the Water, Sanitation, and Hygiene Sector

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Public health practitioners increasingly agree that it is not enough to provide people with water and sanitation hardware. It seems evident that an approach is needed to tackle the “software” – that is, to ensure the necessary behaviour change along with the hardware. Presentations in this session will demonstrate the useful application of a systematic methodology of behaviour change based on a psychological approach in different projects in the water, sanitation, and hygiene sector.

The first presentation (Mosler) will introduce the setup of the methodology and the RANAS (Risk, Attitudes, Norms, Abilities, and Self-regulation) model of behavioural change. The second presentation (Inauen and Mojahidul) will show the effectiveness of different evidence-based behaviour change techniques in augmenting arsenic-safe water consumption in Bangladesh. The third contribution (Kamara Tumwebaze) presents behaviour change interventions for toilet cleaning in slums of Kampala (Uganda) developed from the results of a survey which was based on the RANAS model. The fourth presentation (Contzen and Mosler) reveals the success of different health promotion activities in Haiti conducted after the catastrophic earthquake of 2010. The last contribution (Huber and Lemma) demonstrates the effectiveness of behaviour change techniques in increasing the consumption of fluoride-free water in rural Ethiopia.

All of these presentations validate the usefulness of the psychological approach in enhancing our knowledge about determinants of behaviour change – knowledge that is indispensable for improving public health campaigning.

Groundwater Quality and Students' Health Status in Residential Areas of Bonamoussadi, Yaoundé (Cameroon)

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In Yaoundé, the limited coverage of the piped-water network and frequent interruptions in the supply of tap water have led populations to rely on water from springs and wells for domestic chores and drinking. Within the framework of the Institutionalisation de l'Approche Ecosystème et Santé Humaine en Afrique de l'Ouest et du Centre (COPES-AOC) and the Swiss National Centre of Competence in Research (NCCR) North-South, a study was conducted between 2009 and 2011 in Bonamoussadi, Cameroon, to identify the prevalence of water-related diseases among students of the University of Yaoundé I that live in densely populated residential areas, as well as to find the sources, pathways, and factors contributing to water contamination in local wells and springs.

The study revealed that up to 73% of students suffered from water-related diseases within six months of the study. Stomach pains were the most frequent complaint attributed to consumption of poor-quality water (37%), followed by malaria (32%), typhoid fever (12.3%), and amoebiasis (10.3%). The study also revealed generally poor sanitation at groundwater supply facilities, with 87% of the water points analysed displaying "high contamination risk" or worse. Total sanitation risk was directly linked to the level of contamination. Frequency analyses of the data revealed a strong association between the degree of faecal contamination and the presence of uphill latrines and/or other sources of contamination such as solid waste. No strong association was found between the degree of contamination and the design of facilities or their default construction (localised pathways).

Contributing factors such as the use of contaminated buckets to extract water from wells and animals' use of springs were identified as major sources of risk. Participatory approaches to addressing these factors may contribute to improving the sanitary and health conditions in the area.

Vulnerability and Capacity to Adapt Water Supply Facilities to Climate Change in Developing Countries

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Climate change has emerged as one of the major challenges in today's world, resulting in extreme weather events such as tropical cyclones, heavy precipitation events, drought, and extreme heat events. Most parts of the world have seen an increase in the frequency of heavy precipitation events causing floods and landslides. The world is not on track to achieving the Millennium Development Goal (MDG) target of halving the proportion of the population without sustainable access to safe drinking water and basic sanitation by 2015, given that about 1.1 and 2.5 billion people still lack access to safe drinking water and improved sanitation, respectively. In this context it is likely that there will be a setback in the progress towards preventing water supply facilities from being destroyed or damaged due to climate change events.

Despite significant improvements in providing access to water supply in the past decades, climate change could have tremendous effects on water supply facilities, especially in the case of poor sanitation infrastructure. Overflow of sanitation infrastructure such as sewer networks, or of onsite facilities such as pit latrines or cesspools in the context of flood events would cause a serious threat to human health due to vast distribution of water-borne diseases. Developing countries are the most vulnerable to these impacts since they have limited access to social, technological, and financial resources. Rapid urbanisation with inadequate and poorly managed water supply and sanitation infrastructure, in conjunction with expansion of informal settlements, further exacerbates risks.

This contribution presents a case study in Thailand, where the devastating floods in late 2011 not only damaged infrastructure but also had detrimental impacts on people's livelihoods due to a lack of safe drinking water for months. Even in a metropolitan city like Bangkok, the disruption of water supply facilities has triggered intense public concerns as to tap water being contaminated with various kinds of pollutants due to uncontrolled distribution of garbage and human excreta, including industrial wastes.

Equitable Access to Water in Multi-water Supply Systems of Bouaké, Côte d'Ivoire

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Equity is a principle of fairness that varies according to the values of each society. While everyone may not possess equal shares of a given resource, they must all have acceptable access. Access to safe water and adequate sanitation facilities are prerequisites for human health. Unfortunately, around a billion people lack such access, mainly those living in poor urban areas of developing countries. Equitable access to safe water is a key Millennium Development Goal (MDG).

In Bouaké, the water supply is intermittent. To mitigate this irregularity, people use or combine several water supply systems. While this improves their access to water, it also creates further inequities. The objective of this study was to analyse equity indicators for these types of diversified systems. A one-time questionnaire was administered to 384 households: 200 in Sokoura and 184 in Oliénoù. Ten indicators were used to assess the equity of the different water supply systems.

Four water systems were used in Sokoura: individual public taps; associated public taps and buying water; a water distribution system with wells; and wells alone. Three water systems were used in Oliénoù: drinking fountains; drinking fountains and wells; and wells alone. Our results showed that only 49% of Sokoura residents have access to water via an individual connection to public water supplies; further, 22% of the area requires an extension of the water distribution network to enable access. In Oliénoù, drinking fountains cover only 12% of water consumption. The difference between the proportion of households that have acceptable access to water and those that do not was statistically significant for 8 of 10 indicators with regard to the water supply systems, showing that the diversity of water supply systems increased inequities. Our multi-criteria equity analysis revealed Oliénoù's predominant wells to be the most equitable water system in such contexts.

Wastewater and Health in Urban–Rural Interfaces: Case Studies in West Africa and Southeast Asia

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Poor hygiene, sanitation, and water quality are responsible for an estimated loss of between 1.7 and 2.4 million human lives annually and cause 54.2 million disability adjusted life years (DALY). Diarrhoea caused by unsafe water accounts for an estimated 19% of deaths among children under five. The majority of this health burden falls on poor people in developing countries. The situation is most critical in highly dynamic contexts of urban–rural interface: in poor and densely populated slum areas that are treated as “backyard” urban wastewater disposal and reuse areas, with severe consequences for human health and local ecosystems. In these contexts and others, wastewater may harm people through direct contact, ingestion, or inhalation; it may also harm them through indirect exposure pathways such as by consuming vegetables or fish/shellfish harvested in contaminated water.

This presentation summarises the results of a comprehensive review of the cumulative health effects of wastewater in contexts of urban–rural interface. It draws on research evidence and experience gained in West Africa and Southeast Asia in the framework of the Swiss National Centre of Competence in Research (NCCR) North-South. The results of microbiological analysis from the two regions revealed contamination of water bodies with faecal coliforms (FC), faecal streptococci (FS), and *Salmonella* spp due to wastewater reuse. In the majority of samples, the levels of bacteriological pollution in all types of water were above the acceptable thresholds of 1,000 FC per 100 ml as recommended by the World Health Organization in regards to irrigation of vegetables. Many samples displayed very high contamination levels of 9.4 E7 FC/100 ml.

The negative impact of wastewater on human health was confirmed by epidemiological investigations. In some contexts, direct contact with wastewater (e.g., on the part of farmers) was the principal risk factor explaining about 35% of cases of illness. Important seasonal and spatial differences were also found regarding wastewater pollution. More capacity building and policy action are urgently needed to assess the health impacts of wastewater disposal and reuse in contexts of urban–rural interface.

Evidence-based Behaviour Change Interventions: Increasing Safe Water Consumption in Rural Ethiopia

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Worldwide, around 200 million people rely on drinking water contaminated with an excess of fluoride. In Ethiopia 8.5 million people are at risk of developing dental and skeletal fluorosis resulting from excessive fluoride uptake through water. Since medical treatment of the disease is difficult and mostly ineffective, the prevention of fluoride intake becomes essential.

In the investigated area, a community fluoride removal filter was installed. In a baseline survey in September 2010, 173 face-to-face interviews were conducted to identify enhancing and hindering factors of filtered water consumption. Two behaviour change campaigns were applied after the baseline: one intervention was designed based on the results obtained from the baseline survey targeting people's perceived costs, the other was based on the common NGO approach targeting perceived vulnerability. The interventions were tailored to the households' requirements (high perceived costs or high vulnerability). The campaigns were evaluated using a survey and analysed as to their effectiveness in changing behaviour and the targeted psychological factors. For the analysis of change over time, non-parametric tests were performed. The intervention on perceived costs decreased price perception and increased the consumption of fluoride-free water. The vulnerability intervention showed no effects, neither influencing perceived vulnerability, nor increasing consumption behaviour.

The results show that evidence-based interventions are more effective in changing behaviour than interventions based on the common NGO approach. Finally, the study showed that if interventions are tailored to households' needs, they show stronger effects in changing behaviour than if they do not fit the target group. Our main conclusions drawn from this study are that (1) with behaviour change campaigns, behaviour can be changed without changing objective barriers, (2) intervention campaigns should be designed based on evidence, and (3) campaigns should be tailored to the target group.

Behaviour Change Techniques to Enhance Arsenic-safe Water Consumption in Bangladesh

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Many arsenic-safe drinking water options have been installed in Bangladesh to mitigate arsenic contamination. However, despite awareness campaigns, not all of these options are being used by the population. Interventions based on health psychological theory are likely to increase effects of awareness or informational interventions targeted at safe water consumption. The aims of this study are to identify behavioural factors associated with consuming arsenic-safe water, and to develop effective theory-based interventions to target these factors.

Behavioural factors from health psychological theory related to consuming arsenic-safe water were determined with structured household surveys in rural Bangladesh. Study 1 (N=396) was conducted in Monoharganj, where deep tubewells provide arsenic-safe water. Study 2 (N=379) was conducted in Shivalaya, where the density of arsenic contamination is lower and allows for well-switching (i.e. using neighbouring arsenic-safe tubewells). Logistic regressions indicated that the following factors are associated with arsenic-safe water use: commitment, descriptive norm, self-efficacy, knowledge, and vulnerability. To target these factors, a set of interventions was developed: reminders, implementation intentions, and public commitment. The behaviour change effects of combinations of these interventions with risk information were then tested in two cluster-randomised controlled trials.

In Study 1, in line with our hypotheses, information alone led to smaller behaviour change than reminders and information (11.8% vs. 29.1% of households switched to arsenic-safe options). Implementation intentions with reminders and information, in turn, led to greater behaviour change than reminders alone (41.4% switched). The combinations of all interventions with public commitment were most effective (65.1% switched). These results were replicated in Study 2, except for the public commitment intervention; this did not lead to more well-switching than the information-only intervention (18.1% switched). The results of this study suggest that interventions based on health psychological theory can greatly enhance effects of informational interventions.

A Systematic Approach to Behaviour Change

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Behaviour change is the result of psychological processes within the individual. Consequently, in health promotion campaigns one has to take into account how the relevant factors can be tackled using behavioural change techniques.

This paper presents the RANAS (Risk, Attitudes, Norms, Abilities, and Self-regulation) model of behavioural change, which postulates that for the formation of new habitual behaviour, five blocks of factors must be positive with regard to the new behaviour: risk factors, attitudinal factors, normative factors, ability factors, and self-regulation factors. Standardised tools for measuring the factors in face-to-face interviews are presented, and behavioural interventions are provided for each factor block

A statistical analysis method is presented which allows determining the improvement potential of each factor. The corresponding behavioural interventions can be selected according to the model. The proposed eight-step protocol for conducting behaviour change campaigns depicts the most important steps required to induce behaviour change in the water and sanitation sector in a systematic way.

Developing Behaviour Change Techniques Targeting Cleaning by Users of Shared Toilets in Kampala Slums

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Access to improved sanitation is a key health indicator as it is a measure to prevent the outbreak of diseases such as diarrhoea. While physical sanitation facilities are the first step to ensuring proper human excreta disposal mechanisms, behavioural aspects in their use and maintenance are equally important. In situations where sanitation facilities exist but are shared among a number of families, maintaining cleanliness is often a challenge. Yet inadequate cleanliness is an important risk factor regarding infections and mortality from sanitation- and hygiene-related diseases. A cross-sectional study was thus conducted in the slums of Kampala to assess the cleanliness of shared toilets. The aim of the assessment was to develop behaviour change techniques targeting cleaning by users of shared toilets.

Household questionnaires were administered to 1500 respondents from 50 randomly selected slums. The assessment tool was developed based on selected components of the RANAS (Risks, Attitudes, Norms, Abilities, and Self-regulation) model of behavioural change. Regressions on habits and cleaning intentions by the users of shared toilets were analysed.

Out of the 1013 household respondents who reported using shared toilets, close to one half (46.1%) were using dirty toilets and slightly less than one quarter (21.9%) reported using neither clean nor dirty toilets. Some habits and intentional factors influencing cleaning behaviours included strength required for keeping the toilet used clean (intention), others' perceptions of one leaving a facility dirty (normative), perceived disgust of leaving a toilet dirty (cognitive), talking to other toilet users about the importance of keeping it clean (expressed cleaning demand), ease/difficulty in keeping a toilet clean (abilities), and perceived goodness/badness of using a dirty toilet (attitude).

Entry factors for development of cleaning behaviour change techniques included talking to other toilet users about the importance of keeping it clean, others' perceptions of one leaving a facility dirty, and ease/difficulty in keeping a toilet clean.

Theme 1, Session 2 Pathways to Sustainable Bioenergy

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Global change calls for a fundamental transformation of the current fossil-fuel-based energy system to new forms of energy provision. Energy from biomass already covers more than 10% of global demand and more than 90% of demand in some developing countries, giving it a potentially important role in decarbonising today's energy system. There is, however, considerable controversy about the social and environmental risks that increased production and use of bioenergy might cause: bioenergy production augments pressure on labour and natural resources and competes with food production, thus reducing food security.

Production and use of bioenergy can only be sustainable if food and energy security, economic benefits and challenges, and possible impacts on natural resources are all taken into consideration. Adequate and up-to-date knowledge and information about realistic bioenergy value chains, as well as strong enabling policies and efficient technologies are needed to promote effective solutions capable of satisfying local to global needs.

This session aims to highlight achievements and limitations of current bioenergy systems and to point towards innovative and adapted solutions. Presentations will address ways in which bioenergy systems can contribute to tackling global change, with a particular focus on climate change mitigation and adaptation, energy security, food security, and rural development. They will highlight different bioenergy systems and explore possible energy pathways for rural and urban communities as well as national energy strategies of developing countries.

National and Local Perspectives on the Impacts of Biofuels on Food Security in Kenya

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The global increase in biofuel production and demand raises concerns about possible negative impacts of this development on food security. Competition for arable land and the rise or fluctuation of food prices are seen as the two major risks threatening the food security of vulnerable communities. Reasons for food insecurity are multi-dimensional, however, and are not always linked to the volume of food production or the prices of food items. Understanding the various drivers of food insecurity as well as the challenges faced by communities in specific contexts is hence necessary to comprehend possible impacts of biofuel development on food security.

The research presented here has two objectives: (1) to provide an overview of food insecurity levels and drivers at the national scale in Kenya and to derive conclusions regarding the potential impact of biofuel development on food security in the country; and (2) to assess food security and land cover change in three case study areas in Kenya to gain context-specific knowledge about the current impacts of *Jatropha curcas* production on food security at the community level.

Preliminary results reveal that levels and drivers of food insecurity in Kenya vary from region to region, are multidimensional, and are linked to several economic, ecological, sociopolitical, sociocultural, and land-use-management-related factors. Findings also indicate that the potential impacts of biofuels on food security are likely to be very different from one area to another. Research in the case study areas revealed that *Jatropha curcas* currently has no negative impact on food security, as it is cultivated only by food-secure farmers, who consider it as a venture crop. We conclude that (1) sustainable biofuel policies at the national level must take account of the diversity of food insecurity drivers in order to identify adequate solutions; and (2) that *Jatropha* is currently not negatively affecting food security in the three case study areas, as it is only cultivated by food-secure farmers as a venture crop. Nevertheless, as a matter of precaution *Jatropha curcas* should not be planted on plots; instead, priority should be given to hedges or food crops in order to avoid negative impacts on food security.

Jatropha: Green Gold? Life Cycle Assessment of Different Jatropha Bioenergy Systems in Eastern Africa

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The need to produce climate-friendly fuels, decrease fossil-fuel dependency, and create rural development opportunities has contributed to a significant increase in biofuel production. Current bioenergy feedstocks such as maize, sugar cane, and palm oil often have a significant negative impact on the environment and compete with food crops for agricultural land. In Eastern Africa, new hopes have been placed in *Jatropha curcas* L., which grows on marginal soils, tolerates droughts, and has seeds that contain high-quality non-edible oil. The oil can be used either to secure rural energy supply or as fuel for the national and international transport sectors. It is assumed that *J. curcas* can be cultivated in a more sustainable way than today's widespread energy crops mentioned above.

The objective of this study is to assess the greenhouse gas (GHG) emissions and the non-renewable energy demand linked to *J. curcas* cultivation, processing, and use in Eastern Africa. The calculation is based on the life cycle assessment (LCA) approach and data collected at case study sites in Kenya, Tanzania, and Ethiopia. The GHG results of *J. curcas* are benchmarked against fossil fuels and used to assess the potential of *J. curcas* for system optimisation. This information can serve as a scientific knowledge base for decision-makers.

The results indicate that the studied *J. curcas*-based energy system reduces GHG emissions by more than 40% as compared to fossil fuels. The GHG results are generally less dependent on where and how the fuel is used than on where and how *J. curcas* is cultivated. Especially the direct and indirect impacts of land use changes determine the GHG balance. The highest GHG reduction can be achieved if *J. curcas* is cultivated as fences, substituting deadwood fences. In addition to its favourable GHG balance, growing *J. curcas* as fences is also preferable over block plantations in terms of land opportunity costs and because it does not compete with food production.

Gold Standard Biogas VER Project: Renewables for Improved Livelihoods and Conservation

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Climate change brings about unprecedented challenges and impacts. Carbon financing comes as an opportunity to combat climate change for the benefit of people and nature. Carbon financing under the Clean Development Mechanism (CDM) was decided by all parties as one of the flexible mechanisms under the Kyoto Protocol in favour of developing countries. There are two CDM modalities: the first, under the compliance market, which is monitored by the UNFCCC, is issuing Certified Emission Reductions (CERs), and the second, under the voluntary market, which is not monitored by the UNFCCC, is issuing Voluntary (or Verified) Emission Reductions (VERs).

The WWF Nepal Gold Standard Biogas VER Project implemented in the Terai Arc Landscape (TAL) uses the voluntary market approach. Under this project, 7500 biogas plants are constructed across TAL, directly benefiting conservation and improving livelihoods of local people living in and around biodiversity hotspots. Initially, the resources for kick-starting the project and constructing the biogas plants were provided by the WWF network. This gold standard project is taken as an example by the WWF network and many conservation institutions as a way forward for long-term conservation through carbon financing.

The biogas project will offer credits for 21 consecutive years, starting from 2007, in three intermittent periods of seven years each. The project has been validated and the first verifications for 2007 and 2008 accounted for 12,125 tonnes of CO₂-equivalent from 2685 plants. The second verification for 2009 accounted for 13,606 tonnes of CO₂-equivalent from 3973 plants. MyClimate is the buyer of these credits and has offered 13.5 euros per ton of CO₂-equivalent.

Alongside creating a sustainable financing mechanism, the biogas project brings multiple benefits. It helps conservation efforts as it reduces the pressure on forests, provides health and sanitation benefits, and has spill-over social benefits such as saving time resources formerly used for collecting firewood and now using them for economic and social activities. The biogas enhances homestead cleanliness. All these benefits uplift the social status of beneficiaries.

Assessing the Drivers of *Jatropha* Adoption in Kenya and Its Contribution Towards Improving Rural Livelihoods

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Recent introduction of *Jatropha curcas* L. in Kenya was aimed at improving rural livelihoods by generating income and supplying sustainable, affordable, and locally produced energy. This study aims to examine and understand the drivers of *jatropha* adoption by smallholders in Kenya and to assess the impact of *jatropha* adoption on rural livelihoods. We hypothesise that capital assets play a major role in *jatropha* adoption, as they enable households to venture into new strategies.

Taking a sustainable livelihoods approach, we assessed who adopts *jatropha*, why and how adoption takes place, and what impact it has on rural livelihoods in three ecologically different study areas in Kenya (Kibwezi, Bondo, and Kwale). We also compared adopters and non-adopters in terms of asset endowment, and assessed the contribution of *jatropha* oil towards energy security of rural households.

Factors affecting adoption were found to be highly site-specific, with financial assets not having a significant influence as initially expected. We also conclude that *jatropha* production is currently not economically viable for smallholders except when planted as fences. However, *jatropha* oil has the potential to bridge energy supply gaps in rural areas. For this reason, we recommend the implementation of adequate policies and rural advisory systems on bioenergy to guide the development of *jatropha* production.

Theme 1, Session 3 Green Growth and Poverty Reduction

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Achieving “green growth” (new sources of employment and income which are environmentally sustainable, low carbon, and socially inclusive) is the new global imperative, and it is an urgent and challenging task. There is a huge demand for guidance and practical examples of successful policy interventions. While no single country can be said to have yet achieved green growth, many emerging economies – including China, India, Brazil – are implementing or experimenting with innovative policy approaches, and have succeeded in stimulating considerable amounts of investment and innovation by business as a result. So there is enormous scope to identify emerging lessons in real time, as policies are rolled out, so as to generate the policy and practical recommendations needed to promote green growth in other emerging and low-income countries.

ODI has started a collaborative four-year research and knowledge exchange programme together with the IPRCC and partners of GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit) in India to promote more informed policymaking by identifying and disseminating lessons for governments, donors, and the international policy community based on experience in emerging markets, in collaboration with research partners in China, India, and Brazil. The Programme aims to provide robust evidence on the existence of the (much vaunted, but as yet largely unsubstantiated) co-benefits or triple wins associated with green economy approaches and includes: (1) the identification of key policies and interventions promoting green growth in each country; (2) consultation with business, to understand the opportunities and constraints to investment, and the supporting policy requirements; (3) assessment of impact on income, poverty reduction, employment opportunities, poverty and the environment (including carbon emissions and natural resource use).

In this session I will present the concept of green growth, and provide some examples of the green growth opportunities that may arise in different sectors of the economy, including agriculture, forestry, energy generation, manufacturing, waste management, construction, and tourism. I will also discuss some of the policies that can be used to promote green growth. This session will therefore provide an introduction to the concept of green growth and associated policies, and the experience from China and India will then be discussed in subsequent presentations given by our partners from each of those countries.

Use of the Capability Approach to Question the Potential of PES for Poverty Reduction

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Through which mechanisms can Payments for Ecosystem Services (PES) reduce poverty in marginal communities? This presentation investigates this question, focusing on market-like PES that are gaining emphasis due to the UN REDD+ programme as well as the Green Economy paradigm. Such PES are often promoted as an instrument for increasing the well-being of local service providers in developing countries, but are also contested regarding their effect on sovereignty and their potential for increasing inequalities between participants in PES schemes. While the question of PES's impact on poverty has been examined in the literature, the focus has often been on increases in income and other assets. Power dimensions have not been explicitly investigated. They have only been considered regarding access to PES schemes and negotiation processes.

Based on a different concept of poverty, this contribution takes another approach to assessing poverty reduction processes: Amartya Sen's Capability Approach (CA). This framework considers people's freedoms to be and do what they value as constitutive of well-being and places these freedoms at the centre of its analysis, rather than focusing solely on means or the presence of assets. This enables accounting for sociopolitical constraints and power relations as well as different values and concepts of well-being constituents. This new conceptualisation of poverty also highlights questions of agency and autonomy of action by distinguishing between opportunity and process freedoms. There is no direct, causal relationship between PES and poverty reduction. Rather, depending on the context, PES can contribute either to an increase or a reduction of opportunity and/or process freedoms that are constitutive of well-being and "development".

Can Market Actors Help Solve Environmental Problems?

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Traditional natural resource economists generally conclude that markets do not manage natural resources well and that political processes do a better job. Free market environmentalists generally come to the opposite conclusion; they compare what perfect markets would do in theory with what imperfect governmental agencies, at their worst, have done in practice.

Free market environmentalism emphasises that incentives matter everywhere. According to its theories, the key to proper incentives is establishment of property rights that are well defined, enforced, and transferable. It also highlights the role of entrepreneurs in producing new property rights. However, it only considers economic values and ignores environmental values. It pays too little attention to the distribution of rights and ignores other important allocating institutions.

Properly designed and implemented, market-based instruments provide incentives for businesses and individuals to act in ways that further not only their own financial goals, but also environmental aims. Such instruments include pollution charge systems (e.g., the deposit-refund system), tradable permit systems, and market barrier reductions (e.g., market creation, liability rules, information programmes, eliminating government subsidies).

For example, market-based instruments have restored the sustainability of fisheries. All ocean fisheries are open access. Each fisherman receives the full benefit of aggressive fishing, and no one pays the full cost. Conventional regulatory approaches have not solved this problem. If the government limits the season, fishermen put out more boats. If the government limits net size, fishermen use more labour or buy more costly sonar systems. Sixteen countries have adopted tradable permits, called “Individual Transferable Quotas” (ITQs). It has been a great success, precluding overfishing and restoring stocks to sustainable levels.

Market actors can help solve environmental problems. Governments should try to correct market failures by restricting the discharge of pollutants, for example, or limiting access to open-access resources. Such government interventions can improve environmental welfare and lead to greater efficiency.

Policies to Achieve Inclusive and Sustainable Growth in India

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Green growth refers to a sustainable development paradigm that is inclusive in nature. The “green” approach must have the potential to deliver “triple wins”: economic, social, and environmental. When analysing policies and initiatives that strengthen green and inclusive growth in India, one needs to look beyond the obvious. There is no single policy that aims at restructuring the current growth trajectory. Rather, there are a number of initiatives in India, some of which focus on environmental aspects while others emphasise either the need for increasing inclusivity or economic performance. Accordingly, there is a fair mix of statutory and non-statutory initiatives.

India’s policy processes have undergone a transformational change in the last decade, with the focus moving away from economic growth and poverty alleviation exclusively and towards green and inclusive growth. India’s 12th Five Year Plan by the Planning Commission is a key umbrella policy that outlines the country’s national priorities for the next five years. The policy document points towards an increased focus on sustainability. Together with the National Action Plan on Climate Change (NAPCC, 2008), the Five Year Plan creates a framework for sustainability-oriented policy measures. While implementation remains difficult in most cases, the Indian government’s intent to work towards sustainable development is evident in a series of legislative, policy, and institutional measures, in addition to its participation in multilateral agreements. India is committed to fulfilling its environmental agreements that integrate environmental, social, and development concerns.

A research partnership between the Overseas Development Institute (ODI) and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) in India aims to analyse the recent policies and initiatives and perform real-time impact assessment of selected measures. The research programme seeks to identify what works for India by analysing a wide range of case studies and focusing on different approaches’ potential to deliver triple wins. Within a broad framework, key questions to be examined include: (1) What are the drivers of and constraints on green and inclusive policies in India? (2) What existing policies facilitate green and inclusive growth in India? (3) What drives the private sector to adopt green business models? (4) What kind of collaborative mechanisms exist to design suitable incentives for green business models? Our presentation will give an overview our initial findings.

Emerging Lessons From China on Policies to Promote Green and Inclusive Growth

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This contribution presents findings from the initial scoping phase of a research programme that seeks to assess the form and effectiveness of policymaking for green growth in China. We begin by broadly tracing the evolution of ideas of economic growth, poverty reduction, and environmental protection in China since the beginning of the reform era in 1978. Early in this period, these three issues tended to be viewed in isolation or were assumed to have automatic linkages. More recently, there have been signs of increasing, though uneven, recognition of the complex interactions, tensions, and potential synergies between them. Moreover, policymakers are beginning to actively explore the potential for policy to shape these interactions and their outcomes. As the limits of the prevailing reform-era model of growth and poverty reduction become increasingly apparent, a new vision of more sustainable and balanced development has emerged in policy discourses. The challenge now is to understand the ways in which that discourse is being translated into reality and to identify the factors shaping that translation.

Efforts to improve our understanding and related policymaking must build on existing knowledge of how policy is actually made and implemented in China. We suggest that a review of the broad institutional foundations of the de facto policy environment in China contains important lessons about the incentives for both policymakers and economic actors to behave in particular ways. Although detailed, localised case study analysis is necessary to assess the strength of these mechanisms and to complement them with location-specific realities, a number of generalised and influential features of the prevailing political economy may already be identified. With respect to policymakers' incentives, key features include the structure of the Party-State and its implications for leadership and long-term planning; the presence of significant horizontal coordination challenges; and the necessity for mechanisms to ensure vertical coordination in a decentralised governance system. With respect to the behaviour of economic actors, we suggest that generalised profit motives might provide both positive impacts, for example, through reputational games with consumers and other actors in supply chains, and negative impacts, through well-known environmental externalities in a context in which regulation systems are only partly developed. Against this background of potential explanatory features, we then lay out a typology of selected key policies or policy areas where additional research may be useful in assessing the degree to which the "triple wins" of green growth are being achieved.

Theme 1, Session 4 Environmental Conflicts Revisited: Institutional Change, Natural Resource Use and Conflicts

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While evidence from research has challenged settled assumptions on the causal link between environmental processes and conflicts, activists and policymakers have made alarmist claims that environmental change in general and climate change in particular will have enormous impacts on humanity. The debate over environmental conflict has gained renewed currency as a result of the ongoing discourse on global climate change

Presentations in this session will focus on mechanisms by which smallholders adjust to effects of climate variability, and on how their strategies might or might not cause conflicts between user groups. The climate-change–security discourse suggests that climate change might lead to unplanned phenomena that can further advance conflict over resources. Contributions, however, will give special attention to wider socio-political processes and the dynamic role of local institutions in resource governance and conflict resolution. Political and institutional responses appear to be among the most important factors in violent conflicts. The session aims to answer the following questions: What factors or conditions influence resource and conflict management discourses and practices? What can be done to strengthen resource and conflict management institutions? What is the role of international markets and policies on interactions between various actors in resource use and conflict? And what connections and contradictions exist between international and national policies?

The presentations will underline that in analysing environmental conflicts, attention should be paid to wider processes of social and political change both at the local and global levels: (1) Alemmaya Mulugeta will analyse discursive environmental conflict patterns and the way they are working within different policymaking and implementing agencies in Ethiopia; (2) Myra Posluschny-Treuner will explore international large-scale land acquisitions in Ethiopia and will try to illustrate to what extent large-scale agricultural land investment serves as an essential strategy to reduce poverty; (3) Gilbert Fokou will show that besides climate variability, sociopolitical processes and the dynamic role of institutions in resource governance play a key role in exacerbating and regulating resource conflicts; (4) Franziska Bieri will compare and contrast the two initiatives governing the global diamond trade and assess their respective impacts on curbing diamond-fuelled conflicts; (5) Aida Gareeva will focus on new tools developed to increase the capacity of local pasture committees to manage conflicts over pasture resources in rural Kyrgyzstan; and (6) Thiam Djiby will outline a conceptual framework for strengthening the sustainable management of natural forest resources in Central Africa.

Governing Diamonds: The Kimberley Process and the Diamond Development Initiative International

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This presentation draws on case study evidence from recent regulatory efforts in the diamond industry, in an attempt to identify effective structures and decision-making processes in the governance of resources.

Diamonds have been a curse rather than a blessing in many countries. So-called blood or conflict diamonds have fuelled warfare and violence in Angola, the Democratic Republic of Congo, Sierra Leone, Liberia, and most recently in Côte d'Ivoire and Zimbabwe. Moreover, artisanal diamond-mining is marked by poverty and dangerous labour conditions. The problems of poverty and conflict over diamonds are fundamentally linked: impoverishment, underdevelopment, and lack of regulation in alluvial diamond mines are the underlying causes for violence, posing important human security threats. Two governance bodies have emerged to address these problems.

The Diamond Development Initiative International (DDII) aims at transforming alluvial diamond-mining so that it contributes to economic growth and development in the local communities. The DDII has the support of key industry players, civil society groups, a few governments, and international organisations. The Kimberley Process (KP) seeks to curb the trade of conflict diamonds by certifying rough diamonds as conflict-free and tracking their origin. The KP consists of 76 member countries and formally involves civil society and the industry in the decision-making process. Stifled by its consensus rule and a narrow definition of conflict diamonds, the KP has come under sharp criticism for failing to act against massive human rights abuses in Zimbabwe's diamond mines. The future of the regulatory system is all but certain.

In our analysis, we compare and contrast the two initiatives governing the global diamond trade and assess their respective impacts on curbing diamond-fuelled conflicts. We conclude that the governance of diamonds requires diverse and parallel institutional efforts, multi-stakeholder involvement, and continued awareness-raising and monitoring activities by NGOs.

Climate Variability, Institutional Dynamics, and Resource-use Conflicts in the Sahel–Coastal Context of West Africa

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The African Sahel region has been experiencing severe climate variability for decades, with deep impacts on livelihoods and interactions between groups of resource users. Ecology studies in West Africa have demonstrated great variations in grazing capacities in time and space, with fluctuations in rangeland productivity from year to year. Thus, transhumant pastoralists from the Sahel have shifted to coastal countries of the South, in search of better grazing conditions. In this process they have encroached on land provided for other uses, extending the “window of conflicts” to the South. Climate variability is likely to exacerbate tensions and conflicts in the contact zone of Sahel and coastal countries. However, recent research findings caution against assumptions concerning the link between resource use and violent conflicts, demonstrating that other factors are more important.

This presentation builds on the postulate that better climatic conditions will not automatically lead to a reduction of the number and intensity of conflicts in Africa. In fact, the human factor as reflected in individual actors and institutions appears to be one of the most important causes of violent conflicts. Based on the results of a social science study conducted in the Sahel–coastal contact zone of Côte d'Ivoire and Togo, we aim to show that besides climate variability, sociopolitical processes and the dynamic role of institutions in resource governance at various levels play a key role in exacerbating and regulating resource conflicts.

We will show that: (1) due to climate variability, various actors have changed their coping strategies, breaking existing arrangements for resource management; (2) formal and informal state authorities have contributed to crafting new rules that have fostered tensions between users; (3) discourses on identity and autochthony are often used to exclude some groups of users from natural resource pockets. It appears in the end that policy reforms that ensure social stability, economic performance, and ecological sustainability are most likely to reduce resource-use conflicts in the West African Sahel.

Management of Conflicts over Pasture Resources in Kyrgyzstan

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Natural resource management in Kyrgyzstan is very important for the rural population, especially if people have no other source of income. For example, pasture management is economically important as it is critical for production in mountain regions; it is politically significant as it constitutes a source of power and leverage in local, regional, and national political arenas; and it is of considerable social consequence because it defines patterns of cooperation and conflict in mountain areas.

The Pasture Law adopted in Kyrgyzstan in 2009 gives a fairly sustainable legal basis for sustainable use of pastures; however it requires an effective mechanism for its introduction, like any new law. The situation concerning conflict management in Kyrgyzstan is not clear currently because of various types of pastures being available under different institutions at different levels. A striking example of this is conflicts over pastures in forest areas. Use of pastures here is regulated by the Forestry Code, which not always matches the Pasture Law, thus causing conflicts.

The goal of the CAMP Alatoo development project is to increase the capacity of local pasture committees to manage ongoing conflicts over pasture resources in the watersheds of the Jergetal and Onarcha rivers in Kyrgyzstan.

The tools for achieving this goal are different workshops at the village level, conflict analysis, development of conflict management plans, and introduction of these plans through small projects. Special attention within the project is paid to improving the political and legal basis of resource management, as this is a precondition for eliminating the causes of many conflicts. These activities are conducted at the national level, in cooperation with government structures.

Current results include the following: (1) Pasture users' awareness of managing conflicts over pasture resources has increased at the local level. (2) Pasture committees, as community-based management institutions, are able to eliminate the causes of conflicts over pasture resources. (3) Practical activities in the context of local pasture management plans have been implemented, including an assessment of the vulnerability of forest pastures and their fodder capacity, fencing of forest plantations, and others.

Discursive Space on Environmental Conflicts in Ethiopia: Does It Exist?

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In Ethiopia, the last ten years have been a period of fast reproduction of international climate change discourses and related activities. Nevertheless, conflict as a possible adverse effect of environmental change has been missing from almost all rhetoric within the country. This visible invisibility requires an explanation.

This presentation will attempt to answer the question why environmental conflict discourse did not become a dominant discourse in Ethiopia. It will try to track discursive environmental conflict patterns and how they were working within different policymaking and implementing agencies during the past decade. By reviewing relevant documents and tracing sequences of events and storylines, two major contributing factors will be explored: (1) limited “policy space” for environmental conflict discourse, and (2) the lack of actors/agencies within and outside the country that could provide precise data on the link between conflict and environmental change in order to advance the discourse.

Specifically, this contribution focuses on two major areas: firstly, it reviews the extent to which environment-related policies and networks in the past incorporated conflict as a relevant issue that requires investigation; secondly, it examines whether the environmental conflict discourse that swept the West has travelled as far as Ethiopia, and whether it has managed to create fields or new forms of agencies in reproducing environmental conflict discourses in Ethiopia.

International Large-scale Land Acquisitions: Agricultural Modernisation and the Fight against Poverty in Ethiopia

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Due to growing awareness of climate change and its consequences, as well as continuously rising food prices, both industrialised and economically fast developing countries aim to achieve more energy security, encouraging large-scale food-crop and biofuel production. This in turn promotes a rush for arable land on the part of foreign and domestic investors. Africa in general is perceived as an attractive destination for land investments, and Ethiopia seems to be particularly suitable due to its large areas of “unused” affordable land. However, Ethiopia suffers from food insecurity and depends on international aid. Its economy is mainly based on small-scale, rain-fed subsistence agriculture, accounting for almost 45% of the gross domestic product (GDP) and 85% of total employment. Thus, agriculture is a key source of employment, growth, and revenue, as well as a long-standing source of food security. Accordingly, the Ethiopian government has stated that poverty reduction is impossible without significant diversification and commercialisation of the agricultural sector and has developed several strategies and policies to achieve this aim.

First effects of large-scale land investments show adverse consequences for the environment and for local populations, such as agricultural intensification, forest degradation, displacement of local populations, expropriation of land, increasing local food insecurity, and increasing poverty. Notably, displacement of local populations might increase competition and tension with people in the receiving areas over access to land and resources, and it may provoke ethnic clashes.

Based on the recent trend towards foreign large-scale land acquisitions in Ethiopia, this presentation analyses drivers of investors and governments, intending to illustrate the extent to which large-scale farming and related agricultural land investment serve as an essential strategy to reduce poverty and to increase agricultural output, as well as to analyse socio-economic and environmental impacts. The presentation focuses on the Oromia region in Ethiopia.

An Institutional Framework for Sustainable Management of Forest Resources in Developing Countries

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This presentation outlines a conceptual framework for strengthening the sustainable management of natural resources in Central Africa. Focusing on forest resources, we employ theories of natural resource management and new institutional economics to investigate how the existence of different stakeholders could impact the governance structure related to common resources across the African continent. Cameroon is selected as an example, since it is one of the most densely forested countries in Africa.

The results of our analysis point to cooperative measures, social capital, and institutional reliability as the three key potential contributors to proper management of Cameroon's forest sector. Cooperative measures support a decentralised management approach involving different stakeholders in planning phases. The involvement of different stakeholders reduces transaction costs and facilitates the implementation of policy measures, since the local population is represented in the decision process. Social capital can be used to link local norms, networks, and values to the top-down policy incentives designed by policymakers.

Finally, institutional reliability creates an atmosphere of confidence and ensures that strategic policy instruments are followed up on. Further, institutional reliability is especially crucial in the African context, where natural resource management processes typically involve diverse agents. Hence, to promote efficient activities and accountability among actors, the relevant institutions should be tailored to represent the common interest. The presentation will also seek to outline the theoretical foundations upon which strategies for effective management of natural resources in developing countries could be based.

Theme 1, Session 5 Adaptation to Climate Change: Actors, Resources, and Livelihoods

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Climate change is one of the major factors shaping the dynamic social-ecological conditions of livelihoods and development. It manifests itself in different ways, depending on the exposure of local populations to specific climatic hazards, people's perceptions of changing conditions, their adaptive capacities, and the sensitivities of social-ecological systems to climate variability and change.

Papers in this session will present ways in which local populations perceive and frame climate change, as well as their adaptation strategies and how social-ecological structures and processes, including policies, shape their sensitivities to climate change. The session seeks to provide answers to the following questions: What challenges and opportunities in resource use and management do local actors associate with climate change? How are local actors adjusting their strategies to moderate the harm or to benefit from the opportunities locally associated with climate change? What roles do markets, policies, and government practices play in shaping local actors' capacity to take action on climate change?

The session will also provide insights on the nature of vulnerability (exposure, sensitivity, adaptive capacity) to climate change in the given research contexts, and will explore the implications for designing responses to climate change.

Barriers and Opportunities in Promoting Sustainable Tourism as a Global Change Adaptation Strategy: A Case From Nepal

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This study conducted in the Kailash Sacred Landscape (KSL) region in north-western Nepal explores opportunities for, and barriers to, sustainable tourism as an adaptation strategy, not only for reducing community vulnerability to climate change but also as an important poverty alleviation measure. A mix of conceptual analysis and stakeholder engagement were employed to identify the key linkages between tourism, climate change, and sustainable livelihoods.

Whilst the primary focus was on specific interactions between tourism and climate change, our participatory and problem-oriented approach revealed a highly complex socio-ecological system, with many social, economic, environmental, and institutional drivers involved. A range of climate-related hazards already impact these mountain communities, with hydrological extremes identified as a pressing issue. Of particular note are recent episodes and experiences with relatively dry conditions (droughts, lack of seasonal snow), as well as shifts in monsoon activity (rainfall intensity as well as late start and cessation of wet season). This was found to have direct implications for issues such as adequate food security and was seen by many as a critical challenge to be addressed. However, a changing climate needs to be understood in a context of multiple stressors, particularly given the weak socio-economic base and the policy drive towards poverty alleviation and sustainable development in the wider KSL region (China, India, Nepal).

Based on the preliminary findings from this research, we conclude with a series of recommendations which are intended to contribute to the development of an upgraded and more comprehensive strategy in support of community-based tourism as a sustainable livelihood option and adaptation strategy for local communities in KSL Nepal. The recommendations concern geographic up-scaling, improvements to the existing scientific evidence base, institutional arrangements, bringing together bottom-up and top-down approaches, demand management, and the importance of learning from experience.

Climate Change and Adaptation in the Bolivian Highlands

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Climate change and climate variability have direct and far-reaching consequences for about one third of the Bolivian population who live in peasant communities and whose livelihoods and economic welfare depend on small-scale agricultural production. While possible long-term impacts on small-scale producers have been widely debated, little is known about the adaptation mechanisms currently used by these populations. In particular circumstances, climate change might also become an opportunity to change livelihood strategies, including shifting into more profitable crops. What factors determine whether climate change represents an opportunity or a major risk for households? How do climate shocks affect livelihood strategies and consumption patterns? What are the overall impacts of climate change on Altiplano communities such as the ones analysed in this study, and how does climate change affect their production practices?

To answer these questions, we modelled the decision-making process that leads to optimal production, consumption, and self-consumption as a function of climate vulnerability perceptions and other control variables. The resulting model was estimated using a panel data set based on a 350-household sample of peasant communities in the central and northern Altiplano region of La Paz, Bolivia. The panel data set comprised information for two points in time (2006, 2009) and thus allowed comparison over time to reveal changes.

The empirical findings show that communities anticipate climate shocks and adjust to them by means of self-consumption decisions, with self-consumption being their only safety net. Model estimates based on hypothetical scenarios (stress tests) suggest that households would not be able to overcome strong negative climate shock situations. Overall results are complemented with qualitative information collected through participant observation and focus groups.

Climatic Variability, the Population's Epidemiological Profile, and Risk Factors in Korhogo, Northern Côte d'Ivoire

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The city of Korhogo experienced a decrease in rainfall from 1971 to 2000, followed by a decade of high climatic variability causing droughts and floods between 2000 and 2010. Knowledge of the population's epidemiological profile and their perceptions of climatic phenomena is needed to understand their vulnerability and plan efficient action for adaptation.

Two transversal household surveys by questionnaire (n = 600), each coupled with a geographic survey, were made during the rainy and dry seasons of 2010. On this basis, we describe the population's morbidity, households' access to water, hygiene and sanitation, people's perceptions of the causes of diseases, and links with weather conditions. The town was divided into three study zones according to vulnerability to flooding and living standard.

General morbidity for the past-30-days recall period at the household level was found to be the same during the dry season (53,9%) as during the rainy season (53,5%). At least 65,5% of the cases of meningitis (IC95% = 45,7–82,1) and 68,2% of the cases of conjunctivitis (IC95%=61,1–74,7) occurred during the dry season, while at least 37,5% of the cases of urinary schistosomiasis (IC95% = 18,6–55,9) and 26,8% of malaria cases (IC95% = 23,2–30,7) occurred during the rainy season. More than 60% of the households used well water for drinking. At least 90% of the households had a latrine, with 77% of latrines being traditional, and 20% being located less than 10 metres away from drinking water wells. A statistically significant correlation was observed between classification in a given study zone, on the one hand, and general morbidity as well as the prevalence of diarrhoea, schistosomiasis, and meningitis, of well water use for drinking purposes, and of latrines, on the other hand. Solid waste and stagnant water covered 15,000 m² and 700 m² of soil surface, respectively, during the survey period.

In such a complex context in terms of health, sanitation, water access, and their links with the weather, how can resilience to extreme climatic events such as flooding be strengthened? A framework based on the ecohealth approach was tested and has yielded promising results.

Overcoming Local Adaptation Barriers through International Agreements? Modes and Challenges under the UNFCCC

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A regime is emerging under the United Nations Framework Convention on Climate Change (UNFCCC) to enhance international cooperation on adaptation to climate change. One of the challenges is identifying the right design of institutional channels to facilitate adaptation to climate change at local, national, and regional governance levels. It remains largely unclear what types of structures and agreements will lead to successful adaptation. Persistent barriers at various governance levels may impede the process of adaptation or lead to highly inequitable outcomes. Although such barriers are frequently claimed to exist, their properties and ways of addressing them in adaptation governance are not fully understood.

Our presentation seeks to identify these barriers and ways of addressing them through international cooperation, by analysing how a UNFCCC adaptation regime might enhance action and develop adaptive capacity in low- and middle-income countries. We begin by developing empirically supported archetypal models of vulnerability and adaptation barriers in urban areas of low- and middle-income countries. This provides an understanding of the persistent obstacles to, as well as change factors of, climate adaptation in urban areas. We then take stock of modes of international agreements on climate change adaptation based on a UNFCCC document study to identify channels through which international regimes may influence local adaptation processes. We use these insights to analyse the determinants of international agreements' effectiveness in facilitating climate adaptation in urban areas.

Conservation of Indigenous Animal Genetic Resources and Adaptation to Climate Change in the Hindu Kush Mountains

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In attempts to solve problems related to food security among the rural poor, development programmes have often introduced crossing of high-input/output livestock breeds with indigenous animal genetic resources (IAGRs). The high reproducibility, adaptation to local weather extremes, optimum utilisation of poor feed resources, and multi-purposefulness of IAGRs are often ignored and undocumented, leading to their dissolution through crossbreeding. Pastoral communities in the remote mountain valleys of the Hindu Kush in Northern Pakistan rear some of these undocumented IAGRs and can serve as a nucleus for their conservation and dissemination. These IAGRs are small in body size and optimally suited for grazing in the rugged mountain rangelands that cover three-fourths of the Hindu Kush.

Our research team has recently characterised and documented two livestock breeds belonging to these IAGRs: Achai cattle and Azikheli buffaloes. Findings show that their mean daily milk production is slightly lower than that of introduced or crossbred animals (4.5 l for Achai cows vs. 10.0 l for crossbred cows, and 8.2 l for Azikheli buffaloes vs. 9.8 l for Nili-Ravi buffaloes). Their milk production appears higher, however, when considering their body-weight-per-production ratio, and it is largely sufficient for home-stead consumption, especially in light of the fact that marketing in remote mountain areas has limited potential. The first service conception rates for IAGRs are much higher than for introduced animals (70% for Achai cows vs. 49% for crossbred cows, and 64% for Azikheli buffaloes vs. 53% for Nili-Ravi buffaloes). Furthermore, both breeds have lower body weights (187 kg for Achai cows vs. 324 kg for crossbred cows, and 459 kg for Azikheli buffaloes vs. 525 kg for Nili-Ravi buffaloes), which makes them fit for steep mountainous terrains.

These data indicate that IAGRs are likely to play a crucial role in the context of climate change as well as food security. We will discuss conservation efforts undertaken so far and propose further steps to help preserve and develop these unique animal genetic resources.

Sustainable Land Management and Carbon Finance: A Case Study with Mobile Pastoralists in Pakistan's Himalayas

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Landless mobile pastoralists in the Hindu Kush and Himalaya Mountains of Pakistan produce milk and meat, maintain biodiversity, and conserve soil. However, the provision of these goods and services is at risk as herders are being marginalised, among other things, by reduced mobility due to tree plantings that obstruct transhumance routes and cash crop cultivation that encroaches on alpine summer pastures. Tilling these steep slopes degrades soils and requires increasing fertilisation to sustain yields.

This study quantifies carbon (C) in cropping and pasturing land uses in the Upper Naran Valley, hypothesising that (1) cropping on pastures reduces C stores, and that (2) the avoidance of emissions by preventing the conversion of pastures into cropland may yield more C payment than conventional mitigation activities focusing on pasture improvement. With regard to hypothesis (1), a one-way analysis of variance on mean soil organic C shows that all variables taken separately have a significant effect ($P < 0.01$) ($n = 72$) [g kg^{-1}]: (land use) crop/pasture 13.3/15.9, (aspect) North/South 16.1/13.2, (elevation) low/middle/high 10.9/16.2/16.8, (soil depth) shallow/deep 1.4/1.53. For biomass C, only land use has a significant effect ($P < 0.01$) with more than twice the amount in pastures ($n = 36$) [g m^{-2}]: crop/pasture 127/318. Enteric methane release from livestock in the pasture scenario is largely matched by increasing greenhouse gas releases due to increasing fertiliser inputs required in the cropping scenario. Regarding hypothesis (2), preventing the conversion of pastures into cropland avoids an average loss of 12.2 t C ha^{-1} or $44.8 \text{ t CO}_2\text{e ha}^{-1}$.

The goal of this ongoing study is to quantify the potential mitigation effect that avoiding emission has by comparison with conventional improved pasture activities as recorded in various other alpine environments in the Himalayas. It remains to determine the minimum price of C, with a view to compensating herders for the losses they incur by renouncing cash crop cultivation in order to preserve pastures. If the minimum price of C turns out to be realistic, payment for ecosystem services could foster sustainable land management.

Theme 1, Session 6 Global Megatrends: Threats and Opportunities for Mountain Development

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Global megatrends – such as economic globalisation and the appearance of new nations on the global political and economic scene (BRIC countries); climate change; population growth; migration; the looming energy crisis; the scramble for natural resources including water, land, and mineral resources; resource degradation; changing global food production and consumption patterns narrowing down food security margins; and poverty – have manifold implications for mountain areas.

This session aims to:

- (1) Give an overview of the threats and opportunities these megatrends present for specific regional or local mountain environments;
- (2) Give an overview of the goods and services that mountains regions, and mountains at a global scale, provide for regional and global development, including highland–lowland systems;
- (3) Present envisaged or proven pathways for sustainable mountain development in the light of global megatrends.

The session chairs will take care to seek for a balanced regional and thematic representation of contributions; these may cover all of the above three points, or only two of them; however, coverage of point (3) above will be essential in selecting contributions.

New Paradigm of Sustainable Mountain Development in Times of Global Uncertainty: The Russian Experience

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A decade after the International Year of Mountains and the Bishkek Mountain Summit, the mountain regions of Russia are still at the periphery of Russia's social and economic development. Mountains and highlands account for over 50% of the national territory and have outstanding resource potential, as well as ethnic, cultural, and landscape diversity. Most of the national territory is located in Northern Eurasia and has severe climatic conditions. Nearly the whole of the Asian part has permafrost. Therefore, it is only the southern mountain massifs (Northern Caucasus in the European part and the Altai-Sayan-Baikal Region in the centre of the Asian continent) that have permanent populations with a century-long history of traditional land use.

This presentation focuses on the Altai-Sayan region. This transboundary ecoregion (1,065,000 km²), a great intra-continental divide, has been facing multiple uncertainties in development, biodiversity conservation, adaptation to climate change, and regional economic and political integration. The four countries in the region have not agreed on a long-term regional concept in their national development strategies. As a result, there is no common vision for the region. Neither regional nor international programmes (UNDP-GEF, UNEP, etc.) were able to come up with an adequate development policy for this mountain area.

The following measures are needed to overcome this conservation deadlock: (1) a new paradigm of sustainable mountain development and biodiversity conservation is needed based on the connectivity of conservation, transdisciplinarity, and the new opportunities offered by information technologies; (2) an Altai-Sayan web atlas should be developed as an interactive/participatory toolbox for conservation management, regional development, monitoring, and decision support; (3) the establishment of an international Altai-Sayan-Baikal Centre (ASBC) for sustainable mountain development would help to provide a new vision and to formulate ideas for development adapted to global change within the regional context. Moreover, establishing an international Mountain Research Centres Network along the Great Asian Mountain Arc from the Himalaya (ICIMOD) to the Pamir (UCA) and to the Altai-Sayan-Baikal region could enhance cooperation on, and understanding of, mountain development issues in times of global change and uncertainty.

Transformation of Human–Environment Systems in the Rural Mountain Regions of the Caucasus (Russia and Georgia)

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Outflow of local populations, a reduction in agrarian activity, and intensive development of tourist business, starting at different times in the 20th Century, are becoming typical for many mountain regions in industrialised countries. In the Caucasus these processes were sharply accelerated by the collapse of the Soviet system and collective farming, resulting in changes in land management and land use, and generally in changes in human–environment relations. Traditional livestock regions in the North Caucasus (Russia) and regions of arable farming in the South Caucasus (Georgia, Adjara Autonomous Republic) were selected for study of newly formed human–environment systems.

In the North Caucasus, outmigration took place during the past century; in the last 20 years it has come to a critical point, with a decrease in mountain livestock numbers and a collapse of range management and spatial regularities of pasturing. These factors result in such contrary effects as convergence and fragmentation of mountain landscapes, and it is socio-economic change rather than climate change that is mainly responsible for current environmental processes.

Adjara had a rapidly growing population up to 1991, and climate-dependent specialisation from the foothill to the highlands, from perennial cultures to monocultural tobacco crops profitable enough to maintain anti-erosion measures. Loss of the USSR's and Russia's market resulted in destruction of tea and tobacco farming and in population outflow. Today, maize and potatoes predominate as the main food crops; the regime of spatial agricultural specialisation has been disrupted. Land degradation can be considered an integral response of the mountain environment to uncompensated farming.

In both mountain regions, private land ownership became the catalyst of ecosystem degradation, contrary to expectations. Development programmes in Russia and Georgia are oriented towards tourist activity rather than agriculture, which signifies changes in the population, new human–environment relations, and a new stage of mountain development in the Caucasus.

Environmentally Friendly and Affordable Rural Transportation: An Important Basis for Sustainable Mountain Development – Examples From Nepal

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Securing access as a general infrastructure service has been a global megatrend over the last decades, but it has been particularly challenging in mountain regions owing to topography, harsh climate, and hazards. High upfront costs and cost recovery analyses have often limited access to infrastructure development in mountains.

A crucial challenge has thus been the selection, planning, construction, and maintenance of a technically feasible and economically affordable mountain transport system. In the Hindu Kush–Himalaya, development of such a system started in the early 1950s and is still in full swing in many areas. It encounters a series of problems including poorly engineered construction, large-size mechanisation destroying vegetation and destabilising slopes, thus creating erosion and landslides that threaten agricultural land. Mechanisation lays off manual labour and prevents local income generation, which is much needed in mountain areas.

This presentation will focus on three integrated sustainable approaches to rural transportation:

1: Mountain road construction and development by the GRECO Green Road Concept:

In Nepal, work began in the 1980s on developing a road building concept with the goal of conserving the delicate mountain ecology and protecting vegetation as a means to prevent soil erosion. Given Nepal's extreme poverty, the road building approach was based on labour-intensive methods in order to generate local employment, and it had to be low cost. The result was aptly called the Green Road Concept.

2: Trans-Himalayan Heritage Routes (THHR) Conservation Programme:

This initiative focuses on the conservation and re-establishment of historic trading routes and the religious and secular structures that accompany them, with a view to incorporating them into a coherent network – which in turn could be attractive for ecotourism development.

3: Promotion of cycling mountain tracks as pre-road start-up infrastructure:

This initiative follows a step-wise procedure to access by developing mountain tracks suitable for bikes and motorbikes, aligned along future motorable road alignments. The aim is to better balance costs against the initially often very small transport volume in sparsely populated mountain regions.

Community-Based Tourism, Regional Development, and Preservation: The Case of Sagarmatha (Everest) National Park, Nepal

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About 30,000 tourists, approximately ten times the local population, visit the Khumbu region of Sagarmatha (Everest) National Park each year as trekkers and mountaineers. They come to enjoy the spectacular mountain scenery, the diverse and unique flora and fauna, as well as the Sherpa culture in this remote area. Tourism is simultaneously an important economic opportunity for the region and a heavy burden on both its natural environment and its local culture.

Tourism has greatly benefited the Sherpas of Khumbu by providing them with a source of income and improving their general standard of living based on opportunities to act as guides and porters. Increasingly, Sherpas are working exclusively for mountain expeditions, a prestigious and excellently-paying occupation. In spite of widespread improvements in livelihood conditions, however, there is still great disparity in the distribution of tourism's benefits among various socio-economic groups of the region. The benefits of trekking tourism are not distributed equitably throughout the park, and many areas remain culturally and economically isolated.

To overcome such problems, The Mountain Institute (TMI) started implementing programmes to support tourism management in the area by introducing an innovative form of tourism known as Community-Based Tourism (CBT). TMI established a project called "Sacred Sites Trail to Khumbu" in the Khumbu region of Nepal, which encourages trekkers to pass through less-visited villages in Khumbu. This presentation will outline the growth of tourism in the Khumbu region and will highlight the economic opportunities which CBT aims to address while maintaining principles of cultural and environmental preservation.

Theme 1, Session 7 Large-scale Land Acquisitions in the Global South: Towards a Research Agenda for the Coming Years

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The extent and the nature of large-scale land acquisitions (LSLAs) in the global South have been difficult to assess up until recently. The lack of evidence has given rise to heated debates over the question of whether agricultural foreign direct investment (FDI) represents a long-awaited opportunity to overcome persistent yield gaps or whether it constitutes a fundamental threat to the livelihoods of poor and vulnerable users of allegedly underused land and to the natural environment.

Nevertheless, the body of evidence on LSLAs has grown in the past years, based on different attempts to assess LSLAs at national to global levels, and on various case studies. The emerging evidence reveals insights into the phenomenon in general as well as into its opportunities and risks. Consensus has grown that despite the urgent need for investments in agriculture in the global South, the risks and limitations of LSLAs outweigh their opportunities.

Agricultural FDI represents a global trend, however, which due to its inherent driving forces will persist in the future. Hence more attention will need to be paid to policy- and decision-making processes that will guide agricultural FDI and LSLAs in the future. This session explores current knowledge gaps and aims to determine what evidence is needed to support such policy- and decision-making processes. On this basis, we will attempt to outline a research agenda for the coming years.

Is the (Incoherent) International Legal Framework Driving Large-scale Land Acquisitions?

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Whether investments in agricultural land in the global South are sustainable or not, depends not least on the legal framework within which these investments take place. This is true for the domestic legal framework both of the country from which investments originate, and of the host country. But the international legal framework in which home and host states are embedded also has both positive and negative impacts.

On the one hand, a range of human-rights and environmental treaties assists in ensuring a careful treatment of land and land rights. On the other hand, particularly trade and investment treaties tend to unilaterally protect investors' rights, while less importance tends to be attached to investors' duties. Such legal incoherencies have been uncovered on a conceptual basis, but evidence of how far these factors indeed contribute positively or negatively to the phenomenon of large-scale land acquisitions is still lacking.

This presentation will introduce the most important legal entry points in the field in order to inform non-legal scientists and to make them familiar with the ongoing debate which is based on coherence theory. Following this overview, the presentation will uncover knowledge gaps and indicate in how far interdisciplinary case studies could contribute to closing them.

The Uneven Geography of Property Formalisation in Southeast Asia: Some Lessons From Laos and Cambodia

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The formalisation of property rights is related to actual tenure security in complex and uncertain ways. Many “land grabs” begin as government efforts to formalise and operationalise claims to so-called state land; meanwhile, land formalisation – frequently in the form of individual or communal titling – is often put forth as a solution to the “land grab” problem. Formalisation, in short, sits on both sides of the issue of LSLA-related tenure insecurity.

This presentation will focus on two case studies of property formalisation at two different scales; both cases concern the issue of unevenness. The first study examines the geography of formalisation at a national scale, based on the case of land titling in Cambodia. The second study focuses on the local scale, examining the way that histories of social and political conflict affect land use zoning in northwestern Laos.

I will use the cases to highlight two gaps in existing knowledge, and two related pieces of an emerging research agenda: (1) Both cases point to the need for more critical histories of property formalisation. This includes donor- and lender-driven property regimes (e.g. land titling projects funded by the World Bank, the British Department for International Development, and the United States Agency for International Development), as well as locally derived land administration efforts (e.g. Laos’s Land and Forest Allocation programme and Cambodia’s Commune Land Use Planning programme). While the literature on these and related interventions is by now well-developed, specifically geographical accounts, and accompanying explanations of why formalisation happens in some places but not in others, have only just begun to emerge. (2) The case of northwestern Laos also points to the need for further studies of how geopolitical and intrastate conflicts shape land entitlements in general, and property formalisation in particular. The uneven geography of agribusiness zoning – a key technology in the space where contract farming and concession-making blur together – highlights the importance of looking at citizen–state interactions (in particular, the governing of problematic sub-populations), as well as the internal politics of land administration (in particular, control over formal geographic information) as distinct, interlocking, and unpredictable processes.

The State of Large-scale Land Acquisitions in the “Global South”

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In a collaborative effort, CDE and the International Land Coalition (ILC), CIRAD, GIZ, and the Institute of Global and Area Studies (GIGA) collected data on over 1200 deals concerning land for agricultural purposes. Overall, it was possible to collect reports on deals covering more than 80 million hectares of land for the period of 2000–2011. This figure corresponds to 1.7% of the world’s agricultural area. So far, 400 deals have been reported as signed, and implementation of deals on the ground has started on 12 million hectares of land. Analysis showed that the interest in foreign land concentrates on a fairly limited number of countries, with a large share of them being in Africa. Many of these countries have high poverty and hunger rates and depend heavily on the agricultural sector. Preliminary analysis has also shown that deals often concern land which is already occupied by farming communities and supports considerable population densities.

Even after intense data-checking efforts by our partner networks, information on many deals remains incomplete. As a consequence, the partnership of organisations has now begun to search for information on land deals using crowd-sourcing techniques. Data on deals is being made accessible on an interactive website, where data can be cross-checked by all interested stakeholders. This process allows adding data on new or not previously reported deals, as well as correcting erroneous data. Information about land acquisition is expected to gain rapidly in quality and quantity. Furthermore, in a number of pilot countries, ILC and CDE have initiated a process of intensified crowd-source-based data collection and analysis. The research component of this project analyses the impacts of land acquisitions on sustainable development with respect to all three (the social, the economic, and the ecological) dimensions of sustainability. This will be done in particular by analysing the contextual patterns of land acquisitions more closely.

The future research agenda regarding land acquisition needs to address a number of questions, such as: What qualities of land are being sought? What are the determinants in targeting the deals? What rationale and what types of business model drive the process of land acquisition? Who are the investors and other stakeholders behind this trend? What kinds of impacts are actually observed? What are bad and good practices in planning and granting concessions, creating transparency, allowing and guaranteeing free, prior, and informed consent, defining and implementing fair compensation, and creating employment? What role can the Food and Agriculture Organization’s Voluntary Guidelines on Land Tenure play in this process? In what way can researchers contribute towards more inclusive and equitable processes?

Can Foreign Direct Investment in Agriculture Save Us From High Food Prices?

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Agricultural foreign direct investments (FDI) in developing countries have increased tremendously as a reaction to the recent price hike on global food markets. With two simple simulation models we show that additional FDI in cereal production can have discernible price effects on global markets.

The first model makes use of the projection devised by the Organisation for Economic Co-operation and Development (OECD) and the United Nations Food and Agriculture Organization (FAO) for production and utilisation during the period of 2011–2020, and is augmented with an econometric price equation. The second model is based on econometric estimates of global cereal production, utilisation, stocks, and prices. From the “supply-of-storage” model we derive the hypothesis that the lower the stock–utilisation ratio, the higher the prices, and vice versa.

Our econometric estimates support this hypothesis. Simulations indicate that an additional expansion of harvested land through FDI by 5, 10, and 15 million hectares over the period of 2011–2020 would lead to price declines relative to a reference scenario of about 7%, 15%, and 22%, respectively. If FDI-induced production growth has repercussions on other producers, the rates of decline are about 5%, 10%, and 15%, respectively. As the majority of the poor are net food buyers, such price effects would certainly help to strengthen the food security of the poor.

Land Acquisition Dynamics in Nepal: Actors, Process, and Effects

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Land acquisition is an emerging phenomenon in Nepal, influenced by global large-scale investment in land. It is also said to be linked with severe food insecurity as well as energy and economic crises in the world. In Nepal, the tendency to lease land is increasing from day to day. Land is leased for different purposes, such as production of herbal products, seed production, establishment of research farms, biofuel production, fruit farming, and others.

Land acquisition by multinational companies and private investors is also beginning in Nepal. In domestic “land grabbing”, real estate companies and business investors are involved in converting agricultural land into built-up areas for housing or other purposes. Domestic “land grabbing” is accelerated by close ties among members of the elite – for example, politicians, land brokers, bureaucrats, and businesspeople – allowing them to manipulate rules, regulations, and laws to their own benefit. Major actors in foreign land acquisition are multinational companies such as, for example, Dabur Nepal Private Limited, Rijal-Tasi Industries, and Pepsicola.

Domestic and foreign pressure on land has severe impacts on food and agriculture, social relations, and indigenous practices. It causes rapid changes in land use patterns, thereby altering local food production systems, with negative effects on local-level food security, local land use patterns, various types of social tension, and resource conflicts. Ultimately, by increasing rural inequality and fuelling resource conflicts, land use change, and social tensions, it has created livelihood insecurity at local levels. Addressing these negative effects of land pressure requires in-depth analysis of (1) the interests, networks, and concerns of the various actors involved; (2) the process of land acquisition; and (3) its effects. This research must involve multiple stakeholders (farmers, policymakers, civil-society leaders, businesspeople, politicians, etc.) and generate socially acceptable knowledge.

Large-scale Land Acquisitions in Lao PDR: Beyond Anecdotal Evidence

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In the last decade, Lao PDR has emerged as a supplier of raw agricultural commodities, tree crops, minerals, and hydropower for the large and dominant neighbouring economies of China, Thailand, and Vietnam. This has led to a drastic increase in the demand for land, largely in the form of foreign direct investments (FDI).

An increasing amount of case studies question the benefits of such investments in land and especially in large-scale monocultural agricultural and forestry plantations, given that the existence of vast areas of unused land in Laos is a myth. Concessions have led to the replacement of forests, thereby reducing natural habitat, traditional agroforestry practices, and crop production. Until now, concessions have failed in most cases to provide real and lasting benefits. Evidence also suggests that institutional capacities for identifying suitable land for investors, as well as for effectively monitoring and regulating the large number of investment projects granted and those in preparation, are currently too low.

Despite such anecdotal evidence, however, no systematic information on large-scale land investments in terms of numbers, size, investors involved, or context was available until recently. A new national land concession inventory now makes it possible for the first time to shed some light on these issues. Currently there are over 2200 projects of FDI in land throughout Laos. Mining, agriculture, and forestry are the sectors covering the largest areas by far, with over 75% of the concession area based on FDI. Most concessions were granted in areas that are fairly easily accessible and have relatively low poverty rates. Nonetheless, almost 30% of the villages in which a concession was granted have poverty rates higher than 50%. This and similar analyses are currently ongoing and offer an exceptional opportunity to gain insights into the larger patterns of land investments in the country, thereby providing transparency and evidence-based guidance to the related heated policy debates and development discourses.

Theme 1, Session 8 Water and Land Management and Governance

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Ensuring sustainable use of natural resources is crucial to maintaining a basis for sustainable livelihoods. The ecological dimension of sustainability has been mainstreamed to a great extent in most current development initiatives and policies; however, many of the approaches used to achieve it have largely been ineffective. Environmental costs are often externalised, and environmental goods and services remain undervalued despite their crucial importance in poverty alleviation and equitable and sustainable development. This situation is further exacerbated by a growing distance and increasingly unequal relations between powerful stakeholders claiming selected ecosystem services at higher levels of jurisdiction, and weaker stakeholders providing environmental stewardship at the local level. As a consequence, unfavourable water and land use and land cover dynamics persist, leading to hard competition, heightened tensions and conflicts, and continued degradation of ecosystems and renewable natural resources.

Against this background, the following question calls for urgent and concerted attention: What strategies and options can enhance sustainable water and land management (SWLM) and governance at different scales and across landscapes, thereby achieving multiple benefits? Globally, a wealth of SWLM knowledge and information exists. Nevertheless, finding appropriate ways to tap this knowledge, use it in decision-making processes, and create an enabling environment to implement SWLM successfully beyond the life-span of projects poses a major challenge. Interaction patterns have become more complex and uncertain as policies and institutions at higher levels of jurisdiction have gained influence. Decision-making processes must, therefore, be understood as a complex and cross-scale institutional dynamic.

This session will address these challenges by bringing together the following concerns:

- (1) Available knowledge on sustainable water and land management: presentation of innovative technical solutions.
- (2) How can we support stakeholder negotiations and decision-making processes among different actors for scaling up and scaling out innovative solutions?
- (3) What should an enabling environment for successful implementation of SWLM look like?

A Half-empty Bucket: Women's Role in the Governance of Water Resources in Zambia

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The water governance system in Zambia has undergone major reforms that have fostered far-reaching decentralisation, the devolution of powers to the lowest level of authorities, and a greater involvement of all stakeholders in the decision-making process.

A rural household survey was conducted in the Lower Kafue River Basin, with the objective to assess, among other things, gendered differences in people's awareness of water sector institutions, the actors' understanding of their roles and functions, and the degree of participation within such institutions. The research uses multiple regression analyses to assess the fundamental role of women in water use, particularly related to household consumption and hygiene.

Results show that women are key actors in water collection and use and that they can significantly influence water use decisions at the household level. In fact, a positive and significant relation between the number of women in a household and total household water consumption is found in all the regression models analysed.

Nonetheless, compared to men, women are less aware of existing water sector institutions and do not seem to have adequate knowledge of their exact functions. Women are also considerably less involved than men in the water governance participation mechanisms and generally have less trust in the influence that smallholders' participation can have on water-related decisions.

In order to implement an effective reform process that includes extensive decentralisation and follows the subsidiarity principle, it is of utmost necessity for the Government of Zambia to increase smallholders' and women's awareness and participation in the water sector. It is also fundamental to improve the capacity of women to act politically in the management of water resources from the grassroots to all higher levels of governance.

Water Use Conflicts in the Mount Kenya Region: Understanding the Spatial and Thematic Dimensions for Effective Interventions

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The ecosystem of the Mount Kenya region is of critical importance, as it forms one of Kenya's water towers. Moreover, the region plays important roles in supplying water for agriculture and hydro-electric power generation, in timber production and tourism, and as a home for both flora and fauna. Over the years, however, the ecosystem has undergone tremendous degradation due to the growing human population, changing land uses, and failure of the institutions charged with the responsibility of managing the available natural resources. For example, over-abstraction of river water, especially in the upper reaches, has led to a decline in downstream flows. This has resulted in enormous socio-ecological imbalances in the lowlands, along with various water-use-related conflicts that sometimes become violent.

In order to document various water-use-related conflicts in the region, a study was conducted in 2005 whose main objective was to identify, map, and characterise different water-use-related conflict hotspots. The goal of the study was to understand their spatial distribution and intensity in order to target water-related interventions more effectively.

To achieve this goal, a field survey campaign was carried out and complemented with site-specific assessments using questionnaires administered randomly within the region. A GPS tool was used to map the geographical locations of all hotspots, allowing for spatial analysis and manipulations within a GIS environment. The results revealed 25 hotspot cluster zones and a typology of ten specific levels of water-related conflicts. The four main types of conflicts identified were (1) downstream versus upstream (30%), (2) agro-pastoralists versus agro-pastoralists (26%), (3) community versus authority (17%), and (4) agro-pastoralists versus wildlife (7%). The outputs of the project provided a sound basis for an innovative strategy of awareness creation towards more sustainable management of water resources and a conflict-free future in the greater Mount Kenya region.

Desire for Greener Land: A Process for Effective Desertification Mitigation based on Sustainable Land Management

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Disturbances in fragile dryland ecosystems can easily result in widespread and severe land degradation and thus desertification. Traditionally, desertification research has focused on degradation assessments, whereas prevention and mitigation strategies have not sufficiently been emphasised, although the concept of sustainable land management (SLM) is increasingly being acknowledged. This presentation is based on research embedded in the EU FP6 research project DESIRE (Desertification Mitigation and Remediation of Land – a Global Approach for Local Solutions; 2007–2012). In close collaboration with local stakeholder groups, DESIRE aimed to establish promising land management strategies in 17 areas affected by desertification around the world. The study sites served as a global laboratory for developing and applying new methods of science–stakeholder collaboration and for trialling traditional and innovative approaches to combating desertification.

The methodological framework developed by DESIRE combines a collective learning and decision-making approach with use of evaluated global best practices. It proposes a concise process, starting out with the identification of land degradation and locally applied solutions through mapping and in a stakeholder workshop, followed by an assessment of local solutions using a standardised evaluation tool, and ending with the joint selection of promising strategies for implementation with the help of a decision support tool. The decision for a particular SLM technology was followed up with test implementation in the field, thorough monitoring, and upscaling via modelling of regional effects and dissemination of results.

SLM practices were mapped, documented, and evaluated by local researchers in collaboration with land users and using the internationally recognised and standardised WOCAT questionnaires. These in-depth assessments of 17 sites, 30 technologies, and 8 approaches were analysed and compared across all DESIRE study sites, highlighting key issues of SLM in drylands. Careful attention was paid to features which specifically characterise SLM in drylands and make SLM practices especially useful regarding the identified threats. Demonstrating a favourable local-scale cost–benefit relationship was found to be crucial to improving people’s livelihoods and preventing further outmigration. However, it was also found that more research is needed to support the case study authors’ assessments of SLM impacts. Long-term field experiments are needed to prove the benefits of SLM – especially with regard to expected bio-physical and socio-economic benefits in the longer term – as well as to provide a solid rationale for investments in SLM, thereby enabling greener drylands to become a reality, rather than remain a desire.

Research on Sustainable Land Management in the Mountain Regions of Central Asia: A Review of Literature from the Last 20 Years

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Issues of land use and management are vital for the Central Asian mountain regions because they are interconnected with critical issues such as food security, poverty, conflicts over land and water resources, and climate change. Rapid changes in the sociopolitical and environmental situation in Central Asia require that researchers provide an up-to-date, scientifically approved basis for evidence-based decision-making towards sustainable development and particularly towards sustainable land management (SLM).

Although much information has been generated by different projects on land use and land management, information is often duplicated, publications usually do not offer fresh data, are isolated, and in many cases do not respond to land users' and decision-makers' needs. The Mountain Societies Research Centre of the University of Central Asia is developing a background paper on SLM with a view to improving this situation. The primary aims of the background paper are to:

1. Assess the state of knowledge regarding SLM in the mountain contexts of Kyrgyzstan and Tajikistan by categorising it based on the analytical structure of the Global Land Project (GLP 2005);
2. Identify emerging research themes in the literature.

Secondary aims are to:

3. Assess the spatial and temporal distribution of the foci of literature;
4. Assess the link between research and practice;
5. Identify the organisations, programmes, projects, and individuals that produce and are the focus of literature.

The analysis of literature includes selected syntheses from the late Soviet era but focuses primarily on the period from 1991 to the present. Both peer-reviewed and grey literature in Russian and English were analysed, as well as selected literature in Tajik and Kyrgyz. This presentation gives an overview of the results of a quantitative analysis of this literature.

Transboundary Implications of Land Degradation and Management in the Ethiopian Highlands: An Overlooked Issue in the Age-old Nile Debate

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The Ethiopian Highlands contribute about 85% to the 84 billion cubic metres that make up the annual water flow of the main Nile at Asswan. Out of this, the Abay Basin (Blue Nile) contributes 57% and the Tekeze (Atbara) and Baro Akobo (Sobat) basins contribute 14% each. For millennia these three major rivers have carried nutrient-rich sediments with fertile soil material from the Ethiopian Highlands and have thus accumulated the extensive Nile Delta, which supported the development of one of the world's greatest civilisations in Egypt and former Nubia. However, the main sources of water and fertile silt have been increasingly affected by unabated land degradation and poverty. As a result, the rivers are no longer carrying only fine and fertile silt but increasingly also transport coarser sediments and gravel, which affects both the quantity and the quality of water downstream.

Both Sudan and Egypt have experienced the negative consequences of this change. The capacity of their dams and irrigation channels has been reduced by the silt, sand, and gravel coming from the Ethiopian Highlands. At the same time, the process of land degradation is negatively affecting millions of people living in the highlands. Paradoxically, this important issue has not so far been a major concern in the downstream riverine countries, who have been focusing on water shares instead. The sharing of the Nile's water has been a major source of tension particularly in the Eastern Nile Region.

In contrast to this negative development, scientific evidence shows that actions for sustainable land management in the highland ecosystems can result in positive on-site and off-site impacts. However, although the problem is severe and more interventions are urgently needed, these nevertheless have to be well-planned and require collaborative action by the riverine countries. Thus, land degradation and land and water management aspects in the Ethiopian Highlands deserve serious attention and should be treated as one of the core issues in the Nile debate.

Theme 1, Session 9

Landscape Transformation: Changing Services of Land in a Globalised World

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Expanding markets and enhanced rural accessibility are leading to an increasing spatial disconnection between the production and the consumption of goods, thereby furthering the rapid transformation of landscapes in developing countries. These processes are characterised by multiple and partly conflicting claims to land in developing countries, and have induced swift and massive shifts in both the socio-economic and the environmental services that land provides at the landscape level. The galloping speed at which increasingly remote entities' claims to land are expanding poses a serious problem for evidence-based decision- and policymaking in the countries affected. Based on four examples of such ongoing landscape transformations from various regions of the world, this session aims to (1) address their effects and (2) discuss approaches to detect and monitor these processes and possible outcomes. Each presentation will be followed by a brief discussion.

Multiple Claims to Land Resources in the Lao PDR: Issues of Lacking Cross-sectoral Spatial Planning

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The Lao People's Democratic Republic (Lao PDR) is situated in the heart of the economically highly dynamic region of mainland Southeast Asia. Based on the country's wealth in natural resources and a change in the ruling Communist Party's policy towards economic opening, the Lao PDR has become a supplier of raw agricultural commodities, tree crops, minerals, and hydropower mainly for the large and dominant neighbouring economies of China, Thailand, and Vietnam. This has led to a drastic increase in the demand for land in the Lao PDR. Until recently, there was no comprehensive spatial overview of these developments. But understanding the spatial distribution of the various land-based economic sectors is essential for informed decision-making with regard to potential related trade-offs.

Against this background, we compiled and analysed information from various sectors to gain an understanding of the dimensions, spatial patterns, respective contexts, possible overlaps, and the potential for triggering conflicts of different claims to land at the national level. Our analysis included the hydropower and mining sectors, as well as large-scale commercial agricultural land concessions and small-scale rotational subsistence-oriented upland agriculture. An analysis of a 2000–2009 time series of MODIS satellite imagery showed that despite the Lao government's policy of eradicating rotational agriculture over the last decade, these small-scale systems are still widespread in the uplands. Very recently, however, there has been a tremendous increase in the number of land concessions granted for mining and commercial agriculture. Our results indicate that over 2600 such deals have been issued to date, and over 75% of the area granted falls under the category of large-scale foreign direct investment (FDI). A considerable share of these concessions are being granted in regions where rotational agricultural systems are the dominant form of land use. The negotiation power of local population groups is especially weak when it comes to sharing benefits and securing access to land. From a natural resource management perspective, our analysis revealed inconsistencies in spatial planning between different sectors; for example, a considerable share of land concessions overlap with protected forests or even national protected areas.

By compiling and analysing the different sectors' claims to land, we hope to provide valuable evidence and insights into the related heated debates (e.g. over "land grabbing"). In addition, we hope that pinpointing examples of inconsistencies in spatial planning between sectors will raise awareness among policymakers and encourage them to take actions towards more coherent cross-sectoral planning.

Socialising the Pixels: Demonstrating the Application of Geospatial Tools for Socioecological Research: The Case of Wayanad

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Natural resource systems are under stress, which at times can be extreme owing to the diverse impacts of environmental change, climatic variation, socio-economic pressure, and economic mayhem. This study illustrates multiple levels of interactions in an agro-ecosystem, using a landscape-level approach supported by a suite of geospatial tools. The stimulus for this synthesis is drawn from reviewing the multipurpose potential of Earth Observation (remote sensing) including Geographical Information Systems (GIS) to bridge the theory-to-practice interface in socioecological research. So far, only a handful of studies have addressed an epistemological approach that in practice can take research beyond disciplinary interests to knowledge integration. There still remains a lack of empirical evidence and an absence of a heuristic mindset that would enable more sustainable and communally beneficial relationships between indigenous practices and paradigmatic processes of (sustainable) development.

The evolving concept of socioecological research conforms to a transdisciplinary approach to understanding the entwining between science and society. In line with that understanding, this study demonstrates geospatial characterisation and assessment that integrates biophysical complexities measured in terms of land use/cover change (LUCC) with related socio-economics. Aligned to the transdisciplinary project BioDIVA (www.biodiva.uni-hannover.de), the analysis explicates landscape-level understanding for the Wayanad agro-ecosystem in Kerala, southern province of India. Traditionally a rice-dominated landscape, the region has witnessed major alterations in agricultural practices as the outcome of development trends, as well as natural and anthropogenic interferences. To illustrate these transformations, socioecological scenarios are expounded using a mixed set of indicators. The scenarios are related to wide-ranging interfaces between (a) landscape dynamics (or LUCC); (b) socio-economic diversity; and (c) local-level climatic variability.

Analysis of landscape dynamics in conjunction with socio-economics and climatology over a historical timeline (1970s to 2010) highlights natural and social processes that drive LUCC. It is noted that multi-temporal geospatial analysis is a fair approach to generate up-to-date information and assimilate multiple layers of scientific knowledge. The process demonstrates potential for integration of knowledge from different sectors in a manner that can be empathised by a range of stakeholders.

Environmental and Socio-economic Trade-offs from Smallholder Oil Palm Expansion in Indonesia

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Development of oil palm plantations over the last 20 years in Indonesia has stirred up controversies due to its negative impacts on biodiversity, ecosystem services, and local communities. However, the significance of the oil palm industry to national and regional economies is substantial. The Food and Agricultural Policy Research Institute (FAPRI) *World Agricultural Outlook* predicts that 36.5 million tons of palm oil will be produced annually in Indonesia by 2025–2026. This is an additional 12 million tons of palm oil compared to the current 2011–2012 production figures of 24.7 million tons. There is an ongoing debate about how the oil palm industry in Indonesia should expand over the next twenty years to minimise the negative impacts and maximise the benefits accrued from oil palm production. At present, approximately 40% of Indonesia's total oil palm cultivation is done by smallholders, while the remaining 60% is in the hands of state and private companies.

Against the background of industry and global community interests in promoting smallholder development, we have explored different scenarios of oil palm expansion in Indonesia with various levels of government support for smallholder oil palm production. We have quantified the key environmental and socio-economic outcomes of four defined policy scenarios: (1) business as usual; (2) smallholder-supported development; (3) smallholder-supported development with improved yields; (4) and industry-supported development.

For each scenario, we have simulated the expansion of oil palm agriculture based on data from geographic information systems (GIS). We model environmental (e.g., forest cover loss, biodiversity loss, carbon footprint) and socio-economic impacts (e.g., infrastructure development, employment opportunities, regional development). We will present preliminary results from our model simulations and provide policy recommendations regarding future expansion strategies for palm oil production in Indonesia.

The Changing Environment: Spatiotemporal Analysis of Landscape Transformation Along Major Development Axes in Ethiopia

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Ethiopia's economy has so far been predominantly agrarian, providing a livelihood for 84% of the total population of about 86 million in 2011. Urbanisation has remained low, at about 16%, which is lower than the sub-Saharan average of 30–40%. This has left the agrarian sector unconnected to urban centres, with minimal or no service provision. Landscape transformation during the past millennia has been unidirectional – converting the natural landscape into land for subsistence and rainfed primary production. Over the last two decades, however, other forms of change have begun to take shape mainly along major development axes. Urban centres have been expanding, and both secondary and tertiary sectors have emerged from a once totally agrarian environment. So far, the magnitudes of these changes in space and time, their implications for key ecosystem functions and services, as well as the driving forces behind these changes have not been explored.

To address this issue, a detailed study was conducted along five major development axes emanating from Addis Abeba. A spatiotemporal analysis of physical changes was conducted and supplemented by a detailed GPS transect and socio-economic survey. A comparative analysis between the different development axes was also conducted with a view to comparing changes over time and finding possible driving forces.

Preliminary results show that most of the existing larger urban centres have been expanding at a very high speed within the last decade; Addis Abeba, for instance, was expanding at a rate of 15 km² per year between 2000 and 2010. Quite often this process replaced or competed with one of the most important ecosystem functions, namely food production. Expansion of the secondary sector showed a similar trend, particularly within a 40-km radius around Addis Abeba. The study further identified hotspot areas where substantial conversion of natural environment to subsistence agriculture is still ongoing, particularly along the development axes from Addis Abeba to Hawassa, Addis Abeba to Jima, and Addis Abeba to Nekemet. However, there are also places where the reverse is observed, particularly along the Addis Abeba to Mekele development axis. Further analysis is currently underway to capture additional implications of landscape transformation processes for the environment and for people's livelihoods, and the key driving factors behind such processes.

Theme 2, Keynote 1

Development in a Changing World: Security Breeds Security

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The world is changing fast. The black swan phenomenon – low frequency, high impact events – has turned the impacts of these global changes clearer, faster, and deeper. Increased unemployment and reduced predictions for growth in the global North warn of further chaos at the economic front. The “development model” in the global North, followed by many in the global South as a role model, is not sustainable enough. On the political front, one has been witnessing the Arab Spring, where a combination of internal and external actors and factors has proved lethal to the powerful rulers. One of the lessons learnt from the Arab Spring is that state security devoid of human security will never result in stable governments. On the energy front, the rise in fuel prices to a record high after 2008 and the Fukushima nuclear plant tragedy have reminded us yet again of the importance of energy efficiency and finding new solutions to the current energy crisis. Regarding the war on terrorism, the United States’ decision to enter in dialogue with the Taliban and the NATO’s back channel diplomacy for an honourable exit from Afghanistan may change the geo-political scene in South Asia. In the social sector development, missed commitments to development assistance by most developed countries and missed Millennium Development Goals by most developing countries are points of concern for the poor, marginalised, and socially excluded people.

Economic and security crises coupled with changing priorities in the developed world require that most developing nations redefine their paradigms of sustainable development in the face of ‘curtailed aid’ or ‘no aid’ scenarios. Indeed, the dependence of their development on the developed world would no longer be sustainable in the near future, meaning they would have to think beyond foreign aid and look beyond the West. This would also affect the traditional export destinations for most developing nations. On the other hand, the recent contribution of US\$ 75 billion by the BRICS countries (Brazil, Russia, India, China, South Africa) to the IMF for avoiding a European collapse not only reflects that such a collapse will affect everyone without exception, but it also shows that the future of poverty alleviation initiatives may be determined by emerging economies.

This keynote address will discuss the issues changing and shaping the world’s future, the sustainability of some of the solutions that have been proposed to tackle these issues, and the role that new development players may play in achieving human development.

Theme 2, Keynote 2

The Challenge of Multiple Inequalities and Transformative Social Change

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Recent studies point to the fact that over the past two to three decades income inequalities have worsened: a recent ILO¹ study found that between 1990 and 2000 more than two-thirds of the 85 countries for which data are available experienced an increase in income inequality as measured by the Gini index. Evidence analysed by WIDE paints an even more drastic picture when it comes to global wealth concentration. This broad pattern of growing income inequality, and even more staggering wealth inequality, under economic liberalisation is supported by data on other dimensions of inequality, for example, the functional distribution of income (i.e. the distribution of income between wages and profits analysed by both ILO and UNRISD), gender-based wage gaps, and social indicators such as enrolment in secondary and tertiary education, access to safe drinking water and sanitation, and maternal mortality (monitored by the UN MDG Report).

In recent decades the mainstream response to evidence of growing inequalities was to dismiss *equality of outcome* (as ‘politics of envy’) by focusing instead on *equality of opportunities* as the appropriate metric for measuring equity/equality. In policy terms this meant an emphasis on ‘human capital’ investment in order to give everyone an equal start in life and produce a more equitable future, along with targeted social provisions (for those who “messed up their chances”), limited to avoidance of absolute deprivation. This made no allowance for structural factors that might play a part in individual outcomes. It thus shied away from serious consideration of other powerful policy instruments that can produce greater equality of outcome (e.g. macroeconomic policy, social policy, land reform).

While the facts of inequality have been well-known for some time now, what seems to have changed over the past two years is the recognition, across a fairly wide spectrum of opinion, of inequality’s powerful and corrosive effects, and the urgency of doing something about it. There are thus opportunities for using the current conjuncture –marked by geo-political shifts (toward a multi-polar world), the sense of danger/urgency among some political elites, and widespread popular discontent – to initiate (or move further along) pathways of transformative change that are equality-enhancing.

¹ Abbreviations: International Labour Organisation (ILO), Women in Development Europe (WIDE), United Nations Research Institute for Social Development (UNRISD), United Nations’ Millennium Development Goals (UN MDG)

Theme 2, Session 10 Beyond the MDGs: Rethinking State Involvement in Poverty Reduction and Development

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The past two decades have seen an important paradigm shift in the role and place attributed to “the state” in support of “development”. Beginning in the 1980s, development discourse and practice were driven by the so-called Washington consensus, an agenda aimed at reducing the importance of the state, giving market forces more space and delegating much of poverty-related development work to the (donor-dependent) NGO sector. We argue that the current Millennium Development Goals (MDGs) are generally embedded within this “neo-liberal” worldview.

A new trend is emerging, however, according to which the state is again been assigned a major role in sustaining and fostering development. This paradigm shift is a result, among other things, of the neo-liberal agenda’s failure to reduce poverty, of increasing social and regional inequalities, and of critical discussions about the NGO and donor sector.

We argue that in debates on development after 2015 – the end date of the present MDGs – it is crucial to reflect upon the type of public institutions needed to overcome poverty and inequality. This, however, raises a number of questions. Research done in the context of Swiss National Centre of Competence in Research (NCCR) North-South shows that development planning often remained a process among donors and higher-level state representatives, detached from local citizen’s concerns. How, then, is a stronger ownership of the state in poverty eradication to be conceptualised? Does this mean that the developmental state model hailed as the basis for the Asian tigers’ success is “striking back”? Or are new forms of a 21st-century developmental state model emerging after two decades of economic and political deregulation in many developing countries? Is the new state-centred development agenda compatible with the promotion of democracy and “good governance”, or is “enlightened authoritarianism” the solution – always keeping in mind the focus on poverty and inequality? How should the political dimension of development be taken into account in debates about the post-MDG agenda? And how can the pitfall of donor-drivenness in the present MDGs be avoided? Is this apparent trend towards strong(er) states driven externally, or is it part of local actors’ endogenous strategies?

This session seeks to offer critical contributions on the various dimensions of state intervention in development and poverty reduction policies beyond the present MDGs. A number of presentations will be followed by a roundtable discussion with Michel Morasini (Assistant Director-General and Head of Department Global Cooperation, SDC), Cécile Molinier (Director, Geneva Representation Office, United Nations Development Programme), Peter Niggli (Director, Alliance Sud – Swiss Alliance of Development Organisations), Rupa Mukerji (Member of the Management Board and Co-Head of Advisory Services of Helvetas Swiss Intercooperation), and Abid Suleri (Executive Director, Sustainable Policy Institute, Islamabad, Pakistan).

State-driven Poverty Reduction in a Context of Crisis: Côte d'Ivoire Navigating Between MDG Constraints and Debt Relief

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The Ivorian government committed in 2000 to achieving the Millennium Development Goals (MDGs). But prior to engaging in this process, the government had already defined, in 1997, strategic areas of fight against poverty according to the approach and process adopted in preparing its poverty reduction strategy paper (PRSP). This was done from the perspective of the initiative in favour of the Heavily Indebted Poor Countries (HIPC). Already within the framework of the HIPC initiative, however, the possibility of partial debt relief hoped for by the state entailed a certain ownership of the budgetary constraints suggested by economic reforms. Another constraint, this time political but with economic and financial implications, was added in 2002 with the severe sociopolitical crisis that took place between 2002 and 2011. After about ten years of concomitant experience in poverty reduction and economic reforms referred to as “pro-poor”, the results achieved in the fight against poverty are not conclusive, according to successive reports established by the Ivorian government in partnership with the UN.

This presentation aims to show (1) how the armed conflict weakened the state's capacity to finance its commitments, but also (2) how the logic of the government's action in favour of poverty reduction was, to a great extent, inspired more by the prospect of eligibility for the HIPC initiative based on economic reforms than by its commitments. Finally it is shown (3) how the framing of economic reforms in view of the HIPC initiative reduces the power of the state to initiate truly endogenous poverty reduction strategies. Thus, the definition of development policy strategies in Côte d'Ivoire, as in many other countries in sub-Saharan Africa, remains the *chasse gardée* of the Bretton Woods institutions.

Participation of Local Poor in the Implementation of the Honduran Poverty Reduction Strategy (Linked to MDGs)

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Poverty Reduction Strategies (PRSs) have been designed to tackle poverty and foster economic growth in highly indebted poor countries and thus contribute to reaching the Millennium Development Goals (MDGs). Since 1999, over 100 Poverty Reduction Strategy Papers (PRSPs) have been developed worldwide, emphasising, among other things, the political participation of poor people. The Honduran PRS also highlights the role of poor people as new actors in political processes to reduce poverty. However, the poverty reduction impact of these strategies as well as the opening of political space for participation is controversially discussed, and the most recent publications on the topic found little evidence for improvement, neither in Honduras nor elsewhere. Poverty and social inequalities are persistent global problems, and the poorest tend to remain excluded from participation processes – and thus from achieving benefits linked to MDGs as well.

Despite the rather disappointing impact at the global scale, the PRSs must have had positive outcomes at the local scale. To reveal them, a closer look is needed at what happened on the ground. The aim of this presentation, therefore, is to give insights into the implementation processes of the Honduran PRS at the local level. It focuses on the population's possibilities of participating in the implementation of a special instrument of the Honduran PRS, the so-called *fondo descentralizado*. This fund explicitly foresees participation of poor and extremely poor people in defining, implementing, and evaluating local poverty reduction interventions. The analysis is based on data from an ethnography-oriented study carried out between 2008 and 2010 in two municipalities in western Honduras.

With this presentation, I seek to shed light on the impact of the Honduran PRS in promoting political participation for poverty reduction among the poorest and to contribute to the broader scientific debate on political participation beyond the PRS approach.

From the Margins to the Centre: Transforming State–Society Relations in Bolivia and How This Impacts on MDGs

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This presentation first provides some background by summarising the main features of the state–civil society interface before and after the radical and paradigmatic shift represented by the rise of Evo Morales as the new President of Bolivia in late 2005. Based on this case, it will then be shown that more integrated ways of poverty alleviation are not achieved just by calling for a stronger state within a given society–state relationship that is predominantly shaped by neoliberalism. Instead, the Bolivian case shows that overcoming basic neoliberal notions of society–state relations – by means of enduring and intense social mobilisation of indigenous and popular classes – and the resulting elaboration of a radically new political constitution was a fundamental precondition for defining new and more effective policies to alleviate poverty as part of a structural transformation.

On this basis, the following questions will be discussed:

- What was the understanding of the Millennium Development Goals (MDGs) before and after the “big change”?
- Which were the roles of the MDGs in domestic policymaking before and after the “big change”?
- Which are the main achievements, constraints, and challenges of the present policy shift regarding poverty alleviation?
- What are the lessons to be learnt for the global debate about the MDGs?

Nepal's Development Beyond the MDGs: Who Is to Take the Lead?

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Although many of the core concerns of the Millennium Development Goals (MDGs) – above all poverty, but also issues such as nutrition, health, or education – are likely to remain unresolved after 2015, identifying new issues as well as potentially relevant institutions is essential if we want to debate and plan for beyond 2015. A significant political dialogue that includes all relevant stakeholders backed by in-depth research must be part and parcel of that momentum.

Regarding Nepal's progress on the MDGs, given the country's uncertain political climate and a fragile economic environment it looks certain that most of the current goals will not be met within the stipulated timeframe. In spite of heavy donor engagement and a state-controlled planned economy, Nepal's overall growth during the last six decades has not been very impressive. While the government's recent claim of having reduced poverty incidence to 25 per cent indicates a welcome development, it is contested, and the level of poverty, particularly in rural areas, remains high. Both donors and the state have been criticised for being ineffective and misplacing their priorities.

But despite these adverse conditions, understanding how poverty and other related indicators have moved in a positive direction demands more careful scrutiny. Moreover, this is happening notwithstanding the challenges of a perpetual transition, successive unstable governments, and general instability. This raises some interesting questions: How is it possible to reduce poverty and child mortality in spite of a weak government? What would be the desired roles of the state as well as the new institutions, including national non-state actors and international donors, in addressing the goals for beyond 2015? Also, what would be the linkage between and amongst these actors? This presentation aims to discuss these very issues in connection with Nepal's performance regarding the MDGs and possible strategies for beyond 2015.

Theme 2, Session 11 Highly Skilled Return Migrants: Enhancing Positive Effects

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The debate over whether international migration contributes to development is now increasingly replaced by the notion of “migration management”. This terminology emphasises the understanding that with proper management, migration can be beneficial for both the receiving and the sending places. While economic remittances have largely determined the discourse on migration management and on the migration–development nexus, less is known about how migration management might enhance the use of highly skilled returnees’ knowledge and skills.

This session aims to discuss migrants’ experiences while working in their home countries after their return, as well as the experiences of migrants who have not (yet) returned home and their reasons for staying abroad.

We very much welcome contributions that critically analyse international migration of highly skilled persons, focusing on their experiences in the countries of origin as well as in the destination countries. We also welcome critical discussions of possible policy measures targeting the return of skilled migrants.

The Influence of Educational Migration on the Development of Inter-state Relations between Kyrgyzstan and Turkey

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Cultural and language propinquity, absence of visa requirements, and the state educational programme foster the flow of migrants from Kyrgyzstan to Turkey for education. Eventually, educational and labour migration have become closely intertwined. This has created a knowledge gap on the topic of migration from Kyrgyzstan to Turkey.

The research presented here deals with educational and labour migration from Kyrgyzstan to Turkey. The core research questions are what knowledge and skills migrants possess and/or acquire, and whether – and how – they influence socio-economic development in Kyrgyzstan and Turkey as well as the relations between the two countries.

The study focuses on social niches and professions where the knowledge and skills of Kyrgyzstan's migrants are used in Turkey (e.g. skilled vs. low-skilled); and vice versa, in what spheres migrants exert what types of influence, whether directly or indirectly, in the country of their origin, and how they apply their knowledge and skills: be it through networks, personal relations, business structures, educational institutions, or in some other way.

The study looks at:

- Factors related to culture and civilisation: religious commonalities, historical relations, as well as lack of various reservations/prejudices;
- Political and legal base: e.g. interstate agreements, migration legislation, and their influence on the increase/decrease or restriction of the migration flow;
- The extent of Kyrgyz–Turkish socio-economic relations; and
- Individual cases of people who are involved in Kyrgyz–Turkish relations, be it as migrants for education or labour or in business relations.

The research hypothesis is that these historical, cultural, economic, and political factors favour and promote rather than inhibit the migration process, and that migration to Turkey has a number of social, economic, and educational consequences for Kyrgyzstan.

Highly Skilled Professionals, Diversity, and International Migration

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Current processes of international migration enable talented, highly skilled, and educated persons to move and compete internationally. We argue that in a globalised world where information travels at a very high speed, international migration should be analysed through the lens of knowledge diversity and competitiveness, and no longer through the lens of the brain gain or brain loss explanations put forward by previous development and policy theories. We therefore consider immigrants as actors who actively take decisions towards improving their lives, with considerations about the quality of life and about professional knowledge being equally important in their decision to migrate.

In the context of a globalised world with expanding markets and intensive production technologies, international migration creates a mobile population of workers who actively search for new ways of achievement. Some may simply seek to cover their basic economic needs; highly skilled and educated migrants are likely to aim for the best opportunities in research and development.

This presentation explores international migration of highly skilled and educated professionals with a focus on how international competition promotes the diversity and multicultural richness of knowledge – a development that is coherent with the contemporary network society and with globalisation. It is assumed that multicultural and diverse migration of highly skilled and talented professionals is strongly supported by migration policies in the receiving countries.

Patterns and Trends of Migration in the Andean Region From a Gender and a Public Policy Perspective: The Case of Bolivia

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Increasing flows of migrants from the Andean region to Europe (mainly Spain) and to other regions within South America (mainly Argentina and Brazil), as well as the growing importance of remittances as a major source of external financing in the region (including South–South remittance flows) put migration at the centre of attention when analysing economic and social impacts of global change in the Andean region.

This contribution presents research done within the NCCR North-South as part of an ongoing comparative study of mobility and migration in West Africa, South and Central Asia, South and Central America, and Switzerland (Special Research Project 5: Mobility and Migration). The work presented here focuses on migration in the Andean Region in general and in Bolivia as a case study. Based on a comparative analysis of the migration and mobility situation in Colombia, Ecuador, Peru, and Bolivia, commonalities and differences will be outlined for each country. In addition to the classic remittance-based analysis that considers economic remittances as an important contribution of migration to development, migration patterns and trends will be examined from a gender and a public policy perspective.

Migration and mobility will be explored against the background of ongoing public policy debates in Andean countries as well as of policymaking discussions in Andean organisations like the Andean Community of Nations (CAN). In the particular case of Bolivia, the aim is to evaluate not only international migration trends but also the related public policy developments in the context of the political, social, and economic processes that started after the change of government in 2006. The overall aim of the presentation is to contribute to the regional and global debates on migration and mobility.

Transferring Skills upon Return: Matching Experiences and Aspirations in the Host Countries with Reality Back in India

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The expansion of globalisation has accelerated international migration flows, especially those of highly skilled persons. There has been a corresponding increase in concern about how to meet the ensuing challenges and what strategies to implement in order to take advantage of potential gains. Skilled migrants can function as agents of development, for they indeed play a key role as a source of knowledge and skills circulating between countries. Their return to their home country could be viewed as a feedback effect of skilled migration, given that migrants' foreign exposure may bring improved levels of knowledge and technical skills. This could then help to generate employment, raise productivity, and build the necessary infrastructure for home country development. Return migration could be very beneficial, depending on the nature of the skills flowing in and the types of opportunity available. Studies suggest that thriving returnees successfully combine access to productive employment and an enabling environment with the possibility of influencing their home country.

Taking Indian skilled migration as an example and adopting a two-fold perspective – country of origin and countries of destination – the research presented here examines the incidence of the international exposure of Indian skilled migrants in their professional and social position upon their return to India, and the difficulties they face in the dynamics of transferring the skills they gained abroad. It also examines the aspirations of skilled Indians and their perceptions of the potential impact of their current activities in destination countries on the development of India, and whether these expectations materialise when they return. Some evidence on skilled Indian returnees shows their contributions through knowledge, skills, and ideas upon their return; however it lacks a comprehensive understanding of the real development impact.

This presentation thus aims to contribute to filling this gap with new empirical evidence. It is based on findings from an international research project carried out by the Cooperation and Development Center (CODEV) at the Ecole Polytechnique Fédérale de Lausanne (EPFL) in collaboration with the International Labour Office (ILO), the Institute of Development Studies, Kolkata (IDSK), and Jawaharlal Nehru University (JNU). It offers a quantitative and qualitative analysis of a dataset of more than 1300 skilled Indians which was collected through two primary complementary surveys addressing a) skilled Indians in European destination countries, and b) skilled Indian returnees. The overall objective of this project is to advance knowledge on skilled return migration and its impact on development, and to explore strategies to leverage the potential of scientific diasporas.

Theme 2, Session 12 Livelihood Futures in Resource-scarce Regions: How Will Food Entitlement Improve?

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Access to livelihood opportunities and activities that help poor people attain food security and livelihood goals is mediated through institutions. Pursuit of decent livelihoods, particularly in resource-scarce rural areas, takes place in an arena where alternative opportunities and choices for improving livelihoods are limited, and thus the institutional context becomes even more crucial. Although institutional and policy reforms – including provision of social security structures – in many developing countries are targeting food security and rural development, these processes are often linked to the emergence of new forms of exclusion and social conflicts.

This session seeks to understand what drives poor people's quest for access to alternative opportunities to secure their future livelihoods, and how processes of social exclusion or inclusion emerge. Within these overall guiding questions, we will examine some of the following questions:

- What is the state of food security and entitlement, and are there any disparities in the context of food security and entitlement in resource-scarce areas? How do formal and informal institutions at the macro, meso, and micro levels determine and affect the entitlement of different social groups?
- What type of alternative livelihood options (such as support structures, enabling institutions, and opportunities to secure food, etc.) exist in resource-scarce regions? Who is in a position to exploit such opportunities, and who is excluded?
- How are livelihood patterns changing in the context of resource scarcity, food insecurity, and the quest for access to alternative opportunities?

Transnational Mobility and Improving Entitlements to Food in Marginal Areas of Nepal: A Research Perspective

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This presentation looks into the possibility of improving food entitlements by making better use of the financial and social remittances from the increased flow of labourers across national borders. This increased transnational movement of labour has become an eminent economic, social, and political phenomenon all over the world, and gives rise to new challenges as well as opportunities to improve food entitlements. It especially has an ability to improve “exchange entitlements” because of remittances and to raise concern for “food safety” because of new knowledge. On the other hand, absence of adult male members due to transnational mobility has a potential to reduce political and social entitlements to food.

Nepal has faced a situation where production entitlements to food, i.e., through households’ own production, have been declining for most households because of fragmentation in land holdings and a general decline in production due to resource degradation. This, of course, differs from place to place and some of the regions of Nepal, especially the far west and mid-west mountain and hill regions, have severe livelihood problems. Resource scarcity and remoteness are some of the reasons for this. Mobility has also been important here, but this has not been able to significantly improve food entitlements.

Improvement in “exchange entitlements” could be one of the main ways to improve food entitlements in Nepal, especially in its marginal regions. Migration can help in this effort if it leads to more income and less risk. Proper information, skill improvement, and diversification both in destination and in occupation in destination countries can help in this venture. Moreover, greater access to infrastructures like roads and energy is also required to facilitate the entitlements to food through “market” (exchange entitlements) or through public distribution (political entitlements). This can also help in ploughing remittances into other income-generating activities to facilitate exchange entitlements. From Nepal’s marginal regions’ perspective, it could be non-timber forest product (NTFP) processing and high-value crop production.

Rural Women and Food Security in India: Contribution and Constraints

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The concept of food security has undergone a lot of change during the past few decades. Availability and stability of food stocks in adequate measures do not necessarily ensure food security. Indeed, hunger, starvation, and undernutrition of a sizeable section of the population coexists with huge piles of food stocks. It is well documented that most poor families in the world spend 80% of their total income on food grains. Despite its good economic performance, India is home to the largest number of hungry people in the world, with over 200 million people who are food insecure. The Global Hunger Index 2009 ranks India 65th out of 84 countries, with a GHI of 29.90. In the Global Gender Gap Index, India is ranked 113th out of 130 countries. The sex ratio, including juvenile sex ratio, has shown an alarming reduction over the years, pointing to deep-rooted gender bias.

India is a predominantly agricultural country where about 70% of the total population lives in rural areas. Patriarchy and other factors force women to keep their hearths on, especially in poor families. Almost all agricultural operations are performed by women. According to the Food Security Atlas of India, there are a large number of food-insecure districts in India. While doing a pilot survey in one such district, the shocking situation was experienced that food insecurity leads to trafficking among women and young girls, which makes them vulnerable to HIV/AIDS and other sexually transmitted diseases. There is a positive linkage between agriculture and rural empowerment. It is beyond doubt that with the improvement of agricultural productivity, on- and off-farm employment increases.

This presentation will attempt to explore and highlight the food-insecure regions of India, the vulnerability of Indian rural women, their struggle for food security and nutrition security, and the constraints they come across, as well as future strategies for improvement. The presentation is based on primary data from various parts of rural India, represented by photographs and appropriate cartographic techniques.

Food Insecurity and Coping Strategies in Resource-poor Semi-arid Lowlands in the Pangani River Basin, Same District, Tanzania

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This study was carried out to understand different configurations of poverty, power relations, and exclusion which lead to some households having poor or limited access to natural resources and consequently becoming food insecure through exclusion in resource-scarce areas of the Pangani River basin, Tanzania. The study also aimed at assessing the resultant coping strategies and the role of support structures by state and non-state actors.

The study was carried out in four villages – Njoro, Ishinde, Mabilioni, and Saweni – located in Same district in the Pangani River basin. Data were collected using Participatory Rural Appraisal techniques, discussion with key informants, structured questionnaires, market surveys, and participant observation. Qualitative data were analysed using content analysis, while descriptive and inferential statistical analyses were performed on quantitative data. Both chronic and seasonal food insecurity occur in the study area; chronic food insecurity was found to be the most common type occurring among households affected by different forms of exclusion. Three types of power relations were found to influence both access to critical resources and food insecurity: strategic, institutional, and structural power relations. Moreover, three levels of household chronic food insecurity were identified in the study area: severe food insecurity, moderate food insecurity, and mild food insecurity. The most common coping strategies, in the order of importance, were casual labour, petty business, remittances, temporary migration, and fishing.

The study concludes that livelihoods in resource-poor and marginal areas are complex, diverse, and highly dynamic. Understanding the changing patterns of livelihoods is an essential avenue for different actors to intervene with different, optimised livelihood options. The study recommends a differentiated approach including state and non-state actor interventions so as to address the problems and complexities of livelihoods in marginal areas with excluded social groups.

Emerging Livelihood Trends in Resource-scarce Areas: Evidence From the Far-western Region of Nepal

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Marginal communities in developing countries are often found to be food insecure and prone to facing hunger. But what exactly causes food insecurity? This critical question has received a lot of attention in the recent food security debates. Based on preliminary findings from a study of the far-western region of Nepal, it can be stated that socio-economic, political, and institutional factors play crucial roles in determining the levels of hunger or food security of these people.

This presentation focuses on these very factors and shows how the formal and informal socio-economic and political institutions determine the production and exchange entitlement of different social and economic groups. The findings suggest that socio-economic structures such as land tenure, property right rules, and natural resource management strategies play critical roles in determining the production entitlement of different groups of people. Also, pricing policies, physical and social structures, as well as rural politics are seen to determine the exchange entitlement of these people. As a result, economically and socially disadvantaged groups such as women-headed households, landless wage labourers, and Dalits face regular incidences of hunger, especially during food-scarce periods. However, these factors and forces are gradually changing due to the rising trend of outmigration, development of physical infrastructure and markets, and some government policies that have been introduced in recent years.

Based on evidence, we argue that social and economic interventions are crucial to improving the food entitlement of deprived communities. Findings show that interventions that improve factors such as social security, physical infrastructure, pricing mechanisms, and accessibility of credit facilities often make the process of converting resources into food entitlement easier and more efficient.

Theme 2, Session 13 The Sanitation–Health Nexus

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The Millennium Development Goal (MDG) target of halving the proportion of the population without sustainable access to basic sanitation by 2015 is still very far from being achieved. Much remains to be done particularly in Africa and Asia. Availability, accessibility, functionality, and correct and continued use and maintenance of sanitary facilities are key to sustainable improvements. Reasons for frequent failures of sanitation programmes are weak intersectoral collaboration, as well as inappropriate technical solutions that do not sufficiently consider aspects of local ownership and socio-economic, cultural, and political perspectives. Only improved practices and sustained use of improved facilities and services can lead to significant health and environmental outcomes. Integrative cross-sectoral planning of waste management is crucial in achieving a positive impact on both health and the environment. Recovery and reuse of resources from wastes while ensuring health safety, for example, can contribute to change and promote sustainable development. The links between health, waste, and the livelihood potential in waste are important elements in achieving equitable improvements that benefit the most vulnerable population segments.

Organised jointly by Swiss TPH, EAWAG, and HSPH, this session will present and debate a decade of interdisciplinary research on the linkages between health, economics, and environmental sanitation conducted within the Swiss National Centre of Competence (NCCR) North-South. The close collaboration between the two Swiss institutions throughout the NCCR North-South and their combined focus on health and sanitation has led to cutting-edge research results. Five contributions by a mix of senior researchers, post-doctoral researchers, and doctoral candidates from the global North and South will showcase past and present research in Africa and Asia. Within the overall topic of sanitation and health, their inputs will cover topics such as sector governance, health burden, gender issues, economics, and engineering perspectives.

The presentations will be followed by a panel discussion on “Reducing Disparities” with Christian Zurbrügg (Head of Department of Water and Sanitation in Developing Countries, EAWAG), Jakob Zinsstag (Deputy Head of Epidemiology and Public Health Department, Swiss TPH), Hung Nguyen-Viet (HSPH), Halidou Koanda (Director, WaterAid Burkina), and Sabin Bieri (Centre for Development and Environment, University of Bern). The panel will be moderated by Marcel Tanner (Director, Swiss TPH).

Demand for Sanitation Among Urban Poor

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This study analyses demand for sanitation and its determinants among urban poor, using a representative sample of 1500 slum households in Kampala, Uganda. We apply both stated and revealed preference analysis. Our results demonstrate the need to distinguish between the sanitation market for house owners and that for tenants, given the differences in their legal situations and, consequently, in investment opportunities and incentives.

At current market prices, we find that 39% of owners possess an improved sanitation facility, while only 5% of tenants have access to such a facility. Our results show that these differences are not only the result of differences in preferences and budget constraints, but are also due to rationed sanitation markets and missing property rights for tenants. The current market price of improved sanitation is higher for tenants – due to rent increases – than for house owners, who can directly make a real-estate investment decision. Moreover, 15% of tenants without access to improved sanitation would be willing to pay the current rental market price of improved sanitation.

This result calls for legal interventions to ensure access to improved sanitation for poor tenants who are dependent on landlords for sanitation investments. In proportion to household income, the willingness to pay turns out to be substantial at around 40% of per capita annual income for both tenants and owners. Sanitation investment decisions are mostly influenced by property rights, space availability, and moving plans as well as by current sanitation conditions. In contrast, education and income only play a minor role.

Biosolids Recovery from Planted Faecal Sludge Drying Beds: Agronomic and Safety Considerations

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Within the framework of the Swiss National Centre of Competence in Research (NCCR) North-South, pilot research was conducted in Cameroon on the biosolids that accumulate at the top of planted drying beds used for dewatering faecal sludge. Taking a sanitation value chain approach, we analysed the biosolids to assess their degree of stabilisation as well as their concentrations of nutrients and heavy metals and hygienic aspects. The quality of biosolids accumulated in the beds was monitored during six months following faecal sludge application and prior to the final harvest.

The analysis showed that the biosolids' C/N ratio (11.3), humification index (14%), humification rate (1.8%), and degree of polymerisation (3.7) were comparable to those of mature composts. Moreover, the biosolids had a high fertiliser value (N: 2%, P₂O₅: 2.3%, CaO: 1%, MgO: 0.14%, K₂O: 0.03%, and Na₂O: 0.09%) and low rates of heavy metal contamination (63, 14, 26, 2.4, 575, 703, 186, and 32 mg/kg for Pb, Ni, Cr, Cd, Cu, Zn, Mn, and Se, respectively). After one month of storage, Helminth (*Ascaris*) eggs dropped from an initial level of 79 eggs per gramme of total solids (viability 67%) to less than 4 viable eggs per gramme of total solids, a level which does not significantly increase health risks according to the World Health Organization's guidelines.

These promising results show that biosolids from planted faecal sludge drying beds, if properly managed, can serve as a valuable organic fertiliser and soil conditioner capable of meeting the needs of local farmers.

Coupling Ecological Reuse Systems With Health Risks Determination: An Innovative Approach to Sanitation

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Wat Tou Thong School, a public school situated on the banks of the Chao Phraya River in Pathumthani province, Thailand, was selected as a demonstration site for testing an innovative ecological reuse system. A vertical-flow constructed wetland (VFCW) system for faecal sludge and grey-water treatment was constructed at the school to test its applicability for sustainable management of health and environmental sanitation in an urban community.

Taking a participatory planning approach, the researchers consulted with all key stakeholders – including schoolteachers, students, parents, and monks – when designing the VFCW unit. During the operation phase, students, teachers, and monks were also involved in maintenance of the system, including plant harvesting and control of the reused effluent. With regard to total solids, organic matter, and nitrogen, the system achieved a treatment performance of over 70%; regarding bacteria, it achieved a 2-log, or 90%, reduction in *E. coli* and salmonella, a performance level normally found in natural treatment systems. During project implementation, students in grades four to six – about 20 boys and girls – were trained in appropriate waste water management techniques and taught how to work in an effluent-fed agricultural field. Lessons on sanitation, ecological reuse, and user awareness of ecological reuse were incorporated into the students' course curriculum and teaching materials, building on basic scientific knowledge.

Focus group discussions indicated that students, teachers, and monks were able to understand the sanitation and ecological reuse system, and awareness was raised among parents, local people, and local authorities regarding water pollution control and associated health risks. One key outcome of the project was an award for achievements in the study of environmental pollution and management given to a sixth-grade student at the Wat Tou Thong School by Pathumthani Province on 9 January 2012.

Health Risks Associated With the Use of Wastewater and Excreta in Agriculture in Northern Vietnam

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We studied the health risks related to wastewater and excreta reuse in an agricultural community in northern Vietnam, with a focus on intestinal parasitic infections and diarrhoeal diseases. Several epidemiological studies were conducted to assess the relative importance of exposure to wastewater and excreta for parasitic infection and diarrhoeal episodes in Hanam province. Exposure data were obtained from household and individual interviews. Stool examinations were used to assess infection status. Quantitative microbial risk assessment (QMRA) of *Escherichia coli*, *Giardia lamblia*, and *Cryptosporidium parvum* infection due to exposure to wastewater and excreta was conducted to estimate diarrhoeal risks in the environmental sanitation and agricultural systems.

Helminth infections were prevalent (*Ascaris lumbricoides* 24%, *Trichuris trichiura* 40%, and any helminth infections 47%). Risk of helminth infection increased for people having direct contact with Nhue River water, as well as for people using human excreta as fertiliser. Tap water use in households proved to be a protective factor against *T. trichiura* infection. Diarrhoeal incidence in adults was 0.28 episodes per person per year (pppy). Direct contact with water from the Nhue River and local ponds, handling practices of human excreta, and use of animal excreta as fertilisers were important risk factors for diarrhoeal diseases. Inadequate use of protective measures, never or rarely washing one's hands with soap, and having eaten raw vegetables the day before were also associated with increased the risks of diarrhoea.

QMRA revealed that the most hazardous exposures included direct contact with the Nhue River, local pond and field water, household sewage, and composted excreta. The annual diarrhoeal risks were much greater than the WHO threshold values of 10^{-3} pppy. Thus, important health impacts were documented in agricultural settings where wastewater and excreta are commonly used. Mitigation efforts must address personal hygiene practices and safe water and food consumption.

Scaling Up Action Research Outcomes: The Household-Centred Environmental Sanitation (HCES) Approach in a Case Study From Nepal

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The Household-Centred Environmental Sanitation (HCES) planning approach was for the first time tested in Nepal, in a peri-urban setting from 2009 to 2011, to validate the novel planning approach, identify challenges, and improve the process. The participatory multi-stakeholder process in the Nala area involved household mapping and surveys, user needs identification and prioritisation, and a stakeholder assessment. Following an expert's assessment of potential sanitation options, community sensitisation campaigns including exposure visits, a sanitation bazaar, and focused community interactions were conducted. Among the three sanitation alternatives, users showed a strong preference for setting up a simplified sewerage system with decentralised wastewater treatment.

Although participatory planning consumes time, it is worth making this investment as it builds local ownership and assists in developing informed decision-making processes for affordable sanitation options. The final outcome of the planning process was an environmental sanitation improvement action plan which is currently being implemented. Thanks to additional funding from the Swiss National Centre of Competence in Research (NCCR) North-South for a Partnership Action, the project is now in its final state of completion. Based on the experience from the Nala HCES case, there are now ongoing efforts to scale up the approach within Nepal's water and sanitation sector. Sector programmes such as the Small Towns Water Supply and Sanitation Programme jointly funded by the Asian Development Bank and the Government of Nepal are willing to locally adapt and scale up the planning approach in its programme areas that cover 21 emerging towns in Nepal. Likewise, WaterAid Nepal is interested in adapting the approach within its programme areas to plan and implement sanitation services.

This contribution aims to share experiences in two areas. Firstly, based on the action research experience from Nala, it critically highlights the key challenges and outcomes faced while developing participatory plans. Secondly, it aims to share the insight that suitable institutional collaboration and advocacy can create opportunities to scale up action research outcomes and influence national policies and governance.

Assessing Willingness to Pay for Constructing Septic Tanks in Rural Vietnam

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The coverage of improved sanitation in Vietnam is still low, especially in rural areas. As a result, water-borne diseases remain key threats to public health. While the government has committed itself to increasing the proportion of people with access to improved sanitation, it cannot afford to subsidise sanitation for the entire population. Thus, improving rural sanitation continues to rely heavily on financial contributions from household-level private users, which depend on their willingness to pay (WTP) for such services. Knowing people's WTP is crucial when assessing the economic viability of projects, setting fees, evaluating policy alternatives, gauging financial sustainability, and designing socially equitable subsidies. However, such information on household-level demand is scarce to non-existent in Vietnam. We assessed the WTP for septic tanks among the rural population in Vietnam and identified the some factors that influence the level of WTP.

The study was conducted in Hanam province, in northern Vietnam. Researchers randomly selected and surveyed 600 households, conducting personal interviews with the main breadwinners or decision-makers in each. Contingent valuation was used to obtain relevant economic data. This method consists in asking individuals how much they would be willing to pay for a change to the quantity or quality (or both) of a particular commodity.

We found that 63% of the studied households were willing to pay for construction of a septic tank. The average WTP level was VND 16 million (US\$ 800), which amounts to about 15% of the households' annual disposable income. Economic hardship was found to be the major reason for not installing a sanitary latrine. Health, cleanliness, and prestige were found to be three major motivating factors for constructing septic tanks. Regression analysis showed that the odds for spending money on improved sanitation services were higher in households with better income, as well as in households whose head had better knowledge of sanitation.

Theme 2, Session 14 Effects of Global and National Policies on Rural Women's Livelihoods and Agency

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This session will explore how global phenomena, such as the increased drive for investment by national and international companies – be it to exploit natural resources, as in the case of Odisha, India, or to set up garment factories for export production, as in Bangladesh – impact on rural women's lives, their livelihood opportunities, and their agency. The role of migration and the effects it has on the women left behind will be explored in a case study from Nepal. Another presentation will explore the role of national policies, particularly land reform, and their impacts on rural women's lives in South Africa.

The presentations will be summed up and their relevance for international development cooperation discussed by Annemarie Sancar, gender expert at SDC, who will moderate this session.

Everyone is Leaving – Who Will Sow Our Fields? The Effects of Migration From Khotang District to the Gulf and Malaysia

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Over the last 10 years, the massive outmigration for foreign employment, mostly to the Gulf Cooperation Council States and Malaysia, has changed the livelihoods and social structure of rural Nepal. In 2011, 450,000 Nepalis left the country to work abroad, earning 23% of the GDP. The remittance inflows into rural districts dwarf other flows of finance, and the absence of men from agriculture and other fields of labour has severe effects on agricultural production and gender relations. Hence, the Swiss Agency for Development and Cooperation (SDC) in Nepal commissioned this study to understand better how development interventions have to adjust to this changed context.

The study was conducted in villages of Khotang district, where between 50% and 70% of households had a member abroad. The study looked at the impact of migration on different wealth categories and found that although the very poor households were less able to use migration as a strategy to improve their well-being status, interestingly, Dalits were more successful than other social groups in improving their assets and social status through foreign employment. The severe lack of male workforce in a subsistence agriculture that is heavily labour-based has led to changed relations between landlords and tenants: with fewer people interested in hiring-in land, it is now the tenants who decide the terms. As migration is predominantly male, the women left behind – particularly in nuclear households with no additional adult male at home – had to manage a much higher workload and were often forced to sell big livestock and leave land fallow or underutilised, resulting in reduced agricultural productivity.

The decision-making power of women, however, did not increase in par with their additional responsibilities. Although women have become the farm managers, bigger decisions continue to be taken by men – via mobile phone. Stress levels are high among women who head households, and family break-ups have been more frequent in migrant households. Yet women have taken on a bigger role in the public space; collective action has become feminised. But at the same time, the high workload has led to decreased interest of women in participating in community groups. The trend towards individualisation among remittance-receiving households leads to the question whether the group-based development approach is a model of the past. SDC is presently working on a development strategy that takes this changed context into consideration.

New Economic Policies and Social Transformation: Tribal Women in Rural Odisha, India

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New economic policies after the 1990s in India and in Odisha (an eastern state) have made a powerful impact on the welfare state. The egalitarian ethics that underlined planned development and the welfare state are changing fast. A pre-eminence of markets has now emerged. Odisha, which is home to 62 tribal/indigenous communities (23% of the total population), has experienced the impact of neoliberal policies in a variety of ways. The government has given the private sector access to resources (minerals, forests, land, and water). Ironically, minerals (bauxite, iron ore, and chromium) are concentrated in the tribal areas, which are located in remote rural hill regions. These areas have now become the favourite destination of large national corporations and multinational companies to invest in mineral extraction and mineral-based industrialisation. Most tribal communities depend on natural resources (land and forests) for their livelihoods, which are hence severely affected by mineral-based industrialisation.

Our previous research indicates that the nature of social transformation that is going on in Odisha is detrimental to tribal society in general, and women in particular, as they are deprived of their rights and their spaces have become restricted. New roles and identities are formed as a consequence of new sources of income in the informal sector, such as, for example, contractual farm work, construction work, domestic work in cities, or prostitution. These types of work are invariably exploitative in nature and alienate tribal women from their habitats. The tribal social system is disturbed and the identity of tribals is at times blurred, especially as a result of mobility to cities. Tribals may be uprooted and incorporated as “marginals” in the so-called larger mainstream society. It is a process of exclusion which makes them virtual slaves. There are some cases of retaliation and violence challenging the exclusionary process and violation of tribal citizenship rights, by tribal women. What is also interesting to observe is the twin process of hinduisation of tribals (strong influence of patriarchy) and simultaneous resistance by tribal women.

This contribution is based on field studies looking at mobility among tribal women and their role as activists against the ruling class and the current paradigm of development followed by the Indian State of Odisha.

Women in Rural Development in South Africa: Facing the Realities of a Changing Socio-political Environment

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The role of women in rural development in South Africa has undergone marked changes since the introduction of democracy in 1994 and the associated creation of a new socio-political environment. Various policies and programmes have emerged since then and women are continuously redefining and negotiating their roles, and their space, in order to be relevant, and to contribute to the development of rural areas.

In the light of these realities, this contribution draws attention to the opportunities and challenges presented by key policy frameworks, some specific initiatives that have impacted on women, and the associated adjustments and changed responses from rural women. Generally the role of women in rural areas has undergone considerable transformation although many are still heads of households and tillers of the earth. Moreover, there has been a significant shift in development thinking that encourages self-development and focuses on assets and confidence-building. Patriarchy, however, remains a factor with which women have to contend, particularly regarding property rights. Women have become key participants in the land reform process despite the general failure of this process to alleviate poverty and improve quality of life. They are using this process to ensure food security for themselves and their families. Despite their increasing visibility in public space, household decision-making still remains a dream for many of them.

This study recognises the references to women empowerment in many government policies, but closing the gap between policy and its implementation continues to be bogged down by governance problems, skills shortages, an ineffective land reform process, and patriarchy. There is indeed a need for effective implementation of policies that will improve the role of women in rural development.

Engendering Analysis of the Global Value Chain in the Bangladeshi Garment Sector: Enhancing or Undermining Women's Agency?

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What is the scope of increasing women's agency while they are serving as garment workers at the bottom of the Global Value Chain (GVC)? Analysing the GVC through a gender lens, it becomes clear that female garment workers – making up 90% of the workers in this sector – require prioritising in policy areas. What is most important is agency creation. Bangladeshi women, having “nimble fingers” and being victims of climate change, were targeted by profit-making factory owners.

This contribution tries to show why garment producers often prefer female workers. Are they being used as “instruments” or given any scope to emerge as “agents”? Moreover, the presentation looks into the question of whether female workers are being discriminated against by factory owners taking advantage of existing “gender relations” and women's “flexibility”. Being victims of natural calamities, many Bangladeshi rural women previously tried to sustain their livelihoods with microcredits but were unable to complete the cycle. They then migrated to cities to work at garment factories. Can these climate refugees, having become garment workers, have any hope to be entrepreneurs again?

The latest literature on this topic explains that the concept of GVC is useful to understand inter-firm relationships and connections between different actors in the chain across the globe. We argue that adopting a gender perspective is critical for getting the full picture of who actually contributes what along the chain. Recently, Bangladesh has drawn the world's attention because it has emerged as the second-largest exporter of ready-made garments, as a pioneer in microfinance, and as a victim of global climate change. Analysing the GVC, this contribution shows how these three factors are interrelated with the growing garment business. It also describes how, in spite of natural calamities, the country has moved up the GVC over the years, using its available and “flexible” female labour force as well as capitalising on the experiences of innovative micro-entrepreneurs.

Theme 2, Session 15 Social Equity and Resilience for Health: Towards Research as Development

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Reducing global and local health inequities has become a high-priority topic in science, policy, and development. In order to mitigate health inequities, it is critical to improve living conditions; tackle inequitable distribution of power, money, and resources; measure and understand the problems; and assess the impact of actions. Addressing the complexity of health inequities and its determinants requires new and innovative forms of research and action. An emphasis on social resilience may pave the way.

This session will explore empirical case research on health inequities done within North–South or South–South research partnerships. Participants are invited to reflect on the perspectives from which they have studied cases of health inequities, and to identify interlinkages of social and economic equity, health, and development.

Insights from these presentations are hoped to generate a discussion on the following questions: 1. Are existing methodologies and approaches helpful in identifying and examining health inequities, and if so, how? How is evidence generated, and how is it used in policy debates and decision-making? 2. What are the strengths and weaknesses of new experimental approaches to public health innovations? 3. What has worked well, and why? Where were goals not achieved, and why? 4. What additional insights can be gained by connecting different methodologies and underlying epistemologies in order to address the complexity of health inequities? 5. How can methodologies be improved in order to deepen and broaden our research, teaching, and interventions on health inequities by combining the perspectives of public health, social sciences and development? By addressing these questions, this session offers an opportunity to discuss and help develop conceptual and practical approaches to mitigating health inequities, and to jointly identify “best practices”. At the same time, it will contribute to a better understanding of inter- and transdisciplinary research and collaboration.

Increasing Resilience of Adolescents in Ghana and Tanzania to Teenage Pregnancy: Factors to Consider

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Ghana's and Tanzania's teenage pregnancy rates are among the highest in the world. While many international and national organisations target young Africans with their interventions, surprisingly little is known about how African youth express their sexuality, particularly in rapidly changing urban contexts. In the past, research focused on the vulnerability and risks of youth. Currently, a growing body of literature uses a strength-based resilience approach focusing on the capacities of actors to deal with adversities.

Using the multi-layered social resilience framework developed by Obrist and colleagues of Swiss TPH, this contribution discusses how social actors as well as interventions on various levels in society can contribute to building adolescents' reactive and proactive capacities to overcome threats related to teenage pregnancy. It is based on data obtained through a quantitative cross-sectional survey in two urban and two rural sites in Ghana and Tanzania in which more than 2500 female adolescents aged 15 to 19 years were interviewed. Findings from this comparative study highlight the fact that teenage pregnancy rates have gone up from 12.8% to 15.6% in Accra and from 14.6% to 15.6% in Dar es Salaam in the past five years. Nevertheless, the study also pointed to influential actors and interventions:

(1) Parents are becoming more important in sexual and reproductive health education for adolescents due to changing family structures. They are, however, in need of positive parent-child communication skills.

(2) Youth magazines are widely used by youth in Tanzania and play an integral part in terms of sexual education. Scaling up of youth magazines is recommended in order to reach urban as well as rural youth, not only in Tanzania but also in other African countries.

Society, Equity, and Health: At the Intersection of Public Health, Social Sciences, and Development

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Reducing global and national health inequities has become a topic of high priority in science, policy, and development. In order to mitigate health inequities, it is critical to (1) improve people's everyday living conditions, (2) tackle the inequitable distribution of power, money, and resources, (3) measure and understand the problems, and (4) assess the impact of actions. Addressing the complexity of health inequities and their determinants requires North–South partnerships and inter- and transdisciplinary collaborations across the natural, technical, and social sciences as well as the humanities.

This presentation puts first results of the Swiss National Centre of Competence in Research (NCCR) North-South Transversal Project Mandate (TPM) “Society, Equity, and Health: At the Intersection of Public Health, Social Sciences, and Development” up for discussion.

The NCCR North-South programme framework places this TPM in the unique position of being able to synthesise and capitalise on a wealth of case study material and methodologies produced in diverse contexts, and to draw on a worldwide network of researchers to examine health inequities from the intersecting perspectives of public health, technology, social sciences, and development. Focusing on concrete cases of health inequities collected in diverse contexts by the global network of NCCR North-South researchers since 2001, the TPM will analyse the perspectives from which these cases of health inequities were studied, identify interlinkages between social and economic equity, health, and development, and examine what additional insights (could) have been gained by connecting different methodologies and underlying epistemologies.

Insights gained from discussion with other researchers and participants at the International Conference on Research for Development will be used to further improve and develop conceptual and practical approaches to reducing health inequities and at the same time deepen the understanding of inter- and transdisciplinary and North–South research collaboration which is at the heart of this NCCR.

Services Access, Health, and Well-being in an Urban Context: Addressing the Complexity of Social and Health Disparities in Nouakchott, Mauritania

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In developing cities such as Nouakchott, Mauritania, access to efficient and appropriate tools for policymaking appears to be a crucial step in planning public health development policies. Despite a large amount of data generated by different studies on social and health aspects in this city, useful information on urban areas for public health planning is typically lacking. Addressing health disparities and social inequalities in urban areas contributes to planning of public health development at different spatial scales. The database available for Nouakchott makes it possible to produce an atlas on social and health issues using national data surveys from 2000 and 2009 at commune level, completed or validated by households, along with geographic surveys at the district level.

The methodological approach is based on the visualisation of health indicators (morbidity of malaria, respiratory infections, tuberculosis, and diarrhoeal diseases, infant mortality, access to healthcare, etc.) and variables (population density, socio-economic conditions, poverty incidence, water and sanitation services, hygiene, etc.). Health disparities and the impacts of different related factors are spatially represented at a high resolution using modern cartographic methods. The analytical focus is on the meso scale.

The expected results are meant to contribute to a better understanding of health risk disparities. The aim is also to improve the performance of urban development planning by placing particular emphasis on development and building up capacities of local public health institutions. The increasing complexity of social and health problems is thus addressed at a high level of spatial information desegregation in order to provide sound evidence and enable appropriate and efficient decision-making regarding Nouakchott's public health services.

Situating Evidence in Public Health Interventions: Experiences from India, Nepal, and Sri Lanka

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Over the past decade or so, there has been an increased interest in generating evidence-based public health policies in South Asia. As a part of the “Biomedical and Health Experimentation in South Asia” (BHESA) research project we investigated research studies in the public health sector that were concerned with generating “rigorous” experimental evidence to persuade governments and policymakers to adopt new policies and programmes.

Drawing on our fieldwork in three countries – India, Nepal, and Sri Lanka – this contribution interrogates the processes that intervene between public health science and politics, through a discussion of selected case studies of evidence generation in public health and health policies and programmes in these countries. In addition to unpacking what is meant by “rigour” in generating evidence in these studies, our research explores the views of a range of actors, institutions, and networks that put emphasis on evidence and influence the uptake of evidence in health policymaking in the three countries.

Theme 2, Session 16 Going Beyond Basic Needs: New Opportunities to Reduce Inequalities in the Metropolises of the Global South

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This session aims to bring actors from different disciplines into an advanced discussion about the development mechanisms and opportunities of cities in the global South.

Faced with the challenges of climate change, economic incentives, and demographic boom, the cities in the South are becoming much more complex than researchers in the North have come to think. Far beyond the basic needs, the cities of tomorrow require extensive governance knowledge and key assets that are compatible with their size and development dynamics. From this perspective, reducing inequalities within metropolitan areas can be considered as a key issue at the planetary level. The articulation of governance and participation must move beyond familiar top-down implementation processes and make room for new actors on the scene.

Presentations will be followed by a discussion, with the aim of developing an agenda for future research and cooperation.

Learning from African Cities

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The aim of this presentation is to highlight the main outcome of an international symposium entitled “Learning from the African City” held in Abidjan in the context of Swiss National Centre of Competence in Research (NCCR) North-South studies on urban planning and well-being. The symposium brought together scientists and planners from the global South and North around three distinct but highly interconnected topics: (1) the production of the city at its fringes, (2) public spaces, and thus the right to be part of the city, and (3) the mobility that connects these spaces. It was also a matter of understanding the phenomena of urban sprawl, mobility patterns, and the traditional core problem of negotiating or losing public space or land. The gaps in understanding such urban transformation pertained to the lack of networks and knowledge regarding urban dynamics as well as the failure to consider interdisciplinary topics.

The main findings are that the ongoing dynamic process of privatisation of transportation and public spaces is leading to growing exclusion of the poorest. Income from land property rights and the need for in-house security with “shelters” reinforce the development of ever more distant suburbs. People’s impoverishment keeps them in the city centre or in distant suburbs, where they face sanitation problems and high transportation costs, respectively.

The links between transportation systems, habitats, and sites of sociability are not addressed by public policy or urban projects. This is the main outcome of the symposium, indicating a need for reflection on the scale of African cities’ governance. It was the first time that researchers tried to show how the mechanisms of producing urban spaces should take into account the complexity of the city.

Design Tools for Sustainable Social Housing Development in Fast-growing Southern Mediterranean Cities

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Many Mediterranean cities are currently seeing a rapid growth of their population. As a result, the need for affordable social housing is increasing. However, new housing developments are unable to meet this demand. Furthermore, because of poor quality construction, irrational usage of energy, and non-contextual planning, these new developments have a strong negative impact on the environment, the urban climate, and interior comfort.

The present research examines ancient construction techniques in search of simple, elementary techniques, structural elements, and architectural principles that can be implemented in the agglomeration of Algiers, Algeria. From an extensive study of building heritage, we propose an architecture that is adapted not only to the socio-economic context, but also to local physical and climatological constraints, and that fits in with local customs, habits, and tradition.

This working process links traditional construction techniques with the latest technologies in order to develop low-tech and affordable solutions which can be implemented in large-scale real estate developments, in the context of rapid population growth and economic hardship.

The outcome of this research is a range of design tools covering a broad array of scales, from urban systems to construction details and construction materials. At a larger scale, urban climate, public spaces, and the energy needs of buildings are improved by optimising the built volumes, especially in terms of orientation to the sun and major wind directions. Within building blocks, typologies are rooted within the local housing history and merged with strong principles of natural ventilation, cooling, and humidity control. In terms of construction, integrative solutions using excavation earth combined with different natural aggregates strongly improve thermal properties of buildings and dramatically reduce carbon emissions.

This research offers a set of low-tech adaptive design tools that allow building cheaper and more comfortable social housing, while reducing the environmental impact and maintaining tradition and history.

Articulating Urban Mobility, Public Equipment, and User Expectations in a Developing Metropolis

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This presentation addresses the challenge of reducing disparities between central and peripheral urban areas under rapid expansion in densely populated regional capitals in Africa and Asia. Recent data published by the United Nations Development Programme (UNDP) and UN Habitat (2010) have demonstrated that in many least developed and developing locations, demographic growth and urban sprawl are no longer correlated to actual economic growth. In recent years, while unemployment, inequality, poverty, and a general lack of infrastructure have remained the key reasons for urban insecurity and social conflicts, market-driven development efforts have often concentrated only on identified commercial and upper-class areas. At the planetary level, despite huge disparities in economic dynamics between the least developed areas and some emerging economic powers such as China, India, and Chile, there are certain similar elements, and common lessons can be learned.

Based on recent research activities conducted by the Urban Sociology Laboratory at EPFL and its institutional partners, this presentation aims to bridge the knowledge networks of different disciplines including architecture, urbanism, socio-economic studies, and policymaking, and to link experiences of developing locations with the anticipated needs of least developed locations. The presentation tackles the challenge of linking top-down development policymaking and bottom-up participatory processes with new strategic approaches. The main topics are urban mobility, public equipment, and user expectations.

The presentation and discussion session will use examples from regional capitals in West Africa, South America, and the Asia/Pacific region to identify key factors that could potentially improve the articulation between central and peripheral urban areas and between social groups. Recent case studies and planning projects from a development context will be analysed methodically put up for interdisciplinary discussion.

Second-wave Urbanisation: Mobilising African Discourses

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Discrepancies in the mobility of urban citizens are far more noticeable in Africa than in the global North. Outsiders use the differences as icons, using them in (photo) “stories” and as ways of “reading” the African city. The differential accessibilities that individuals and households have are less visible and less often spoken about.

The intellectual, planning, and policy paradigms and discourses that guide surveys and interventions in urban transport have not kept up with – let alone resolved – urban accessibility and mobility inequalities in African cities. The effectiveness of conventional science, technology, and managerial practice is compounded by concern over its appropriateness to the conditions and challenges of second-wave urbanisation in Africa.

This contribution urges alignment of urban transport research with new urban imaginaries, and formulation of new ideas about urban transport and travel in Africa with African partner institutions and civic interest groups.

Theme 2, Session 17 Making the Labour Market Work for the Poor: Pathways Towards Inclusive Development?

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The ongoing drive towards better integrating the poor into global commodity circuits and production networks has had a profound, if diverse, impact on many regions in the global South. Framed programmatically with labels such as “markets for the poor”, “value chain integration”, or “financial inclusion”, development hopes rest on the economic effects of these projects in terms of improved livelihoods and poverty reduction. Although the international development community has arguably been successful in promoting economic growth and alleviating poverty, there is a lively debate in the academic and policy-oriented literature concerning the distribution of the benefits and costs of market-making and market-expansion projects. Against the background of the ongoing financial and economic crisis, this session engages with processes of social exclusion and marginalisation in labour markets and possible pathways towards more inclusive policies.

In this context, the aim of the session is to discuss constraints and opportunities for different labour market participants in their respective regional and national regulatory settings. More specifically, the presentations address exclusion and perpetuated poverty among youth, gendered access to particular professional segments, resilience to economic shocks, and the question of upgrading in export-oriented agricultural value chains. The case studies cover four world regions (South America, Central America, West Africa, and South Asia) and address the question of labour market access with reference to multiple dimensions of difference (gender, age, ethnicity, and class).

Aspects to be addressed include:

- The existence of different labour markets and the relation/permeability between formal and informal labour markets
- State and markets, and the role and adequacy of different regulatory policies: labour market, financial, social, and fiscal policies
- Equality of opportunities versus equality of outcomes: The effect of labour market and other policy/development interventions on different social groups
- Use and assessment of such policies by different target groups
- Effects of financial and economic crises on particular segments of the labour market and respective groups
- Assessment of different measures of economic empowerment (such as value chain integration or M4P initiatives)
- Economic growth and development objectives: increased income, human well-being, and expanding capabilities

Employment Policies for Poor Youth: The Need for Multidimensional Interventions

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The situation of young people in poverty, who have difficulty in achieving qualifying positions in the labour market, is especially worrying in Latin America. While precarious employment is widespread among all young people, for those in poverty the succession of unstable, low-skill jobs with poor conditions and the extension of these uncertain labour trajectories over time often results in a long-term reproduction of poverty. This scenario not only affects individual rights and development potential, but is also linked to increasing youth violence experienced in the region.

In this context, youth employment policies become highly important. Nevertheless, in Argentina the strategies of intervention seem quite limited: they consist almost exclusively of training courses and, in the last few years, of support for productive micro-projects led by young people. The problem is that these interventions generally do not reach the most vulnerable groups, since they are not adapted to their needs, interests, and conditions of life.

This contribution explores the labour experiences of young people in poverty in Greater Buenos Aires and the relationships they established with different “youth-oriented” employment policies. It analyses how these policies influenced youth entrance to the labour market, as well as which youth needs were ignored by the interventions. It also explores the differences between men’s and women’s needs for training and support. The presentation concludes with a discussion of the convenience of developing comprehensive, gender-sensitive employment policies oriented to poor youth in order to address different aspects related to their employability: social capital, basic education, social skills, and vocational training.

Discourses of Gender Identities and Gender Roles in Pakistan: Women and Non-domestic Work in Political Representations

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This contribution aims to explore the manifold and changing links that have been constructed between women and work by Pakistani state discourses between the 1940s and the early 2010s. The main focus of the analysis is on discursive spaces that have been created for women who engage in non-domestic work.

Based on a critical review of existing academic literature, it is argued that Pakistani women's non-domestic work has been conceptualised in three major ways: as a contribution to national development, as a danger to the nation, and as non-existent.

The study concludes that, even though some conceptualisations of work have been more powerful than others and have become part of concrete state policies at specific historical junctures, alternative conceptualisations have always coexisted. Disclosing the state's implication in the discursive construction of working women's subjectivities might contribute to the destabilisation of hegemonic concepts of gendered divisions of labour in Pakistan.

Economic Crisis, Resilience, and the Informal Sector: An Analysis of Barriers to the Creation of Decent Jobs

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Like in most sub-Saharan African countries, the labour market in Côte d'Ivoire is dominated by the informal sector. In fact, facing the consequences of economic crisis such as increased poverty and unemployment, participation in the informal economy through the creation of micro-enterprises is one of the main resilience strategies followed by various social groups (youth, women, immigrants, graduate students, officials, and others).

However, employment in the informal economy is highly precarious, as informal jobs are characterised by low incomes and lack of social protection. To make things worse, business conditions are far from enabling, starting from a lack of access to key public services (water, electricity, telecommunication, etc.), non-existent or insufficient legal or official norms, and no working time regulation. In other words, the issue of decent working conditions is particularly acute in the informal sector.

With reference to the livelihoods approach, this presentation analyses determinants of the difficulty of creating decent jobs in the informal sector. First, it describes the types of capital needed to create decent jobs in this sector. Second, it shows how, in the case of the activities studied, the mechanisms of access to these capitals constrain the creation of decent jobs.

Labour Arrangements and Financial Inclusion of Agricultural Workers in a Dynamic Agricultural Region in Mexico

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In this presentation, we focus on the contractual labour relationships of agricultural wage workers in a productive agricultural region of Mexico. We describe the array of their financial practices (formal and informal, including tied labour–credit arrangements), and we try to assess whether, and to what degree, their status as agricultural workers translates into some form of exclusion/rationing with regard to their financial practices.

From a theoretical standpoint, this research builds on an institutional economics framework, particularly in terms of the concept of market failures, the embeddedness of markets into social relationships and networks, and the exploration of interlinkages between labour markets and financial markets, at a micro level. From a methodological standpoint, the study draws on insights from a combined quantitative and qualitative analysis of first-hand socio-economic data.

The data was obtained by means of a regionally representative quantitative household survey applied to 400 rural households (out of which 170 turned out to earn some share of their income through agricultural wage) and 40 in-depth interviews conducted with a sub-sample of households involved in agricultural wage. This Q-square approach enabled us to uncover the heterogeneity of rationales and processes at work behind the statistical relationships.

Theme 2, Session 18 Statebuilding Versus Peacebuilding? The Construction of Political Legitimacy in Fragile and (Post-)Conflict Contexts

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Helping to build strong, accountable, and stable political institutions is increasingly considered as a cornerstone of peacebuilding policy and practice. Peacebuilding has thus moved from its initial focus on how to achieve peace between belligerents to a comprehensive approach which centres on state-building as both an objective and an instrument towards the establishment of peaceful societies and polities. In parallel, debates about state-building are moving away from a technicist approach – which rests on the belief that building states is about finding the right set of tools that can be applied in any context – to a more political approach. It is now generally admitted (1) that state-building is first and foremost a political process, (2) that states are not separated from society, but that, on the contrary, they need to be understood in their relations with society, and (3) that state-building is primarily an endogenous process, that is, a process led by social, economic, and political forces within a particular society. Reconciling the agendas of peacebuilding and state-building, however, leads to risks and tensions. Outside interventions in the name of peacebuilding can impact negatively on historical processes of state-building, just as elements of a state-building agenda can have disruptive effects and endanger peace.

Against this background, understanding local power dynamics is crucial. Stable and sustainable states are states where the exercise of power and authority is based on a – generally tacit and implicit – social contract. In this contract, citizens relinquish part of their power to specific social and political institutions. State authority is granted through social acceptance and recognition rather than (the threat of) physical force. Legitimacy is key to the emergence of stable states. Far from a culturally or socially given quality, legitimacy is a historical construct that results from protracted social struggles and trade-offs between groups and actors. Understanding how it is constructed is key to any effort at accompanying processes of state formation, especially since outside interventions are always integrated in local politics, and since they can have both legitimising and delegitimising effects.

This session explores some of these dynamics, looking at how state and other political institutions are shaped by and through conflict. With case studies looking at different moments of the war-to-peace continuum, it sheds light on the complex interplay between state-building and peacebuilding.

Bridging the Perspective Gap: How Perceptions Influence Cooperation Between Local and International Peacebuilding

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Peacebuilding is usually associated with international actors intervening in a post-conflict context. Accordingly, the positive impact of local contributions is often overlooked. In this presentation it will be argued that both international and local approaches to peacebuilding should be considered and that cooperation between the different actors engaged in peacebuilding influences the effectiveness of their programmes. Cooperation is, however, often hampered by diverging perceptions of peace and conflict as well as by dichotomist portrayals of each other.

Taking the Democratic Republic of Congo as a case study, the presentation draws on empirical data gathered in spring 2011 and 2012 in the eastern district of Ituri. It analyses how differences in local and international actors' perceptions have shaped the interaction between them and the legitimacy of their programmes. The first part of the presentation will focus on the images that local and international actors have and promote of themselves and each other. These images have formed in historical processes and frequently serve to justify and legitimise the relevant actors' engagements.

As will be shown in the second part of the presentation, this has led to dichotomist perceptions that create an "us" and a "them", thereby hampering constructive cooperation between the different actors. Cooperation is defined by the author as partnerships which do not deny inherent power asymmetries, but in which differences between the various actors are seen as a potential source of success, rather than an obstacle to cooperation.

Therefore, in the third part of the presentation it will be argued that both the international community and local actors have had their distinct comparative advantages in efforts to calm the district of Ituri since the major outbreak of violence in 1999. However, if these advantages are not harnessed, the entanglement in rivalries risks overshadowing the goal that both sets of actors proclaim to pursue: peace.

Mobilisation for Political Violence: Who Joins Pro-governmental Militias and Why?

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With the end of the Cold War, in the framework of what has been referred to as “new wars”, it has been argued that population pressure in the form of large youth cohorts – so-called “youth bulges” – increases a country’s likelihood to experience armed conflict, in particular when these youth groups are excluded from political and economic participation. Indeed, the role of youth in violent conflicts has risen sharply since the early 1990s, either as part of insurgent/rebel movements or as part of counterinsurgent/pro-governmental armed groups and militias.

The literature addresses these two groups, i.e. rebellion movements and pro-governmental armed militias, differently, as if there was no similitude between their respective members. This is one of the two gaps that this presentation aims to address. My conviction or thesis is that there is no fundamental difference between insurgent and counterinsurgent combatants in terms of profiles and fighting motivations. Both are motivated by the quest for better political, economic, and social participation. Compared to the extensive research on rebel recruitment, the process of counterinsurgent mobilisation remains unexplored. This is the second gap to be addressed in this contribution. To defend the above thesis, I will draw on a case study of armed militias that emerged from 2002 to 2011 in Côte d'Ivoire. During the recent conflict in Côte d'Ivoire (2002–2011), youth armed militias indeed played a crucial role in supporting former President Laurent Gbagbo. The so-called “Young Patriots”, a wide network of associations, went through different phases during this period, ranging from great successes to ultimate defeat. Côte d'Ivoire thus provides a very pertinent case. The study will address the following questions: Who joins such counterinsurgent groups and why? How do these groups succeed in recruiting poor peasants in defence of a status quo that typically appears staked against their own interests? In what ways do rebel and counter-rebel organisations differ? What are the implications of counterinsurgent mobilisation for our understanding of the dynamics of civil wars? Does the construction of legitimacy play the same role in the political sustainability of counterinsurgent movements as it does in that of rebel groups?

The main purpose of this research project is to (1) explore the conditions under which irregular armed groups that are linked to government authorities are recruited and formed, and (2) investigate how these armed groups develop the political discourse upon which their social legitimacy rests. One of the crucial aspects of this research is the analysis of the perspectives of pro-governmental combatants in the process of peacebuilding. How do they negotiate their social and economic integration?

The Water War in the CNO Zone of Côte d'Ivoire: When a Public Good Becomes a Weapon of War

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In Bouaké, after the outbreak of the rebellion in September 2002, all public services were highly disturbed due to neglect or looting of infrastructure and the desertion of office of all or part of the staff. Concerning the water supply service, this situation resulted in extensive damage to the supply network (accidental or deliberate breakage of pipes) and the near impossibility of maintaining treatment plants in working order (no chlorine, absence of technicians). Combined with poor water conditions (drying up of rivers due to lack of rain), these constraints led to problems in supplying water to the population, with lower pressure sometimes leading to suspension of the service for shorter or longer periods of time.

In the context of sociopolitical conflict, this apparently merely technical problem became, at least in the imagination of a large segment of the population, a true act of war. From the perspective of these people, water ceased to be a public good, and the fact that water supply had stopped came to be seen as a “weapon of mass destruction” used to punish people for their real or perceived support of the rebellion.

This presentation aims to explain how water, a public good, became a weapon of war during the Ivorian crisis, at least in the imagination of people. How was this perception of water as a weapon constructed and imposed? To what extent was the government responsible for the situation? What was the role played by the “Forces Nouvelles” in the construction and dissemination of this perception?

Security Sector Reform as a Development Instrument: Bridging State-building and Peacebuilding Objectives

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Although security sector reform (SSR) activities may help to build and strengthen the state even if they are poorly designed and implemented, this happens at the expense of broader peacebuilding objectives. This presentation argues, however, that SSR is able and meant to serve as an important instrument for achieving a wide spectrum of peacebuilding goals – including political stability and legitimacy, as well as development and human security.

Indeed, SSR has the potential to support both state-building and peacebuilding. SSR represents a range of activities that improve political stability and human security, as well as human development and public security. This is done through technical exercises and by facilitating behavioural change, and the activities are carried out by local owners with – requested – international assistance. However, SSR can meet these objectives only if it is designed and implemented in line with its main principles; if it is directed at creating and supporting the conditions for legitimate and “good” security sector governance; and if it is not implemented in the guise of “quasi-SSR” activities that actually have little to do with SSR.

The presentation highlights mistakes that have been made in applied SSR, as well as key lessons that have been learned and which, in turn, must inform future SSR activities. The paper draws on the author’s recent work on the concept and application of SSR, particularly in reflection of its origins as an articulation of the security–development nexus.

Cultural Politics of Governance: Democratic Practices and State-building in Post-conflict Rural Nepal

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Nepal is at the crossroads of political change and governance reform as it comes out of a decade-long armed insurgency and a century-long unitary form of governance to draft a new constitution for a federated republic of Nepal. November 2005 marked a dramatic turn in Nepalese politics when the parliamentary parties and the Maoists, their erstwhile adversary, joined hands through a twelve-point agreement for ousting the monarchy. Political power is shared among political parties including the Maoists, the former rebel group which won a majority in the 2008 election to the Constituent Assembly. However, these political forces have deep-rooted disputes that were aggravated during the insurgency and are still alive. In this political context, Nepal provides a captivating political and governance conjuncture endowed with a great deal of interest among the national and international academia, planners, and policymakers, particularly as to the question of how the political and governance processes in a war-torn society may simultaneously move towards “peace and democracy” (Jarstad and Sisk 2008) and “rebuilding governance” (Brinkerhoff 2007).

Focusing on new political ensembles such as the All Party Mechanism and the Integrated Project Selection Committee in post-conflict governance and development projects in the rural society of Khotang district, one of the eastern hill districts of Nepal, we explore sociopolitical power relations, governance practices, and state-building at the grassroots level. Taking an Integrated Project Selection Committee meeting in rural society as a methodological entry point, we examine how decisions are made and negotiated in the realm of a “liberal and radical” political coalition in a pluralistic society.

We argue that power-sharing and development projects are characterised by particularly elite-driven negotiations which are accentuated by local political impulses, and that local state authority employs legitimacy. This might give rise to subversion of the local state and governance system and produce new political subjectivities in local politics and governance.

Theme 3, Keynote 1 Biodiversity, Self-organisation, and Sustainability

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Although the concept of biodiversity is now well anchored in public policies and international agreements, there is limited understanding of what biodiversity actually is, why it exists, and why it is important. In this lecture, in which I focus especially on agro-ecosystems, I will argue that new ideas about complex adaptive systems offer a valuable basis for understanding biodiversity. I will show how natural ecological systems emerge through processes of self-organisation that operate over a wide range of temporal and spatial scales, and lead to system-level properties such as diversity, stability, nutrient conservation, and population regulation. Many of these properties are important for human well-being, and they are increasingly recognised as ‘ecosystem services’, to which an economic value may be assigned. But despite this recognition, modern agriculture promotes practices that maintain agro-ecosystems in the early stages of the adaptive cycle, characterised by open nutrient cycles and boom-and-bust dynamics.

In conclusion, I suggest that the emerging theory of adaptive systems offers important insights for managing ecosystems more sustainably. These include: (i) the importance of adaptation, both ecological and genetic; (ii) the importance of emergent properties that arise from (self-organised) biodiversity within and among habitats; and (iii) the importance of continuity of management for self-organisation to occur. Some of these aspects can be illustrated by examining ancient agricultural systems that have remained productive over thousands of years.

Theme 3, Keynote 2 Interdisciplinarity and Interculturality

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The formation of the social sciences has been characterised by growing specialisation, with the creation of different disciplinary fields that have constituted themselves and claimed theoretical autonomy from other fields. “The social” – or social reality – is no longer the only reference point that organises the research field: many objects and groups of objects have been transformed into disciplines and professions. The division of labour in research that created this diversification of sciences and the corresponding specialisation has made it possible to increase knowledge on and understanding of specific aspects of social life; however, after having passed through the resulting phase of analytical separation, which was necessary for penetrating the object of study, it is also necessary to reassemble the complexity of social reality. In this sense we require that interdisciplinarity allows linking of two, three, or more dimensions of reality.

This paper will begin by exploring two movements in the process of knowledge creation: following the theoretical framework of Leszek Nowak, the first can be called *idealisation*. It implies the pathway of increasing abstraction from an object of study. This can be used for defining the field of a discipline or as a nucleus for explaining one specific aspect of reality. Following the same theoretical framework, the inverse movement can be called *concretisation*, that is, the reflection on how the isolated object of study relates with a growing number of other dimensions of reality. In each discipline of the human and social sciences, however, there is not just one theory. Each discipline is built on a diversity of theories that either conflict or collaborate in different ways. This paper will propose some ideas about how to conceptualise interdisciplinarity and the inter-theoretical dimension, which are not the same.

The paper will then also connect interdisciplinarity (a scientific concern belonging to the dominant modern world) with forms of knowledge that belong to other kinds of scientific culture. Indeed, in countries like Bolivia, which has a strong cultural diversity, we need not only interdisciplinary and inter-theoretical work, but also an intercultural dialogue. This dialogue embraces forms of knowledge claimed to be scientific and other forms of knowledge that organise the representation of the world and reality according to cultural foundations beyond those of the dominant sciences. Therefore, after focusing on the translation between theories within the boundaries of the modern sciences, we will analyse processes of translation of cognitive elements belonging to sciences and other cultures. This will lead us to explore the fundamentals of *dialogical-intercultural hermeneutics*, concluding in considerations of *trans-criticism*; the latter refers to dialogue and knowledge production that goes through, or builds upon, reciprocal and cross-critical dialogue of different forms of knowledge.

Theme 3, Session 19 Reconciling Cultural Diversity and Biodiversity: Assessing the Role of Communal Reserves, Community Conservation, and Other Models

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This workshop aims to take stock of conservation models seeking to reconcile the conservation of biological and cultural diversity. Loss of both types of diversity represent a major challenge in the 21st century, and integrative models have increasingly formed part of new approaches employed to promote sustainable development after Rio. The workshop will bring together both Northern and Southern-based research practitioners with hands-on and fieldwork experience garnered in such domains. Organized jointly by the Graduate Institute of International and Development Studies (IHEID) and Regional Coordination Office in South America (JACS SAM), particular emphasis will be placed on models designed and put into practice in the global South, with a strong emphasis on Latin American models such as communal reserves, indigenous territories, and similar models. Efforts will also be made to invite researchers and practitioners from other regions. The main questions we will focus on are:

- What can we learn from the first generation of such approaches?
- What advances are being made and what challenges experienced?
- What are policy lessons are emerging from the NCCR North-South research network and others?

Timbering Practices, Indigenous Communities, and Protected Areas: The Dilemmas of Inclusion and Participation

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This presentation analyses timber extraction practices and the choices people from indigenous communities make to extract timber resources in a protected area in the Peruvian Amazon. The analysis focuses on the implications these practices and decisions have for community structure and for protected area management, and how they are expressed in economic, social, and cultural “stakes” in the competition for access to and use of forest resources at the interface of indigenous communities, the state, and the market.

Evidence shows that indigenous people are exposed to pressures and changes in their forest resource use practices. Development processes among indigenous and non-indigenous communities in the Peruvian Amazon, and in particular the Harakmbut communities of the Madre de Dios region, are characterised by weaknesses in the social control system within their own communities. These weaknesses allow for increased illegal timber extraction and limit the implementation of conservation strategies that promote participation.

Forest users, whether indigenous or not, develop strategies and resort to different institutional arrangements that allow them to access forest resources. These institutional arrangements range from local or communal institutions based on traditional arrangements to state laws, informal rules, and even illegal agreements – although these are legitimate to a certain degree in these Amazonian areas. Against this background, the present analysis challenges the notion of homogeneous and cohesive communities, and shows how communities function to reproduce “otherness” – a function that emerges especially when these communities are the product of a process of reinvention.

Understanding these issues is of fundamental importance, as logging practices are being institutionalised in the Peruvian Amazon which undermine conservation efforts and affect biodiversity and people’s livelihoods. Recognising the vulnerability of forests and people at the micro level can help to establish potential strategies for improved resource use and for developing sustainable practices and institutions suited to these particular realities.

Coastal Development and Marine Conservation in Harmony with the People: A Case Study from Costa Rica

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Most coastal communities in Costa Rica have been experiencing the negative effects of social and political exclusion, including environmental degradation and overexploitation of marine resources. Artisanal fisheries are particularly affected, posing serious threats to communities whose livelihoods depend on coastal resources.

The efforts of a local cooperative in the community of Tárcoles (Puntarenas, Costa Rica), CoopeTárcoles R.L., with the support of a service cooperative named CoopeSolidar R.L., have produced an interesting policy initiative known as Marine Areas for Responsible Fishery. These areas are intended to protect coastal resources by establishing responsible fishing regulations in agreement with the main stakeholders.

This presentation explains the process and challenges of establishing these areas and recommends further actions towards environmentally sensitive and socially inclusive policies, sharing useful lessons for fishery communities under similar challenges, government policymakers, and scholars.

Are We Really Interested in Preserving Bio-resources? Observations From an “Eco-development Project” in a National Park of India

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This presentation is intended to show how a global approach of “conservation and development” actually leads to “further” impoverishment of local people. Drawing from field-level experiences on a “conservation and development” project in a national park of sub-Himalayan West Bengal, India, I argue that ineffective implementation – rather than the conceptual background of the “conservation and development” approach, which is often criticised by conservationists – is the major cause for continuing impoverishment.

The root cause behind such ineffective implementation lies in conservationists’ and forest managers’ colonialist (mis)perception of nature and human–nature interaction, particularly in the context of developing countries like India. I argue that an integrated “conservation and development” approach involving local people’s functional (instead of cosmetic) participation in conservation, is the better alternative compared to the globally dominant “fortress conservation” approach. Forest authorities need to change their attitudes towards local communities and develop skills in working with communities based on mutual trust and respect to achieve effective implementation and enhance the livelihoods of forest-dependent people.

Reserva Comunal Yanasha: Lessons About Cultural and Biological Diversity in the Peruvian Amazon

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This contribution will present a case study of “community conservation” from the *Reserva Comunal Yanasha*, the first communal reserve established for indigenous peoples in the central jungle area of Peru. Community conservation areas are increasingly promoted globally as integrative solutions to address biological and cultural diversity and increase social equity. While community conservation areas are generally promoted as an alternative to previous forms of conservation, this case study provides evidence that a number of fundamental dynamics are often overlooked. The recent nature of some of these dynamics only provides a short time frame to assess their specific impacts. Nonetheless, based on ethnographic field and policy analysis, this contribution will explore the 25-year history of the *Reserva* in order to argue for a critical anthropology of community conservation.

Participatory Conservation in Practice: Power Dynamics in a Mexican Indigenous Community Conservation Area

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One of the main features of Indigenous Community Conserved Areas (ICCAs) is that communities are the main drivers in decision-making regarding the areas and in their management. Approaches like community-based conservation and ICCAs – in which power devolution is implicit or explicit – bear great potential to protect key ecosystems, environmental services, cultural practices, and, ultimately, facilitate environmental justice. Nevertheless, in practice, power devolution can take several forms and have different meanings.

This case study analyses power interactions in the implementation of the ICCA El Cordon del Reten, San Miguel Chimalapa, Oaxaca, and investigates the implications of power devolution in participatory conservation in Mexico. From July 2010 to May 2011, researchers used participant and direct observation, semi-structured interviews, and surveys to explore power dynamics in the decision-making process surrounding implementation of the ICCA. The existing power relationships indicate a diversity of local strategies deployed to claim and maintain power while external actors (e.g. government agencies, NGOs) seek to find new ways of persuading people in a context where use of coercive power only sows resistance. Local communities make consistent demands to maintain power over decision-making regarding management of natural resources. Nevertheless, there is a need to further develop local institutional capacities that uphold accountability, transparency, and sustainability.

This case study emphasises the need for approaches that carefully avoid reproducing old top-down approaches to conservation using new legal terms and discourses, as well as the importance of developing local institutions capable of accepting power and responsibility. Suitable approaches and institutions will provide a basis for effective coexistence of different conservation models that protect biocultural diversity.

The Role of the Human Dimension in African Conservation

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Different forms of human–wildlife conflict have posed a great challenge to human security and conservation in Africa, particularly in shared landscapes. Attempts to address these challenges, however, have been overly biased towards ecology or wildlife security.

Solutions on this basis have largely ignored the human dimension, which is arguably the most important factor. One of the reasons for this oversight is that wildlife research in Africa is largely designed, implemented, and funded by external agents, who for various reasons are reluctant to involve locals in their research.

This presentation examines some failures and successes and suggests a paradigm shift in African conservation thinking. The examples covered in this presentation are:

1. Human–elephant conflict and attempted mitigation measures in Laikipia, Kenya.
2. Livestock depredation and the use of monetary compensation in Amboseli, Kenya.
3. The capture and trafficking of wild carnivores to the Middle East from East Africa and efforts to curb this trade.

The PACS Study: What Kinds of Incentives Can Encourage Agrobiodiversity Conservation?

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The majority of the planet's food comes from a very small number of crops: about 30 species account for more than 85% of global crop production. Out of approximately 380,000 known plant species, fewer than 20% are eaten and only about 150 are domesticated for farming. Further, crops' genetic diversity within species is very narrow and existing agrobiodiversity is being lost at a rapid rate. However, a recent pilot scheme to reward farmers for conserving traditional crop varieties indicates a promising way for stemming the loss.

To support the creation of conservation incentives while improving smallholder livelihoods, Bioversity International and collaborating partners have been assessing the potential of Payment for Agrobiodiversity Conservation Services (PACS) in three countries. The teams have worked on selected sites in Peru and Bolivia with quinoa as well as on minor millet in India. PACS is a form of Payment for Ecosystems Services (PES), which provides farmers with rewards for the ecosystem services they provide or protect. However, most PES schemes are largely focused on forests, carbon sequestration, and wild biodiversity. Such schemes overwhelmingly ignore issues of domesticated biodiversity conservation and associated ecosystem services related to the maintenance of gene flow and evolutionary processes.

In Bolivia and Peru, 38 community-based organisations were invited to tender for competitive contracts to conserve one or more threatened landraces of quinoa – a priority crop in the region. The aim of the competitive tender was to identify the most cost-effective way to maintain not only the genetic resources per se but also traditional knowledge, and other key sociocultural factors (e.g. seed systems) required to sustain them. It was also important to consider potential trade-offs between cost-efficiency and equity/pro-poor concerns.

The pilot study revealed important differences in the costs of participation. Minimum in-kind rewards (such as farm inputs and machinery, construction, and school materials) demanded by communities to secure one hectare of a priority landrace ranged from the equivalent of USD 143 in Bolivia to USD 2,400 in Peru. The considerable differences between communities in the value of the rewards demanded point to opportunities to minimise intervention costs. In-kind community-level rewards, rather than cash to individuals, were shown to provide sufficient incentives to encourage farmer groups to participate in conservation activities. Thus, it appears that some PACS schemes could be funded via existing government agricultural and educational development programmes.

Many related research and development issues are currently being explored. These include exploration of the potential for integration of PACS approaches with niche product market/value chain development interventions in order to support the financial and environmental sustainability of these types of interventions.

Theme 3, Session 20 Governance of Biocultural Diversity: Challenges in Integrating Sociocultural and Ecological Processes in Sustainable Development

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A growing number of research and policy debates point to the intrinsic relationships between biological and cultural diversity, suggesting that conservation of these diversities should be addressed in an integrated fashion. This means integrating two potentially highly synergetic fields of research, policy, and development action. Scientific evidence supporting this view, as well as its practical relevance have been summarised elsewhere (Maffi and Woodley 2010). Policy relevance arises from a recent initiative of the United Nations Educational, Scientific and Cultural Organization (UNESCO), which proposes to establish a new “joint programme of work on biological and cultural diversity led by the secretariat of the Convention on Biological Diversity and UNESCO” (http://www.unesco.org/mab/doc/iyb/icbcd_working_doc.pdf). However, the question of how governance – or institutional dynamics – can be shaped in such a way that they produce positive trade-offs and outcomes for fostering and conserving both biological and cultural diversity in land and natural resources, is not yet well developed.

In order to explore the main factors driving institutional or governance dynamics shaping biocultural diversity and the implications this has for dealing with spatial and temporal scales, this session focuses on economic, social, political, and cultural organisations. Presentations of case studies from various countries around the world will allow comparing the ways in which different development projects related to land and natural resource governance are affecting biocultural diversity. On this basis, we will discuss the main challenges and options for addressing biocultural diversity conservation by means of interdisciplinary research, transdisciplinary co-production of knowledge, policy dialogues, and by redefining development interventions.

Governance of Biocultural Diversity: Theoretical Aspects, Framework, and Empirical Perspectives

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Over the past two decades, biocultural diversity (BCD) has emerged as a field of transdisciplinary research focused on investigating cultural and biological diversity manifestations. The concept is not restricted to distinct and quantifiable amounts of natural and social “units” but rather investigates the way multiple stakeholders perceive the complexity and the challenges of relations between human and non-human diversity. For this reason, BCD is also a social and political construction based on philosophical, ethical, and anthropological considerations, giving theoretical insights and helping to understand collective action.

The growing interest in this field of studies is based on the plausible hypothesis that diversity loss endangers fundamental rights, and on basic interests and values such as ecosystem sustainability, cultural self-determination, minority rights to expression, as well as multiple other world manifestations of life richness. Relevant scientific research has already demonstrated that biological and cultural diversity are intrinsically related.

In this sense, the governance of biocultural diversity refers to ways in which multiple stakeholders take decisions or influence each other during the process of creating, implementing, and updating norms defending or weakening BCD. Such governance processes concern, for example, the defence of indigenous intellectual property rights; sociopolitical resistance against the homogenising effects of genetically modified organisms promoted by transnational firms; or the development of an international regime for dealing with biodiversity based on the United Nations Convention on Biological Diversity.

Using a theoretical background derived from philosophical and anthropological work, this presentation aims to stimulate a debate on revising basic concepts of biocultural diversity governance.

Constructing Sustainable Development from the Locality: The Experience of the Network for Sustainable Agricultural Alternatives in Western Mexico

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This presentation describes the experience of the Network for Sustainable Agricultural Alternatives (RASA) in western Mexico, which can be considered an initiative of civil society constituted by different social actors to construct new strategies for sustainable rural development. Its work focuses on farmer training and fair trade practices in the field of organic agriculture.

Presented here are different aspects of RASA, including insights gained and the challenges that lie ahead for consolidating sustainable rural development. RASA is a social organisation with features of a new social movement, and seeks to play a more important role in civil society, as well as in political decision-making regarding rural development in Mexico. It received Partnership Action (PAMS) funding from the Swiss National Centre of Competence in Research (NCCR) North-South on two occasions.

Integrating Political, Economic, Educational and Sociocultural Processes in an Ecosystemic Model of Culture

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There is evidence that agrobiodiversity has a great potential for contributing to improved incomes, food security, and nutrition, in particular in marginal areas. Agrobiodiversity products hold a vast heritage of indigenous knowledge associated with their management and use, and are linked to traditional resources and territories, local economies, as well as cultural values.

The question raised by this study concerns the importance of defining a global approach to providing evidence of the role of agrobiodiversity products for livelihood security and identifying which interventions are needed to support rural livelihoods through a sustainable market of agrobiodiversity products based on biocultural heritage. A portfolio of case studies is used to conceptualise a draft framework for looking at how the market of agrobiodiversity products can sustain biodiversity and livelihoods, based on a combination and adaptation of approaches derived from market chain analysis and the livelihoods framework, integrating perspectives from multidisciplinary and transdisciplinary research approaches.

At the heart of this framework are the people's livelihoods and their links with agrobiodiversity. The framework focuses on marginal environments, where agrobiodiversity is adapted to difficult conditions and represents an easily accessible resource for poor rural communities. The specificities of the geographical, social, and cultural environments characterise both livelihoods and the use of agrobiodiversity. All these aspects are fundamental for market development. The concept focuses on improving livelihoods through market development of agrobiodiversity products, while providing farmers with an incentive for sustainable use of agrobiodiversity and the maintenance of both biological and cultural diversity. The concept looks at how to establish and improve access to markets through market interventions, capacity development, collective action, and sustainable resource exploitation. The whole process is nevertheless threatened by trade-offs, such as market globalisation, market specialisation, overexploitation of natural resources, or disappearance of traditional knowledge.

Examples from case studies will be the basis for an open discussion to reflect on the need for a global approach to providing a verifiable body of evidence to address future development interventions.

Biocultural Diversity in Kathmandu Valley: Interrelations Between Governance and Development of World Heritage Sites

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Kathmandu Valley in Nepal is endowed with seven groups of world-famous historic and artistic monuments and buildings which have been included in the United Nations Educational, Scientific and Cultural Organization's list of World Cultural Heritage Sites: the Durbar Squares of Hanuman Dhoka (Kathmandu), Patan, and Bhaktapur, the Buddhist stupas of Swayambhu and Bauddhanath, and the Hindu temples of Pashupati and Changu Narayan. All these heritage sites contribute to biocultural diversity and are major tourist attractions in the valley. Different cultural groups residing in the valley have been protecting various flora and fauna, such as rhesus monkeys, pigeons, various other birds, and trees in these sites.

However, the valley's population has rapidly grown in recent decades, due to the decades-long Maoist Conflict, pull factors such as facilities and services, and natural growth, to reach almost 4 million. Multicultural people from different sections and subsections of caste and class reside here. Various development activities have provided support in maintaining the biocultural diversity of Kathmandu Valley. Further, inclusion of the sites on the world heritage list has played a crucial role in their preservation and rejuvenation. In turn, local people have benefitted from a boost in the economy. On the other hand, from pollution of the sacred river Bagmati to disappearance of the heritage sites due to skyrocketing buildings, a number of factors have challenged the beauty and the majesty of Kathmandu Valley.

This presentation aims to explore the impact of development on the biocultural legacy of the heritage sites based on empirical data and a literature review. At the same time, a policy analysis and an investigation of the mutual relationship between the sites and the local people provide insights into the role of governance in developing the heritage sites as well as maintaining biocultural diversity. Based on the findings, the presentation concludes that the complexity of maintaining biocultural diversity at the sites calls for transformation knowledge produced through extensive involvement of multiple stakeholders such as politicians, bureaucrats, development workers, environmentalists, biologists, and local people in comprehensive policy dialogues.

Dialogue between Local and Global Knowledge Systems: A Means of Facing Two Conceptual Risks of Biocultural Diversity

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Biocultural diversity has emerged as a new paradigm in academia and policymaking, as a response to the growing concern over the loss of both biological and cultural diversity. This presentation aims to highlight options for dealing in a productive way with two risks associated with applying the concept of biocultural diversity. The first risk is that “conserving” biocultural diversity can easily lead to the essentialisation and freezing in time and space of such diversity by outsiders, stripping it of its natural and cultural dynamics. The second risk can arise when promoting cultural diversity by overemphasising certain specific types of that diversity (e.g. “indigenous” or “traditional” knowledge) compared to others (e.g. “Western” or “global” knowledge).

Own recent research on the transformation of Andean ethnobiological knowledge has shown that biocultural diversity is highly dynamic and that it is both vulnerable and resilient. Furthermore, contact with global knowledge systems such as formal health care and agricultural technical innovations does not automatically lead to displacement or loss of biocultural diversity, which can thus be shown to be associated also with cultural resistance and renewal.

These insights suggest that biocultural diversity might best be enhanced by favouring the capacity for internal renewal exhibited by local knowledge systems. This can be achieved through inter-epistemic dialogue that reveals the potentials and limitations of both local-indigenous and dominant (global) knowledge systems. Inter-epistemic dialogue has proven capable of opening a space for the co-evolution of all knowledge systems involved when promoted by the scientific community through a transdisciplinary research approach.

Living Well (“Vivir Bien”): An Alternative to Development

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The currently dominant economic model has shaken the whole underlying principle of life and changed the natural conditions. It has revealed serious contradictions, such as ecological destruction, environmental degradation, social inequality, and discrimination. Specifically, it has deployed a concept of development considered “universally valid and desirable” for all peoples of the world. This vision of development puts its faith in progress, an image-driven, prioritised development based on quantitative aspects. This development relies on economic growth as the main indicator of well-being.

The rationale underlying the project of modernity, under an ideology of economic progress, has been dominant for many years now, commercialising and perverting the nature of production processes. This model has ignored ecological conditions and the limits they impose on production, surpassing the thresholds of carrying capacity, recycling, and self-regeneration and thereby undermining the ecological sustainability of production. This means that the model puts its material bases first and destroys the potential of life itself. In doing so, it has excluded peoples’ collective knowledge and identities from cultural diversity. It has invaded and imposed a hegemonic and homogenous culture that subordinates human values to economic and instrumental interests, thus degrading the conditions and meanings of existence.

Given this context, indigenous peoples have come to express in their struggles the right to visualise other ways of life and happiness. These struggles are for the redefinition of their living spaces and for an identity based on cultural difference. They concern the reappropriation of their natural history, for control and decision-making regarding the conditions of production, consumption patterns, and their ways of life.

These ideas are embodied in the concept of “Living Well” (“*Vivir Bien*”). This critical line of thinking highlights the crisis of modern civilisation and enunciates possible future states which are constructed from other conceptions of life, from an indigenous world view that is radically different and opposed to Western cultural contents. “Living Well” is not an alternative development model, but an alternative to development itself.

Governance of Biocultural Diversity: Local People's Involvement in Resource Governance in Nepal

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Human beings are an intrinsic part of the environment, and human societies are inextricably linked with it. Nepal is very rich in terms of both sociocultural and biological diversity. There are more than a hundred caste/ethnic groups with unique cultural milieus, and a large number of IUCN-recorded species. Nepal's biodiversity profile (IUCN 1996) lists 844 species of birds, 100 species of reptiles, 43 species of amphibians, 185 species of freshwater fish, 635 species of butterflies, 5160 species of flowering plants, and 1120 species of non-flowering plants. Cultural values, knowledge systems, and institutions in Nepal have been manifested in socio-environmental relations. Recently, there has been extensive debate and discussions among academia, planners, and policymakers about what systems are needed to maintain biocultural diversity and improve resource management, with a view to improving local people's livelihoods and ensuring their rights to these resources. A number of scholars (Wade 1988; Ostrom 1990; Herring 1990; Uphoff 1992) have focused on the importance of institutional development for collective action for resource management at the local level.

Focusing on the governance of traditional forest resources by local communities in Tanahau District of western Nepal as a case study, we empirically examine how the governance of biocultural diversity is produced and reproduced in the local cultural environment, and analyse the socio-environmental relations with changing livelihood patterns of local people. At the same time, we examine the role of institutional development and policy reforms in linking conservation of biodiversity and sociocultural diversity at the local level.

Based on this case study, we argue that governance of biocultural diversity emerges as a key site of contestation over sociocultural, economic, political, and environmental aspects, as it is persistently related with the everyday life of people. Because of the complex interconnection between the different aspects of human life, the governance of biocultural diversity requires a multi-stakeholder approach in order to generate transformational knowledge and informed policy dialogues to address upcoming challenges in governance of biocultural diversity at the local and global levels.

Theme 3, Session 21 Legal Pluralism and Transformations of the Commons: Lessons for New Bottom-up Institutional Designs

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This session deals with the question of how legal pluralism affects the management of common-pool resources (pastures, wildlife, fisheries, water, land) as complex human-transformed cultural landscape ecosystems. These can be drylands or wetlands in which the ecological specificities, human use, and rules and regulations (institutions) governing this use have undergone fundamental changes. The session is aimed at discussing three basic issues related to the main conference topic of resource use and development, with a special focus on Africa.

The presentations will outline moments of key changes that transformed cultural landscape ecosystems into separate resources subject to different legal management regimes in the context of a nation state. They will also address the question of the basic discourses used by state actors to legitimise these institutional changes in governance. Moreover, they will explore how these changes were perceived by local actors, whose livelihoods depend on these landscapes and who are now confronted with the claims of multiple and frequently more powerful users. These claims will be analysed in the context of widely used concepts of decentralisation, democratisation, citizenship, and participation, which – from a political-ecology viewpoint – have been considered as Trojan Horses used by the more powerful actors to control natural resources and as strategies of de-facto centralisation (Blaikie 2006, Poteete and Ribot 2010).

Further, we will discuss various concrete strategies developed by local or immigrated users to deal with problems of legal pluralism and power relations related to common-pool resources, ranging from indirect resistance by means of what Scott (1985) labelled “weapons of the weak” (poaching and sabotage of state-owned resources) to attempts to profit from opportunities for new forms of bottom-up institution-building, making use of different constellations of legal pluralism. Finally, the panel will seek to outline possible conditions for bottom-up institution-building in a context of global change and especially in dynamic ecosystems such as wetlands or drylands subject to strong seasonal changes in Africa.

Negotiating Forestry Management: The Role of Local Conventions in Domination and Resistance Strategies in Senegal

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In Senegal, natural resource management (NRM) policies evolved from being authoritarian in nature during the post-colonial period of the 1960s to favouring political decentralisation and power transfers from central to local authorities in the 1990s. The state attempted to satisfy international agreements and donors' conditions on NRM. These included promotion of participatory policies and democratic decentralisation. As a result, diverse forms of NRM tools and governance emerged. These tools take many forms, such as management plans for different resources (e.g., forest management plans), international codes of conduct, local codes, agreed protocols, and others. Many are ostensibly established following negotiations and represent "local conventions". They have at least three focuses in common: (1) an economic focus, with the intent of generating revenue; (2) a sociopolitical focus, with ethnic groups articulating notions of belonging to a given ecosystem – such as a forest, a natural pool, a reserve, or any other territorialised natural resource – and specific powers and/or privileges being distributed between different groups of actors who organise their relationships vis-à-vis NRM issues; and (3) an environmental and ecological focus, the stated aim often being to regulate extraction practices and steer use of natural resources in the direction of sustainability.

Due to the high stakes involved and the possible redistribution of valuable access to resources and revenue sources, however, the establishment of local conventions in Senegal has mostly occurred via asymmetrical negotiations that favour elites, in which the stakeholders include technical experts, state authorities, development actors, local people, and elected authorities. While local groups such as the Fulbe and Manding are supposed to benefit from local conventions and externalities due to their dependence on forest resources, they remain excluded from discretionary decisions and market opportunities.

While decentralisation policies outwardly promote the transfer of forest management power to rural communities, actual decision-making power still rests largely with state- or market-based actors who exercise "strategies of domination". In an effort to legitimise their domination, these actors use various strategies, including promotion of discourses on sustainable use of natural resources; emphasising the need to conform to the Sahel's ecological constraints; manipulation of forestry decentralisation law; introduction of market regulations; and more. Local people and their representatives respond by developing "strategies of resistance" intended to subvert the domination of these stronger actors. Local conventions thus present a dynamic arena of domination and resistance between actor groups vying for control of resources and profits.

Strategies of Local Resource Users and the Paradox of State Control and Democratisation in North Cameroon

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The Waza-Logone floodplain in northern Cameroon, one of the most productive pockets of natural resources in the African Sahel, is increasingly under pressure. This area has been used for centuries by various categories of resource users (e.g., farmers, fishermen, sedentary and mobile pastoralists) for their livelihood activities. But nowadays, changing climatic conditions combined with human-induced hazards have contributed to a drastic reduction in the availability of resources. Changes in management rules have also introduced an institutional pluralism characterised by the coexistence of several types of legal systems: statutory and customary systems – and combinations of the two – coexist in the same territory, resulting in overlapping rights, contradictory rules, and competing authorities. Where local rules were dismantled, the new bureaucratic institutions that replaced them have often failed to establish mechanisms of management, monitoring, and penalties, resulting in a lack of a clear authority. In these contexts, most resources are now either subject to open access or have been privatised. Meanwhile, local resource users have developed new strategies such as creating of “trap fields” on pastureland, digging fishing channels on transhumance corridors, buying free access to pastoral resources, and excluding others. These strategies lead to escalation of conflicts between individual actors or groups of actors ranging from verbal insults to armed oppositions ending in bloodshed. In a context of reinforced statehood, democratisation, and decentralisation, these individual, local strategies appear to be paradoxical outcomes of state strategies that were intended to foster sustainable management of natural resources.

This presentation aims to analyse the strategies of local resource users who exploit overlapping institutional contexts to craft new rules for natural resource management. Based on a discourse of statehood and democratisation, it will be shown that in certain contexts of legal pluralism where the state is superimposed as the main manager of natural resources, several resource use trends may be observed: first, boundaries are no longer clearly defined and foreigners may easily cross borders to use pockets of resources; second, local populations often use violence to claim exclusive rights to resources; third, less powerful actors lose out and are forced to use natural resources even more intensively. Finally, legal pluralism can either contribute to a decline in the social, economic, and ecological conditions of local development, or, conversely, constitute a unique opportunity for institutional innovation.

Pulling Down Fences, Crafting New Rules: Resource Governance, Resistance, and Opportunities in Zambia's Kafue Flats

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Common-pool resources such as wildlife and fisheries are under massive pressure in Zambia's Kafue Flats floodplain in the wake of a major institutional change from common property to state property 50 years ago. A historical and New Institutional analysis (Haller and Merten 2010) indicates that overuse of fisheries and the mismanagement of wildlife go back to the erosion of traditional institutions that were crafted in pre-colonial times by local Ila, Balundwe, and Batwa groups. These institutions were undermined by the state's claiming ownership of resources. Indeed, the state set up its own institutions to manage what was previously common property. The current economic crisis faced by the government, however, has rendered the frequently costly state institutions ineffective, leading to a situation of de-facto open access to common-pool resources. Compounding matters and creating more confusion, various state agencies claim management responsibility over the same area, leading to a fragmentation of resource management regulations and problematic legal pluralism.

There have been several attempts to mitigate these problems via participatory strategies, but the results have been mixed. We will present new findings from three such attempts, two of which emphasise wildlife management: the World Wide Fund for Nature's Wetland Project and the Administrative Management Design (ADMADe) initiative, focusing on a protected area and a game management area, respectively. Both attempts yielded poor results due to misconceptions of local communities' forms of traditional representation and misinterpretation of local economic and political incentives for participation. Both projects faced major local resistance.

The third case presented is a participatory co-management process for fisheries that was launched in 2004 based on an initiative of local staff of Zambia's Department of Fisheries, local interest groups, and researchers. It included a broad local debate on how to manage the fisheries sustainably, which gave rise to locally crafted by-laws for joint management of fisheries in the Kafue Flats. Despite many difficulties, case three is a good example of local collective action that is being scaled up to govern common-pool resources. It also demonstrates a process I call "constitutionality", which refers to the emic sense of ownership of an institution-building process.

Multiple Users, Legal Pluralism, and Global Interests: “Land Grabbing” Processes and Local Strategies in Kenya’s Tana River Delta

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This presentation will examine the impacts of “land grabbing” processes in Kenya’s Tana River Delta, and the resistance strategies of local communities and conservation organisations opposite large-scale land appropriation by national and international corporations. The Tana Delta comprises riverine forests, wetlands, and rangelands and is home to various indigenous pastoralists (e.g., Orma, Wardei), farmers (Pokomo), and fishing communities (Luo). Their traditional multi-user livelihood strategies have helped preserve exceptional local biodiversity. Recently, eight development projects have been planned in the delta, six of them related to plantation crops, primarily fuel crops such as *jatropha*, oil seeds, and sugar cane, in addition to titanium mining projects and gas and oil exploration.

As in many places throughout Africa, property rights in the delta are often complex and overlapping, with concurrent systems of private, public, and common land and different rights of access, usufruct, leasehold, and freehold. County Councils hold much of the land in the delta in trust on behalf of residents. Moreover, traditionally, the Pokomo and Orma had specific customary institutions embedded in rituals that enabled herders to gain access to water points and pasture on the banks of the Tana River during the dry season. Customary institutions defining these rights emerged over years, indicating a long interactive and integrative history of the two communities. These local institutions were violated by the state through its land tenure reforms, which denied nomads access to water and pastures during the dry season. This is said to have caused conflicts between different user groups, leading to a flare-up of intertribal violence in the Delta between 2000 and 2001.

However, tenure issues changed again very recently: in the past, the Trust Land Act permitted the Council and the Ministry of Lands to make decisions, but the New Constitution of 2010 has altered these arrangements, converting lands held in trust into community-owned lands over which local land boards have a say. It remains to be seen how this will work in practice.

So far, legal actions and campaigns have succeeded in halting some of the “land grabbing” projects planned in the Delta. The final part of this presentation reviews people’s resistance strategies and the move towards management plans in the Delta created in partnership with local communities.

Theme 4, Keynote 1

Maximising the Impact of Research for Development: The Challenge and Possible Solutions

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There is no hot line between research and better development policy, practice, and outcomes. Huge sums have been spent on unproductive development research, and huge sums have been invested in unproductive development interventions. We live in an increasingly interconnected world where solutions to poverty lie as much in changed behaviour in the developed and middle-income countries as in developing countries, where policy processes are increasingly complex, multifactorial, and non-linear, and practical interventions involve a continuously expanding network of actors with multiple, often divergent incentives. But recognising this, and learning from recent research into complexity, networks, political incentives, innovation systems, and new communication technology, new forms of global knowledge networks are emerging that have the power to transform the world. In this presentation John Young, Director of ODI's Research and Policy in Development Programme will present some of the challenges, some cutting edge research, and some innovative new approaches.

Theme 4, Keynote 2

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Abstract missing

Theme 4, Session 23

What Makes Development-oriented Research Partnerships Effective? Looking Back to Move Forward

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Research partnerships are meaningful when partners can expect significant added value from their collaboration. Successful partnerships are based on mutual interests and a shared vision. Partners are confronted with various challenges such as defining the agenda and responsibilities together, dealing with different expectations and goals, communicating across a variety of epistemological borders, strengthening capacity, finding adequate funding, to list the most important ones mentioned in the literature.

This session will focus on experience with North–South and South–South research partnerships, and envision ways ahead to strengthen such partnerships. The presenters will address the following questions:

- How was the added value of research partnership defined in your case? What approach was chosen, what processes were defined, and what methods or tools used to implement them?
- What worked (enabling factors)?
- What did not work (hindering factors) and why?

In addition, suggestions for responding to some of the following challenges should be made:

- Funding (sources and conditions)
- Asymmetries
- Conflicting expectations and goals
- Internal communication and mutual learning
- Capacity building (sustainability)
-

The session will focus on experience garnered in different regions of the world, using different approaches. Presenters will highlight lessons learned, pointing to factors of success and to main stumbling blocks, with suggestions about how to overcome these stumbling blocks based on their understanding of the added value of research partnerships. They will conclude by discussing challenges ahead.

Stakeholder Partnerships to Enhance the Effectiveness of Health Research Capacity Strengthening: ESSENCE on Health Research

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The ESSENCE on Health Research initiative is a collaborative framework between funding agencies investing in research in low- and middle-income countries to scale up coordination and harmonisation. It aims to improve the impact of investments in institutions and people and to provide enabling environments to address the needs. Over the last few years, ESSENCE has identified strategic areas, including monitoring and evaluation of research capacity and costing of research, which resulted in the development of an ESSENCE Good Practice document series.

Throughout the process of development of these documents, collaboration between diverse groups from the global North, South, and in between occurred. This allowed ESSENCE to garner experience in playing the role of a neutral platform for development of consensus in what at first seemed to be difficult issues to tackle. In addition to ESSENCE member funding agencies harmonising their policies, the agencies also recognised that supporting successful research capacity in low- and middle-income countries requires various specific competencies. Additional programmes in areas such as governance and management, strategic planning, evidence assessment, ethics, and translation of evidence into policy are now either being implemented or under development.

This presentation will likely generate interest from a diverse audience attending the forum, such as funders, research leaders, individual researchers, and policymakers. It is expected that questions and comments received from the audience will help to generate a list of future activities to be explored by ESSENCE member funding agencies.

New Trends in Partnership Research in Africa

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African academic and research institutions are gradually engaging with international research norms and academic integrity; meanwhile, however, funding schemes are fragmented and still not adapted to local needs. To maintain and increase academic standards, scientists have to negotiate capacity building and external funding in relation to the type of research suitable for reducing disparities and asymmetries.

Multidimensional partnership principles are central in pooling and sharing resources and communicating knowledge. In addition, the historical links between partners play a fundamental role, constituting a solid and trustworthy context within which individuals with strong mentorship can become key agents of change in their research environment.

The African Institution Initiative, launched in 2009 and fully funded by the Wellcome Trust Foundation, builds on the foundation of the NCCR North-South and allows African-led consortia to focus on development of individual and institutional capacity for more competitiveness and independence. Training programmes for PhDs and Postdoctoral fellows are nurturing a global partnership. But this would not be possible without also developing capacity in management and administration among researchers and non-scientific staff beyond the science domain. Moreover, national and regional research governance bodies are being approached and sensitized to adapting their research funding framework for Africa (e.g. the Ivorian National Science Foundation will be replacing their Strategic Programme for Supporting Science).

Such a global research partnership is an intercultural involvement that enables learning for positive change in African academic and research institutions. The main challenges faced are that partners need to support their institution's core component and to comply with commonly agreed-upon principles. In that vein, governments must also buy into new initiatives for research funding and consider research as a key for development and a true base of independence and sovereignty.

20 Years of Influencing Disaster Risk Research and Management: LA RED in Latin America

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LA RED, the Latin American Network for the Social Study of Disaster Prevention, was established in 1992 by 14 persons from 8 countries, with backgrounds in academia, NGOs, and government. All were united by the conviction that disaster and disaster risk are social processes. All wished to influence research and promote policy from a social perspective as the UN International Decade for Natural Disaster Reduction started out very much oriented towards physical science and technocratic terms.

20 years on, and following a conceptual and methodological roadmap that promoted comparative research on disaster risk reduction issues considered from a development angle, publications, methodological advances in analysis and information collection, discussion, and policy influence, LA RED has amalgamated hundreds if not thousands of disaster risk researchers and practitioners in the Latin American region under similar and complementary conceptual and action frameworks. Besides the publication of more than 20 books and special journal issues and a very significant, if not decisive, contribution to conceptual development and practice in the region, LA RED has developed the DESINVENTAR disaster database now used extensively worldwide; developed the first local-level risk management training programmes in the region; advised and participated in numerous committees and consultancies; and has had a notable influence on the content and design of multiple new laws and norms on risk management in the region. Three of its founding members have received the UN Sasakawa award given for the most outstanding contributions to disaster risk reduction worldwide every year.

The success of LA RED may be explained by a combination of factors associated, amongst other things, with its interdisciplinary, cross-professional basis; the mix of academia and practitioners; a fundamental common belief amongst its members and collaborators that disaster risk is a social construction and based in particular on skewed development processes.

Opportunities and Challenges of North–South Research Partnerships

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This presentation is based on the research conducted by the Regional Coordinators' Forum to assess partnerships implemented in 21 countries in Asia, Africa, and Latin America within the NCCR North-South research programme. The focus of the research was to examine the dynamics, effectiveness, challenges, and opportunities of the partnerships. The research employed a combination of qualitative and quantitative methods and respondents were collaborators of the NCCR North-South as well as some boundary partners.

The results showed that the key added value of research partnerships was the network of committed researchers working together with a transdisciplinary approach, using process-oriented procedures (reflective learning and adaptation), and based on partners' involvement in decision making.

Among the important factors enabling effective partnerships revealed from the research were: a judicious choice of partners, partners' willingness to deal with power issues, defining the agenda and responsibilities together, priority and resources for capacity building, commitment of research partners to engage with society, a sound transdisciplinary approach, the creation of stable regional bodies, and common guidelines and procedures.

Some of the major factors found to hinder partnership research were lack of a strong broader national policy and regulatory and institutional framework in the South, a mismatch between the expectations of partners in the North and delivery from Southern partners because of policy needs, a continued need to invest in capacity development, the need to utilise locally available resources and ensure diversification of the resource base, the difficulty of fulfilling diverging expectations, the difficulty of linking research, policy, and practice, and the difficulty of dealing with power asymmetries.

The paper concludes that success of research partnerships between the North and the South depends upon a common vision, mutual trust, and collective benefits (materials or immaterial).

Theme 4, Session 24 Advances and Constraints in North–South Technology Transfer and Delivery

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Access to technology empowers research institutions in the South, as it gives them tools to develop locally adapted solutions. In addition, the availability of techniques and technologies in Southern research institutions contributes to building a scientific environment that is attractive to local scientists who have been trained abroad.

This workshop intends to evaluate strategies for efficient technology transfer from advanced research laboratories and organisations to their partner institutions in the developing world. Other aspects of technology transfer to be discussed during the selected presentations in the session include: (1) sustainable establishment of technology in sub-optimal conditions, (2) contribution of capacity-building to scientific innovation, (3) impact of technology transfer, (4) priorities in technology transfer, and (5) impact of funding strategies on Swiss–South partnerships and sustainable technology transfer.

Both the Cassava Research Group at ETHZ and the Tef Research Group at the University of Bern are actively involved in transferring crop plant technologies to Africa. Examples from both Swiss universities will be given to illustrate advances and constraints in North–South technology transfer and delivery.

Technology Transfer in East Africa: Promoting the Uptake of Quality Seeds of New Varieties by Smallholder Farmers

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The SFSA creates value for small farmers in developing countries through innovation in sustainable agriculture and the activation of value chains. SFSA focuses on productivity and markets, helping “pre-commercial” smallholders to become more professional growers. This adds value for rural communities and sustainably improves food security.

Availability of quality seeds of new varieties remains a severe constraint in the improvement of agriculture for smallholder farmers in East Africa; typically less than 10–20% of seeds planted are quality seeds (far less for clonal crops such as potato), whereas the overall share of quality hybrid maize seeds in Kenya is 78%.

This presentation will describe efforts to promote access to quality seeds of improved varieties in Kenya through engagement of the private sector in public–private partnerships along with innovative market and credit-led extension schemes.

The New Extensionist: Going Beyond Technology Transfer

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The “New Extensionist”, also known as “Extension-Plus”, goes beyond providing solely technological skills and services to farmers and other actors in rural areas. Many non-technical skills and services are needed in order to adequately improve the lives of small-holder farmers. Accordingly, the New Extensionist has a much broader function than simply transferring technologies: he or she acts as broker and facilitator of rural development processes. The New Extensionist recognises that technologies and other innovations are developed by farmers, too, and not just by researchers. Extension and advisory services connect science to users in a healthy relationship that not only provides reliable, straightforward, and timely information to farmers, processors, marketers, and community members, but also channels solid feedback to scientists and researchers about users’ own innovations, insights, problems encountered, and opportunities discovered. Without this link there is no assurance that innovations, traditional knowledge, or unbiased information will be used to serve sustainable food security.

Extension thus plays a critical connecting role in agricultural innovation systems. Extension also helps smallholders to respond to risks such as climate change, environmental degradation, and market volatility. The role of extension must thus go beyond technical and production functions to include the entire social and cultural milieu. Obviously, this requires a long list of hard and soft capacities that cannot be found in one person; thus most advisors should be well-qualified generalists with a diverse combination of soft skills and a multidisciplinary agricultural background so that they can broker access to other forms of technical support. There is a need to identify the key skills and most appropriate methods for developing the New Extensionist who can operate capably in a complex system. These new competencies should be integrated into extension training curricula.

Building Public–Private Partnerships in Developing Countries to Develop Sustainable Solutions to Reduce Malnutrition

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GAIN was established in 2002 to build partnerships between the public and private sectors to reduce malnutrition. GAIN's major strategy is to bring together key stakeholders to increase efforts and investments in addressing malnutrition, an issue which had received limited international attention for the previous twenty years. The first programme launched by GAIN in 2003 focused on food fortification in developing countries, accelerating the reduction of vitamin and mineral deficiencies through a variety of interventions from large-scale, country-wide nutrition programmes to more targeted interventions to address the needs of specific target groups (e.g. infants to 24 months, pregnant and lactating women).

As a public–private partnership, GAIN engages with private-sector actors at both the global and the local level to support each of its initiatives. A key element of GAIN support consists in providing technical assistance to local food and beverage industry players to improve the nutritional value of their products. This technical assistance includes value chain analysis, business planning, transfer of best practices from Western countries in industrial design, product formulation, and quality assurance/quality control processes, as well as creating demand through social marketing.

Currently, GAIN's programmes contribute to improving the nutritional status of over 530 million people in the world.

A Model of Public–Private Partnership for Developing Water–efficient Maize for Africa

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Frequent droughts are a major element of climate change and pose a persistent challenge to African agriculture, making farming risky for millions of smallholder farmers who rely on rainfed crop production. Droughts have contributed to reducing crop yields, particularly of maize, the most important African staple food crop, thus threatening food security. Identifying ways to mitigate drought risk, stabilise yields, and encourage smallholder farmers to adopt best agronomic practices is fundamental to enhancing food security and improving livelihoods in Africa.

The Water Efficient Maize for Africa (WEMA) public–private partnership was formed to bring together the expertise and technologies of public and private-sector organisations for the benefit of smallholder African farmers. The African Agricultural Technology Foundation (AATF) leads this partnership, which includes CIMMYT, Monsanto, and the national agricultural research systems of Kenya, Mozambique, South Africa, Tanzania, and Uganda. The partnership uses conventional breeding, molecular markers-assisted breeding, and transgenic technologies to develop drought-tolerant maize adapted to the maize-growing agroecosystems in Africa that are expected to experience more drought episodes with the projected climate change.

Partnership activities are implemented by project teams, including the product development, product deployment, regulatory, communication, and intellectual property management teams. They work with a broad range of stakeholders, including farmers and the local private seed sector, to deliver improvements in maize seed to farmers royalty-free, alongside best agronomic practices. This presentation discusses the partnership, the strategies being used, and the progress achieved to date by the project partners and teams.

Theme 4, Session 25 Showcasing Research Products

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Development research is only effective if it is used as a basis for decision-making, influencing, referencing, and – most importantly – to bring about sustainable change. Increasing attention is being paid to the question of how researchers can communicate results in a meaningful and interesting way to policymakers, practitioners, and society at large and, in doing so, fulfil the potential of research to improve policy and practice. Innovative approaches to communicating research results are needed in order to bridge existing gaps between academia, policy, and practice. This session aims to showcase ways of visualising research results that reach society, practitioners, and policymakers, with a focus on transdisciplinarity.

This interactive session will present selected “multimedia products” from different sectors and research projects within and outside the Swiss National Centre of Competence in Research (NCCR) North-South. The products that will be featured include videos, guidelines, planning toolboxes, and others. We expect a lively session with different formats and products that reflect the wide variety of outputs and lessons learnt within and outside NCCR North-South.

Tools to Assist Key Stakeholders of Faecal Sludge Management in Burkina Faso

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In West Africa, as in most of the developing countries, urban dwellers rely on on-site sanitation systems such as latrines and septic tanks. These systems produce high quantities of faecal sludge (FS) that needs to be collected, transported out of the residential areas, and treated to ensure a safe and healthy environment. Frequently, this does not happen. FS that is left untreated in the cities constitutes a source of water-borne diseases. The companies that collect and transport FS are commonly informal and unrecognised by both the population and the authorities.

The National Office of Water and Sanitation in Burkina Faso (ONEA) and EAWAG are collaborating in a project to develop sustainable wastewater and FS management solutions by strengthening the capacities of key stakeholders. This presentation describes the tools and activities implemented in Burkina Faso to identify the key stakeholders of FS management and to evaluate and meet their capacity-strengthening needs.

An institutional analysis revealed that the small companies that collect FS mechanically face the most severe constraints and suffer a considerable lack of both skills and means. For this reason, efforts were focused on them and on ONEA's operating staff in charge of wastewater and FS treatment plants. Several meetings were organised with ONEA and the emptying companies to inform them about the environmental and health risks resulting from current FS management practices. Additional studies were conducted to understand the activities and financial flows of FS emptying companies, and a handbook was designed to promote good practices in terms of hygiene, security, and financial management. A training plan and guidelines for safe operation and maintenance of infrastructures were developed for ONEA staff.

Discussions with the emptying companies proved to be essential for their collaboration in the project. Even though some of them were reluctant to implement changes, the trade association was reorganised, and several directors showed a strong willingness to improve their company management. Out of the three training sessions for ONEA operating staff, the most successful one was that organised with another utility that has strong practical experience. Combined with additional capacity strengthening, information to other stakeholders, and mechanisms to assist the small emptying companies (e.g. subsidies), these measures have the potential to greatly improve the financial sustainability of emptying companies, the quality of the services they deliver, and their integration in the city development plans. The measures are transferable to other countries, where they can be adapted and appropriated.

Microbial Risk Assessment in Vietnam: Translating Research and Training Into Policy

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Until recently, the availability of training in risk assessment in general was very limited in Vietnam, and training in microbial risk assessment (MRA) was not available at all. To fill this gap we developed a training course in MRA by compiling existing MRA trainings, contextualising them, and adapting them to the local context. The resulting course teaches participants the concept of risk analysis, the steps of an MRA and how to implement these steps, as well as risk communication and management. A first one-week training course was successfully held.

MRA was also used for assessing health risks related to wastewater reuse in agriculture and food safety in Vietnam. Diverse scenarios of exposure to wastewater when working with wastewater for agriculture, as well as consumption of pork meat were studied to quantify health risk. The results showed that water and vegetables were heavily contaminated with pathogens; risk in the scenarios tested was high and largely exceeded the acceptable level stipulated by WHO. The results also revealed the most critical issues in terms of risk, thereby pointing to topics on which interventions should focus. The findings can serve to improve policies on and practices of waste reuse.

MRA has been recognised by health staff, lecturers, researchers, and policymakers at the Ministry of Health (MOH) as a useful tool that provides scientific evidence for decision-making and risk management. A book on MRA was published in Vietnamese with support from the Ministry of Health and the World Health Organization (WHO) in Vietnam. It serves as a guideline on MRA, which is a component in Vietnam's Food Safety Law. The university has adapted the health risk assessment course for undergraduate and graduate public health students. Further initiatives to intensify research on MRA are ongoing, and researchers of the team have been selected to become part of the MOH's national task force on risk assessment.

Voices of Youth on Teenage Pregnancy

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Tanzania has one of the highest teenage pregnancy rates in the world. While many international and national organisations target young Africans with their interventions, surprisingly little is known about how African youth express their sexuality. This contribution presents a project that aimed to fill this gap by providing insights into sexual and reproductive health realities of female and male students aged 15–18, with a specific focus on teenage pregnancy. The project took a visual action research approach, which (1) helps to empower and therefore build resilience in youth, (2) informs policy and decision-makers, practitioners, and researchers, and (3) stimulates discussions on the appropriate and effective design of future interventions. Main activities included the participatory development of videos by male and female adolescents aged 15–18 from two secondary schools in Dar es Salaam and Mtwara Town, Tanzania.

During a workshop, the selected youth ranked (1) key reasons for teenage pregnancy as well as (2) key actors and sources of information which provide them with knowledge and skills to overcome risks related to teenage pregnancy. Building on the outcome of these ranking activities, the youth developed videos with a camera team that reflect the key findings of their rankings. Beginning in May 2011, the youth presented their videos to policymakers and practitioners from the Tanzanian government, donors, and international/national NGOs active in the field of teenage pregnancy. The social learning process initiated during the workshop was filmed and, together with the youth videos, included in a final video, which has been made available to local TV stations as well as international and national organisations.

The project not only provided important insights into teenage-pregnancy-related realities but also documented that videos can be a transdisciplinary tool for research and practice. This is reflected in the strong interest of practitioners as well as donors, who would like to continue working with the involved youth and use the videos for follow-up interventions.

“Action”: Publishing Research Results in Films

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Researchers commonly disseminate their research findings in academic papers or books that have a selected and limited target audience. A potential method for disseminating information in a different way is by means of film, but this means tailoring the material to this medium and, in many cases, collaborating with people who have the necessary skills. The aim of this presentation is to reflect on the experience of making a film from the researcher’s perspective.

I will shed light in particular on how the film-making team worked together, and I will provide examples of the preceding research, as well as the shooting and editing of the film material. The long period of research leading up to the film was a major factor in its success. In addition, all of the people involved have to be willing to share their experiences, recognise each other’s expertise, and be able to compromise.

The film was much more than just an extension of the ongoing multi-site qualitative research. The shooting not only provided new insights into people’s lives but also forced me to think much harder about my research and “the fieldwork”. The additional costs and efforts related to the film can be justified by a transdisciplinary understanding of research that requires the results to be disseminated beyond academic circles, attract attention from policymakers and activists, and also allow the subjects of the research (who generally do not read English academic articles) to become an active audience.

Theme 4, Session 26 Towards an Integrated Development Research Approach

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In the past decade, development research within the Swiss National Centre of Competence in Research (NCCR) North-South gradually converged from disciplinary towards inter- and transdisciplinary approaches. Multiple examples from research on health, sanitation, and resilience highlight the benefits of closer cooperation, but also reveal the difficulties of connecting different epistemologies. Moreover, North–South research is faced with intercultural debates on its philosophical and ethical foundations. The ongoing globalisation of trade, transport, and communication does not allow for restriction to isolated local preferences but calls for exchange. Exchange, in turn, proves to be increasingly important in solving ever increasing problems of global change.

Concepts developed within the NCCR North-South on social and reproductive resilience, integrated material flow, quantitative microbial risk and social science analyses, and health in social-ecological systems point towards integrated development research approaches. Such approaches have the power to bridge epistemological gaps between natural sciences and the humanities, connecting outcomes of research on natural resource management, health, sanitation, livelihoods, and governance. It is evident that the complexity of social development cannot be tackled using one single method. However, past experience with studies from different disciplinary perspectives in similar contexts points to the potential of mutual learning and understanding. The benchmark is less the theoretical foundation than empirical experience from within and outside the NCCR North-South, from which we can induce commonalities and methodological connections between scientific disciplines as well as between cultural paradigms.

The aim of this session is to present different integrated development research approaches and to discuss them with the audience with a view to identifying gaps in mutual understanding, debating the validity of epistemological connections, and possibly moving towards integrated methods for development research.

Interdisciplinary Research on Environmental Sanitation and Health: Conceptual Framework Development and Field Test

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We developed a conceptual framework for improving health and environmental sanitation using an approach that combines health, ecological, and socio-economic assessments. The framework has three main components: health status, physical environment, and socio-economic environment. Information on each of these three components can be obtained using standard disciplinary methods and an innovative combination of these methods. Analyses based on this framework lead to extended characterisation of health, ecological, and social risks, while enabling comprehensive identification of critical control points.

Interventions based on comprehensive analysis take account of biomedical, engineering, and social-science perspectives or a combination of them. Moreover, such interventions encompass not only technical solutions but also behavioural and social changes which are derived from the resilience patterns identified during the analysis. The framework was conceptualised and validated for the context of urban and peri-urban settings in developing countries, focusing on different types of waste such as excreta, wastewater, and solid waste, as well as their influence on food quality and their related pathogens, nutrients, and chemical pollutants.

We tested the framework in a case study in northern Vietnam, where we conducted a combined assessment of the impacts of human excreta and wastewater reuse in agriculture on health, the environment, and society. The aim was to propose sustainable and adapted interventions for improving health and environmental sanitation. Impact on health was assessed based on epidemiological and microbial risk analyses. Environmental impact was assessed for both sanitation and agriculture systems, with a focus on nutrient flows. Perceptions and behaviour regarding health risks were evaluated, along with people's ability to prevent health risks. Our contribution will present results from this case study and insights regarding interventions proposed.

Production of Innovations within Farmer–Researcher Associations Applying Transdisciplinary Research Principles

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Small-scale farmers in sub-Saharan West Africa depend heavily on local resources and local knowledge. Science-based knowledge is likely to aid decision-making in complex situations. In this presentation, we highlight a FiBL-coordinated research partnership between three national producer organisations and national agriculture research bodies in Mali, Burkina Faso, and Benin. The partnership seeks to compare conventional, GMO-based, and organic cotton systems as regards food security and climate change. The three-year process began in 2009 in the context of “Syprobio”, a collaborative research and development project funded by EuropeAid. In addition to difficulties encountered, we will present key determinants of successful research and development (R&D) integration.

Researchers and organic farmers from the three West African countries and Switzerland identified promising innovations in management techniques that are mainly implemented locally. In the West African cotton belt, only wealthy and risk-prone households opt for capital-intensive production. The majority of poor farmers opt instead for the organic agriculture value chain. The development of technologies at farmer level constitutes an alternative to externally developed technologies that are often capital-intensive and require external inputs and subsidies (e.g. mineral fertiliser or pesticides). Ten farmer groups in the countries included identified 164 innovations in five key areas: soil fertility, plant health, seeds, crop management, and socio-economics. Most are based on farmer ideas and experiences and can be adopted fairly easily by other pioneering farmers. Twenty-nine technologies were selected in April 2012 by the researchers and advisors involved and will be subsequently tested on farms. We describe the dual role of sociology, in both development and research, and highlight the importance of applying a transdisciplinary approach in order to integrate farmer knowledge with interdisciplinary research at the conceptual level.

We will also present the main determinants of success when implementing a transdisciplinary approach, ranging from subjective challenges to organisational, methodological, and practical issues. Ensuring good communication that drives and nurtures community involvement, based on key events at various levels, is viewed as a central challenge by most stakeholders. Another challenge is minimising the costs of farmer-driven innovation and technology development in order to convince donors and policymakers to continue investing in such processes. The EuropeAid-funded research for development project will end in 2015.

Land-tenure and Conservation Initiatives: A Critical View of Sectoral Approaches in Northern Pakistan

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This contribution presents two case studies reflecting on how sectoral approaches to natural resource management led to unintended negative impacts in Northern Pakistan. The first case is from lower Swat, where land-tenure conflicts between hillside landowners and landless herders led to rapid resource overuse and severe deforestation in the 1970s. In order to rehabilitate these hillsides, afforestation programmes were initiated with the consent of landowners. Afforestation turned out to be an efficient means for landowners to evict landless users: according to the data collected in 6 villages in 1998, 63% of the hillsides were fenced for afforestation and access to them was denied to landless herders, who had to reduce their herd sizes by 60% and were forced to seek daily wage labour elsewhere. Local media reported that members of this disadvantaged social group became primary recruits in the Taliban movement between 2006 and 2009.

The second case is from upper Swat and Naran, where off-season vegetables were promoted in the early 1980s with the aim of alleviating poverty by generating alternative income. Off-season vegetables earned local farmers ten times higher returns than their previous farming activities, leading them to convert ever more forest and pasture land into farm plots for growing vegetables. Data show that, over the past 30 years, cultivation has extended to 5% of the total area of the Naran uplands, with an approximate annual gross income of 2500 US dollars per hectare. Due to the above-mentioned tenure ambiguities, locals were reluctant to invest in proper terracing even though they cultivated steep slopes with gradients of up to 44°. Instead, they sought to earn short-term income from “tilling-and-abandoning” practices leading to severe erosion.

Our reading of these two case studies suggests that insufficient understanding of complex socioecological systems may foster harmful consequences for both people and the environment. We argue, further, that it is a combination of local holistic understanding, demand-driven approaches, and flexible agencies' development agendas that are adapted to needs which may ensure sustainable achievements.

Towards Implementation of Integrated Development Research in Elaborating Copacabana Local Diagnosis

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This contribution concerns a group research project carried out as part of a larger research module on “Human Settlements, Urbanisation and Territory”. Copacabana is one of the main towns on the Bolivian shore of Lake Titicaca. It hosts a large 16th-century shrine, the Basilica of Our Lady of Copacabana. It is also a tourist destination. Copacabana is experiencing an accelerated process of urbanisation, which has implications for urban services such as sanitation and sewerage, water, and solid waste collection. To elaborate a diagnosis of the local situation, which presented a series of overlapping interconnected problems, students from around ten different disciplines (Master’s Programme on Population and Development) interviewed not only elected members of local authorities, but also local stakeholders, businessmen, merchants, and even tourists. Examination of these local voices and in-situ observation led researchers to engage in an inter- and transdisciplinary discussion in order to develop the diagnosis. The disciplinary approach common in academic settings, based on fragmented perspectives of reality and without local stakeholders’ participation and inputs, would not have allowed the real dimensions of this polycrisis to be comprehended.

Several learning objectives were met during this group research project. Students had to learn to work in interdisciplinary teams; develop a common language in order to communicate among different disciplines; establish an active dialogue with local stakeholders by way of overcoming the language barrier (official vs native); be sensitive to their colloquial mode of communication in order to identify challenges and concerns; and, above all, develop empathy with non-academic stakeholders.

Participating in this dialogue between science and society calls for individual and collective reflection. Researchers need to reflect on their personal behaviour and communication skills as individuals when interacting with common citizens, strengthening their ability to see the world through the latter’s lens. Students and faculty members are called upon to reflect on the role of university as an integrator, with the goal of joint problem-solving in their communities and in society in general.

The process of participation demands new approaches. Ideally, local citizens and authorities should participate from the early stages of a project, allowing for a joint decision-making process, joint problem definition, joint responsibility for decisions, and joint ownership of ideas as a result of this process of problem-solving.

Reflection on this group research project will help to deepen our understanding of the complexity of applying integrated development research.

Theme 4, Session 27

When Does Knowledge Have an Impact? The Interaction of “Science” and “Policy” in Development and Peacebuilding

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One of the core objectives of the Swiss National Centre of Competence in Research (NCCR) North-South has been the generation of scientific knowledge and its interaction with policy practice. This workshop session aims to (1) provide a conceptual input on the conditions that affect this type of interaction, (2) capitalise on relevant experiences from within and outside the NCCR North-South, (3) provide consolidated and case-based lessons learned as recommendations for designing future research for sustainable development.

The session is expected to produce comparative knowledge and to “scale up” insights produced in the NCCR North-South. It will explore decision-making among state and international actors in the policy arenas of sustainable development and of peacebuilding, and will focus more precisely on the conditions and the effects of interaction between scientific knowledge and policy. In particular, contributions are expected to offer empirical insights that can help to answer the following questions: What type of knowledge was exchanged between which actors at what levels? To what extent were different types of knowledge included into policy decisions? How has this inclusion become visible? What kinds of impact were observed? These questions are based on the assumption that the impact of scientific knowledge on policy varies according to the context (i.e. political culture, institutions, policy level) and the policy contents (i.e. type of knowledge, degree of technicity, degree of politisation).

Peacebuilding Evaluation: Can More “Scientific” Methods Enhance the Legitimacy of Peacebuilding?

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Great expectations were raised when the peacebuilding field became increasingly professionalised. The application of project design methodologies, monitoring systems, and evaluation drawing on the scientific state of the art appeared promising with regard to making impacts more visible, learning from success and failures, and improving the effectiveness of peacebuilding interventions. A decade later, expectations seem more humble. While the focus on results, value for money, and impact assessments has created a growing buzz in the discourse of donor organisations and implementing NGOs, most of these concepts remain empty words to practitioners.

In this contribution I argue that many of the mainstream approaches to design, monitoring, and evaluation (DM&E) draw on a managerial logic, and therefore rely on levels of certainty and plannability that are not normally achieved in an inherently political and complex endeavour such as peacebuilding. But although many practitioners have become aware of these shortcomings, increased pressure to deliver results in return for funds granted, as well as the larger discourse on effectiveness and accountability have led organisations to focus overly narrowly on mainstream DM&E approaches.

The Transfer of Knowledge Into Policy: Challenges in the Field of Peacebuilding

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Peacebuilding is a relatively new policy field. It emerged after the end of the Cold War, apparently as an extension of development policy. Therefore, it was first conceived of as a rather technocratic policy both in its handling and in its analysis. Following its semantics, “peace” was to be “built”. Knowledge about “governance”, “democracy”, and “statehood” was to be packed into programmes and instruments and implemented in recipient countries as one would contribute to the building of roads and houses. Mainstreaming concepts such as “conflict prevention” and “conflict sensitivity” was expected to be sufficient for taking into account the policies’ political dimensions and effects.

Difficulties encountered in many places triggered a re-appraisal of peacebuilding’s technocratic nature. Conceptual criticism of peacebuilding’s *mission civilisatrice* opened up the road to a more critical assessment of the so-called “liberal peace” approach. This had an impact on the analysis of the role of knowledge and ideas in peacebuilding. A categorisation of different types of ideas helps to differentiate and understand variations in policy processes and successes within peacebuilding.

Public Development Interventions in Lao PDR: Based on Contextual Evidence or Serving Globalised Agendas?

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Like any other form of goal-oriented development, sustainable development depends on knowledge as an essential precondition for deliberating and pursuing future development pathways. However, knowledge production and knowledge sharing face a critical challenge. On the one hand, development contexts seem to be increasingly difficult to compare as their specific social, environmental, and economic characteristics are shaped by increasingly globalised driving forces. This calls for context-specific knowledge to support decision- and policymaking. On the other hand, decisions and policies are increasingly framed beyond the local level, thus requiring generalised evidence. As a consequence, a growing cross-scale knowledge gap is undermining evidence-based negotiations, decisions, and policies.

Drawing on an actor perspective, we analyse 341 public-sector development actors in Lao PDR in terms of their specific development interventions, the underlying knowledge and agency, as well as their social networks. In a first step we present spatial patterns of key development indicators describing different development contexts, and analyse how these features correspond to the issues addressed by ongoing development interventions. Revealing major inconsistencies, we assess the factors that have shaped the respective development activities and show that knowledge about the specific contexts of interventions plays a marginal role. Against this background, a social network analysis of interactions between the relevant development actors allows discussing options for enhancing the role of knowledge in decision-making processes.

Science Meets Practice: Getting Ready for Fruitful Knowledge Sharing Between Researchers and Stakeholders

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How can the gap between science and policy in sustainable development be bridged? What can be done to improve knowledge sharing? And what conditions enable fruitful encounters between science and practice? These are just a few questions that research for sustainable development is required to address time and again.

Based on research conducted in a Transversal Package Project on “Knowledge, Power, Politics” (2006–2010) within the Swiss National Centre of Competence in Research (NCCR) North-South and subsequent project work at the Centre of Competence Environment and Sustainability (CCES) of the ETH Domain, this contribution begins by outlining selected key concepts of knowledge and then delves into empirical and practical evidence of knowledge sharing between science and practice, as experienced by researchers, professional intermediaries and communicators, and stakeholders.

Insights from the above projects suggest that there are a number of key factors which are essential for fruitful knowledge sharing, such as mutual respect and awareness of the diversity of thought collectives. This contribution focuses on the innovation potential that lies in creatively managed knowledge interfaces between science, policy, and/or practice. It observes “impact” in the processes taking place at these interfaces, and shows that these processes can be subversive as well as empowering as actors interact and join efforts towards making a change.

Theme 4, Session 28 The Impact of Research on Policy: The Case of Stakeholder Dialogues in Development-oriented Research

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Interest is growing in the impact of development research on policy and practice. How do relevant research results find their way into development? For a long time, the buzzword was knowledge transfer: At the end of a research project, relevant results are communicated to potential users, who are expected to apply these insights in their daily work. Today, the concept of knowledge transfer is considered behind the times, because it disregards the non-linearity, complexity, and uncertainty of research, policy, and practice.

The RAPID Outcome Mapping Approach (ROMA) is a new approach to analysing and effecting research impact. It allows planning impact from the outset of a research project and supports continuous impact monitoring during all stages of research. Key steps are a careful mapping of the policy context, identification of the most important non-academic stakeholders, a clear definition of desired development changes, and the establishment of a learning and monitoring framework. Yet, careful planning and monitoring is not enough to achieve impact in development-oriented research.

Research projects also have to respond to the particular complexities governing international development. This is why this session focuses on stakeholder dialogues, or achieving impact by bringing the right people together. Development-related research is rarely restricted to one particular policy- or development sector. Topics related to health, sanitation, nutrition, or land use usually involve stakeholders from different policy and development sectors, such as planning, finances, and education. Moreover, different levels of impact have to be considered: International donors, national governments, town mayors, and end-users of development interventions often pursue divergent and conflicting interests. Bringing these stakeholders together is vital to achieving impact.

Using ROMA, the presentations in this session will reflect on how development changes were achieved through stakeholder dialogues involving multiple levels and multiple sectors. Based on these experiences, new and more adequate approaches to managing research impact will be discussed.

Negotiating Intersectoral Services in Remote Rural Zones of Sahelian West Africa

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In remote rural zones of the Sahel in Africa in general, and in West Africa specifically, health is modified by the hardship of work in harsh environments and difficult (time-ly) access to health services. Maternal and child mortality rates are among the highest worldwide, particularly in West Africa. Most families keep animals to diversify their nutrition and income. Livestock is the most important source of income for pastoralists and sometimes for national economies. Mobile pastoralists face multiple challenges in maintaining their health and the health of their animals. And there are other mobile people facing similar challenges to access social services: rural–urban migrants, seasonal migrants, and internally displaced people. Our research is based on One Health, a concept that seeks to add value to existing public health, veterinary, and environmental services through increased cooperation, for example in the context of vaccination outreach services, control of diseases transmitted from animals to people, food safety, and food security. This seems promising for resource-poor remote areas, where money and personnel for health care are in short supply.

The main goals of our North–South research partnerships in Chad, Mauritania, Togo, Mali, and Côte d'Ivoire are to better understand health problems and to identify and test adapted health interventions. Health and ill-health are looked at from different perspectives with interdisciplinary teams. Improving the understanding of ill-health and daily use of health and veterinary services in complex remote rural zones is only possible in long-term projects, with the commitment of all partners, and following an iterative process of participatory research and sharing during local and national workshops to decide on interventions to test. More flexible research protocols are needed to allow for this process. A project should facilitate interaction between researchers, authorities, and the communities.

We mainly engage with technical staff of the national ministries and international organisations, communities and their representatives, local authorities, and research institutes – as well as with donors and NGOs. We inform ministers regularly – but it is difficult to build on their commitment given the frequent changes. Health is rarely the only priority. The programme partnered with veterinary services and education in Chad and with nutritional services in Mauritania and may be as important for TB patients as the health services. This programme is necessary to tap synergies in remote zones. Silo approaches are too costly and are less trusted. To go from good outputs to a national policy requires long-term perseverance. In Chad, for instance, a first document on intersectoral services for mobile pastoralists was available 6 years ago – and is now again being circulated between ministries.

Strengthening Trust among Stakeholders Through Mediated Dialogues for Effective Forest Governance in Northwest Pakistan

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This presentation offers insights and lessons learned from a dialogue process initiated with the intention of improving coordination and trust and reducing conflicts between stakeholders for sustainable forest governance in Northwest Pakistan. Another key objective of the dialogue process was to engage stakeholders and practitioners (especially those responsible for policymaking at the provincial and federal levels) in research-informed dialogues and to influence policymakers with a view to improving existing practices of forest management in Pakistan. The project was carried out under the Partnership Action for Mitigating Syndromes (PAMS) programme of the Swiss National Centre for Competence in Research (NCCR) North-South. Stakeholders at different levels were involved in the process, for instance:

- Forest owners and users, community-based and civil society organisations, local forest administration at the village or local level;
- Forest Department officials, local NGOs, and political leaders at the district level;
- Provincial political leaders and members of parliament, and provincial forestry officials at the provincial level;
- NGOs, federal officials of the Ministry of Environment, and media at the national level.

Capitalising on the intensive research conducted by NCCR North-South researchers on multiple forest-related issues in Pakistan, the dialogue process was commenced at the local level and then taken to the higher levels, including the national level; we succeeded in engaging heterogeneous groups of stakeholders in the process. Through “research-informed dialogues” and other related activities, we tried to influence policymakers and bring local stakeholders’ concerns to attention at the national level. It remained a challenge, however, to maintain a balance in the dialogue process when different groups of stakeholders lacked trust in each other.

Are Multi-stakeholder Processes in Poor Urban Communities Effective? Some Evidence From the Field

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Within the framework of the Swiss National Centre of Competence in Research (NCCR) North-South, EAWAG-SANDEC analysed stakeholder perceptions regarding the Household-centred Environmental Sanitation (HCES) approach, a participatory planning approach recently validated in several countries. In two of these – Laos and Nepal – post-intervention surveys were conducted with experts and key informants to assess satisfaction regarding the degree of participation, the effectiveness of planning outcomes, and process efficacy. The surveys specifically investigated the variability in people's perceptions regarding the costs and benefits of community participation. Empirical findings show that experts and participants show high satisfaction rates regarding involvement in decision-making. The earlier and more extensively residents were involved in the process, the higher the satisfaction rate turned out to be. Our comparative field research further shows that:

- (1) Community-based planning comes at a cost and must involve a well-structured participatory process, which takes time. This includes a thorough assessment of the enabling environment and the institutional arrangements, but also the ability to combine expert knowledge and advice with the community's wishes and priorities.
- (2) Participants must be given the capacity to effectively shape environmental decisions and ensure long-term operation and management of the system and services. When decisions are highly complex – involving technical, economic, and institutional responsibilities – it is essential to develop the necessary knowledge and confidence to meaningfully engage community residents in the process.
- (3) Implementation and project delivery at the neighbourhood level should be done incrementally and phased in batches. It should start with easily implementable “quick-start” solutions before tackling more complex off-site solutions (e.g. decentralised treatment systems).
- (4) Our study revealed that well-designed participatory planning is highly correlated with the skills of the process facilitator but also with the tools, methods, and communication channels utilised. Coordinating effective community participation requires a special set of skills which include participatory project management, negotiation, and problem-solving. Special attention must be given to inclusive community participation that prevents “elite capture”.

“We Have a Lot to Tell You!” Bridging the Gap Between Youth and Decision-makers

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Teenage pregnancy is a major health concern, especially in developing countries, due to the high risk of complications, even death, for both mother and child. Tanzania has spearheaded many efforts to better understand and improve the sexual and reproductive health of young people. However, to create interventions that will effectively steer young people towards responsible parenthood, more knowledge is needed about their capacities as well as their social environment. To gain more vivid insights into young people's realities, a Partnership Action (PAMS) project was implemented in which adolescents in two secondary schools – in Dar es Salaam and Mtwara Town – were invited to create short fictional videos on: (1) what they see as key reasons for teenage pregnancy; (2) their main sources of information on how to avoid teenage pregnancy.

To ensure the videos reached key audiences, a workshop was organised that brought together youth and relevant stakeholders, such as government representatives, national and international NGOs, and international donors. The young video-makers were invited to present their clips and speak directly to policymakers. It was the first event of its kind to facilitate direct communication and interaction between actors from different levels: affected youth from the local level, NGO representatives from the meso level, and policymakers from the macro level.

Through their videos, the youth themselves became the protagonists of a campaign to improve their lives. Various international and national NGOs and donors expressed great interest in the videos. Several Tanzanian TV stations aired them. The Swiss Agency for Development and Cooperation (SDC) agreed to finance screenings of the videos during outreach activities in four districts in Tanzania, inviting the young video-makers to participate as agents of change.

The project highlighted how multi-stakeholder engagement within and across different levels in society can fill knowledge gaps and initiate social learning processes.

Disaster, Gender, and Inequality in the City of La Paz, Bolivia

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From the moment of its foundation, the city of La Paz has faced problems of soil instability due to its geological, geotechnical, and topographic situation on high slopes. Ongoing rural–urban migration processes, urban sprawl, and development models based on exclusion further increase the incidence of natural disasters such as floods and landslides. National laws on risk management are in place, but fail to achieve the expected impacts among both the municipal authorities and the population. This is due to their top-down nature. The different communities respond to risk management when prevention processes are established.

This presentation showcases three studies conducted in La Paz. The first one, funded by the Swiss National Centre of Competence in Research (NCCR) North-South, took place from 2004 to 2009 and investigated women’s and men’s perception of disasters, risks, threats, and vulnerability, with a view to strengthening resilience to natural disasters. The second study, conducted in 2011 and funded by Oxfam, looked into different actions by which the government authorities at the different levels can respond to disasters. The third one, a pilot study, identified gender-specific behaviour during disaster response and recovery.

Findings provide insights in the interactions between different players. At the local level there are poor and excluded families – an urban population with a feminine face – that suffer the risks of informal labour conditions and instability. They are represented by neighbourhood councils. In the event of a disaster, the entire population including the neighbourhood leaders lose their houses, working tools, and livelihoods. The neighbourhood councils negotiate with the municipal government and participate in planning; the municipal government develops laws and policies and invests moneys to stabilise the different neighbourhoods. Although the laws foresee coordination with the departmental and national governments, this does not always happen. The national government designs and funds national policies for risk management (Law 2140) and carries out actions when disasters strike. Humanitarian agencies and donors provide resources for disaster and/or emergency assistance, and international and national NGOs support these initiatives.

As a result of these studies, (1) the La Paz Foundation (an NGO) launched activities to promote risk management; (2) Oxfam invests in projects in La Paz; and (3) the affected population is provided with evidence and information to support the elaboration of requests addressed to the municipal government.

Who Needs Research? Challenges of Linking Research With Policy in Unstable States

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The role of research in influencing policy formulation and responding to socio-economic challenges in South Asia, particularly in its unstable states, has been intensely scrutinised in the recent years. Despite the attention this topic has garnered, however, there is very little evidence so far to suggest any definitive formula for making the link between research and policy effective. The gap between research and policy formulation remains a common feature in the region, where the countries, despite facing similar socio-economic, political, and environmental problems, have fostered a sense of mutual mistrust and even hostility towards each other. This in turn has hindered new initiatives based on collaborative research in developing a collective response to such problems.

Given this background, this presentation focuses on the effectiveness and challenges of research–policy linkage in post-conflict Nepal. While giving examples of some success stories of research–policy linkage, such as the efforts made by the Consortium for Land Research and Policy Dialogue (COLARP) in disseminating and discussing the knowledge generated through research with government ministries, constituent assembly committees, and community-based organisations, it also analyses the multifarious difficulties in meaningfully linking research with policy, as the existing research does not always synchronise with the pressure and priorities under which the policymakers operate. The researchers, too, are often seen to be indifferent towards whether their voices have been heard by policymakers, as long as they have their papers published in “peer-reviewed” journals. The people at large, on the other hand, often complain of having become overwhelmed by research projects without any visible results.

What is the best way to bridge this gap? This presentation argues that the role of global partnerships (e.g. the collaboration between the Swiss National Centre of Competence in Research North-South and Kathmandu University) can become pivotal not only in bringing researchers and policymakers together, but also in creating a space for all the stakeholders involved to play constructive roles in strengthening this vital linkage.

The Role of Stakeholder Involvement in Policy-relevant Research Contributions to Sustainable Development

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Research for sustainable development, being directed at triggering or supporting sustainability-oriented societal change processes, can be designed in many ways. Conceptions of research projects correspondingly vary considerably in terms of their policy relevance. This is due to differing ways in which researchers approach and frame sustainability problems and respective societal dynamics, that is, how they deal with complex realities. This presentation will be based on a meta-study of sustainability research, combining theoretical conceptions from fields such as policy sciences and transdisciplinary research with my own empirical analyses.

In the first part of the presentation, I will elaborate on some basic conditions under which stakeholder dialogues generally have the potential to increase the relevance of research contributions to societal change processes. In doing so, I will suggest a definition of the term “relevance” and introduce a distinction between problem orientation and take-up conception of research projects. In this context, I will also make a suggestion on the meaning of the word “right” in the expression “bringing the right people together”, among other things.

In the second part of the presentation, I will distinguish different types of relevant research contributions to societal change, using the example of several recent development-oriented projects at the Centre for Development and Environment (CDE) and ETHZ on land use issues. These projects varied considerably in their use of stakeholder involvement as well as in the importance they attached to this instrument.

I will conclude by discussing success factors and constraints as reported by the researchers and as resulting from my project analysis.

Theme 4, Session 29 How to Get Transdisciplinary Work in a North–South Context Published: Learning From Experiences

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Science is increasingly confronted with the demand that it contribute to innovation and societal development and thus to reaching a public beyond the science community (ICSU and ISSC 2010). Scientific publishing is considered an essential means of validating and communicating research results and is the system upon which new research is based and academic careers are built. Its rules are still based on fairly closed disciplinary debates and on knowledge exchange within the academic community.

Transdisciplinary (TD) research – that is, research that deals with complex life-world problems by integrating knowledge of non-academic stakeholders and different disciplines – explicitly addresses societal development and the challenge of communicating beyond the science community (Pohl et al 2007). At the same time, it is bound to fulfilling the essentially disciplinary rules of scientific publishing, which often exclude work of this kind. This places TD researchers in a double bind. Moreover, in a North–South context, an additional difficulty arises: scientific publishing rules have been defined in the North, making it difficult for many authors from the South to access this means of validating their work (Canagarajah 2010). Here, we can speak of a possible triple bind that challenges authors and reviewers of transdisciplinary research in a North–South context, as well as editors of scientific journals who try to develop an enhanced “publication culture” in transdisciplinary research (Kueffer et al 2007).

This working session will bring together authors, reviewers, and journal editors. The discussion will be triggered by three presentations and the results of a survey inquiring about the concerns faced by ICRD participants when publishing their development-oriented research insights, and will focus on the following aspects:

- Authors’ and journal editors’ experiences with writing and submitting TD work, and dealing with reviewing processes and policies,
- Ideas about how to overcome stumbling blocks when publishing TD work in peer-reviewed journals, and
- Enhanced review criteria for transdisciplinary work.

The overall aim is to build understanding of the challenges of publishing TD work and come up with recommendations for the “Research Agenda” to be developed within the

framework of the ICRD.

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Exploring Experience With Promoting and Publishing Transdisciplinary Work: A Case Study from the NCCR North–South

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Academics using a transdisciplinary research approach face many challenges, including integrating the languages and cultures of different disciplines and learning how to navigate within and between disciplines. For them getting transdisciplinary work accepted as a step in the academic ladder – which mostly depends on disciplinary curricula – can be a slower, rougher, and much less linear process than if they follow a single disciplinary approach. Moreover, when publishing transdisciplinary research in scientific journals they meet difficulties, as they are asked to follow the essentially disciplinary rules of scientific publishing, which often exclude work of this kind.

In the present paper I will highlight and share among peers some experiences with pursuing transdisciplinary research within the framework of the NCCR North-South programme, seen from the academic career perspective as well as from the perspective of publishing an article in a peer-reviewed journal.

The first challenge I faced was getting acceptance for transdisciplinary research from the department hosting my PhD research at the University, as this was the first time that such research was undertaken in the department. More difficulties emerged when I sent my PhD thesis for review before going for the defence. The two reviewers pointed out that disciplines overlapped in the document and that they did not know whether they had to review human science work or environmental engineering science outcomes. In addition, they were very surprised that I took into account non-academic statements in my analysis. So a meeting was initiated in the department; my supervisor and I were asked to provide some clarifications about the study before the reviewers accepted to go through the document and give their comments.

The second problem was related to article publication. The journal I targeted for an article publishes environmental science research. The first reply I received after sending my article to the identified journal was from the Editor and not from the reviewers. He emphasised that although the research was interesting I should send the article to another journal because his journal did not publish such research. He strongly advised me to carefully read the aims and scope of the journal. But at the time I did not know of a journal that published transdisciplinary work. I decided to send the article to another journal. Four months later I received the reviewers’ comments asking me to explain the transdisciplinary approach in detail and to reformulate the methodology section. This was a really time-consuming process. Fortunately, in the end the work was accepted by the journal.

The Very Slow Publication Process of a Paper on Transdisciplinary Research

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In 2005 a group of researchers involved in the NCCR North-South programme met for a two-day workshop to outline a paper on the programme's approach to, and experiences with, transdisciplinary research. The group consisted of PhD candidates who had conducted development-oriented research in a number of countries, and several senior researchers interested in reflecting on the transdisciplinary approach in a systematic way. The aim of the workshop was to collectively develop the questions the paper should address, define the paper's structure, and think about a possible journal for the paper. Additional meetings and periods of email exchange led to the formulation of a manuscript with which all authors felt comfortable.

In February 2007 the paper was submitted for the first time; it was rejected a few weeks later with the suggestion that the manuscript would be better off targeting another journal. The paper was submitted to this new journal in March 2007 and rejected after review. The reviewers said that the paper did not add new insights and that it did "not succeed in illustrating and advocating the role of the researcher in TRSD [Transdisciplinary Research for Sustainable Development], and that the new concepts introduced, such as 'thought collectives' add[ed] very little to our understanding of the topic". Taking up the reviewers' comments and suggestions, the paper was rewritten and the analytical part was extended. The paper was then submitted to a third journal, which rejected it because it did not fit with its profile; finally, it was submitted again to a fourth journal in March 2008. The fourth journal's review required a round of major revisions, followed by an additional round of minor revisions, before the paper was accepted in January 2010. During this additional fundamental revision the theoretical part was extended, a methods section was added, and the analysis and discussion was extended again.

This presentation will analyse the process of reviewing and rewriting the paper. We will emphasise how the content and structure of the paper changed: what parts were added, what parts were removed or shortened, and what parts were relocated within the paper. We will argue that the collective learning process ended up being a distinct research project. The presentation will conclude with lessons learned and suggestions for the review-and-rewrite process of papers reflecting on transdisciplinary research.

MRD's Editorial Policy for Publishing Transdisciplinary Work

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Publishing transdisciplinary research poses specific challenges, in particular with regard to peer-review processes. Indeed, transdisciplinary research addresses different knowledge communities – academic and non-academic – based on different value systems. No well-established set of rules exists as yet for reviewing and promoting transdisciplinary work in the science system. Based on a rich experience as journal editors, we will discuss how we have dealt with these issues in the case of Mountain Research and Development (MRD).

The mission of MRD – an international, indexed, and open-access journal – is to foster sustainable development in mountains. It aims to publish research that addresses life-world problems, enhances the dialogue between science and society, and fosters the co-production of knowledge. In addition to publishing disciplinary and interdisciplinary development-oriented work on mountains and mountain people, MRD therefore also supports the publication of transdisciplinary work.

As a journal embedded within the traditional academic publication system, MRD acknowledges that peer review is an adequate means to assess the soundness and salience of research. However, for transdisciplinary work, the peer-review process needs to take into account the value systems and rules of both science and development communities. MRD has thus formulated a set of innovative review criteria that reflect the particularities of transdisciplinary work, for example the validation of development experience and research results through stakeholders. The journal has also adapted the review process for papers that bridge the gap between science and society and offer sound “transformation knowledge”. In this presentation, we will explain and illustrate MRD's special review process and criteria for transdisciplinary work. Moreover, we will discuss some of the main challenges of communicating with reviewers and authors about the specific requirements of transdisciplinary articles. We will point out what lessons could be learned as editors, authors, and reviewers of transdisciplinary work.

3 Posters

All posters presented during the ICRD 2012 are reproduced in this chapter. The first section contains posters that thematically correspond to one of the ICRD 2012 parallel sessions; the second section contains posters prepared by NCCR North-South PhD students.

Session-related posters

Posters are grouped in alphabetical order of first author.

NCCR North-South PhD posters

Posters are grouped according to the three thematic nodes and 15 research projects carried out within the NCCR North-South.

Please note that some of the NCCR North-South PhD posters also correspond to one of the parallel sessions, whereas others are grouped as general research posters.

Thematic Node 1: Institutions, livelihoods, and conflicts
Research projects 1–6

Thematic Node 2: Health, services, and planning
Research projects 7–10

Thematic Node 3: Natural resources, economy, and governance
Research projects 11–15

Information: On page 276 you will find a more detailed programme (including time and location). The full programme has been prepared as a separate booklet.

If you are looking for a specific poster, please consult the index on pages 279–292, which lists the first authors of all posters in this chapter alphabetically.

Implementation of mobile Lab-on-chip diagnostic device to combat Malaria and Tuberculosis in rural Africa, A case study of rural Nigeria

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Illustrated Main Text

Before the advent of Mobile phones in Nigeria, telephone density was less than one in 200 subscribers, a decade after, there is now one in two people using mobile phones. Nigeria is now the biggest mobile market in Africa surpassing South Africa with close to 100 million active subscribers. This explains the transformative power of wireless technologies on individual, social, economic and societal well-being. Up to 60% of Nigerians currently live below the poverty line with majority of them living in rural areas where quality healthcare are inaccessible. Opportunities to extend and deliver healthcare services to rural populations in Nigeria have been demonstrated with numerous pilot projects demonstrating benefits. As a consequence the national policies in Nigeria are in tune with this new development. Reducing Maternal and child diseases, which Nigeria ranks one of the highest in the world, is now a main policy focus. However, shortage of high skilled medical experts and poor transport infrastructure are identified obstacles to quality healthcare delivery to those in rural areas. The National Health Policy gives importance of appropriate health technology and equipment's for tackling these challenges. Using wireless technologies to bridge geographical gap of healthcare delivery constraints is also enshrined in the National ICT Policy of Nigeria since 2004 and is a part of its rural connectivity policy.

Project Description

The goal of this project is to implement, evaluate and improve on a low-cost mobile based malarial and tuberculosis diagnostic devices. The mHealth system will provide quality and affordable diagnoses by community health workers (CHWs) in the rural villages of Nigeria. The system is meant to delivers secure and high-quality diagnostic data. Diagnosis can either be instantly made by CHW or remotely by an expert at the point-of-care.

Beneficiary

The target beneficiaries are community health workers and rural populations in Nigeria.

Project Benefit

The need is to address cheaper and quicker means of diagnosing malaria infections in rural areas of large country like Nigeria. The benefits are that prompt therapeutic and preventive care will be instituted, especially amongst vulnerable populations such as under-five children and the pregnant women. Thus, drastically reduce maternal and infant mortality incidences due to undiagnosed malaria. Health workers' productivity will also be improved as less time is devoted to diagnosis and more time for patient care. Public health benefits such as syndromic surveillance monitoring of diseases outbreaks is possible and can easily be replicated in other Sub-Saharan Africa.

Nigeria Quick Fact	Yr., 2010
Population, total (millions)	158.4
Population growth (annual %)	2.5
GDP (current US\$) (billions)	202.5
GDP per capita (current US\$)	1,278
GDP growth (annual %)	8.7
Life expectancy at birth, total (years)	51.4
Mortality rate, infant (per 1,000 live births)	88.4
Literacy rate, youth female (% of females ages 15-24)	65.3
Prevalence of HIV, total (% of population ages 15-49)	3.6

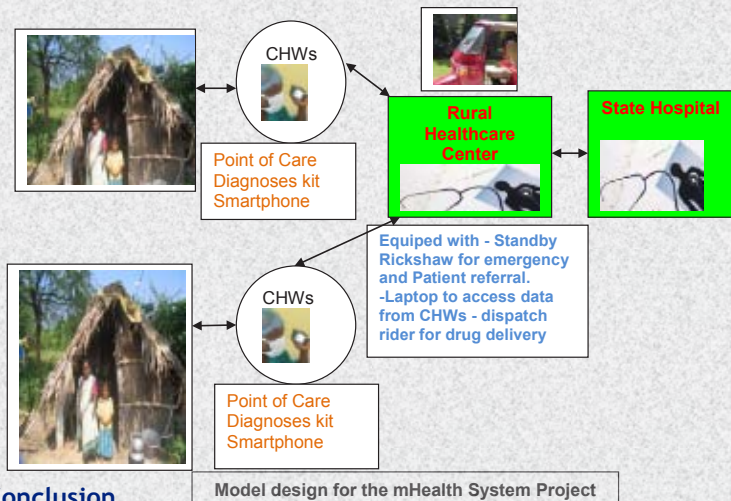
Source: World Development Indicators

Introduction

Malaria and tuberculosis (TB) are major public health problems in Nigeria, as 97% of its almost 160 million populations are exposed to high risk of infections. Malaria accounts for more cases and deaths than any other country in the World. WHO estimated that out of 100million malaria cases, over 300,000 results to death every year in Nigeria. This is actually higher compare to 215,000 death estimated per year in Nigeria from HIV/AIDS. A study conducted by the economic section of US embassy in Nigeria confirmed the fact that Malaria contributes to an estimated 11% of maternal mortality in Nigeria. It account for 60% of outpatient visits and 30% of hospitalizations among under-five children in Nigeria. It is estimated to have greatest prevalence rate of about 50% in children of between age 6 - 59 months in the South West, North Central and North West regions of Nigeria. And has the least prevalence rate of about 27.6% children of between 6 - 59months in the South East region. Additionally, Nigeria is ranked fourth on the World Health Organization's (WHO) list of Tuberculosis (TB) high-burden countries. HIV has been identified as a disease responsible for the increase in TB epidemic, leading to a 6 percent annual increase in the number of TB cases and a four-fold increase in HIV rates among people living with TB between 1991 and 2001. Incidence of tuberculosis is the estimated number of new pulmonary, smear positive, and extra-pulmonary tuberculosis cases. The latest report on the incidence of tuberculosis in Nigeria (per 100;000 people) was 133.00 in 2010 as stated in the World Bank report released in 2011 while the 2009 report published by the World Bank in 2010 stated that the incidence of TB (per 100;000 people) in Nigeria was 130.00. The same report confirmed the TB incidence in 2008 to be 145.00 . Nigeria is one of the most developed economies in Africa. The petroleum industry provides 95% of foreign trade earnings and about 80% of budget revenues. Yet, agriculture is the main source of revenue for two-thirds of the population living in the rural community. Still, more than 50% of Nigerians live in poverty with poor infrastructure as the main obstacles for future sustainable development.

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Conclusion

Despite expressions of political will by the Federal government of Nigeria to control Malaria and Tuberculosis (TB), implementation has been severely hampered by a lack of funding. A recent grant from the Global Fund to Fight AIDS, Tuberculosis and Malaria is expected to help close the government's budgetary gap. However, corruption in government leading to delays in disbursing even the limited funding that has been allocated to control of these diseases are still prevalent which have also made it more difficult to attract additional support from the Global Fund and other international development partners. Therefore, involvement of non-governmental organisations such as Global Resources Information Technology Network (GRITEN) will help to facilitate project implementation and increase the awareness-raising efforts, placing special emphasis on the curability of Malaria, TB and AIDS in Nigeria.



SUPSI

Building citizenship on skills.

An applied research on peace building skills and social emotional learning skills as milestones for a positive and caring youth.

Davide Antognazza, Lorenza Kyburz, SUPSI/DFA Locarno

Short project description

This research project stems from the collaboration between the Dipartimento Formazione e Apprendimento of SUPSI and the Instituto de Investigaciones y Acción Social "Martin Luther King" of the Universidad Politécnica de Nicaragua.

The project aims to a sharing of expertise on two related areas, both central for the development of active citizenship: peace building skills and social and emotional learning skills. The research project has two main goals:

- To evaluate the teachers training process in the two countries in order to understand which characteristics should be included into a training aimed to develop social emotional learning skills and peace building skills in teachers and in their pupils.
- To understand how the teachers of the two countries will learn about the two topics, how they will apply them to their classes and the level of learning of their pupils.

Main goals/Expected results

- To identify the most relevant practices in training educators and teachers in social and emotional learning and peace building skills and integrating them in the school curriculum.
- To compile basic educational materials that can be utilized in a wide range of settings.
- To spread awareness about social emotional learning and peace building

skills' methods and practices in both Nicaragua and Switzerland through participation in various conferences and congresses. The Nicaraguan staff will be able to share the results through its collaboration with the local Ministry of Education. Moreover, information will be spread around through the documentation and systematization of the experience. These documents will be later presented at the presence of public administrators, the media and organizations working on children and youth rights. The Swiss staff will share the results with the institutional network developed by SUPSI, especially through scientific communications and teacher continuing education activities.

- To affect the field of teacher education in both countries preparing guidelines that suggest successful methods of teaching social and emotional learning skills and peace education skills.
- To collect materials that we will be able to use both in Nicaragua and Switzerland in programs of education and continuing education for educators and teachers.

Development relevance

Our project belongs to the aims of Millennium Development Goals: "Develop a global partnership for development". We focus on the basic importance of school education for the development of citizenship. The school system has to be sensitive to some crucial themes, like peace building and social emotional learning, which represent the roots for the change we want to promote in our socie-

ties, in order to achieve a better life standard everywhere in the world.

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Duration of the project

April 1st, 2012 – March 31th, 2013

Future sustainability

The project works under the assumption, in which the applicants believe strongly, that several teachers in each country will be willing and excited to learn how to integrate peace building skills and social and emotional skills in their classes.



A teacher training on Peace Building Skills by the Nicaraguan team.



A teacher training on Social Emotional Learning by the Swiss team.

Decreasing diversity through LSLA! A multifunctional view on land as antidote

Norman Backhaus, Department of Geography, University of Zurich; norman.backhaus@geo.uzh.ch

Large-scale land acquisitions (LSLA) are often conducted with an economic or an ecological focus. Investors disregard the multi-functionality of land that is at the base of natural but also cultural diversity. Consequences are mono-cultures with products to be sold only on the global market or conservation areas that, while protecting biodiversity are inhibiting cultural diversity. A wider scope that is sensitive to the diversity of functions is proposed using a model of land and landscape perception.



Sustainable livelihoods through a fenced-off palm oil plantation that produces bio-fuel for the world market or small-holder farms with crops for the local market – a decision between economic gain and the conservation of diversity? (Photo by the author)

Tunnel vision Mono-functionality

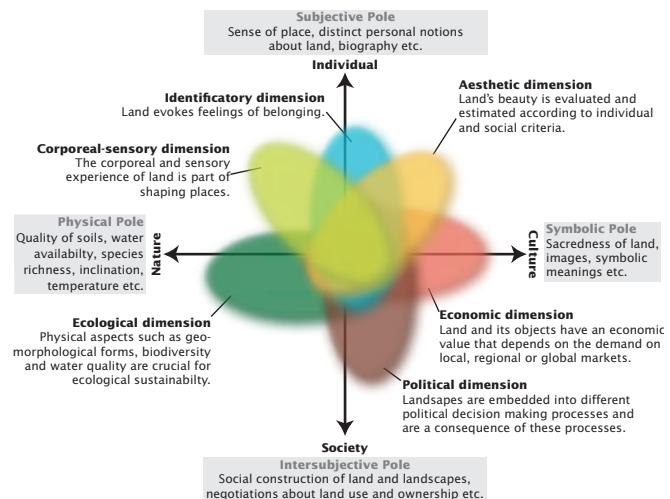
To be profitable on a global market, investors in LSLA resort to mono-cultures¹, resulting in decreasing natural and cultural diversity. Both consequences can be detrimental to the sustainability of affected people's livelihoods.² Even LSLA with the aim to protect nature and to enhance biodiversity run the risk of contributing to the loss of cultural diversity by barring people who have previously used the area's resources³.

Taking off the blinders Land and landscape perception

Land is more than an economic resource or a container of biodiversity. Its multi-functions (e.g. ecosystem services⁴) are valued on different scales – from the individual to the global – and not always on a monetary basis. The four-pole model⁵ makes this transparent.

Putting things into perspective Render visible what's hidden

Not all dimensions that play a role in people's appreciation of land are relevant for specific LSLA. However, land deals that take land's multi-functionality and its different perceptions into account have better chances to result in a win-win-situation, from which all affected people can profit.



The four-pole model of land and landscape perception (Backhaus et al. 2008)

Taking a closer look Land and its multi-functionality

Several dimensions are relevant beside land's suitability for economic gain or ecosystem protection. Often they loom in the background of *political negotiations* about LSLA but are rarely made transparent:

- People *identify* with land that they grew up with or that belonged to their ancestors.
- Tilling the ground, ambling around one's land, touching and smelling the harvest are *sensory* practices through which people connect to land.
- The beauty of landscapes is not always deemed as relevant for land deals. Yet *aesthetics* are not only important for tourism but they are also part of people's livelihoods.

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From vulnerability to resilience: water and sanitation in informal peri-urban settlements in Tegucigalpa

Mario Baide Muñoz and Elsa Lily Caballero, MGSU-PLATS-UNAH Universidad Nacional Autónoma de Honduras, JACS-CCA, RP9

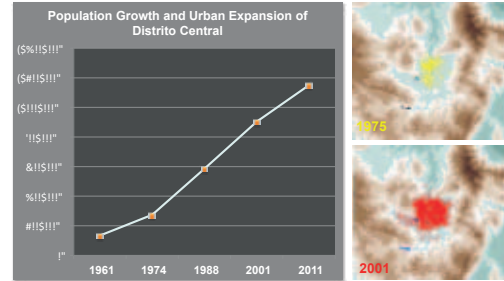
Based on the cases of “Colonia Nueva Oriental” and “Colonia Mirador de Oriente”, settlements on the outskirts of Tegucigalpa, endogenous and exogenous elements which move the inhabitants to the informal occupation in order to satisfy their housing necessities are analysed, emphasizing in the vulnerability towards natural phenomena and the access to adequate water and sanitation services. This proposal is aimed to identify and to discuss aspects of urban planning, informal urban land market, public services access and risk management, in order to enhance processes of resilience.

Growth and Urban Expansion of Distrito Central

Distrito Central (Tegucigalpa and Comayagüela), the capital city of Honduras, currently concentrates 28% of the total urban population of the country (1,029,199 inhabitants). Since 1950 it becomes the fastest growing city in the country as a result of import substitution policies, agro-industry promotion, and State reforms, which made Tegucigalpa the biggest employer in the country.

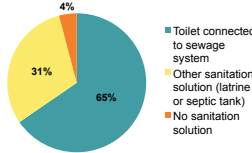
In the second half of the 20th century, the rural-urban migration had as its main target the capital city because of employment expectation, educational opportunities and access to health services. In the last 20 years, aside from immigration and natural demographic growth, there is an internal spatial mobility in order to obtain housing, or as a product of settlement relocation processes related to exposure to socio-natural hazards. These phenomena have contributed to the expansion of the urban area that from 700 hectares in 1950 has increased to almost 12,000 hectares in 2010.

However, the population growth was not joined by adequate urban planning processes, thus the city expansion has been developed in a disorderly manner, on a steep and fragile terrain, and since the 50s the informal land market has developed and strengthened: land for informal housing is enabled without basic services networks, especially water and sanitation.

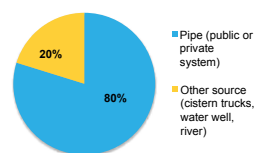


Sources: Population data from DGE/INE. 1961, 1974, 1988, 2001 Censo Nacional de Población y Vivienda (National Census of Population and Housing). Urban expansion images from Angel et al. 2004. Rapid Urbanization in Tegucigalpa, Honduras.

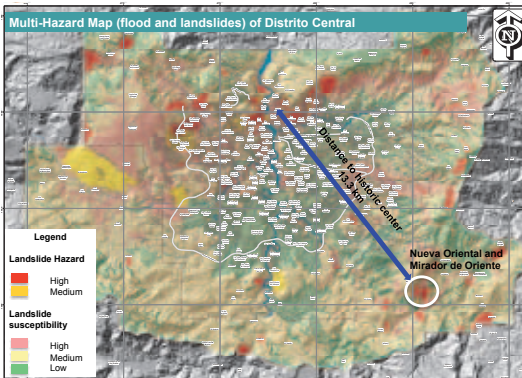
Sanitation solutions in Distrito Central



Source of water in Distrito Central



Source: INE 2001 Censo Nacional de Población y Vivienda (National Census of Population and Housing).



Source: Base map from IHCIT-UNAH-UNDP, 2011. Mapa multiamenaza (Inundaciones y Movimiento de laderas) del Municipio del Distrito Central - República de Honduras.

Vulnerability in periurban settlements in Tegucigalpa: Nueva Oriental and Mirador de Oriente

The case study settlements are born as a result of an extralegal land occupation process since 2002 in the eastern periphery of the city; they are developed along settlements that arised in other peripheral areas immersed in the informal land market after Hurricane Mitch. Located in an area classified as highly threatened by landslides, it has nowadays almost 2000 inhabitants, mostly from other informal settlements in the city, that found in this place an opportunity to access a land of their own.

Besides the lack of adequate infrastructure to meet the threat of landslide, the communities have no access to the water supply and sewer systems of the city; the cost of water is \$6.50/M3 (the cost to subscribers of the city's pipe network is \$0.08/M3), while latrines are the sanitation solution for 90% of the people.

Recent institutional efforts to reduce vulnerability	
Planning	<ul style="list-style-type: none"> Municipal Development Plan with emphasis in risk reduction Local ordinance to regulate construction in risk areas + risk inspectors certification Multihazard Map of Distrito Central IHCIT-UNAH-UNDP
Land Regularization	<ul style="list-style-type: none"> More than 40,000 informal parcels to be regularized
Non structural measures	<ul style="list-style-type: none"> Community training and organization for Risk Management (Local gov., UNDP, EU-DIPECHO, JICA)
Adaptation measures	<ul style="list-style-type: none"> Rainwater harvesting projects in low income neighborhoods (Adaptation Fund)

Potential of the case study communities to jump from vulnerability to resilience	
Sociopolitical strengths	<ul style="list-style-type: none"> Community organization and strong leadership Involvement of women and youth in the processes of community development
Socioenvironmental strengths	<ul style="list-style-type: none"> Prior knowledge to build and live in areas with steep terrains and landslide susceptibility Use of lightweight materials (wood) that do not load the ground excessively Experience in self-built rainwater harvesting systems as an alternative for water supply



Picture 1: Overview of Colonia Nueva Oriental. Picture 2: Lack of adequate retaining walls. Picture 3: Typical alley. Picture 4: Typical latrine. Picture 5: Difficult access to latrine.



Agroforestry species of the Bolivian Andes: an integrated assessment of ecological, economic and socio-cultural plant values



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Introduction

Agroforestry is a promising method for enhancing land-use sustainability in the Bolivian Andes. However, its benefits in terms of rural development are under-recognized due to gaps in linking biological and socio-cultural factors. Understanding users' perceptions while taking into consideration both local and global environmental goals thus become preconditions for shaping the integrated governance of bio-cultural diversity in agroforestry systems.

Our study aimed to narrow these gaps by developing an analytical framework for analyzing the site-specific socio-ecological factors and interactions related to local woody species and assessing their ecological, economic, and socio-cultural plant values in order to identify the most promising agroforestry species.

Methods

Study Area

The framework was tested in **TRES CRUCES**, an indigenous peasant community at 2,760-3,830 m asl (Dept. Cochabamba, Bolivia).



Data Analysis

Assessment of woody plants (n=46)
Apparency (Importance Value, IV)¹
Use value (Relative Importance, RI)²
Identified Cultural Influence (ICI)³
Spearman rank correlation
Principal components analysis (PCA)
Regression analysis

Data Sampling

Vegetation surveys
Semi-structured interviews
Group discussions
Transect walks
Participatory observation

Results

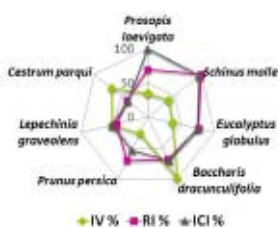


Fig. 1: Local woody species with highest IV [%], RI [%] and ICI [%]. RI is significantly correlated ($p < 0.001$) with IV ($R = 0.72$) and ICI ($R = 0.87$).

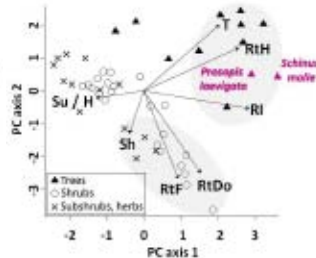


Fig. 2: PCA of use values (RI), relative frequency (RtF), relative dominance (RtDo), relative height (RtH) and life-forms of local woody species (tree [T], shrub [Sh], subshrub/herb [Su/H]).

Discussion and Conclusions

Results showed dominating seral woody species along an altitudinal gradient. Although shrubs were more ecologically apparent than trees, trees were perceived to be more valuable as the usefulness and cultural importance of species increased with plant height and timber availability. Phytosociological factors played a minor but still significant role in perceived usefulness. *Schinus molle* and *Prosopis laevigata* (<3200 m asl), *Polylepis subtusalbida* (>3200 m asl), and *Baccharis dracunculifolia* (both zones) were evaluated as most promising for agroforestry use. In conclusion, our analytical framework proved to be a valuable tool for context-specific integrated agroforestry plant selection. Nonetheless, economic, technical, and socio-cultural limitations of cultivating native agroforestry species were revealed as well. Agroforestry science and practice should, therefore, focus on enhancing reproductive potentials of existing woody vegetation, as well as problem-oriented horizontal dialogues between indigenous, expert, and scientific actors.



Acknowledgements

Andrea-von-Braun-Stiftung (München, Germany)
Agroecología Universidad Cochabamba (AGRUCO) (Cochabamba, Bolivia)



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Assessing health risk due to exposure to arsenic in drinking water in a rural setting in Hanam, Vietnam

Tung Bui-Huy^{1,2}, Tuyet-Hanh Tran Thi², Hung Nguyen-Viet^{2,3,4}

The public health situation of the population of Hanam Province in Vietnam is of great concern due to the daily exposure to arsenic-contaminated drinking water. Optimising arsenic removal efficiency of current sand filters at household level or switching to cleaner or As-free water sources is crucial for preventing or reducing community health risks.

Arsenic contamination in tube-wells water in Vietnam

In the Red River Delta area, about five million people use tube-wells for drinking and other domestic purposes even though this water source is highly contaminated with arsenic (As) at different levels. Estimating health risks caused by As exposure in drinking water is important to understand the impact of As contaminated drinking water and to prioritize public health interventions.

We characterized the As contamination and assessed health risks related to As contaminated water in Chuyen Ngoai commune (9,324 inhabitants), Duy Tien district, Hanam province using the Environmental Health Risk Assessment Framework.



Photo 1. Sand filter with tube-well in Chuyen Ngoai, Duy Tien district, Hanam.

Method

We used the the Australian Environmental Health Risk Assessment Framework and focused on exposure assessment and risk characterization:

* Exposure assessment was conducted by:

- Measuring As concentrations in 300 tube-well water samples before and after filtration (Photo 1, Figure 2)
- Estimating water volume consumed for drinking purpose in 150 interviewed households, which gave the daily consumption dose from oral route.

* Health risks characterization:

- Comparing the As levels in water with the National technical regulations on drinking water quality, and by comparing the daily consumption dose with the Tolerable Daily Intake (TDI) value set by WHO.
- Using the Cancer Slope Factor index and lifetime average daily dose to estimate the cancer risk of people using As contaminated water sources for eating and drinking.

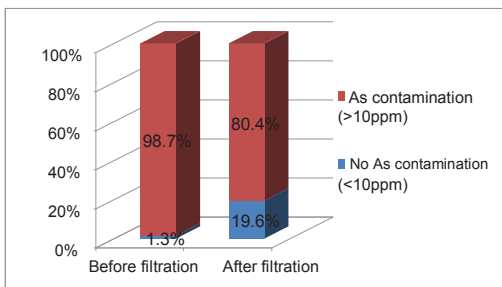


Figure 1. As concentration in tube-well water before and after sand filtration.

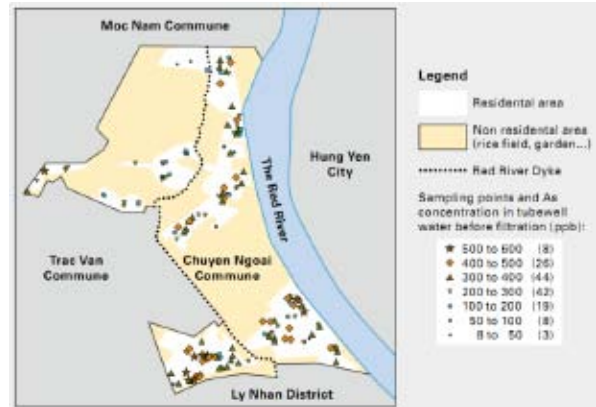


Figure 2. Sampling sites and As contamination (before filtration) in Chuyen Ngoai commune.

Results

- * Water was heavily contaminated with As. The concentrations in drinking water before filtration varied from 8 to 579 ppb (mean: 301 ± 121 ppb).
- * The majority of households designed their sand filters themselves, but 80.4% of the filters did not meet the standard for As removal.
- * As daily consumptions of 60% adults were lower than the level of the TDI ($1 \mu\text{g}/\text{kg}/\text{day}$).
- * The average cancer risk in adults due to consuming filtered tube-well water for drinking purpose was 23.5×10^{-5} . This cancer risk would be 1.2 and 1.5 times higher after 5 and 10 years drinking filtered water, respectively.

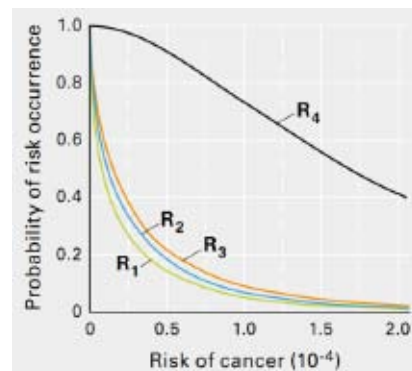


Figure 3. Estimated risk of cancer due to As-contaminated drinking water

R: Risk of current consumption of filtered water, R₂ and R₃: Risk after 5 and 10 years of drinking filtered water, respectively, R₄: Risk of consuming filtered water over a lifetime.

Conclusions and recommendations

Our study showed high contamination levels of As in tube-well water in Hanam causing high health impact to the consumers. Improved filtration measures or the replacement of the current drinking water sources (i.e. by rain water, clean pipe water...) to prevent health risks for the local population are recommended.

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Factors Determining the Effectiveness of Public Health Promotion Approaches to the Earthquake and Cholera Outbreak in Haiti

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Background

Emergency Situation in Haiti

- January 2010: 7.0-magnitude earthquake – 230,000 people died, 300,000 were injured, 2 million were affected and nearly 1.5 million were left homeless.
- October 2010: Cholera outbreak spreading quickly to nearly all departments causing 544,044 infections and 7,150 fatalities to date.
- Oxfam has reacted with public health promotion reaching up to 700,000 people.

Hygiene Promotions in Emergencies

- Personal hygiene, i.e. handwashing with soap, is especially relevant in a disaster context where risks for diarrheal diseases are elevated.
- Hygiene promotions are rarely studied in an emergency context.
- The present study evaluates the effectiveness of Oxfam's handwashing promotions in post-earthquake Haiti.
- According to the RANAS model (Mosler, 2012)¹, it is assumed that promotion activities, to be effective, have to influence a set of behavioral factors (i.e. health related beliefs and perceptions) which in turn change handwashing behavior.



Figure 1. Hygiene promotion in Haiti.

Research Questions

- Which behavioral factors are most important in determining handwashing with soap?
- Which promotion activities influence which behavioral factors and have an impact through these on handwashing with soap?

Methods

Data Collection

- Displacement camps and neighborhoods in Port-au-Prince and surrounding
- Cross-sectional design
- 811 face-to-face interviews with the primary caregiver

Dependent Variable

Frequency of handwashing with soap at key times

Data Analysis

Regression and mediation analyses

Results: Food Related Handwashing With Soap²

Results: Research Question 1

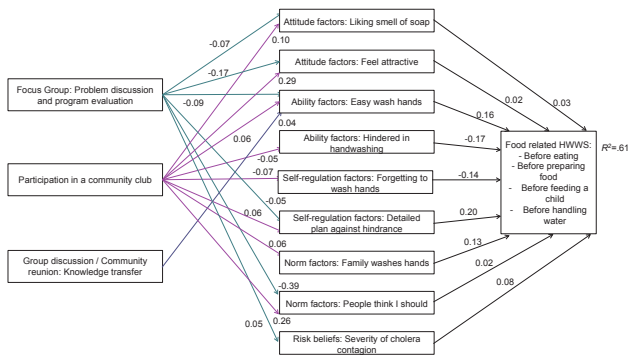


Figure 2. Association between selected promotion activities, behavioral factors and food related handwashing with soap. Unstandardized regression coefficients are displayed. Only significant coefficients with $p < .05$ are presented. HWWS = handwashing with soap.

- Attitude, norm and ability factors are most important in determining handwashing with soap.
- Health risk factors and health knowledge are of only minor importance.
- The behavioral factors mediate the association between promotion activities and handwashing with soap.

Results: Research Question 2

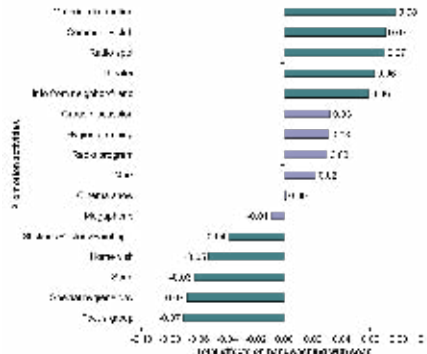


Figure 3. Total unstandardized effects of promotion activities on food related handwashing with soap. Turquoise bars represent significant unstandardized regression coefficients with $p < .05$.

- 6 promotion activities are associated with increased handwashing with soap: radio spots, radio programs with Q&A, material distributions with instructions for use, information from friends or neighbors, hygiene theaters and community clubs.
- 5 of the promotion activities are associated with decreased handwashing with soap: experiencing a focus group, stickers, posters and paintings, hygiene songs, special hygiene days and home visits.

Conclusions

- Some of the promotion activities have a positive influence on handwashing with soap, some have a negative influence, others have no effect at all.
- Some of the promotion activities should be seriously revised and others, although successful, have still the potential to be improved.
- Carefully redesigning the activities, conducting pre-tests and subsequently protocoling the behavior change effects is inevitable for having reliably effective promotion activities.

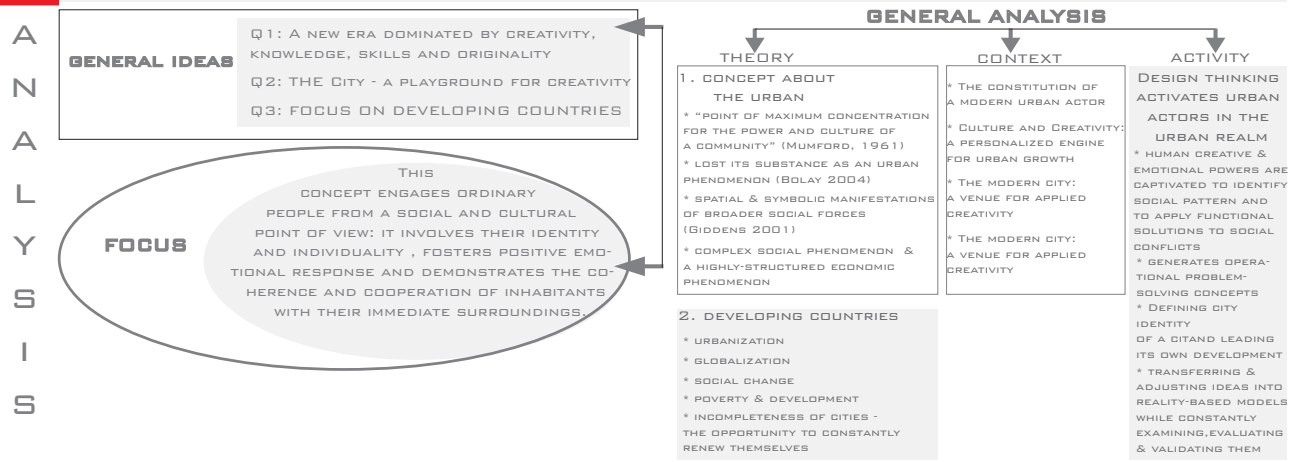
¹ Mosler, H.-J. (2012). A systematic approach to behavior change interventions for the water and sanitation sector in developing countries: a conceptual model, a review, and a guideline. *International Journal of Environmental Health Research*, 1-19. doi: 10.1080/09603123.2011.650156.

² Similar results found for feces related handwashing with soap.

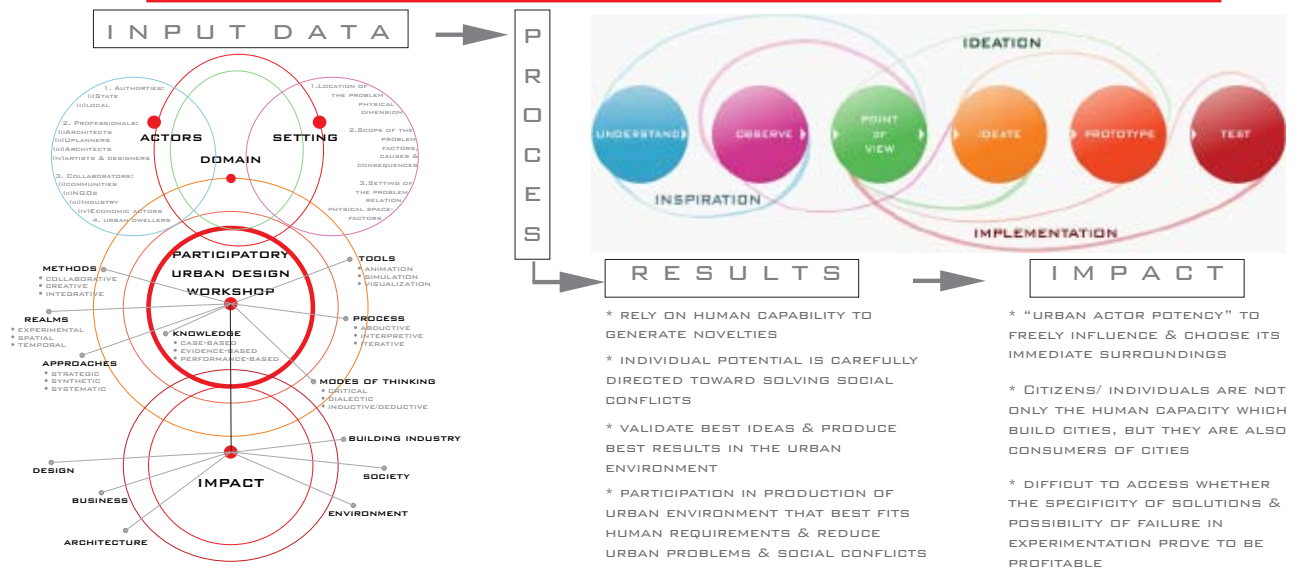
^{*}This study was funded by Oxfam America and carried out in close cooperation with Oxfam America, Oxfam Great Britain, Oxfam Quebec and Intermon Oxfam.

URBAN DEVELOPMENT - STEP INTO THE PROCESS!

A THIS POSTER DISSECTS THE DESIGN THINKING PROCESS, WHICH IS APPLIED TO SOLVE GROWING URBAN ISSUES IN DEVELOPING COUNTRIES. THESE COUNTRIES HAVE BEEN GENERATING URBAN CONFLICTS WHILE CONSTANTLY IMITATING WESTERN URBANIZATION. **B** THIS ANALYSIS IS BASED ON THE HUMAN FACTOR AS AN INTER-MEDIUM, AS A DESIGN ELEMENT IN DEVELOPMENT STRATEGIES. THE INDIVIDUAL REPRESENTS A POTENTIAL VECTOR OF SPONTANEOUS URBAN PROSPERITY, WHEN DERIVED FROM RESOURCES SUCH AS DESIGN, STYLE AND AESTHETIC VALUES. **R** URBAN ACTORS WILLINGLY INTEGRATE THEIR CUSTOMS AND NEEDS INTO THE PROCESS OF FINDING SOLUTIONS FOR URBAN CONFLICTS BY GRADUALLY BLENDING IDEAS TOGETHER THROUGH INSPIRATION, IDEATION AND IMPLEMENTATION PHASES OF DESIGN THINKING. **A** **C** **T** KEY WORDS: "PARTICIPATORY URBAN DESIGN" METHOD, DESIGN THINKING, CREATIVITY, DEVELOPING COUNTRIES



PARTICIPATORY URBAN DESIGN



CONCLUSION

PARTICIPATORY URBAN DESIGN POSES A CHALLENGE TO THE REDEFINITION OF A SCIENTIFIC APPROACH TO URBAN CONFLICTS AND CORRESPONDING URBAN PLANNING PROCEDURES, THROUGH A CREATIVE, DYNAMIC AND ITERATIVE PROCESS OF DESIGN THINKING WITHIN AN URBAN SETTING. IT IS A HUMAN-CENTRED, USER-FRIENDLY CONCEPT, WHICH FOSTERS HOLISTIC THINKING AND FLEXIBILITY IN DEVELOPING STRATEGIES - BLURS THE BOUNDARIES BETWEEN VARIOUS DISCIPLINES AND STAKEHOLDERS, AS WELL AS THEIR MUTUAL ENDEAVOURS TO PROVIDE A WIDE RANGE OF POTENTIAL SOLUTIONS OF RECOMBINATION AND APPLICATION IN CERTAIN ENVIRONMENTS, AND FINALLY, GENERATES A NEW VISION OF THE CITY THAT SUITS CURRENT SCIENTIFIC AND CULTURAL TRENDS.

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WOMEN EMPOWERMENT THROUGH CONSERVATION IN RESERVA DE LA BIOSFERA DE LOS TUXTLAS (VERACRUZ, MEXICO).

Conceptual framework.

- Division of resources and responsibilities reflect gendered power relations inserted in the use, perception and control of natural resources (Rocheleau, 2005).
- Social norms determines who can use+control spaces (McDowell, 2000).
- Women Empowerment: Control of resources+information / participation and bargaining power (individual – community decisions) (Kabeer,2001; Agarwal, 1997).
- Women posses a different knowledge from men...women's knowledge continues to be overlooked (Chambers+Henshall-Momsen, 2007).

Study Area.

56% of rainforest in the north was destroyed from 1967 to 1986 –Dirzo&García (1992).



Reserva de la Biosfera de Los Tuxtlas (RBT) is located south Mexico, in the State of Veracruz. It was declared in 1998 to preserve rainforest as well as cloudy forest.

Extensión: ±155,000 ha. ■ Main economic activities: primary and tertiary sectors ■ Population: ±33,000 inhabitants ■ HDI: medium ■ Rural population ■ Presence of popoluca and nahua ethnic groups (south the Reserva).



Conservation + women.

“Solar” can be an exceptional example of diversity and productivity –Townsend (1999).

As a consequence of domestic work actions taken by women are those close to home and/or towns. At “solar” (homegarden+home) conservation take place, but it is invisible for being considered as female work having domestic consumption as final destination, size of the plot (considered very small) also contributes to its invisibility.

“The NGO has some ‘solar’ projects, about two decades ago every home had one and now they are few. It’s considered an old tradition among young people, it’s an old tradition of course but it’s also very important not just only for economic purposes but conservation too” – Acosta.



“There was a project to forest recovery, there men those who participate in that project, women participate mainly in ‘solar’ projects [...] ecotourism is another project where some women participate and some companies at the coast participate in recycling, some women also participate.” – Andrade.

Final considerations:

- Conservation also takes place along quotidian life, for that reason it is important to estimate conservation taking place at micro-scale.
- For women at RBT gender division of labour and socio-cultural practices are important in determining their access/control of spaces for conservation.
- Most spaces are limited to home –or close to- and devaluated; however, some women have got access to public spaces for conservation (mainly participating in productive or comunal work).
- Through conservation at RBT women have found some opportunities to reconsidered their gender identities; however, empowerment is still a far goal.



“My husband told me not to participate in the project, he said it was not for men that women’s place is the kitchen [...] While the ecotourism project started to run we had a gender workshop... It was very sad to me to see how my marriage was plenty of violence... I cried a lot that day, but it was a change for me... my life changed 180° ” – Sixtega.

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North URBOS ICRD 2012 Research for Global Transformation



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Productive sanitation: Conversion of urban waste into business opportunity and food security in Côte d'Ivoire

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Context and research question

In low-income countries (LIC) like Côte d'Ivoire, one of the sustainable approaches to tackle the crucial waste management problems in growing cities (health problems related to waste) is enhancing resource recovering activities consisting in looking at waste as a resource, not as a problem. In most cases, vegetable crops producers in LIC often use chemical fertilizers to increase their production which increases the risk of contamination. Therefore, the question is *how to mitigate the health risks associated with unsustainable practices related to waste management and vegetable agriculture without compromising livelihoods and at the same time improve food security and health?* This research will demonstrate how it is possible to turn waste into jobs and opportunity, assess health risk associated to unsustainable practices and improve food security in Côte d'Ivoire.

Research Objectives

- to analyze current practices of UWM & UFP to better understand strengths, weaknesses, opportunities and threats with special focus on important risk factors, & population's willingness to improve the situation
- to increase awareness among urban farmers and waste managers on the potential of compost production and use for soil improvement in terms of organic matter and nutrients
- to pilot a decentralized composting system of organic wastes in Yamoussoukro and evaluate compost utilization in local context.

Methodology

General approach: cartography, sociology, statistics & classical engineering science.

- socio-environmental survey, semi-structured interviews, participatory workshop data will previous be collected as inputs of the implementation of a pilot decentralized waste composting system.
- laboratory analysis will evaluate the quality of the compost from these organic wastes
- Market business plan analysis will be conduct to evaluate compost utilization in local context

Preliminary results

Risk factors in Tiassalé

- Urban agriculture:** Very high risk factor practice in a the whole cultivated area. Farmers are using chemical fertilizer in bad conditions to produce vegetables crops for the city of Tiassalé and also for that of Abidjan. Figure 1b
- Urban waste management:** important risks in practices (figure1a & 2)



Figure 1 : Unsustainable practices of waste management (a) and vegetable crop production (b) in Tiassalé

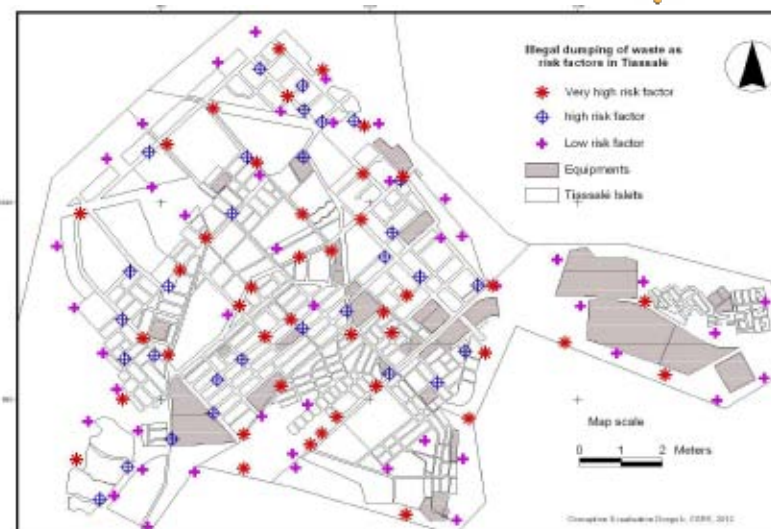


Figure 2: Risk factors related to unsustainable waste management in Tiassalé (Côte d'Ivoire)

Key messages

- The current practices in terms of waste management and vegetable production in Africa and particularly in Côte d'Ivoire are important sources of contamination at different levels.
- The technology of organic waste composting improves this situation and, in addition, can provides interesting business opportunities:
 - 1. Composting systems can significantly reduce the waste to be collected and dumped,
 - 2. In addition, a good soil amendment can be produced out of the waste, which if used can help avoid the degradation of soils by chemical fertilizers and reduce health risk
 - 3. Farmers involved in such sytem, will reduce expenditures of inputs and will increase the profits of sale.

Capacity building of water users on climate change risk management in Kyrgyz communities

(transferring scientific knowledge and jointly testing opportunities for adaptation)

Salamat Dzhumabaeva, Central Asia Mountain Partnership (CAMP), Kyrgyzstan

Climate is the most important and continuous factor of the natural environment, which daily influences the living conditions and livelihood of people. Climate change becomes more obvious, and weather conditions become more unpredictable.



The influence of climate change on the living conditions and livelihood of the inhabitants of mountain villages in Kyrgyzstan is particularly important when it comes to the availability and allocation of annual flow of surface and underground water. Climate change reveals itself in the form of an increase in the frequency of hazards, extreme meteorological phenomena and changes in the flow of the River. Therefore, it is important that the local population is aware of these tendencies and has skills for adaptation to climate change. Capacity building of water users on climate change risk management is an important issue, as according to the long-term prognosis climate change will result in changes of flow River. Goal: increase of awareness on climate change adaptation on watershed.

Target group: farmers, local authority, state administration and local organizations.

Activities:

1. Runoff prognosis based on time series (1931-2005), used extended to 2011. Updated database related to the influence of climate change on water management in the Sokuluk River Basin based on the PREVAH Hydrological Model used by Ershova.
2. Structure of developed training module L4S (Learning for Sustainability) on climate change adaptation.
3. Implementing measures adapted to changes of runoff of Sokuluk river on local communities level.
4. Two documented technologies on climate change adaptation for Wocat data base.

Partners: Bodies of local-self-government (A/O), Water users association (WUA) in the pilot territories, the Kyrgyz-Russian Slavonic University (KRSU) and the University of Bern

Expected results:

1. Database, related with climate change impact on water resources management in Sokuluk watershed, is updated with a glance of long-term forecast and used for practical events development and modules
2. Awareness of local population on risk management of climate change is increased
3. Local communities are able to determinate and implement activity on adaptation to risks of climate change.



Figure 1. Simulation Game for Adaptation to Climate Change



Figure 2. Soil and water conservation technologies

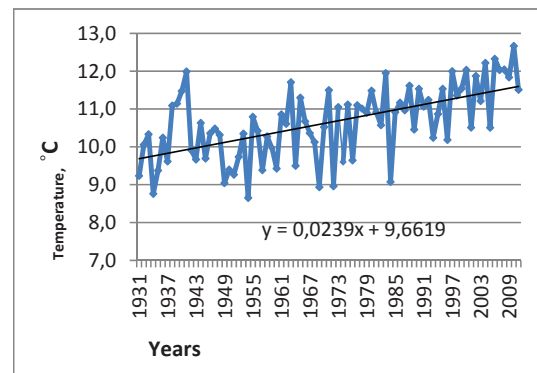


Figure 3. Raising the temperature in 80 year period shows an increase in mean annual temperature at 1.9 °C

Assessment of Water Resources in On-Orcha and Jergital River Basins for Sustainable Water Use

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After collapse of Soviet Union structure of water use was changed. How water recourse use in the present time is main aim of study. Study area is On-Orcha and Jergital River Basins (Kyrgyzstan). There are a lot of problems in this region: pasture degradation against firm increase of livestock population; as well as ineffective water use, that characterized by huge water loss in irrigation canals due to their bad technical condition and other.

1. Objectives of the study

1. Assessment of territory distribution of water balance characteristics in the investigated basins such as:
 - Precipitation
 - Potential Evaporation
 - Moisture availability
2. Calculation of surface water recourse
3. Assessment of volume of water consumption
4. Assessment of canals efficiency

3. Results

Assessment of territory distribution of water balance characteristics is carried out base on 7 meteorological station located in the central part of inner Tien Shan. Altitudinal dependency was calculated for design maps of water balance characteristics (fig.1)

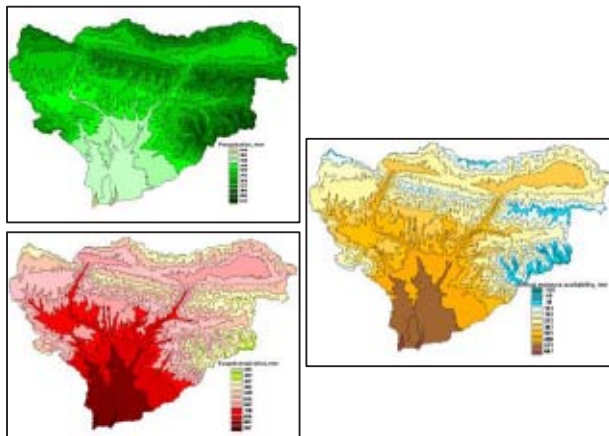


Figure 1. Maps of annual water balance characteristics

Analysis of moisture availability distribution is shown 51% of territory has deficit of water (evaporation greater than precipitation), in other word this area necessary to irrigate.

Calculation of surface water recourse. Surface water recourses contain in rivers, lakes, glaciers and swamps. The main water recourse is river flow: there is 33.7 million m³ of water in the Jergital river and 318 million m³ of water in the On-Archa river. Amount of water in lakes, glaciers and swamps is not significant (less than 1% of river water recourse). River recourses has main significance for irrigation. Since river flow is variable it was calculated annual distribution of flow for different probability (fig.2).

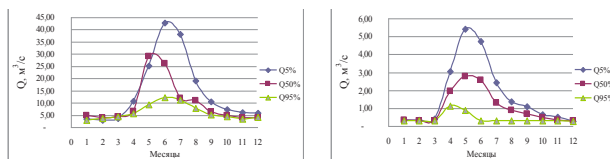


Figure 2. Annual distribution of On-Archa and Jergital river flow for different probability

Distribution rivers flow within year is very useful for irrigation, since maximum of river flow coincides with hottest period of year and maximum of water consumption. However sometime it is arise lack of water in July (hottest month of year).

Water consumption was evaluated base on interview of local population due to there is no measurement of water consumption in the study area. River water recourses can wholly supply demand of water recourses (annual volume of water is 352 million m³, consumption is 295 million m³).

Technical condition of irrigation system and canals efficiency was assessed base on data of field work during 2009 – 2010 years. It was carried out next kind of work: 1) expert estimation of technical condition of hydraulic constrictions, 2) GPS measurement of objects location, 3) canal discharge measurement in more than 50 points. Base on collected data was calculated efficiency of canals.



Figure 3. One of the canals in satisfactory condition



Figure 4. Measurement of water discharge

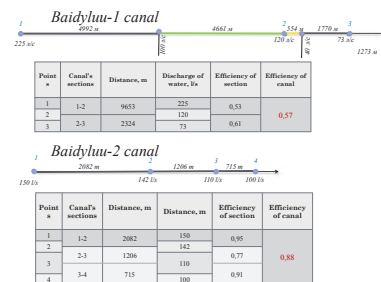


Figure 5. Calculation efficiency coefficients of Baidyluu-1 and Baidyluu-2 canals

Technical condition of hydraulic constructions and irrigation system is unsatisfactory: nonengineering hydraulic constrictions predominate in the system, there are no water-gauges, feck of canals are earth cover canals with efficiency coefficient less than 0.6.

5. Recommendation

- To align water measurement in the system, for this purpose to reconstruct non-working hydroposts as well as to create new hydroposts.
- To set water outlets in the canals by water-gauges.
- To carry out partly reconstruction of the earth cover canals for increasing of efficiency coefficients.
- To develop the existent water discharge institutes by creation Associations of Water Users, Federations, Committee etc.
- For advance knowledge level of water users, to conduct technical trainings with members of Associations of Water Users regarding water measurement, water distribution and operation of irrigation system.
- To develop the module of sustainable water management for local population.

Testing Fog-Water Collection along the Eastern Escarpment of Eritrea

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Fog is considered as an alternative water resource for fresh water in the eastern escarpment of Eritrea. This area is bestowed with high-altitude dense fog, which is formed during the uphill movement of adiabatically cooled humid air masses from the Red Sea. A pilot project was implemented in 2007 in the villages of Arborobue and Nefasit where the high fog-water yields were measured during the fog-period (from November to March), actually the dry season. In each village, ten Large Fog Collectors (LFC, each 40 m²) were installed through the funds of Water Foundation (Germany), technical assistance from FogQuest (Canada) and with full engagement of the local implementing partners (Water Resources Department, Zonal Administrations, the beneficiary communities, and Vision Eritrea).

1. Background

Eritrea is located in the horn of Africa and it has mostly arid and semi arid climate with about 70% of its land area classified as hot and arid receiving an average annual rainfall of less than 350 mm. This minimal annual rainfall compounded with recurrent drought that could not sustain a perennial river flow. As a result, many communities face shortage of potable water outside the main rainy season and rely on inadequate and unsustainable water resources for both human and animal consumption.

In the study area, eastern escarpment of the country, the conventional water supply structures from artificial reservoirs or ground water are not a feasible option due to nature of the topography (very steep and high relief). Hence, in these areas there is a need to explore readily available and viable natural water resource to alleviate the problem of water supply and to improve the livelihood situation of these rural communities.

2. Objectives

The aim of the study is to evaluate fog-water as a potential source of water in the eastern escarpment of Eritrea.

3. Methodology

Initially, the daily rate of fog-water collection has been measured using a Standard Fog Collectors (1 m²) and once the feasibility study proved that the rate of fog-water collection are sufficient an operational pilot project with LFC has been implemented and evaluated.



4. Results and discussions

Technical: the fog-water collected per unit area is adequate to sustain a water supply system. The assessment has been made in Arborobue (7.6 L day⁻¹ m⁻²), Seidici (4.4 L day⁻¹ m⁻²), Nefasit (3.3 L day⁻¹ m⁻²) and Embatkala (1.9 L day⁻¹ m⁻²).

Equally, the quality of fog-water harvested is clean and safe for drinking purposes.

Economical: The installation and operation costs of the fog collection technology is low as compared to conventional water supply systems since the technology is simple and delivers water through gravitational force without a need of electrical power.

Items	Cost (USD)
Total cost for full fog-water supply system (10 LFC, 15m ³ reservoir and 1.2 km long PVC pipeline system)	31,959
Total beneficiaries in Arborobue village	827
Cost per beneficiary	39
Operational months	Nov to Mar

Social: the beneficiary communities especially Arborobue has accepted the technology as their viable and best option to provide adequate and safe water and thus showed high motivation and a strong sense of ownership to sustainably operate the water supply system.



5. Conclusions and recommendations

The pilot project demonstrated that fog could be utilized as a sole water source like for schools if the fog-water is stored in adequate reservoirs and managed efficiently.

However, the technology has some limitations that it needs regular maintenance and supervision by trained members of the beneficiary community. These include tightening loose cables, mending torn mesh and in worst cases erecting collapsed meshes.

Research of Morfometric Characteristic for Sustainable Water Management in the Kugart River Basin

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The water capacity of the rivers of Kyrgyzstan is an important component of national economy. Actions for water savings for an irrigation and small hydro energy are required. Therefore studying of morphology of river basins – an important task for investigation of river bed evolution; also for development of decisions on protection of territories against destructive force of rough and mud streams.

Study area: Work is executed in framework of the SCOPES project. The Kugart River basin is study area; it located in Suzak region of Zhalalabat area of the Kyrgyz Republic. Feature of the Kugart River is spring flood almost each year in the lower part of the river basin. It leads to flooding of settlements and irrigated areas. Furthermore there is lack of water in summer, in low-water period.



Fig. 1. Flood time on the Kugart River



Fig. 2. Low-water period on the Kugart River

Input data for research: Complexity and inaccessibility of mountain part of the catchment does not allow studying morphological structure of a relief visually and in details on maps, to identify location of small water stream. It is the reason to arise water cataclysms (rapid increase of water discharge and sediment transport). Therefore we choose DEM and satellite images for studying of relief morphology.

Conclusion: The conducted researches are theoretical base for studying river bed evolution also the water resources management and their rational use.

Results: On space image was calculated NDVI, which characterizes the degree of coverage of the vegetation of the earth's surface. Slope aspects and they steepness was defined by using DEM. In spite of considerable slopes, mountains ridges are covered by forest. The bared rocks are visible only on as patches.

Dissection density of hillsides and foothills are various. The fractional dissection of foothills is connected with young superficial rill and gully erosions, and also with a considerable surface runoff on slow-penetrating loess soil. Relief surface features of the basin show that terrain was formed basically by gully and rill erosions. Figure hydrosystem allows assuming the existence of a not very well expressed by the North-Eastern system fractures.

The quality of ravines and gullies per 1 sq.m were defined for the upper, middle and lower parts of the basin.

A comprehensive analysis of the mud ravines density, vegetation, slope aspects and they steepness allowed making the map of mudflow danger, the given 3 zones: the upper with weak export mudflow, average with the strong ejection of mudflow, and the lower zone of the sediment accumulation.

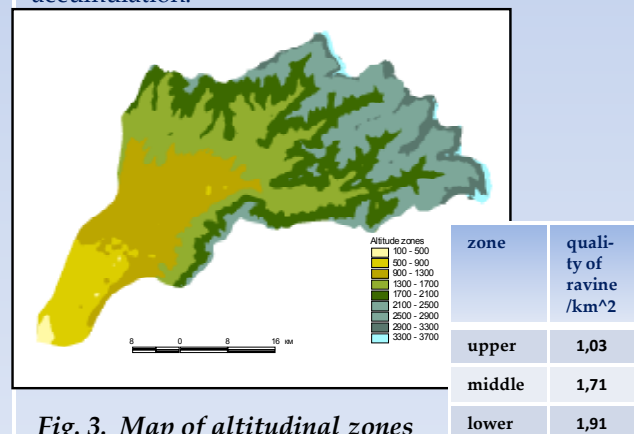


Fig. 3. Map of altitudinal zones of the Kugart River Basin

Landscape dynamics in Sagarmatha (Mount Everest) National Park, Nepal

Rodney Garrard, Centre for Development and Environment, SAS
 Start date of PhD study: 01.09.2009

Thanks to the unique selling position of having the highest mountain in the world, (Mount Everest 8,848m), Sagarmatha National Park (SNP) is an international tourism hub. With a resident population of approx. 6037, the region was visited by approx. 35,571 tourists in 2011. The research project is centrally concerned with the on-going landscape transformation of SNP and its Buffer Zone (BZ), and assessing the impacts of such change on selected environmental services. Through this research I intend to provide insight into the underlying drivers of land use and cover change and what this means for the sustainability of the region (Figure 2).



Figure 1. [left] Namche Bazar as seen by F. Müller in 1956 as part of the Arbeitsgemeinschaft für Vergleichende Hochgebirgsforschung (Association for Comparative Alpine research, Munich) and Österreichischer Alpenverein (Austrian Alpine Association, Innsbruck) geographical expedition to the region. [right] Namche Bazar in 2009. Today, Namche is a bustling tourist centre ~1300-1400 residents) and HQ for SNP/BZ authorities. (Archives of A. Byers; and R. Garrard 2009).

"It is critical to embed a stakeholder dialogue in such a research agenda, and thereby create a process of mutual learning and knowledge exchange."

Selected guidance questions

Spatially explicit (Q.1 & Q.2)

What are the current systems of land use in SNP/BZ and how have these systems evolved over time?

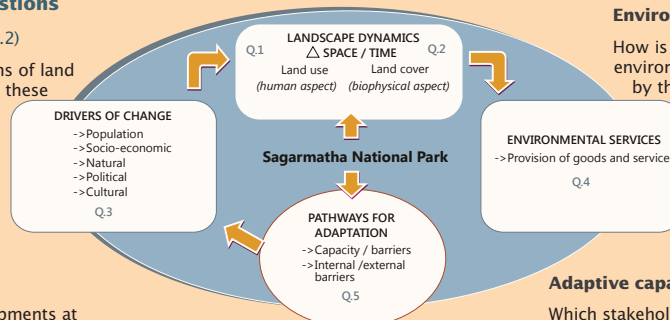


Figure 2. Relationships between the different elements in the proposed project.

Drivers of change (Q.3)

What are the critical developments at present, and can the effects of change over time be quantified?

Environmental services (Q.4)

How is the provision of selected environmental services affected by the changes in landscape dynamics?

Adaptive capacity (Q.5)

Which stakeholders (groups) would win or lose under different scenarios, and why?

Interpreting landscape change (Q1 & Q2)

We have found it difficult to interpret the general patterns of, and reasons for, increases in land cover for a variety of reasons. The sites and contexts of the vegetation increases vary, as do the reasons for them. Some are explicitly cultural; most, if not all, are related to human activity. More complex is dealing with the mismatch between the increases in land cover and local people's assertions that forest has decreased (Garrard et al. 2012b [in review]).

Drivers of change (Q3)

Nearly all the landscapes we observed showed increases in vegetation from 1956 to 2011. Some of the changes we observed led to our efforts to better understand the complexities of these changes, from understanding land cover change to understanding the part that symbolic landscapes may play in perception and culture. Some of the increases in vegetation that we observed can be linked to tourism and global conservation concepts. Others have shown how some of the land cover increases in the region can be complexly related to socio-economic processes (Garrard et al. 2012b [in review]; 2012 [in prep]).

Community perspectives to changes in environmental services (Q4)

Such perspectives can offer a direct route to better understand the complex interplay between mountain ecosystems, environmental services and the determinants of human well-being. This study uses a novel application of repeat photography as a diachronic photo-diary to examine local perceptions of change in relation to selected environmental services. Here we adopt a radical local view of environmental service change. Results show a broad consensus among local people regarding adverse changes to important environmental services, particularly protection against natural hazards such as landslides and floods (Garrard et al. 2012a [in review]). Furthermore, local's perceive that most environmental services as having improved.

Adaptive capacity (Q5)

This year's field work will utilise the research findings and generate a portfolio of community-based adaptation strategies by evaluating vulnerability/risk and assess adaptive capacity elicited from the response of the communities. Our approach is grounded in the knowledge that people must be empowered to transform and secure their rights and livelihoods. We also recognize the critical role that local and national institutions, as well as public policies, play in shaping adaptive capacity.

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Garrard, R., Kohler, T., Wiesmann, U., Price, F. M., Byers, C. A., Sherpa, R. A. (in prep). Interpreting landscape dynamics in Sagarmatha (Mt Everest) National Park: Land use and cover change and surrounding social context.

Tapping Local resources for HIV prevention among the Borana pastoral community

Mirgissa Kaba, SPH, Addis Ababa University; Marcel Tanner, STPH; Jakob Zinsstag, STPH; Damen Hailemariam, SPH, Addis Ababa University

HIV prevention intervention has contributed to declining HIV prevalence and incidence, has improved VCT, PMTCT and ART service uptake. Nevertheless, HIV infection continued to challenge sections of a population in defined geographical settings in Ethiopia. Among the Borana pastoral community persistence of the problem is mainly associated with the failure of actors to appreciate and mobilize local resources in prevention efforts

Background and rationale

HIV prevention interventions in Ethiopia were guided by the generic abstinence, faithfulness and condom use model. Whether such model works cross-culturally was not assessed. Besides attention was not given to available local resources which could have been mobilized for result. Consequently, HIV prevention intervention in Borana did not result in expected result in reducing prevalence, improving uptake of VCT and PMTCT.

Objectives and guiding research questions

The study was carried out to determine if the community believes there are local resources that if mobilized could help to improve HIV prevention interventions in Borana. Furthermore, the study aims to generate evidences if such local resources are amenable for mobilization.

Methods of data collection and analysis

Data for this particular report was drawn from the larger PhD study carried out in the community during 2008-2009. Data on HIV awareness, sources of information, if there are local resources and approaches that should have been adapted were collected using In-depth interviews and FGDs with community member, local leaders and local health authorities. Data was categorized into themes and subthemes following objectives and interpreted. MAXQDA 10 qualitative data analysis software was employed in the process.

Key findings

Awareness about HIV and AIDS in Borana was precarious where sexual practice and sharing skin piercing objects were considered as major modes of HIV prevention. Abstinence and faithfulness were the major modes of prevention. While these were heard, girls remain to be chaste to marriage and extramarital practice is tolerable and widely practiced in Borana by both men and women.



Public gatherings organized by community health workers, school teachers and students, and visiting relatives from urban settings are sources of information. Local health department share information through posters, billboards and leaflets developed at central level without adaptation to local context. Credibility of such information was doubted since these are not coming from the Gada leaders (respected local leaders who are powerful in the community)

Gada leaders and their messengers (Makkala) were recognized as source of information in Borana tradition and this is still recognized as an important channel to disseminate important information.



Local assembly (*Gumii Gaayo*) which takes place every four year is a forum to discuss and decide on critical issues of concern and where regulations are made and publicized. Such forum has never been considered for neither information sharing nor to make critical rules on how to prevent HIV infection.

Conclusions

Comprehensive response to HIV prevention is expected to adapt to local context with an engagement of respected Gada leaders

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Designing institutions regulating pasture use in Kyrgyzstan

Ulan Kasymov, Humboldt University of Berlin, Central Asia
 Start date of PhD study: 01.04.2010

The design of formal institutions shapes transformation processes in pasture management in Kyrgyzstan. While informal institutions are determined by bargaining over pasture access and use among herders and livestock owners, the new pasture legislation affects power asymmetries and may change distributional consequences.

After the breakup of the Soviet Union, Kyrgyzstan has been faced with a challenging transition from a state-managed to a market economy. Rapid reforms created a temporary institutional vacuum which stimulated a process of refilling by informal and newly created, decentralized formal institutions. New institutions and governance structures in pasture management are being created in a top down process. They are lacking in competences and experience and are facing difficulties adapting to existing setups. The gap between formal rules and rules in use may decrease the impact of pasture management reform.

The key objective of this study is to critically assess and analyze institutions in pasture management at a local level in Kyrgyzstan. The project analyses the institutional context in the process of transformation, adapting to new legislation and interaction between rules in use and formal institutions. The most important research question is how the bargaining process and emerging institutions (rules in use) are shaped by change of formal institutions.

Specific methodological emphasis is on the combination of case study and laboratory/field experiments to study the behavior and outcomes in asymmetric common pool resource dilemmas. The distributional theory of institutional change is applied by explaining the rule making process.

Preliminary results suggest that the institutional change has a redistributive character and that new formal institutions are favoring small herders/livestock owners and contributing to livestock mobility.



Figure 1. Herders family at the summer pasture Archaluu-Suu (photo by the author).



Figure 2. Planning of pasture use by the Pasture Committee in Jergetal community (CAMP Alatoo archive).

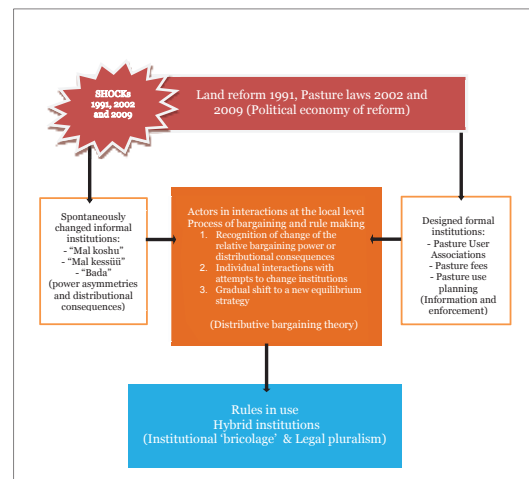


Figure 3. Analytical framework (based on Knight 1992).

Analytical water governance framework (based on example of irrigation system in Khorezm, Uzbekistan)

Anisiya Kudryavtseva

Department of Political and Cultural Change, Centre for Development Research (ZEF), University of Bonn, Germany

Introduction

Objective

To enable understanding of water governance arrangements within Shovot-Kulovot irrigation system (Khorezm, Uzbekistan) through analysis of their constitutive components.

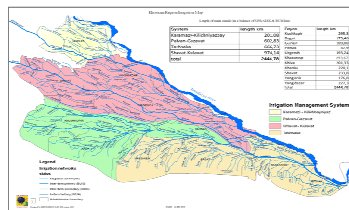
Background

Shovot-Kulovot Irrigation System is dense irrigation system, comprising of many kilometers of primary canals, secondary canals and tertiary canals (see figure 1: depicted in pink color).

Basic characteristics

- Irrigation canal networks: 8
- Irrigation area: 105 thousands of hectares
- Average withdrawals for vegetation period: 571.6 billions of cubic meters
- Water Consumers Associations: 43

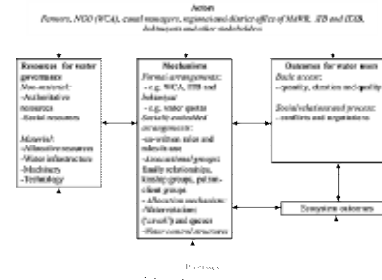
Figure 1. Irrigation system of Khorezm, Uzbekistan



Source: GIS lab of ZEF/UNESCO Khorezm Project, 2007

Shovot-Kulovot Irrigation System – Web of water governance I

Figure 2: Water Governance in Shovot-Kulovot irrigation system (Author's compilation, based on the Franks and Cleaver, 2007)

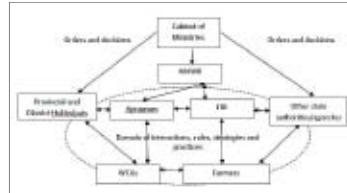


To understand better range of resources and mechanisms, Franks and Cleaver (2007) suggested to investigate factual decision-making processes in water management. Therefore, my study addresses de-jure and de-facto distribution and allocation, in terms of who are the actors, how they make decisions negotiate, what resources are used and which mechanisms come into place here. The Figure 2 illustrates the interplay among the components of the water governance framework as can be seen in sub-basin Shovot-Kulovot, Khorezm region, Uzbekistan.

The actors, resources, mechanisms and outcomes interplay as Franks and Cleaver (2007) stated; on the one hand, actors use the resources to construct arrangements (mechanisms that organize access to water), in order to gain anticipated outcomes; on the other hand, the processes, e.g. decision-making and negotiation, are being conducted for resources to be transformed with the means of mechanisms of access into outcomes.

Shovot-Kulovot Irrigation System – Web of water governance II

Figure 3 - The organizations, water users and significant domain of rules and interactions (Authors' design).



Actors

Resources

Mechanisms

Processes

Resources used by water users	Resources used by suppliers
<ul style="list-style-type: none"> ➢ Farmers and WCA (Water Consumers Association) 	<ul style="list-style-type: none"> ➢ ITB (Authority of Irrigation System)
Allocative: technology (e.g. pumps); Authoritative: information, social identity, social relations, water rights.	Allocative: technology (water structures, pumps); Authoritative: power and authority, legal rights.

Formal arrangements:
- e.g. WCA, ITB and *hokimiyat*
- e.g. water quotas

Socially embedded arrangements:
-un-written rules and rules-in-use

Associational groups:
family relationships, kinship groups, patron-client groups

Allocation mechanism:
-Water rotations ('asvak') and queues
-Water control structures

- Decision-making
- Negotiations
- Actions

Conclusions

Actors

❖ As the scheme suggests, the irrigation system in question is an arena where many actors come together, mainly pursuing own interests. For example, local government (*hokimiyat*) pursued its interest of fulfilling state-quota plan on cotton crop production.

Resources

❖ The resources used can be distinguished between those employed by water users and water suppliers. Both the categories of actors used, for example, technology as an allocative resource. However, we see here that authoritative resources employed by both categories of actors differ. Thus, supplier uses authority and power, whereas water users rely more on their social relations and can justify access to water through water rights (allocation plan of water quotas).

Processes

❖ The conclusions with respect to processes are noticeable. Water management processes and practices are based on multi-tier decision-making. Therefore, the exclusion and inclusion into the process become focal point in analysis of decision-making. The canal managers, for example, were excluded from decision-making which took place in basin and sub-basin levels, and were confined to boundaries of respective districts. The decisions were frequently taken at the meetings organized in district and regional offices of MAWR (Ministry of Agriculture and Water Resources) and *hokimiyats* (local government) where agenda was put.

Outcomes for suppliers (water managers)

❖ Because of the divergent of interests of many actors here, water managers are not able to deliver water evenly and timely to water users.

❖ The pursuit of written rules within the formalized arrangements has led to coping strategies like carrying out hidden water use accounting.

❖ These arrangements make working in the water sector unattractive for young specialists. It creates high pressure in particular on canal staff.

Outcomes for water users

❖ Such arrangements create lots of hindrance for water users, resulting in inflexibility in choosing crop to grow, as state-quota systems are enforced by them as well.

❖ It provides less opportunities to participate in decision-making processes

Environmental outcomes

❖ Secondary soil salinization, decreased soil productivity and high water losses

Reference
Franks, T. and Cleaver, F. (2007). Water governance and poverty: A framework for analysis. *Progress in Development Studies* 7(4): 291-306.

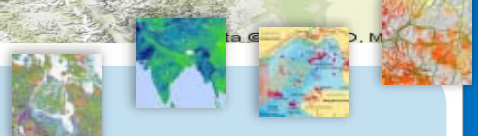
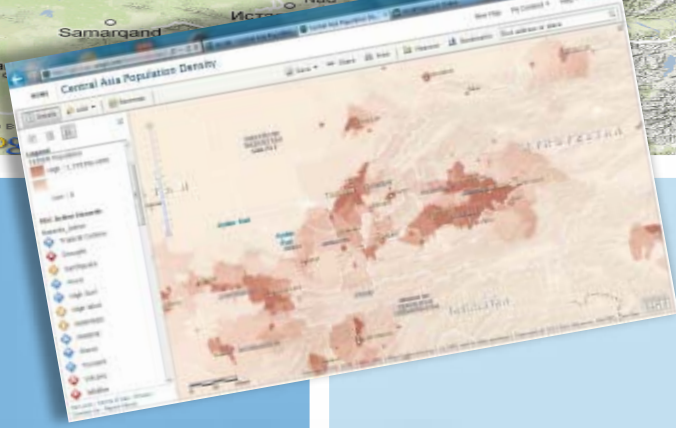
SUSTAINED DEVELOPMENT



Cloud GIS

A Collaboration Platform for Development Research and Implementation

Any Internet-connected device is serving as an access point for authors, managers and users of geospatial information. Data, software, maps and presentations are stored online. A services-oriented architecture enables collaboration and sharing across institutions.



Advantages and Strengths:

- Working with information (not only data)
- Sharing with everyone
- Online collaboration
- Choice of basemaps
- No local installation / license
- Access from any client



Issues:

- ❖ Internet connectivity
- ❖ Bandwidth requirements
- ❖ Collaborative mindset



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abstract

Research for Development invariably requires access to geospatial information (GIS – Geographic Information Systems), with spatial resolution depending on the scale of enquiry. Whether the focus is on a community, on regional or national levels, research will involve multiple stakeholders. These actors will contribute and work with multiple, disparate and often highly dynamic data sets, requiring flexible access to geospatial databases by all partners.

It is argued that cloud-based services, built on open standards (like OGC) and accessed through readily available clients offer a particularly suitable set of architectures for trans-national collaboration across various digital divides. The authors demonstrate that thresholds for basemap availability, access to software tools and collaborative environments are significantly lower in cloud-based environments, provided that Internet access with reasonable bandwidths is available.

Geospatial data, analytical processing and modeling are indispensable for monitoring tasks, the development and implementation of indicators and for spatial contextualization. Regardless of any particular emphasis on disparity and transformations, exploring the dynamics of change and change impacts, or the search for sustainable resource management; leveraging the power of spatially explicit and distributed technologies facilitates the dedication of more resources to the actual task at hand and less for "overhead" of making GIS available within an initiative.

Cloud-based GIS therefore has become increasingly important for trans-disciplinary and international research partnerships, and for capacity building as well as effective capacity use. This can be illustrated with a range of online examples of shared data sets and applications as well as collaborative workflows and community scenarios.



Developed at the Austria – Central Asia Centre for GIScience
Kyrgyz State University for Construction, Transport and Architecture

Fight against TB and AIDS: representations and equity in health interventions in West Africa

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Abstract: TB and AIDS are diseases with dramatic social consequences. Related to social and cultural representations and the low level of institutional and intergenerational communication, fighting against these diseases suggests new forms of sociability and inequity in the availability and access to DOTS and antiretroviral therapies. Understanding these factors allows the development of actions to prevent them more effectively and reduce inequalities in access and innovative strategies for effective care of patients.

Introduction: In West Africa, communicable diseases including tuberculosis and AIDS remain major public health problems. Despite the existence of simple and effectiveness strategies for prevention and treatment, the behaviours remain the same. Increasing poverty, rapid urbanization and the failure of health systems, appearing as vulnerability factors that affect individual's health and change their values. It appears to underlie this situation plus the externality preventive measures and gendered representations of local body and society. These performances, by the behavior they induce have a negative impact on all aspects of prevention, diagnosis, treatment and management of these diseases. This discussion reviews the pernicious effects of representations in trying to explain how they are obstacles to prevention and a more equitable access to treatment. In this context, studies conducted in West Africa (Cote d'Ivoire, Burkina Faso, Mauritania, Chad) have focused on representations of TB and AIDS tandem, the contextualization of discourses and practices of populations acrosses social and sexual relations confronted with AIDS and the social reconstruction and health governance taking account of urbanization and rapid social change.

Methodology: A framework was established to ensure complementarity between the subjects and disciplines used. The observation units have been carefully chosen in relation to each case in an approach that respects ethical principles. The triangulation of qualitative methods was admitted to understand the values, social norms and gender roles as interpreted by the target of the studies. Content analysis of narratives produced by the Keys informants were made to understand, in a comparative approach, the perception of TB modes transmission, sexual representations in AIDS context and the modes of affirmation and recomposition of the social disruption itself due to these diseases. Finally, micro-projects for communities as pilot projects integrating new insights were implemented with institutional stakeholders to ensure sustainability in the final stages.

Key findings

1. Representation, gender and reconstruction of social relations

AIDS and TB are meaningful to communities. While representations associated with tuberculosis are on the hereditary nature, those relating to HIV/AIDS lead stigma and social exclusion. These representations are preventing many people from getting the support they need because of rejection, fear of rejection by their partner, family or community. These representations prevent them from performing a screening test, to adopt preventive behavior or to respond appropriately in risk situations. They contribute to a reconstruction of social relations, the transformation of social status and new forms of sociability.

2. Communication and generation- and genderspecific relationships associated with TB and AIDS

Although communication is the essential link in the prevention of AIDS and TB in the doctor-patient dyad, it is impaired by the low level of biomedical knowledge of AIDS transmission and misperceptions, leading to the development of medical syncretism and local interpretations. Social activities, sexual practices subject to social changes, intergenerational negotiations and gender shape human interactions, produce socially constructed discourse and lead to new representations of sexuality as well as femininity and masculinity adapted to the experiences of different social groups of actors.



National prevention campaign in Ouagadougou, Burkina Faso (foto: Patricia Schwärzler)



Communication on TB in Tchad, (foto: Moustapha Taleb)

3. Equity effectiveness and governance

The medical management of patients is characterized by a highly unequal distribution of health facilities and an offers often non-standards compliant. It raises questions of good health governance. The use of social ties, despite free health care, remains a common alternative while the political environment, while offering institutional arrangements and a strong commitment does not always effectively ensure an equitable management and the goal of universal access.

Conclusion

In a public health approach, the results may give new impetus to health systems in West Africa. Programs such as health for mobile populations, STIs, family planning and reproductive health of young people are already concerned by these results.

Acknowledgment

The authors acknowledge support from the Swiss National Centre of Competence in Research (NCCR) North-South: Research Partnerships for Mitigating Syndromes of Global Change, co-funded by the Swiss National Science Foundation (SNSF), the Swiss Agency for Development and Cooperation (SDC) and participating institutions.

Quantitative Microbial Risk Assessment (QMRA): research status and future development

Hung Nguyen-Viet^{1,2,3}, Nguyen Hong Nhung¹, Nguyen Thi Bich Thao¹, Charles N Haas⁴

Quantitative Microbial Risk Assessment (QMRA) is much more developed and applied in developed countries. However, there is an increased need to assess the risk of pathogen exposure in developing countries due to unhygienic conditions and (re)emerging infectious diseases. We argue that promoting the development and application of QMRA in developing countries and identifying existing methodological gaps is needed.

INTRODUCTION

Since 1983, the use of QMRA has emerged from a theoretical construct as a method that has seen application around the world. Problem domains include water and sanitation, food safety, and risk from airborne infectious agents. The use of QMRA has increased significantly as a tool for assessing the risk to humans associated with pathogen exposure.

To explore the use of this method in the international scientific community and to discuss possible directions for the application and research of QMRA, we systematically searched peer-reviewed publications on QMRA.

METHOD

We searched peer-reviewed publications on QMRA from databases for the period from 1980 to December 2011.

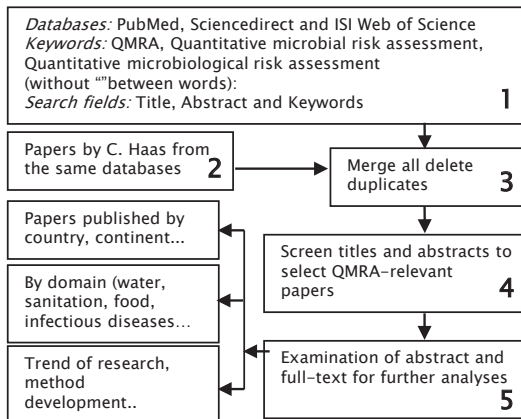


Figure 1: Search procedure

RESULTS

There were 463 hits that fit the established criteria. Among these, only 11 were review papers (2.66%) while the rest (403 papers, 97.34%) were original research papers

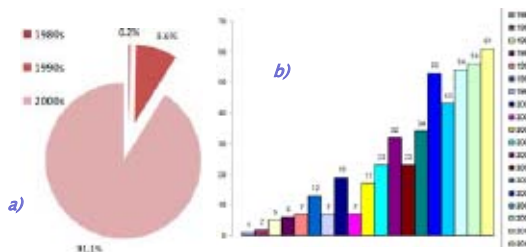


Figure 2: Distribution of the papers published through decades (a) and through year (b)

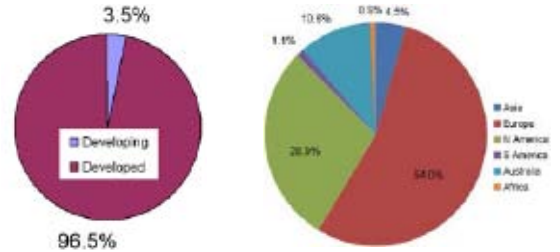


Figure 3. Regional distribution of papers by the first authors

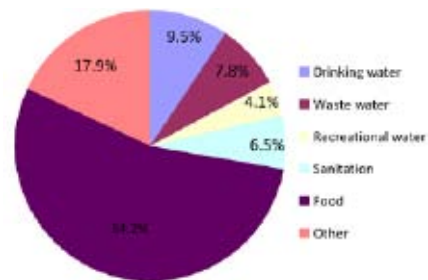


Figure 4. Distribution of the papers according to the fields

- QMRA papers published before 1990s focused only on food research. From the early 2000s, QMRA has been applied for research on water and sanitation, infectious diseases.

- The number of studies on dose-response assessment increased, whereas information on exposure assessment remained limited and relies mainly on assumption.

- Application of statistics and integration of parameters such as exposure time, age and immunity of the host into the dose-response model was observed. However, dose-response models need to be developed for other remaining pathogens, in particular new emerging infectious diseases and further studies on exposures are needed.

CONCLUSIONS & RECOMMENDATIONS

- There have been a growing number of peer-reviewed papers on QMRA over the past 4 decades. QMRA has been applied mainly in the domain of food and water.

- QMRA has been developed and extensively used in the developed world, in particular US, Europe and Australia. Application in developing countries is very limited.

- QMRA application in developing countries is improving thanks to the North-South collaboration, in particular to the introduction to QMRA in the WHO guidelines on wastewater and human excreta reuse in agriculture and aquaculture.

- There is a need to generate data on exposure assessment for QMRA in different areas and regions as well as develop dose-response studies integrating other parameters (immunity, time, age, environmental conditions...).

- The capacity of South and North-South research partnerships on QMRA need to be strengthened.

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PROTECTION OF THE ECOSYSTEMS AND FIGHT AGAINST POVERTY IN MADAGASCAR

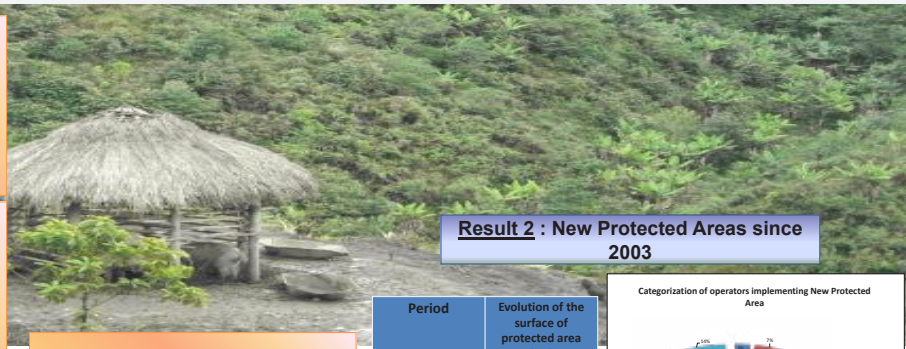
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Context

The Convention on Biological Diversity (CBD) had taken a goal to increase by 10 % the size of the world protected areas for 2010. Madagascar has aligned this way and according to the presidential commitment (Durban, 2003) → extension of the protected areas about three times their current size (1,7 million ha in 2003 in 6 million ha in 5 years).

Problematic

This extension of protected areas in Madagascar involves about one rural million people who are affected by the creation of these new protected areas. The extension of protected areas has been effective on the one hand and on the other hand one speaks to the effort on reducing rural poverty. A crucial question: « what solution for those people who live around these new protected area (NPA) »?



Result 2 : New Protected Areas since 2003

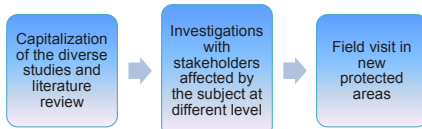
Period	Evolution of the surface of protected area (Ha)
Before Durban 2003	1'778'028
2005	945'288
2006	1'090'297
2007	554'771
2008	383'511
Total	5'751'895



Objective

To propose an approach which integrates the instrument "protected area" with the sustainable and intensified use of some agro-systems by local populations around these protected areas.

Materials and Methods



Result 3: from the visited protected area



Mikea National Park - Southwest of Madagascar (category II - IUCN)
 Size: about 370,000 ha
 Population affected by the creation of the protected area:
 - farmers and fishermen
 - main economic activities based on slash-and-burn cultivation of forest, hunting and gathering of secondary products of forestry, commercial fishing and subsistence fishing.
 - 8'517 households
 - Alternative micro-projects identified: rehabilitation of secondary road - water supply to the villages - staffing of advanced equipment to fishermen - training in vegetable farming with fertilizer and seed supply - Beekeeping Training - Training on the establishment of nurseries and reforestation.

Result 1 : Proposed areas for conservation sites (sept 2004)



Blue : Actual protected areas
 Red: Areas proposed for conservation sites
 Green: other areas apart from protected areas and conservation sites
 Source: SAPM

Discussions

Participation of the local population is considered essential and indispensable for sustainable conservation of protected areas. Indeed, micro-development projects realized around the protected area are in reality compensations in the losses due to its creation. But one objective of SAPM – Network of protected area in Madagascar – is "to maintain ecological services and sustainable use of natural resources for the reduction of poverty and sustainable development". However, we found that these micro-projects do not constitute really development activities and there is a lack of a systemic framework that integrates the two objectives. If this last aspect does not find a solution, the pressures on the protected area will be more and more important and the livelihoods of local populations will be increasingly precarious

Conclusion

The preservation of the ecosystems is certainly very important but must be harmonized with a rural development strategy that integrates the protection of the agro-systems. Protected area should overtake this strict conservation to go hand in hand with sustainable use of agro-systems around them; in these agro-systems identified, there are small units which can become sustainable systems and exploitable intensively for local population.



Perspective

Our research is ongoing and the continuation of the research will be the proposal and application of the Learning for sustainability approach as tool to combine the protection and rural development strategy.

A Systemic Biomass Management Analysis of Small-Scale Farmers in the Hill-Zone of Western Tajikistan

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Plant residues are commonly used as feed and manure as fuel for cooking and heating in rural areas in the hill-zone of Western Tajikistan. Because residues and manure are scarce, not much remains to be used as fertilizer to secure soil health. However, this would be of importance to secure rural livelihood, since artificial fertilizer is expensive and not enough is available.

Mixed Farming and Soil Health

Most farming households in the hill-zone of Western Tajikistan can be considered as subsistence-oriented, mixed farming systems. Most farm-households grow annual food crops and keep animals. Wheat is the most important crop, since bread is consumed every day. Some farmers cultivate orchards or vineyards outside their house garden. The grazing areas are commonly organized and cows, sheep and goats graze on the field plots after harvest. Straw, hay and perennial forage crops are used to feed the animals in winter. This diversification in mixed farming can be a strategy to minimize risks. Furthermore, an integration of crop production and animal keeping can be used to recycle resources efficiently. So, products or by-products of one component serve as a resource for the other. The result is a cyclical combination of natural resources where plant residues and livestock are main pillars. Plant residues are a source of feed. Furthermore, manure and plant residues are important sources of soil organic matter and nutrients. Consequently, an application of these organic compounds to soil will support soil health and fertility (Fig. 1).

Methodological Approach

Mathematical material flow analysis (MMFA) was used to describe and quantify biomass storages and flows with a model. This approach focuses on improving system understanding. Based on quantitatively oriented interviews, a rough estimation of the household's

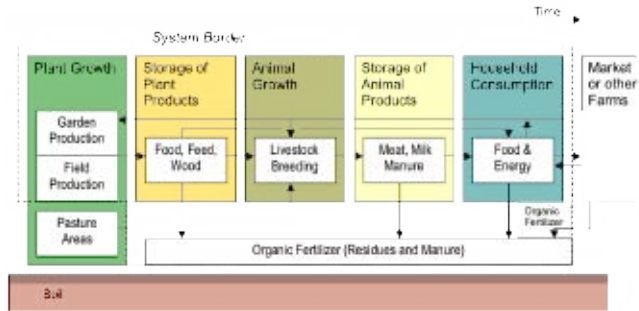


Figure 1: biomass use in farming households in the hill-zone of Western Tajikistan. Black arrows represent flows and white boxes storages of biomass.

Table 1: exemplary field plots of farming households in rural Tajikistan (often complemented with a kitchen garden)

Household Categories	Small	Medium	Large
Land Managed [ha]	0.6	2.75	7
Wheat	0.20	0.50	2.00
Chickpeas or Other Cereals	-	0.25	1.00
Potatoes	0.05	0.05	0.50
Other Tuber & Roots, Legumes and Vegetables	0.05	0.10	1.15
Alfa Alfa/Esparzet	-	0.35	0.35
Orchard/Vineyard with Hay Making	-	0.75	1.00
Hay Making without Trees/Vines	0.30	0.75	1.00
Animals Kept [No.]	1	9	14
Cows	1	4	4
Sheep/Goats	-	5	10

agricultural production and consumption amounts was conducted. Accordingly, characteristics of exemplary farming households were defined (Tab.1), depending on the size of the land used for farming. Based on this model approach, different options for increasing the biomass flow to the soil, such as energy efficiency and land use types of higher productivity can be evaluated and compared.

Results: Current Food, Feed and Energy Situation

In the following section, first results are discussed. The quantification of biomass flows and storages indicates that wheat demands can not be met in small and medium households. Large households are able to sell grain, since they cultivate larger wheat plots (Fig. 2). To improve this situation, either higher crop yields or larger fields are important.

Furthermore, plant residues can be essential to feed the animals throughout the winter (Fig. 2), until grazing on daily pasture starts in March/April. Large households again produce a surplus of straw, which they can sell.

The interviews indicated that fuel supply with wood and manure from their own farms is hardly enough. This is part of further study.

Consequently, at the moment recycling of organic materials on-farm is hardly feasible. As a result, soil health and rural livelihoods are endangered.

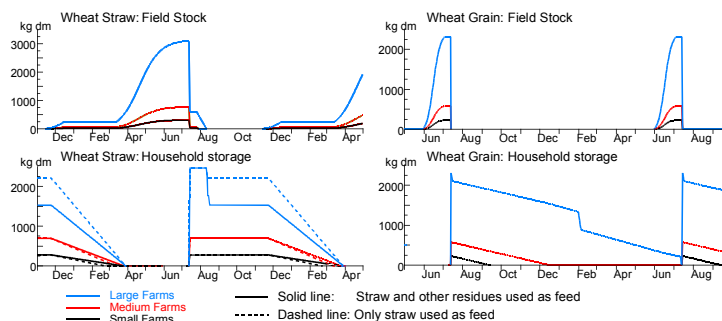


Figure 2: MMFA modelling results in kg dry matter per household showing growth (top figures) and storage usage (bottom figures) for straw and grain of winter wheat

Urban sanitation: Entrepreneurships among the urban poor for waste recycling in Patancheru, AP, India

Vincent A. Schmitt¹, Priyanie Amerasinghe², Dionys Forster³, Bharadwaja Vadloori², Urs Niggli³

Urban sanitation is a growing problem in rapidly growing cities. This study was aimed at establishing small-scale businesses, that prepare compost from the organic fraction of city waste.



Photo 1: Municipal waste is usually collected along the road site



Photo 2: Organic waste is collected for composting



Photo 3: Compost pile is turned for aeration



Photo 4: A compost pile left for maturing in Patancheru

Introduction

Urban sanitation is a growing problem in cities that are developing fast. This is reflected in the Greater Hyderabad Municipal Corporation (GHMC) area, where an annual urbanization rate of 4.7 % has been reported. The waste generation is estimated at 2,3 mt per day. Biodegradables (52 %) are mixed with non-degradables, and decomposing piles of waste is a common site. This has resulted in odour problems and reduced environmental sanitation, especially, where the waste has not been collected in time.

Objective

The project aimed at developing entrepreneurships, among the urban poor, and facilitated small-scale business ideas that recycle the organic fraction of the municipal waste, in an attempt to reduce environmental pollution and enhance livelihood incomes as well as revitalise peri-urban soils.

Material and Methods

Between August 2011 and January 2012, a public-private partnership was developed between the municipality of Patancheru and a women's self-help group. Small-scale composting units were developed after a participatory diagnosis of institutions and stakeholders, selection of promoters and a survey of marketing strategies. An agronomic trial illustrated the benefits of using organic compost in revitalising the soils, using selected crops.



Photo 5: The promoter group with their compost product. The method of compost production is in the back ground.

Preliminary Results

- The urban sanitation and health, and community development cells of GHMC played a key role in the identification of suitable beneficiaries and site selection.
- The promoter group comprised six women and were able to register as a welfare-society. They can now avail themselves of government subsidies.
- As part of the partnership agreement the municipality provided the space, water and transport for the composting plant, which was successfully linked into the daily routine so as to avoid an extra cost to the administration.
- The organic fraction of waste, 14'286 kg per day in Patancheru, was easily obtained from vegetable markets and city waste and recycled to approximately 4 tons of compost containing 43 kg N, 13 kg P, and 38 kg K. However, C-rich material (sugar can trash, wood chops) was deficient and had to be collected from elsewhere to prepare compost product that was of high quality.
- Training materials and awareness campaigns had to be an integral part of the entrepreneurship development. Sustainability requires constant contact and motivation within the first year.

Conclusion

The recycling of organic waste is feasible, if it can be organised in a participatory manner. Yet, the final product has to be popularised, as the beneficial effects are not well known. Coupled with demonstration trials and political campaigns, such entrepreneurships can thrive, and be an effective proposition for reducing pollution within cities.

This poster presents part of a research project on "Fertile Soils for Peri-Urban Agriculture in Hyderabad" funded by Lonza Ltd., Switzerland

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Application of PFA-QMRA tool for preventive environmental sanitation: Case study in Klong Luang

Nawatch Surinkul, Asian Institute of Technology, JACS-SEA
 Start date of PhD study: 15.08.2004

Rapid urbanization from agricultural communities to urban communities causes inadequate basic facilities including water and sanitation resulting in deterioration of water quality and increasing of human health risks on microbial contamination.

Klong Luang municipality is an example of peri-urban area in Thailand, has 18 villages with a total area of 43 km² with approximately 60,000 population. Similar to the most municipals which rapidly changed from the agricultural community (Fig.1) to mixed agricultural/urbanized community (Fig.2). Vegetable farmland and paddy filed are seen behind building along the roads. With an adequate sanitation comparing to the fast growing of municipal, wastewater is partially drained to sewer or drainage system and discharged into canals. Many pathogens are then released to environments and can cause the health problems to people who have contacted to contaminated sources in their related activities.



Fig.1 Previous agricultural community Fig.2 Agricultural/urbanized community

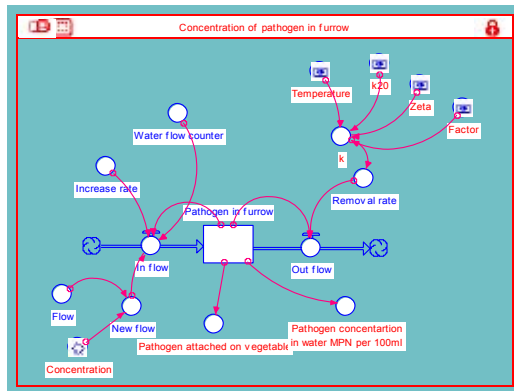


Fig.3 Example of PFA model for pathogen concentration

This paper applied Pathogen Flow Analysis (PFA) and Quantitative Microbial Risk Assessment (QMRA) for the preventive environmental health and sanitation planning. Concentrations of *E. coli* were firstly observed in environmental resources and waste flows. They were subsequently used to predict the concentrations at exposure activities by the PFA model (developed in STELLA) as shown in Fig.3. QMRA model thereafter used results from PFA together with exposure dose (amount) and dose- response model of *E. coli* to estimate health risk as shown in Fig.4.

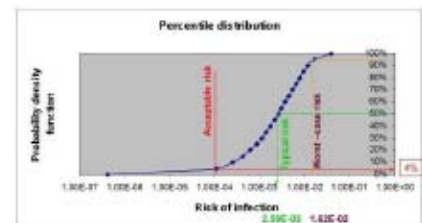


Fig.4 Example of QMRA model for risk estimation

Observed concentrations of *E. coli* in this area were found in the ranges of 3.0E+02 to 1.6E+05, 2.2E+04 to 1.9E+08, and 1.1E+06 to 3.5E+07 MPN/100 mL from canal water, wastewater and faecal sludge.

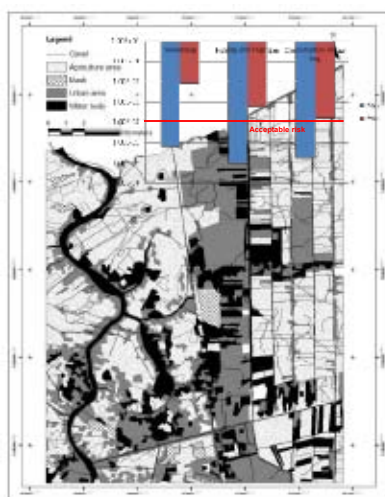


Fig.5 Risk results of activities related to land use

Based on the observed concentrations of *E. coli*, yearly risks of activities, swimming in canal, fishing and irrigation of canal water in farmland and consumption of raw vegetable (Lettuce) (Fig.5) were in ranges of 5.99E-06 to 7.96E-03, 8.99E-07 to 5.83E-04, and 1.7E-06 to 1.5E-04, respectively. The maximum risk of all activities are higher than the acceptable risk at 1.0E-04. Therefore, interventions to reduce risks can be performed by an effective onsite sanitation to prevent the spreading of pathogen from household to environment, and by personal hygiene. With the extrapolation of risk models, for example, 1,000 times reduction at exposures could achieve 1,000 folds of risk reduction results.

This study was conducted within the joint research by the National Centre of Competence in Research (NCCR) North-South program and Environmental Engineering and Management, School of Environment, Resources and Development, Asian Institute of Technology.

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Irrigation of lettuce with waste water contaminated by faecal sludge: case study of Avo'o river (Yaounde – Cameroon)

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Background

- The majority of faecal sludge in Yaounde is disposed of as uncontrolled discharge from Nomayos without treatment.
- This uncontrolled discharge is found beside the Avo'o river usually by farmers to irrigate market garden produce.
- This situation can cause the real risk of health.

Material and methods

Site description

This site has a surface area of around 300 m² and received approximately 755 m³ of untreated faecal sludge per week. The Avo'o river is situated upstream of this site.



Microbiological and parasitological analysis

a) Material

- samples of faecal sludge;
- water samples from the Avo'o river;
- Lettuce (*Lactuca sativa*)

b) Parameters and methods

- Microbiological parameters: faecal coliforms (FC) faecal streptococci (FS) (Rodier, 2005)
- Parasitological parameters: helminths eggs (Bailenger modified by WHO)
- Growth parameters: Three sites of uncontrolled discharge of faecal sludge have been identified on the peripheral zone. The parameters which have been considered were:
 - Crop size, measured using a double decametre;
 - number of the fresh leaves, by counting;
 - length of leaves, measured with a graduated ruler.

Data analysis

The data was analysed using Excel Windows 2007. And variance analysis (ANOVA) was realized by SPSS. Windows version 11.0.

Results

Microbiological analysis

Table: mean of FC and FS of faecal sludge, water of Avo'o river and lettuce n = 33 of each sample

Samples	FC	FS
Faecal sludge (UFC/100 ml)	22,86 × 10 ⁵ ± 25,47 × 10	10,68 × 10 ⁵
Avo'o river (UFC /100 ml)	3060 ± 2114	1130 ± 917
Lettuce (UFC/100g)	3888 ± 1038	1448 ± 450

Parasitological analysis

Table: mean number of helminth eggs in different samples n= 33 of each sample

Samples	Helminth eggs
Faecal sludge	3601 ± 845 eggs /l
Water of avo'o river	285 ± 145 eggs/ l
Lettuce	43 ± 8,30 eggs/ 100g

Growth parameters of lettuce

The analysis of variance (ANOVA) and the Student-Newman-Keuls test for growth parameters of lettuce show that there is significant difference between sites, size, number of fresh leaves and length of leaves (p < 0,001).

Table: mean of any growth parameters of lettuce

Sites Size (cm)	number of fresh leaves	length of leaves (cm)
S1 20,40 ± 17,70 abc	21,20 ± 19,40 abc	13,8 ± 6,50 abc
S2 25,10 ± 17,80 abc	28,60 ± 19,20 abc	16,90 ± 7,03 abc
S3 30,10 ± 19,10 abc	27,50 ± 18,10 abc	19,90 ± 8,20 abc

Conclusion

Despite the noticeable growth of *Lactuca sativa* irrigated with Avo'o river, high concentration of faecal coliforms (3888 UFC/100ml), faecal streptococci (1448 UFC/100ml) and parasites realised on their leaves (43 eggs/100 g) highlight the necessity of a better management of faecal sludge in this city.

Acknowledgements

COPEs A.O.C and IRCD (Canada)

Measuring awareness and perceptions: using Protection Motivation Theory framework in Vietnam

Tu Vu Van¹, Pham Duc Phuc¹, Nguyen Thanh Huong¹, Hung Nguyen - Viet^{1,2}, Andrea Tamas², Christian Zurbrugg²

We developed a questionnaire of Protection Motivation Theory framework for measuring the perceptions and awareness of farmers and the practical aspects of wastewater reuse. The developed questionnaire had 34 questions on eight different aspects; it ensured the structural and logical values. The results showed that potentially safe handling of wastewater reuse through raising farmers' awareness about the health risks associated with wastewater reuse and improving their ability to cope with these risks.

Wastewater reuse and health risk in Vietnam

Reusing wastewater for irrigation and in aquaculture has a long tradition in Vietnam. Hanam province is in northern Vietnam. The province is affected by reusing wastewater from the polluted Nhue and Day rivers (Picture 1). Particularly, in Nhat Tan and Hoang Tay, two communities situated in the Hanam province, the diarrhoeal rate is 1.5-2 times higher than in other communities of Hanam province.

We believe that the negative health impacts on farmers can be partly attributed to their lacking awareness about the health risks associated with wastewater reuse and their poor hygiene behaviour.



Picture 1. The gate of a ditch gets water from Nhue river for irrigation in agriculture.

Protection Motivation Theory (PMT)

PMT was applied to develop a questionnaire to assess perceptions of fear of disease, self-efficacy, response-efficacy, severity, vulnerability, as well as aspects of motivation, action (hygiene practice and hygiene practice in relation to wastewater use) in order to provide the basics for suggesting improvement interventions of safe reuse practice (Fig.1).

Method

First, we identified farmers awareness and practices through in-depth interviews with 30 farmers, group discussions and observations in the Nhat Tan and Hoang Tay communes to formulate the questionnaire centred on PMT.

Next, the questionnaire-based survey was conducted with 335 farmers, followed by a second round of interviews with 64 of these same people to verify reliability of the questions.

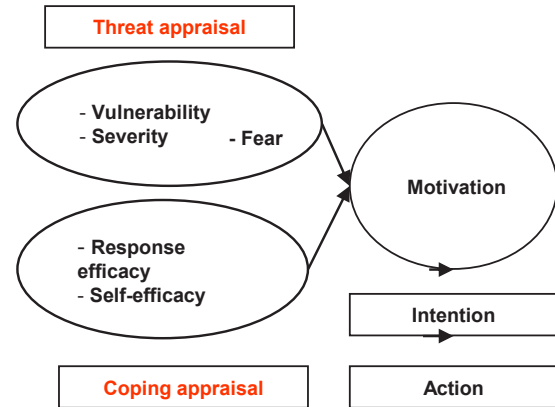


Figure 1. The diagram of PMT is adapted from Roger, 1983

Results and conclusions

Results showed there was a lack knowledge about the health risks related to wastewater reuse, unsafe reuse of wastewater and incorrect practices of using the protective measures to prevent diseases.

The developed questionnaire was validated to ensure the structural and logical values. The questionnaire with 34 questions focused on eight different aspects, reliability index of these questions is all above 0.65 Cronbach's Alpha and correlations of PMT coefficient varied between 0.11 and 0.35 (P<0.05). These correlations show that motivational aspects can be improved by increasing fear of disease and perceived self-efficacy, response-efficacy and threat severity. However, the data reveals that the relation between motivation and practice of improved hygiene was rather weak (Fig.2).

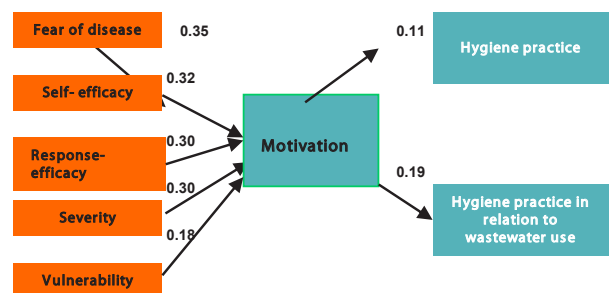


Figure 2. Correlation between awareness, motivation and hygiene practice.

1. Hanoi School of Public Health, Vietnam
2. Eawag/Sandec, Switzerland

The authors acknowledge the support received from the **Swiss National Centre of Competence in Research (NCCR) North-South: Research Partnership for Mitigating Syndromes of Global Change**, co-funded by the Swiss National Science Foundation (SNF), the **Swiss Agency for Development and Cooperation (SDC)** and **Eawag's Partnership Programme (EPP)**.

Effect of Toposequence and Terraces on Selected Soil Attributes and Crop Performance at Anjeni, Central Highlands of Ethiopia

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1. Abstract

In the Northern Highlands of Ethiopia, depletion of soil nutrient due to soil erosion has been a critical problem limiting agricultural production. To overcome this problem, the government has mobilized communities and resources for the construction of physical soil conservation structures in areas with steep slopes and undulating terrains. This study was conducted to assess the effects of toposequence and soil terraces constructed in 1985 on physico-chemical properties of soil and crops yields. Soil samples were collected from deposition and loss zones between soil bunds at a depth of 30cm. The effect of toposequence variation was assessed at five slope positions (toe slope, foot slope, back slope, shoulder slope and crest). Yield of wheat and maize were taken from deposition, middle and loss zone of terraces. Results of the study showed that higher mean value of organic carbon, and total nitrogen were obtained at deposition zone than loss zone. Toe slope position followed by crest slope position showed higher mean value of the soil chemical properties while smaller values were recorded at shoulder slope position. Mean value of yield for the testing crops were higher at the deposition zone of the terraces while the lowest at the loss zone. In general soil conservation measures landscapes reduced soil erosion, improved soil physical and chemical properties and increased crop yield.

2. Introduction

Depletion of natural resources is one of the major challenges in northwestern Ethiopia. The rate of soil degradation and its consequences in the developing world including Ethiopia is tremendously high. Ethiopia loses about 1.3 billion tons of soil every year. Poor land use managements including lack of appropriate soil conservation measures have played a major role in causing land degradation in the country. As part of highlands of Ethiopia, Anjeni watershed has undulating terrain which increase rate of soil loss. This study was part of the continued effort that started in 1980s for generating information at Anjeni on the role of soil conservation measures to mitigate soil erosion and maintaining organic matter and nutrients. Therefore, the main objectives of this study focuses on assessing the effects of toposequence variation and soil bund on selected soil physico-chemical properties and analyzing the contribution of soil conservation measures on crop yield.

3. Materials and Methods

- The research was conducted at Anjeni Watershed, in Ethiopia located at 10°40' N and 37°31' E with an altitude range of 2405-2507 meters above sea level.
- 20 soil samples were collected from upper, middle and lower parts of the terrace at 0-30cm depth to evaluate the effect of terraces (Fig 1).
- 35 soil samples from seven transects and five slope positions (toe, foot, back, shoulder and crest slope) were taken to evaluate the effect of toposequence (Fig 2)

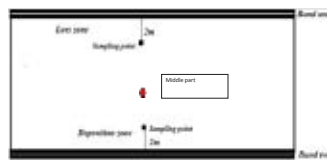


Fig.1 soil sampling between bunds

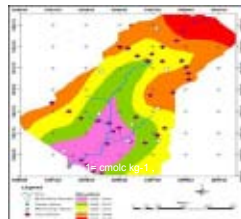


Fig. 2 Soil sampling points

- Yield data were collected at deposition, middle and loss zones of terraces. Maize and wheat were used as test crops. For each crop, 36 samples were taken from four different farm plots.
- The data from laboratory and field were analyzed using SAS 9.2 software (SAS, 2003). Mean comparison for the treatments was computed using Duncan's Multiple Range Test (DMRT).

4. Results

4.1 Effect of Terraces on Physico-Chemical Soil Properties

Table 1: Effect of terraces on selected soil chemical properties

Terrace zone	%OM	%TN	P- Olsen (PPM)	pH (H ₂ O)	Exchangeable base ¹				SEB ¹	CEC ¹	%PBS
					Na ⁺	K ⁺	Ca ²⁺	Mg ²⁺			
Deposition	3.02 ^a	0.20 ^a	7.88 ^a	5.8 ^a	0.09 ^a	1.43 ^a	8.69 ^a	2.05 ^a	12.29 ^a	21.12 ^a	58.31 ^a
Loss	1.77 ^b	0.14 ^b	6.73 ^b	5.9 ^a	0.17 ^b	1.28 ^b	8.19 ^b	2.08 ^a	11.68 ^a	20.80 ^a	56.24 ^a
CV (%)	31.1	24.5	24.5	5.4	14.8	23.0	10.5	21.7	7.9	6.4	6.2
SE _x	0.23	0.01	1.09	0.03	0.03	0.23	0.26	0.10	0.23	0.37	0.75

¹ = cmol_c kg⁻¹. SEB = Sum of Exchangeable Bases.

PBS = Percent Base Saturation

Values in a column followed by the same letter are not statistically different at p ≤ 0.05.

- For most of the soil parameters, the deposition zone showed higher values than the loss zone and statistically significant.

5. Conclusion and Recommendation

The study was designed to evaluate the long-term effects of soil and water conservation at Anjeni in the central Highlands of Ethiopia. The study watershed was fully covered by graded fanaya juu 27 years ago and well maintained. The areas between consecutive fanaya juu changed into bench terraces. Most soil attributes increased towards the lower parts of the terrace and the minimum value was recorded at the upper parts of the terraces. The yield of test crops was also higher at the lower parts of the terraces. The conservation structures used to maintain soil nutrients within the field, which otherwise could result in both onsite and offsite consequences. Improving and maintaining the soil organic carbon through soil conservation is an important part of findings of the research, as it is an indicator for the improvement of the soil quality.

The top-sequence based evaluation showed a statistically significant difference among the landscape positions. Higher values of soil attributes were found at the toe positions followed by the crest.

Acknowledgement

This paper is part of the research "Assessing the Long-term Impacts of Soil Terracing on Carbon Sequestration in the Highlands of Ethiopia", which is fully supported by Swiss National Centre of Competence in Research (NCCR) North South. We thank Adet Agricultural Research Center for its facilitation to use soil laboratory facilities. We thank farmers of Anjeni for their detailed information for the sampling fields and warm communications during our field study.

4.2. Effect of terraces on the Yield and yield components of wheat and maize

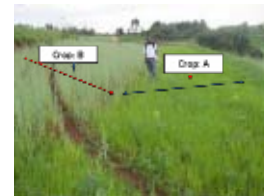


Fig. 3. Farmers' response for low and high soil fertility at the upper and lower parts of terraces respectively. Crop A is teff, one of the most stable food crops, which demands more nutrient than Crop B (Triticale) are planted at the lower and upper parts of the terraces (Photo: Tadele Amare, 2010).

- Farmers perceived the importance of positional effects of bunds

Table 2. Effect of terrace on Biomass(kg ha⁻¹), Grain yield(kg ha⁻¹) and plant height(meter) for wheat and maize

Terrace zone	Wheat			Maize		
	Grain Yield	Bio-mass	Height	Grain Yield	Bio-mass	Height
Deposition	1077.2 ^a	5208.3 ^a	0.64 ^a	2695.1 ^a	17125 ^a	2.38 ^a
Middle	759.9 ^b	4183.3 ^b	0.59 ^a	1685.9 ^b	10250 ^b	2.16 ^b
Loss	656.2 ^b	3491.7 ^c	0.52 ^b	1072.9 ^c	9292 ^b	2.08 ^b
CV (%)	22.5	12.80	10.56	36.1	21	7.48
SE _x	45.47	21.17	0.02	18.3	9.7	0.05

- Yield and yield components were higher at deposition zone than the other zones of the terraces

Table 3 The effect of toposequence on soil properties

Treatment	%OM	%TN	P- Olsen (ppm)	pH (H ₂ O)	Exchangeable base ¹				CEC ¹
					Na ⁺	K ⁺	Ca ²⁺	Mg ²⁺	
Crest	2.96 ^{ab}	0.17 ^{ab}	6.90 ^a	5.9 ^b	0.45 ^a	2.06 ^{ab}	8.16 ^a	2.16 ^{ab}	22.64 ^a
Shoulder	1.42 ^c	0.15 ^b	7.05 ^a	5.4 ^c	0.46 ^a	1.42 ^c	7.22 ^b	1.987 ^b	19.61 ^b
Back	1.99 ^{bc}	0.152 ^b	7.43 ^a	5.6 ^{bc}	0.40 ^b	1.85 ^{bc}	7.42 ^{ab}	2.17 ^{ab}	21.12 ^{ab}
Foot	2.09 ^{bc}	0.15 ^b	7.43 ^a	5.5 ^c	0.42 ^{ab}	2.08 ^{ab}	7.40 ^{ab}	2.026 ^{ab}	21.38 ^{ab}
Toe	3.78 ^a	0.24 ^a	8.36 ^a	6.2 ^a	0.40 ^b	2.39 ^a	8.04 ^{ab}	2.487 ^a	22.88 ^a
CV (%)	31.37	29.97	33.63	4.2	10.57	18.08	10.49	19.72	9.77
SE _x	0.13	0.01	0.67	0.07	0.02	0.09	0.15	0.08	0.44

¹ = cmol_c kg⁻¹

- For most of the soil attributes the highest value was observed at toe slope position followed by the crest position.

Mountain Research and Development

MRD: a journal that fosters sustainable mountain development

Mountain Research and Development (MRD) fosters sustainable development in mountains by:

- supporting peer-reviewed interdisciplinary, disciplinary, and transdisciplinary research on mountains,
- capitalizing on development experiences,
- promoting policy dialogue,
- and strengthening networks within the mountain community.

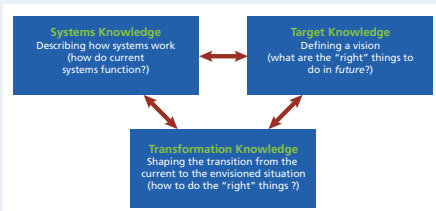
MRD brings together development and science

In the context of global change, mountain areas face demanding challenges when trying to achieve more sustainable and equitable development.

Sound scientific knowledge about human and natural **systems** is needed as a basis for decision-making.

Mountain societies also need to define the **targets** of their intended development.

Moreover, we need to know how these development targets can be reached, i.e. how to achieve the **transformation** towards greater sustainability.



MRD brings together these three different types of knowledge, and validates them through peer review. It thus also fosters knowledge exchange between the science and development communities.

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MRD's innovative peer review procedures take into account the value systems and rules of both the science and the development communities.

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- Papers present practice-oriented research aimed at coping with development challenges, and well-researched and validated development and policy experiences, exploring their transferability across mountain contexts.
- Papers offer innovative development approaches and recommendations for policymaking, decision-making, and practice, and are embedded in the relevant national or international debates.

MountainResearch – systems knowledge

- Papers offer original, innovative, and sound scientific research relevant to sustainable mountain development and an international academic audience.
- They may present new concepts and methodologies employing disciplinary, interdisciplinary, or transdisciplinary approaches.
- In addition, case studies on little-researched topics or mountain areas are welcome.

MountainNotes – target knowledge

- Papers present mountain research and mountain development agendas of global relevance.
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- MRD publishes 4 issues per year, either as Focus Issues or Open Issues.
- MRD is indexed in Thomson Reuters' Science Citation Index® and Journal Citation Reports®, as well as in numerous other indices.
- MRD has a 5-year impact factor of 0.833 and a 2-year impact factor of 0.476 (for 2010).



Featured green economy papers (MRD 32.2)

MountainDevelopment

Natalia Magnani (2012) shows that green economy technologies such as biogas plants may be a good idea, but their implementation is unlikely to work if these technologies are not acceptable to local communities.

→ The paper develops **transformation knowledge** to think about how to design successful participatory decision-making processes for a greener economy.

Magnani, Natalia. 2012. Exploring the local sustainability of a green economy in Alpine communities: A case study of a conflict over a biogas plant. *Mountain Research and Development* 32 (2): 109–116. <http://dx.doi.org/10.1659/MRD-JOURNAL-D-11-00105.1>



MountainResearch

Mattias Borg Rasmussen's (2012) participant observation study in a poor peasant community in the Peruvian Andes shows that green economy concerns will only be integrated in household strategies if they are meaningful to the local people and supported by effective local governance.

→ The paper presents **systems knowledge** that answers the questions of how and why local people adopt or do not adopt a new, greener economic innovation.

Rasmussen Mattias Borg. 2012. Greening the economy: Articulation and the problem of governance in the Andes. *Mountain Research and Development* 32 (2): 149–157. <http://dx.doi.org/10.1659/MRD-JOURNAL-D-11-00106.1>



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www.mrd-journal.org

MRD is published by the International Mountain Society (IMS); institutional members: SDG, ICIMOD, FAO, CONDESAN, CDE-University of Bern, MRI, UCA, ICAS, CMS

IMS International Mountain Society

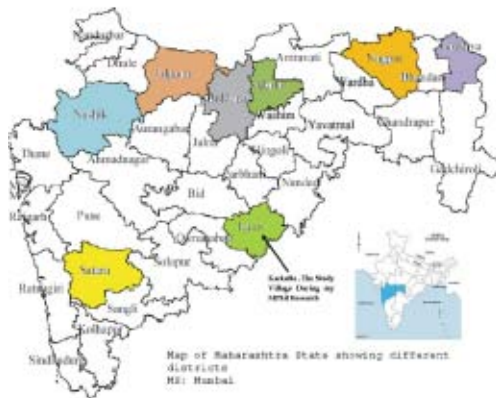
Agrarian Change, Dalits and Social Movements: A Study in Maharashtra, India

Awanish Kumar, Tata Institute of Social Sciences, Mumbai, India, JACS South Asia
Start date of PhD study: June 2010

This study aims to analyse the emergence and growth of Dalit social movements in rural Maharashtra (India) from the perspective of changes in agrarian relations. The underlying hypothesis of the study is that agrarian structure and labour processes at the village level influence the nature, politics and organization of various agrarian, peasant and Dalit movements.

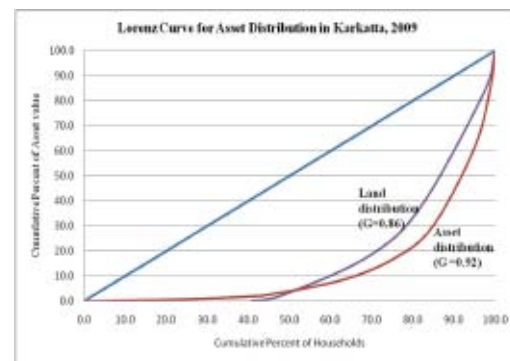
Methodology

- Restudy of selected villages, which have been studied earlier in the 1950s and 1960s, using structured questionnaires
- The method of "village study" - taking the village as the unit of analysis and studying it as a web of social and economic inter-relationships



Caste-specific Occupational Diversification

- "Better" forms of non-agricultural employment such as salaried and non-manual jobs limited to landed and upper caste households
- Intergenerational analysis and occupational/caste mobility indices show that Dalits are stuck in manual labour
- Re-emergence of unfree labour relations in the village society: the phenomenon of "naukri" among Dalits



The Study Village

- Primarily rainfed agriculture and diversification of cropping pattern and occupations
- Village population: politically dominant Marathas (47 per cent) and Dalits (36 per cent)

Dalit Identity: Land and Case

- Shaped by caste and everyday marginalisation regarding land (see high correlation between land and newer sources of incomes)
- But earlier struggles on land and wages failed
- Thus village remains site of inequality, also with respect to options of mobility (educational and urban)

High Landlessness in 2009

- Rise in proportion of small and medium land holdings, but top 5 per cent households owned 27 per cent of total reported land and bottom 50 per cent only 3 per cent
- About 75 per cent of Dalit households remained landless in 2008 – 2009
- Land transactions and tenancy were not able to ameliorate landlessness, especially Dalits

Dalit mobilisation today (first results)

- At village level: Yuva Bhim Sena (Young Bhim Army)
- Living memory of Ambedkar's visit to nearby town in 1954, earlier struggle for land
- Now, emphasis on separate political identity to counter Maratha domination

Agrarian crisis and mobilization: tracking a social movement in India

In central India, the situation for cotton farmer has taken a tremendous turn – often to the worse (=agrarian crisis). In this context, many different groups claim to speak on behalf of the farmers. The PhD project addresses this multitude of groups forming a fluid social movement around farmers suicides and analyses if and how this movement contests rural development.

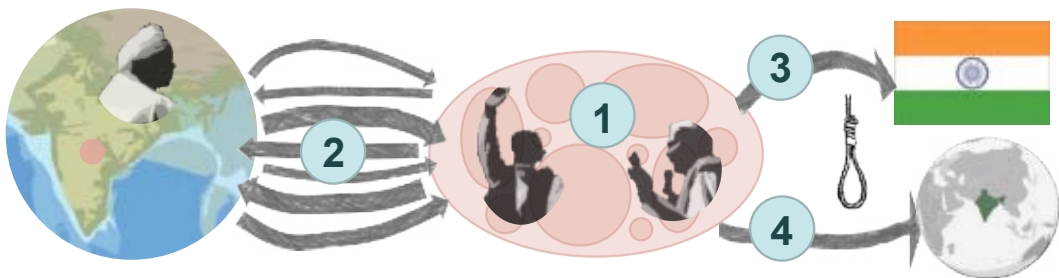
Agrarian crisis and movement

Situation in Eastern Maharashtra

- Case study: **Vidarbha** region
- **Indebtedness** of farmers (very unequal)
- High prevalence of „**farmer suicides**“

Movement

- **Many different** groups + individuals
- Mobilization around same topic
- Leaders often non-farmers



Guiding research questions and preliminary results

1 The movement: actors and ideas?

- Different ideologies, little cooperation
- BUT: very similar, though little visionary ideas about rural development (e.g. only about price)

3 Addressing the state?

- State as main enemy, but perceived as the only actor able to provide the solutions suggested by the movement
- Activists also brokers for farmers to access schemes of the state

2 Mobilizing the farmers?

- Through activists in villages
- Often used proposition is being „**not political**“ – even if demands are political

4 International networks?

- Outlook: Who uses farmer suicides (as a very emotional issue) in transnational agrarian movements and for which aim?



Meeting for higher cotton prices, Selu, 2011



Meeting to support an activist, Buldhana, 2011

Data has been collected through semi-structured interviews with activists and villagers. The two photos show two farmers' meetings during fieldwork (Silva Lieberherr, 2011).

Rural Development Visions and Practices of Culturally Rooted Social Movements in North-West Pakistan

Muhammad Luqman, University of Agriculture, Faisalabad, Pakistan, JACS SAS
Start date of PhD study: May 2011

Civil society organizations and social movements are expected to play a critical role in rural development. Some organizations claim to be deeply rooted in the traditional and religious culture and sometimes challenge the state in providing basic services. This research project systematically analyzes these social movements and organizations working in the Hazara division of Khyber Pakhtunkhwa (KP) province of Pakistan.

Background

In KP province of Pakistan different social movements and local organizations claim that they are in better position compared to the state to serve marginalized communities. In this regard the present research study was designed to critically analyze the claims, visions and actual practices regarding the notion of rural development of cultural organizations (incl. religious) which are deeply rooted in the rural society of KP.



Map of Pakistan showing the study area KPK

Methodology

Qualitative and quantitative methods are being used

1. Inventory of organizations/groups or movements
2. Selection of two organizations as case studies
3. Study of the working strategies of the selected organizations
4. Analysis of the perception of respondents regarding rural poverty and inequality.
5. Key informant interviews and focus group discussion for in-depth analysis and interpretation of the result



People gathering demanding separate Hazara province in Abbotabad (Photo by M. Luqman)

Core Objectives

- Critically analyze the philosophical foundations such as beliefs, claims, visions and actual practices (regarding rural development) of culturally rooted organizations
- Compare the working strategies and effectiveness of these organizations with those of the state-led rural development departments
- Record and analyze the respondents' perceptions regarding rural poverty, inequality and the role of organizations to overcome poverty and inequality

Provisional Results

Qualitative interviews revealed first reasons of the *emergence* of social movements:

- Unequal and unjustified distribution/ allocation of resources within the province
- Inefficiency of the state in providing basic services and human rights
- Protection of religious and ethnic culture
- Bringing change in the marketing mechanism/ policy of agriculture produce
- Gender discrimination

The organizations/groups/movements working in the study area can be broadly categorized into:

- *Rural Development/Human Rights*
- *Cultural Identity*
- *Religious Identity*



Newly constructed bridge after destructive floods in Batagram district (Photo by Waqar Tareen)

Rise of Ethnic Movements and Contested Rural Development in Nepal

Mahendra Sapkota, Kathmandu University, Nepal, JACS South Asia
Starting date of PhD study: June 2011



In recent years, development has been contested due to emergence of different kinds of non-State actors and movements to challenge the state-led development. There are controversies in claims, expectations and aspirations. The contestation in Nepal is furthermore complicated with the rise of ethno-politics in present state-restructuring process.

Figure 1: Who represent us? People raising their hands in a public protest program organized by the Tharu Welfare Society in Dang, Western Nepal, January 2012 (Photo: Mahendra Sapkota).

The entry point

- Knowledge gap in the linkage of social movements and changing notions of development.
- To view the gap, case study of the Tharu movement as an indigenous ethnic movement.
- Does the movement represent how people feel? And in turn, what do people expect from it?

Objectives

- Understand the perceptions of people on rural development from the perspective of the Tharu movement.
- Specific focus on the cause- effect relationships of the Tharu movement and rural development.

Why the Tharu movement?

- Represents one of the largest ethnic and marginalized groups (the Tharus) of Nepal.
- Heterogeneous setting of culture (intra-ethnic), geography (West and East), economy (income gaps) and power relationships (landlords vs. bonded labors).
- But, the movement claims for Tharu ethnic identity and regional autonomy.

Methodology

- Framed with critical social research design.
- Field site: two districts of Terai region; Dang and Sunsari (3 villages from each).
- Grounded approach including PRA, FGDs and participant observations.

Some observations in the field

- Growing dissatisfaction among the Tharus with existing poverty, inequality and exclusion.
- Gap of local elected bodies giving more spaces for the movement as non-State actor.
- Presence of local, regional and national networks of the movement.
- Diverse issues, perceptions and characteristics even within the Tharu movement.
- Involvement of various stakeholders and spaces for other ethnic movements making the development "contested".



Figure 2: A preparation for a torch rally demonstrated in front of the Constituents' Assembly in Kathmandu, April 2012 (Photo credit: Min Raj Chaudhary).

Democratic Transition: Cultural Politics of Governance in Nepal

Tulasi Sharan Sigdel, Kathmandu University, Nepal, JACS South Asia
Start date of PhD study: November 2009

Post-conflict governance in rural Nepal has become a site for producing alliances among local state, political parties, civil society, and different social groups. It has been produced as 'elite-negotiated process' and is largely constricted to competition for authority, identity and opportunities for patronage gain for higher class at local scale.



Figure 1: Red spots reflecting the geographical sites of study areas (Map from different internet sources; technical support: Kiran Maharjan)

Background

- Nepal is passing through transition as it emerges from violent conflict to write a new constitution, institutionalizing democracy and political changes.
- There is no elected local government.
- Local governance transpires through ad hoc mechanism of bureaucracy, All Party Mechanism (APM) and Integrated Project Selection Committee(IPSC).

Objectives

- To explore the process of building up democratic polity and governance from grassroots.
- To examine how people enact and subvert in governance at local scale.

Methods

- Village level case study
- Completed fieldwork
- Snowball sampling: 120 in-depth interviews (52 women)
- FGDs: 10
- Observation: Meetings (village council, IPSC): 7; public hearings: 2

Results and discussion

- Local state has become a key site of governance attracting wide range of governance actors.
- IPSC brings local state, political parties, civil society, women and caste/ethnic groups together in local decision making. Different social groups are evolving as governance actors overtly producing governance as public space.
- People subvert local decision making through network alliances, sometimes crossing the political boundary.
- There appears menace that these alliances are being incarcerated as elite space and governance as elite-negotiated process.
- Local leaders claim themselves as real representatives of people but people express their discontents to them for being dishonest to peoples' voices and constricting to patronage and personal gain.



Figure 2: State authorities & local leaders in a public forum responding to ordinary people (above), Photo: T Sigdel, 2009.



Figure 3: Participants of a public hearing program in Diktel, district headquarters of Khotang, Photo: T Sigdel, 2009.

Intra-household food insecurity: gender dimension of food entitlement

Nirmal Kumar BK, Kathmandu University, Nepal, JACS South Asia
 Start date of PhD study: August 2010

In the resource scarce areas of far-western region of Nepal, cultural and social institutions shape barriers to women to establish command over adequate amount of food.



Background and rationale

Women and young girls living in resource scarce areas are more vulnerable in terms of malnutrition and hunger, particularly during food-scarce periods. The study aims to elucidate the state and the changing pattern of institutions that affect women's food entitlement in these areas.

Figure 1: Members of women's society describing their activities, Photo: SAs.

Objectives

The study aims to analyze how institutions shape women's food entitlement; how these institutions are changing and what impacts these changes have on women's food entitlement.

Methodology & methods

- Case studies in three village development committees (VDC) of far-western region of Nepal (Figure 2)
- Household surveys, key informant interviews, focus group discussions



Figure 2: Map of research sites, Source: K. Maharjan.

First results

Factors of women's entitlement failure

Women...

- ...do not enjoy the ownership of land due to patrilocality and patrilinearity.
- ...have high work burden and less time to engage in earning activities.
- ...are not trusted for share tenancy and contract farming.
- ...face gender discriminations in investment in education and in health.
- ...need an authority letter or presence of a male family member for commercial purposes (taking loans, exchange of goods).
- ...are not allowed to consume sufficient animal products and, because of the practice of eating left-over, they access less food.
- ...are not allowed to plough, therefore female-headed households face labor constraints.



Figure 3: Processing rice is the major responsibility of women, Photo: Nirmal BK.

Observed changing patterns

Increasing...

- ...number of women getting land certificate in Thakuri families.
- ...number of women as household heads among Dalit families.
- ...number of active 'women's societies'.
- ...trend of equal wages to men and women.
- ...women's reliance on the market.

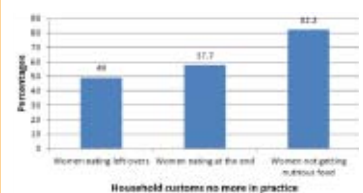


Figure 4: Change in intra-household food distribution practices.

The recent rise of large land deals by foreign investors in developing countries is a controversial issue. This PhD project focuses on the land acquisition process and implications for local people. Two case studies on European investors in Tanzania (Kilolo and Pangani district) highlight the problematic relationship between forestry companies and local people.

Transnational land acquisitions and local livelihoods in Tanzania

Martina Locher, Department of Geography, University of Zurich, JACS East Africa
Start date of PhD study: February 2010

Research question: Forestry companies as long-term development partners for local communities?

Forestry companies depend on local people's acceptance to protect their slow-growing produce without excessive costs for fire prevention. Thus, they promise the following benefits:

- jobs for local people
- infrastructure services



New village office in Pangani District, provided by the Tanga Forests Ltd, a subsidiary of the Norwegian Green Resources AS (Photo: M. Locher 2011)

Conclusions

Investors do bring some development, but:

- announced partnerships are based on **unequal power relations** due to local people's limited political power and restricted livelihood alternatives
- without external support **local people depend on goodwill** of their 'partners'

Data

based on qualitative interviews and focus group discussions with male and female villagers, company staff and government officials.

Results: Local people in weak positions in land-related decisions and negotiations for benefits

Politicians' dual role in land deals:

- cooperation with investors leads to conflicts of interest
- difficult for local people to deal with

"These investors always come with district or regional leaders, they [...] put pressure on us. We are afraid to tell them that we cannot sell our land, because those leaders could do something bad to us." (villager, Kilolo district)

Jobs offered, but with poor working conditions:

- hard work, low salary
- accepted due to lack of alternatives

"They [company's managers] know that even if they pay you low salary you must work on their plantation because that's the only way you can get money." (villager, Pangani district)



Job opportunities in Kilolo district: the tree nursery of the New Forests Company, a UK based investor (Photo: M. Locher 2011)

Food security and livelihood futures in the resource scarce highlands of Pakistan

Amir Rana Muhammad, University of Agriculture Faisalabad, Pakistan, RP2, JACS South Asia
Start date of PhD study: July 2010

Food insecurity has emerged as a serious socio-economic issue in Pakistan. Despite various interventions by the state and development donors, most of the districts in the Khyber Pakhtunkhwa (KP) province are food insecure. The core objective of this PhD study is to identify the social groups and households who are excluded from access to food and income support structures in the resource-scarce mountainous zone of the province.



Food Insecurity Map of Pakistan (Source: WFP/SDPI 2010)

Main research questions

- What is the situation of food security and patterns of livelihood strategies in the study area?
- What is the performance and effectiveness of different types of SSNs? Who is excluded/included?
- What is the relationship between food security, social status and exclusion?
- What policy guidelines can be suggested to ensure food/livelihood security for socially excluded groups?

Background and Rationale

Recent studies on food security have proved that most of the districts of Pakistan are food insecure combined with high incidence of poverty. For mitigating this problem the state, NGOs and international donor community have introduced various support structures or social safety nets (SSNs).

Research approach

- WFP's *Comprehensive Food Security and Vulnerability Analysis* → food availability, access, utilization
- Amartya Sen's *Entitlement approach*
- Qualitative and quantitative research methods

First results (qualitative studies)

Three categories of SSNs exist in the study area: SSNs offered by the State, by NGOs and by individuals. These SSNs can be categorized into following groups:

- *Cash transfer*
- *Education & health care*
- *Micro financing*
- *Miscellaneous (traditional, local)*

- SSNs offered by the NGOs are comparatively easily accessible.
- People with less political and social capital are 'excluded'.
- Traditional SSNs are offered at individual level rather than collectively.
- Remittances is a major source of income. An increasing trend of growing 'off-season vegetables'.



Children collecting garbage to earn their living in Batagram, KP (Photo by Waqar Tareen)



An advertisement showing key features of Benazir Income Support Programme – largest SSN offered by the Govt. of Pakistan

Uncovering law's hidden spatialities: mobility restrictions in Kyrgyzstan

Craig Hatcher, University of Zurich, RP3, JACS Central Asia
Start date of PhD study: October 2010

Migration in Kyrgyzstan is characterized by a strong internal movement from rural areas to the capital city, Bishkek. New arrivals are obliged to register their new address with the city authorities, thus allowing them to access local public services such as medical care and schooling. A problem arises however: new arrivals renting private apartments or living in the city's illegal settlements have difficulties with registering.



Photo 1: An illegal settlement on the outskirts of Bishkek: as the properties are not recognised



Photo 2: An apartment block in Bishkek: tenants also often face changes when registering

- 1. WIDER CONTEXT: REGULATING INTERNAL MIGRATION**
 - Kyrgyzstan's laws on registration are based on the Soviet Union's propiska system (1932) implemented to restrict migration to cities.
 - Cities became privileged spaces.
- 2. MAIN RESEARCH AIM AND QUESTIONS**

Aim: to uncover hidden spatialities in the law of residence registration in Kyrgyzstan.

Question (1): How are these spatialities represented and materially presented?

Question (2): How do these spatialities affect different groups in Bishkek?
- 3. ANALYTICAL FRAMEWORK: LEGAL GEOGRAPHY**
 - What can be defined spatially can also be defined legally.
 - Focussing on everyday law involves going beyond official sources and understanding how «law is lived» by individuals.
- 4. METHODOLOGY**
 - Semi-structured interviews with individuals involved in various ways with the registration process.
 - Legal analysis of national and international legislation.

- 5. FINDINGS: TENANTS vs. OWNERS**
 - Registration problematic for many new arrivals to the city.
 - Residents of illegal settlements (photo 1) as well as tenants of private apartments (photo 2) find it difficult to register without a formal written agreement.
 - Landlords often refuse to enter into an agreement (figure 1) for two main reasons:
 1. Entering into a formal agreement increases the cost of the utility bills that the landlord is liable to pay; and,
 2. The landlord fears that the tenant will be able to claim ownership of their property.
 - Tenants and residents of illegal settlements must therefore register or access public services through unofficial means.
- 6. CONCLUSIONS**
 - There is a need to go beyond official sources of law and look at how it is experienced in its everyday context in order to uncover hidden spatialities.
 - There is a spatio-legal ordering prevalent in the law: it favours owners above tenants.

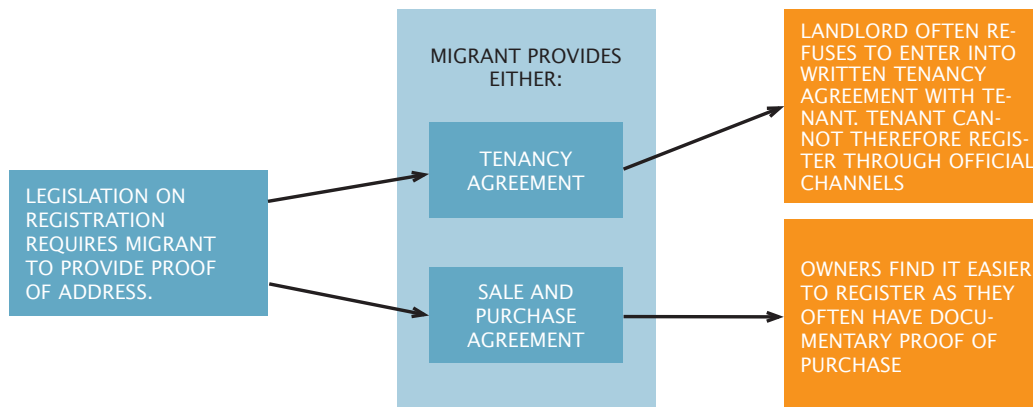


Figure 1: Registration process in Bishkek for those new arrivals that either rent or own their properties.

Will Kyrgyz Students in Turkey Return to Kyrgyzstan?

Jarkyn Samanchina, Bishkek Humanities University, Kyrgyzstan, JACS CAS
Start date of PhD study: July 2010

Cultural and language kinship, absence of visa requirements, and the state educational program have contributed to an increasing flow of Kyrgyz students to Turkey. Eventually, student and labor migration have become closely intertwined raising questions about shifting patterns of mobility, interculturality of higher education and policy response.

Objectives

- To study the social niches and professions where knowledge and skills of Kyrgyz student migrants are used in Turkey
- To find out if student migrants plan on returning to Kyrgyzstan
- To identify if student migrants have influence on the development of relations between Kyrgyzstan and Turkey

Methodology

- Semi-structured interviews with Kyrgyz students in Ankara and Istanbul, Turkey
- Meetings with student associations



Photo by "Kyrgyz Friendship and Culture Society - Ankara"
02/12: Kyrgyz students in Ankara, Turkey

Provisional Results

- Students note personal and professional growth by studying in Turkey but fear not being able to apply acquired knowledge and skills upon return to Kyrgyzstan.
- Many do not plan to return to Kyrgyzstan and choose staying in Turkey for 5-10 years to earn money, or move elsewhere.
- Students critique lack of engagement of the Kyrgyz Ministry of Education in identifying priority majors for students and subsequent assistance with job placement.
- Students who cannot study in western countries choose going to Turkey.
- Experiences from Ankara and Istanbul differ, since Istanbul provides more social and economic opportunities.
- Students work illegally in Turkey using their on student visa.
- Students expressed a heightened degree of patriotism towards Kyrgyzstan and concern for its future.
- Students are active in political activities representing Turkey-Kyrgyzstan political relations.



Photo by "Kyrgyz Friendship and Culture Society - Ankara"
02/12: Kyrgyz student soccer teams in Turkey



Photo by "Kyrgyz Friendship and Culture Society - Ankara"
02/12: Kyrgyz students at a culture fair in Turkey

Land grabbing or an essential move towards development? A case study of Ethiopia

Myra Posluschny-Treuner, *swisspeace*, JACS Horn of Africa
Start date of PhD study: 1 March 2011

Ethiopia, one of the poorest countries in the world and heavily dependent on international food aid, is identified as being one of the main targeted countries for land grabbing. While the Ethiopian government sees land investment as an essential part of their development strategy, international actors accuse land investors to trigger displacement of local people and increase food insecurity. This PhD research aims to contribute to a clearer and profound understanding of large-scale land acquisitions in Ethiopia.



Source: John Spooner retrieved 2012 from Jennifer Franco and Saturnino Borras Jr.: Regulating landgrabbing? Transnational Institute, December 2010

Background

Based on a growing global awareness of climate change and its consequences, the continuously rising food prices as well as the industrialized and economically fast developing countries aim to achieve more energy security through biofuels, a variety of foreign and domestic investors are encouraged to acquire vast areas of agricultural land in the global South. In that regard, Ethiopia seems to be particularly suitable due to its large "unused" affordable fertile land. The Ethiopian government fosters the shift to large-scale agriculture as an essential basis for agricultural modernization and hence, the improvement of agricultural productivity which shall lead to increased food production and economic growth. According to the findings of the Oakland Institute in 2011 at least 3.6 million ha land has been transferred to investors in different parts of the country. The Ethiopian government recently announced that 5284 investors received about 2.2 million ha of agricultural land only in year 2012. However, pursued research indicates that first effects of large-scale land investments show adverse consequences for the environment and local population. It has been reported that forest degradation, displacement of local populations, expropriation of land, increasing local food insecurity and increasing poverty could be attributed to large-scale land investments. Moreover, those effects may lead to local conflicts which again might trigger political instability.

Objectives

Objective of this PhD research is to analyze impacts of large-scale land investment on smallholders and the rural population in Ethiopia, taking socio-economic effects into account, investigate political power and policies as well as institutional dynamics, map and analyze perceptions of all stakeholders, highlight potential and existing conflicts and reflect on aspects of gender and ethnicity and their influence.

Guiding research questions

The overall research question of this PhD study is "What are the large-scale land investment impacts on smallholders and the rural population in Ethiopia? To answer this broader question, several sub-questions will be addressed:

1. How do international and national policy processes influence large-scale land investment in Ethiopia?
2. Who benefits and who suffers from such large-scale land investment in terms of the Ethiopian government, investors, smallholders and the rural population?
3. How effectively do rural communities cope with land investment-related challenges?



Large-scale land investment for tea cultivation in Oromia region, Ethiopia. Photo: Myra Posluschny-Treuner, 2012

Provisional results

Although large-scale agricultural land investment is strongly promoted by the Ethiopian government, administrative procedures for investors are very time-consuming and lack transparency. Furthermore, the performance of private commercial farms in Ethiopia is very slow. This is mainly due to labor shortage or a shortage of the investor's capital.

Moreover, no direct link between displacement of rural populations and large-scale land investment could yet be identified. The Ethiopian government seems to take the resistance of people living in identified investment areas into consideration. Additionally, land rent contractual agreements oblige the investor to provide job opportunities to the people residing in the investment area. However, extremely low wages and missing safety regulations cause dissatisfaction among workers.

AIDS, Power and local Governance in Northern Côte d'Ivoire

Cynthia Ozoua BAILLY, Centre Suisse de Recherches Scientifiques Côte d'Ivoire / JACS West Africa / RP 5
Start date of PhD study: April 2010

In September 2002, following an attempted coup, rebel forces took military and political control of northern Ivory Coast, forcing the state to withdraw from these areas. This retreat was materialized by the closure of governmental structures and the departure of a large part of the staff. It also led to the involvement of many actors and the development of new forms of local governance. This project looks at the governance in the fight against AIDS, in a political field where state and non state actors struggle for legitimacy and positioning.

Background and rationale

The crisis of September 19th 2002 led to the disintegration of health facilities in central, northern and western parts of the country, characterized by a loss of authority of the state. To overcome the lack of health facilities, alternative forms of governance and health services provisions were developed by non-state actors. This investment of non-actors was also visible in the fight against AIDS, with an increase in the number of actors in the sector.



A pediatric center for AIDS financed by an International NGO in Bouaké



The division of Côte d'Ivoire during the political crisis of 2002

Objectives and guiding research questions

With the return of state administration in 2007, amid the context of Ouagadougou political agreement, one can observe an encounter between on the one hand, state structures in the health sector, and on the other hand the people and non-state structures put in place during the crisis. Following on this encounter, the objectives of the present research are:

- Identify the different stakeholders of local governance in the fight against AIDS sector
- Analyze the power relationship between said sectors
- Understand the logic and practices that guide their action
- Analyze the way in which the state strives to have legitimacy, in a health sector where it has only been an actor for five years (2002-2007)

-Methodology & methods

- ❖ Qualitative approach
- ❖ Personal Interviews
- ❖ Participative Observation
- ❖ Special Reports and Documents analysis

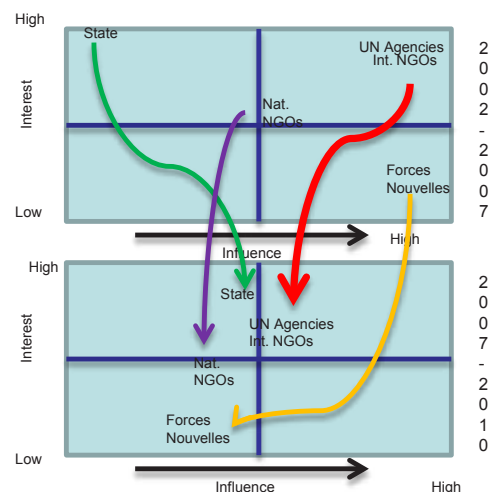
-Progress/Provisional results

- In Northern Ivory Coast, six groups of actors are engaged in the fight against AIDS: state actors, national NGOs, international organizations, United Nations Agencies, and the rebel group Forces Nouvelles.

- The actors of the local governance active in the fight against HIV / AIDS use various strategies to position themselves at the local level:

- ❖ Creation of regulation and coordination entities, lead by the state instead of United Nations Agencies, which had been fundamental in terms of coordination during the state's absence.
- ❖ Carrying out activities related to the fight against AIDS
- ❖ Funding actions fighting AIDS

- The strategies used by the actors at the local level depend on non local factors e.g. the political context of the country, and the international economic situation of funding institutions
- The political context of the country determines the position of each group of actors in the fight against HIV at local level
- The position of different stakeholders at the local level may change depending on economic, political, and organisational factors.
- To protect their interests, actors mobilize different power plays in the arena of local governance:
 - ❖ Non recognition of state authority through clear or implicit collaboration with state structures
 - ❖ Leadership revendication by discrediting the knowledge and experience of others
 - ❖ Identity adjustment e.g changing the name
 - ❖ Refusal to cooperate with the other actors by omitting important information and/or not undertaking activities



-Dynamic in the position of stake holders in local governance of fight against HIV

This diagram shows that the position of actors in the fight against aids at local level changes, and may be modified by the political context of the country that determines which strategies each actor will use. For example, the political agreement of Ouagadougou contributed to reinforce the state's position, and reduced that of Forces Nouvelles and International NGOs.

Decentralization and ‘negotiating statehood’ in urban Ethiopia

Demissie Ferdissa, PHD candidate, NCCR North-South, HOA, date started .01 Apr.2010

The implementation of ethnic decentralization in urban parts of Ethiopia seems to have produced unintended political outcomes the most fascinating of which is the diffusion of the national and elite centered conflict of statehood to the local level in a way that it engages the local community.

Background and rationale

Ethnic based decentralization has been in place in Ethiopia an since 1991 and it is attractive to explore the political effects of this new political order on the multiethnic cities of the country.

Problem statement and Research objective

The implementation of an ethnic based decentralization in multiethnic cities seems to be challenging in Ethiopia. This study explores the challenges and effects of this ethnic political system on multiethnic cities in the country.

Methodology and method

It is a case study approach that focuses on two towns, namely Adama and Hawassa cities. Data collecting methods are: observation, group discussion and interview .

Table I Some facts about the case study towns 2011 central statistical Agency of Ethiopia (CSA)

S.n	Name	Pop.No. in 2011	Rank in pop. size	Regional location
1	Adama	260,600	3 rd	Oromia
2	Hawassa	200,400	6 th	SNNPR



Fig 1 : Map of the ethnic federal Ethiopia

Research findings (tentative)

> implementation of ethnic decentralization in multiethnic cities have had unintended political outcomes.

> It diffused the national and elite centered conflict of statehood to the local level

>It engaged the urban community in contest and competition over citizenship, history, symbols, identity, power and resources of the state.

❖ Note: It is to these processes and dynamics of conflicts of statehood between urban communities that the term ‘negotiating statehood’ refers in this study.

The role of business in peace and conflict: A Sri Lankan perspective

Rina M. Alluri, TN1 IP swisspeace, JACS SAS
Start date of PhD study: 01.09.2009

This study analyzes the changing role of the private sector in contributing to peace and conflict issues in Sri Lanka. An emphasis is placed on understanding how conflict has impacted the role and activities of big business in Colombo and small to medium sized enterprises in Jaffna from the time of the peace process until present (2002-2012).

Background and rationale

This study emerges from the assumption that private business actors can have both positive and negative impacts on peace and conflict issues and that the role of local companies is a key factor that has often been ignored. Three years after the end of the civil war in Sri Lanka, the prospects for peace and the opportunities for the future remain uncertain. The impacts of the conflict on the socio-economic context and the role of different actors in contributing to conflict transformation are relevant to understanding how sustainable peace can be achieved and maintained.

Objectives and guiding research questions

This research aims to answer the following research questions:

1. What have been the successes and failures of business-led peace initiatives?
2. What are the potentials and challenges of engaging private sector actors in peace promotion in Sri Lanka?
3. How did the socio-political and economic impacts of the civil war play a role in influencing private sector involvement in peace promotion?

Methodology & methods

This PhD used an inductive approach. 111 qualitative semi-structured expert interviews were carried out in Sri Lanka and Europe. Due to the scarcity and sensitivity of information on this topic as well as sensitivity, the 'snowball effect' was used to identify interview partners.

The Peace Process and Business for Peace Initiatives

During the peace process of 2002-2005 the timing and political context provided an opportunity for a few Colombo-based big businesses to effectively lobby for a peaceful resolution to the conflict. The large successes of such business for peace initiatives in a short period of time were exemplary to their potential to get more engaged in political issues. International donors and NGOs began to finance business for peace initiatives such as Sri Lanka First and the Business for Peace Alliance. Other civil society actors criticized this approach as it forced them to compete for funds with the profit-seeking private sector.

In the north, the LTTE governed the private sector through taxation and regulation while the military had restrictions placed on freedom of movement. Members of the northern private sector were also included in talks organized by the leadership of Sri Lanka First in collaboration with international NGOs that aimed to bring LTTE members, business actors and policy makers from Sri Lanka with those in Northern Ireland and South Africa to show how their counterparts had overcome their differences and pushed for peace despite similarly complicated contexts. Many Chamber members also received training from the Business for Peace Alliance. While these dialogues were extremely important steps, the political agenda of the conflict parties as well as other involved actors prevented the opportunity for these Northern actors to play a role in bringing a peaceful resolution to the conflict.

Figure 1: New developments and construction rarely benefit the local people in Jaffna



Source: Author's photograph

Post-war Sri Lanka

In post-civil war Sri Lanka, critical actors do not have a lot of political space to engage in promoting peace, reconciliation and human rights. From a business perspective, while some companies have the opportunity to benefit from government tenders, they must do so in compliance with government method and ideology. Therefore in post-war Sri Lanka, one can observe that business actors do not have a lot of political space, support nor capacity to engage in peacebuilding activities. Thus, one can identify that there has been a 'changing role' of business in Sri Lanka. Although the time and context was ripe in 2002 to contribute to peacebuilding through dialogue, awareness and promotional activities, the political context has had an impact on the opportunities to support social development and peacebuilding in the post-war situation.

Figure 2: Illustration depicting current investment climate



Source: The Sunday Times, "Investor confidence vital for attracting FDIs"

Although there have been some institutions and processes put in place to make the post-war business environment more conducive to economic growth, interviewees indicated that there remains a fear to invest, particularly from local investors and Diaspora groups. Moreover, questions remain on how the local private sector can play a role in supporting the post-war process while also having access to priority developments put forth by the government.

Private Sector in Conflict Context: A Nepalese Experience

Rajya Laxmi Gurung, Kathmandu University, RP6, JACS SAS
PhD: July 2010

In conflict context, Private sector (PS) is mostly considered as conflict-enabler or conflict-affected sector. However, there is also role of PS in peace building. Nepal peace building process has seen the subtle involvement of private sector. There involvement ranges from informal negotiation to more proactive role in post-conflict phase.

Background and rationale

- Cause: Poverty, horizontal and vertical inequality, uneven development.
- Decade-long Maoist conflict has resulted in economic costs worth about \$2 billion, claiming the lives of more than 15,000 (Jha 2008).
- It has also affected the growth of the PS.
- Its economic capability, grass root reach and political associations made PS as a strong contender for peace building.
- Nepal is in process of writing a new constitution, reconstruction, and addressing the causes of conflict, provide peace dividend as well as leading sustainable and equitable growth.
- However, the knowledge and empirical literature regarding the role of PS in peace building is very limited.



Hydropower Company involved in community development (Road construction) in Sirubari VDC, Sindupalchowk District. Source: Photo: Rajya Laxmi Gurung, 2011.

Objectives and guiding research questions

- Examine the state of arts of private sector's engagement in peace building in Nepal.
- Assess potentials, limitations and determinants of their engagement.
- During the conflict, PS was engaged in informal negotiations with local rebel leaders.
- Because of the increase of the cost of conflict on PS, its involvement in peace building increased.
- Lobbying, dialogue, peace rally, media pressure were used by PS for consensus building.
- In post-conflict phase, it is involved in lobbying for economic reform, creating investment-friendly environment, policy recommendations.
- Profit-seeking motive and sometimes negative image hinder PS involvement.

Methodology

- Mixed (Qualitative and Quantitative)
- Case Study
- FGDs

Progress and Provisional Result



Negotiation between local community and Hydropower Company regarding community involvement in Hydropower project in Gaurishankar VDC, Dolkha District Photo: Rajya Laxmi Gurung, 2011.

Bridging the Gap – Examining Local Dimensions of International Peacebuilding in the DR Congo

Sara Hellmüller swisspeace, University of Basel
Start date of PhD study: 01.01.2011



UN Offices, Bunia, DR Congo



NGO Office, Bunia, DR Congo

The PhD dissertation treats the significance, the implications and the potential of what is called the 'local dimension' in international peacebuilding programs. It is structured around three propositions derived from theory, namely

- (1) that the sustainability of peace largely depends upon the way in which local actors and institutions are brought into peacebuilding initiatives,
- (2) that understanding the interactions between local and international actors as well as promoting a well designed and structured relationship between them increases the effectiveness of peacebuilding programs,
- (3) that a proper understanding of the different symbolic and cultural perspectives of peacebuilding actors facilitates the coordination of efforts to effectively build peace.

The propositions are being worked through by seeking to answer the following research question: *How do local, national and international approaches to peacebuilding interact with each other in a post-conflict context?*

Methodology: Because of the absence of a clear theoretical framework to answer the research question, the nature of the dissertation is hypothesis-generating based on case study methodology. Thus, a chosen case will provide insights that can be generalized to a larger population of cases.

This population is delineated through three scope conditions:

- (1) the study applies to African countries (spatial),
- (2) which are in a peacebuilding process (temporal) and
- (3) in which the conflict took an ethnic dimension on the local level (substantive).

The case selection is thematic, in that the research focuses on reconciliation programs as one specific aspect of peacebuilding; and spatial through the choice of the eastern District of Ituri in DR Congo as case study site. The latter represents an interesting case due to the special attention paid to the area by international actors as well as the variety of local initiatives on the ground and the seeming lack of cooperation between the two sets of actors.



Focus Group Discussion, Bembeji, DR Congo

Data Collection: The study has started with a mapping of local, national, and international reconciliation programs present in the DR Congo through desk research, a review of existing documentations and a short field visit (6 weeks). Then, empirical data on the different programs as well as on their interaction with other initiatives was collected during an extended field visit (3 months) through focus group discussions, participant observation, in-depth interviews as well as consultation of local media and mission reports.

This inquiry seeks to assess the propositions outlined above:

- (1) how the programs promote local ownership;
- (2) how the different actors cooperate with each other, what their comparative advantages are and how this cooperation is influenced by power asymmetries inherent in their relationships; and
- (3) how culture shapes the perspectives of the different actors on peace and conflict and therefore their priority setting.

Lastly, through interviews with beneficiaries of the selected programs, it will be analyzed how the diverse programs resonate within local communities and how they have influenced relationships between antagonistic groups.

Contribution: The dissertation wishes to contribute to scientific debates on successes and failures of peacebuilding approaches, including criticism of the dominant approach of liberal peace and the suggestion of alternatives. Practically, the findings of the study will provide guidelines for practitioners on how to become aware of, approach and integrate different local perspectives. The research will offer insights of such local perspectives and clarification of underlying normative assumptions of peacebuilding actors.

International Norms Lost in Translation? Darfur and the Politics of Saving Strangers

David Lanz, *swisspeace* & University of Basel, ProDoc "Global Change", Innovation and Sustainable Development"
Start date of PhD study: February 2009

This project explores the real-world effects of the Responsibility to Protect (RtoP) doctrine, according to which the international community has a duty to protect vulnerable populations from mass atrocity crimes. To this end, it develops a case study of the conflict in Darfur, examining how activists have framed it as a test case for 'saving strangers' and how this has affected the international response as well as the calculations of domestic actors in Sudan.

Theoretical background

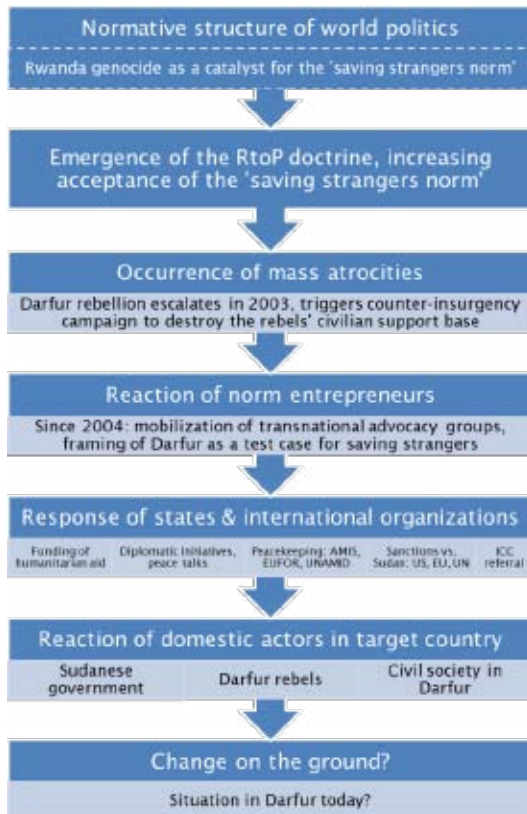
This study is situated in the literature on the role of international norms, defined as collective expectations of proper behavior in world politics. Against this background, it conceptualizes the RtoP doctrine as the 'saving strangers norm', based on three principled beliefs: mass atrocities are morally wrong; all potential victims should be protected regardless of their nationality, ethnicity, or religion; and the onus of protection falls on the international community.

Analytic framework

Drawing on norm diffusion theories, this study employs an analytic framework that distinguishes three processes through which the 'saving strangers norm' is translated into practice:

- Promotion and projection by norm entrepreneurs in campaigns, discourses, images etc.
- Response of states and international organizations to norms campaigns
- Reaction of domestic actors in conflict countries, i.e. governments and insurgents

Table 1: Analytic framework of PhD study



Picture 1: George Clooney at rally in Washington DC, 27 April 2006



Methodological considerations

Adopting a constructivist approach, this study develops a case study of the Darfur conflict. It shows how different actors have made sense of Darfur in the context of the 'saving strangers norm' and what actions resulted from that process. To capture these dynamics, the study relies on a dual methodology. Based on key informant interviews and official documents, it uses text analysis techniques to assess how agents have perceived and framed the 'saving strangers norms'. It also employs the process-tracing method to assess the real-world effects of norms campaigns.

Picture 2: Sudanese President Omar al-Bashir one the day after his indictment at rally in Khartoum, 5 March 2009



Selected publications

- Lanz D. (2011) *Why Darfur? The Responsibility to Protect as a Rallying Cry for Transnational Advocacy Groups*. In: *Global Responsibility to Protect* 3 (2), pp. 223-247.
- Lanz D. (2009) *Commentary – Save Darfur: A Movement and its Discontents*. In: *African Affairs*, 108 (433), pp. 669-677.
- Lanz D., Sguaitamatti D. and J. Giroux (2009). *The Tormented Triangle: The Regionalisation of Conflict in Sudan, Chad and the Central African Republic*. Working Paper No. 47, Crisis States Research Centre, London School of Economics.

Negotiating history: Memorials in the contested history of Burundi

Sandra Rubli, MA lic rer soc, sandra.rubli@swisspeace.ch, swisspeace & University of Basel, PhD candidate
Start date of PhD study: 01.01.2009

In Burundi's various cycles of violence mobilization occurred, among other factors, along ethnic lines. As a result there are two divergent readings of what happened, one related to who is responsible and one related to who the victims are. In the context of a post-conflict state-formation process local actors are struggling to ensure a representation of their version of history as depicted in memorials and in the search for legitimacy and the strengthening of their position.

Background

Memorialization and memorials are a rather under-researched topic within the field of transitional justice. Memorialization is simultaneously both remembrance of the past and shaping of the future. In contrast to memory which is dynamic, ever-changing and affected by the progression of time, memorials are 'set in stone' suggesting an idea or fact that been placed in its ultimate form, often beyond debate or contradiction. As memorials often reflect tragic events of violent conflicts, the process of determining what shape a memorial should take and how it should be used is a highly politicized process. Thus political actors are negotiating and competing for the shape and form of memorials, and especially for the version of historical narrative or past which they reflect.



Memorial to remember the victims of a massacre in the surroundings of Itaba, on September 9, 2002, Itaba



Memorial commemorating the high school students who were burnt alive on October 21, 1993, Kibimba



National monument, 'symbol of national reconciliation', dedicated to all victims of the various cycles of violence, Gitega

Research

As part of a PhD study, this research looks at three memorials in Burundi which remember the killing of Tutsi students (Kibimba), a massacre of the Hutu population (Itaba) and all victims of the various cycles of violence since the country's independence (Gitega). The memorial in Kibimba was erected by the then president of Burundi on the initiative of the parents of the killed students. The memorial in Itaba was constructed during the election campaign in 2005. Finally, the construction and design of the national monument in Gitega was undertaken by the current ruling party CNDD-FDD. Using the example of these three memorials this research analyzes how Burundian political actors compete, shape and negotiate a certain version of the past in the quest for legitimacy and power in the post-conflict state formation process in Burundi. It addresses issues such as which and whose history is depicted in the memorials, on whose initiatives they have been constructed, and how they are perceived by the population living in the surroundings. Therefore interviews with high-ranking politicians, experts and 'ordinary' citizens have been conducted, various news papers and radio broadcasts have been analyzed and several official ceremonies have been observed and attended.

Preliminary results

Although the national monument in Gitega is supposed to be a 'symbol for national reconciliation' it is highly contested by opposition political parties. This might be due to the fact that they have not been included in the choice of the design, location and the depicted meaning of the memorial. The local memorials in Itaba and Kibimba which remember specific events during the violent conflict in Burundi are perceived by politicians of all colours as a Hutu and Tutsi memorial respectively, thus legitimizing claims of genocide. While the population living in the surrounding areas of those memorials consider memorials as important for a reconciliation process, they do not agree on whether there should be one national monument which remembers all victims or whether there should be different local memorials which remember specific violent events. Having said this, they do generally accept the presence of a local memorial remembering the victims of the 'other' ethnic group. This question of the local significance of memorials is contested against a background of a perception by some that the process of reconciliation and the significance of memorials are in fact imposed from 'above' by the (national) administration and politicians.

Chiefs, state-building, and development in independent South Sudan

Martina Santschi, *swisspeace*, JACS Horn of Africa
Start date of PhD study: 01.05.2007

Chiefs play a key role at the local level in South Sudan. They provide vital services and enjoy considerable local legitimacy. They act as a bridge between local communities and government institutions. However, chiefs' functions vary from place to place, and their roles are sometimes contested by government bodies and by community members.



A group of chiefs, elders and community members chatting between two court cases in Wanyjok (Aweil East County, South Sudan). Photo: Martina Santschi, 2009

Significant stakeholders at the local level

Chiefs play an important role at the local level in independent South Sudan. They provide an array of vital services, from mobilising people for community projects, collecting taxes, intermediating between communities, local government institutions and international agencies, to adjudicating disputes and acting as community representatives.



Litigants in a customary law court in Wanyjok. Aweil East County, South Sudan. Photo: Martina Santschi, 2009.

Between state and society

Community members dismiss chiefs whose performance is considered as inadequate. Thus community members see chiefs as their legitimate representatives who can be released by their people. At the same time, both community members and the South Sudanese legislation consider them as part of the local government. That positions them in both spheres: state and society.

Contested practices and competencies

The practices of chiefs are contested. Some examples:

- **Who has authority to dismiss chiefs:** members of their communities, or county commissioners?
- **Which court gets to hear cases?** Different customary courts compete for cases.
- **Who gets the court revenues?** Chiefs and local government officials contest the allocation of court revenues and taxes.
- **Who manages the chiefs' courts?** Members of the judiciary and local government disagree over the administration of chiefs' courts.



Member of the Executive Chief Court in Baac, Aweil East. Photo: Martina Santschi, 2009.

Chiefs' roles and their authority are partly contested. However, in view of the limited funds and capacity of new government institutions, they are likely to continue to play a vital role at the local level in South Sudan.

Reproductive Resilience to Teenage Pregnancy in Eastern Ghana: A Study of the Begoro Community

Sylvia Esther Adu-Gyamfi, University of Ghana, Legon, JACS West Africa, (RP7 "Sexual and Reproductive Resilience")
Start date of PhD study: 01.01.2011

The Ghana Health Service in 2007 reported an increase in the rate of teenage pregnancy in Fanteakwa in the Eastern Region of Ghana from 523 in 2005 to 579 in 2006. Focusing on adolescent girls in a peri-urban area, Begoro in Ghana, the study aims at providing insights into adolescents' sexual and reproductive health realities and resilience against or coping well with and after teenage pregnancy.

Background

In Sub-Saharan Africa, adolescents are faced with numerous health challenges which affects their productive contribution to development. In 2009, about 12% of girls aged 15-19 years in Ghana were pregnant or already mothers.

Using the Multi-Layered Resilience Framework (Obriest et al., 2010) this study aims at analyzing factors that can build adolescents' resilience against teenage pregnancy and enable already pregnant girls to cope well with teenage pregnancy and early motherhood.

Photo 1: Girls in Accra, Ghana (Photo: C. Ahorlu)



Research Objectives

1. To investigate how adolescents in Begoro interpret their sexuality and teenage pregnancy
2. To identify female adolescents' capacities, social connections and involvement in institutions and organizations that might contribute to building resilience against teenage pregnancy
3. To analyze how social actors, institutions and organizations can build resilience of adolescents against teenage pregnancy in the district.

Photo 2: Interviewing an adolescent girl in Begoro (Photo: S.Adu-Gyamfi)



Approach

A mixed method approach is being used for data collection:

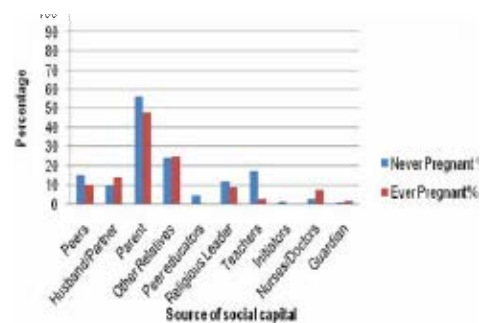
- For the quantitative data (cross-sectional survey) 500 adolescent girls, aged 15-19, were sampled from Begoro a peri-urban community using multistage cluster sampling.

- Purposive sampling was used to select 20 (10 high and 10 low resilient) girls for follow up over the course of four months for qualitative data collection using in-depth interviews and observation to identify resilient pathways.

Preliminary findings

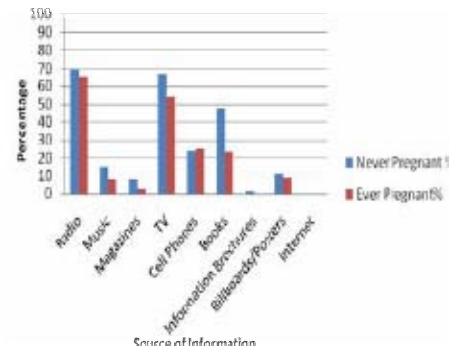
- 500 adolescent girls were interviewed
- 81 (16%) have ever been pregnant or were pregnant, indicating that pregnancy rates did not decrease in the past years. In 2008, 16% of adolescent girls in rural areas begun child bearing between the ages of 15-19 years (Ghana Demographic Health Survey, 2008).
- 65% of the never pregnant girls had someone they could turn to in case they had questions or needed support related to how to protect themselves against teenage pregnancy.

Fig1: Access to social capital among female adolescents (15-19 yrs) in Begoro, Ghana



- 69% of the ever pregnant girls had someone they could turn to when they need support related to pregnancy and neonatal care.
- 80% of the ever pregnant girls and 90% of the never pregnant girls had access to other sources of information

Fig. 2: Access to cultural capital (TV, radio etc.) among female adolescents (15-19 yrs) in Begoro, Ghana



Progress and achievements

- Quantitative data analysis has been finalized
- Qualitative data collection is ongoing

Funding: NCCR North-South

Supervision: Dr. Collins Ahorlu¹; Dr. Constanze Pfeiffer²

Institutions: ¹Noguchi Memorial Institute for Medical Research, University of Ghana, Accra, Ghana; ²Swiss Tropical and Public Health Institute, Basel, Switzerland; ³University of Basel, Switzerland.

References:

- B. Obriest, C. Pfeiffer and B. Henley (2010). Multi-Layered Social Resilience: A New Approach in Mitigation Research, *Progress in Development Studies (PIDS)*, 10(4), 283-293, 2010.
Ghana Health Service (2009). Accra
Ghana Health Service (2007). Accra
Ghana Demographic Health Survey (2008). Accra

More information: www.north-south.unibe.ch; www.socialresilience.ch

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Rural Urban Migration and Resilience of Maasai Pastoralist Youths in Tanzania

Emmanuel Munishi, Institute of Physical Geography (IPG), Albert-Ludwigs Universität, Freiburg, Germany

Start date of PhD study: 01.10.2010 (associated to NCCR North-South TN2 and RP7 "Sexual and Reproductive Resilience")

Rural-urban migration has become an important process among the Maasai nomadic Pastoralists in East Africa. Using a multi-site approach, this study explores influences of rural-urban migration of Maasai pastoralist youths on both: migrants in Dar es Salaam and sending households in Ngorongoro District in Tanzania. The aim is to understand migration related threats and learn about factors that can contribute to building migration related resilience of migrants as well as their sending households.

Background

Maasai society has experienced sweeping social, economic, political, climatic, environmental and technological changes ultimately subjecting them to precarious livelihood situations. Consequently, Maasai have increasingly migrated to urban areas as a livelihood strategy. However, little is known about migration related threats that Maasai migrant youths as well as their sending communities encounter and factors that can contribute to building the resilience of migrants and sending households in dealing with these threats.

Research objectives

- 1.) To ascertain and systematically document patterns and factors for rural urban migration of Maasai migrant youths in Tanzania.
- 2.) To understand what type of migration related threats Maasai migrant youths as well as sending communities encounter and how they cope with these threats.
- 3.) To understand factors that can contribute to building Maasai migrant youths and their sending communities' resilience in dealing with migration related threats.



Photo 1: Maasai migrant youths sleeping outside in Dar es Salaam
(Photo by E. Munishi)

Approach

This qualitative study is guided by the newly developed Multi-layered Social Resilience Framework by Obrist et al. (2010) and considered the Maasai migrant youths between 14 – 35 yrs. It employed a sample of 110, including 50 male migrant youths, 30 key informants [Government and NGO officials], and 30 household representatives of local Maasai communities. Maasai migrant youths and key informants were purposely sampled, and migrant sending households' representatives randomly selected.



Photo 2: Interview with household members in Ngorongoro
(Photo by L. Ngengeya)

More information: www.north-south.unibe.ch

Progress and achievements

Data collection and data analysis are completed. The thesis will be submitted by February 2013.



Photo 3: Interview with a migrant sending household in Ngorongoro
(Photo by L. Ledio)

Preliminary findings

- Migration factors are decline of pastoralism and agriculture, local conflicts over land and unemployment. Social networks and communication technology catalyses the process.
- Threats by migrants include (1) financial constraints such as unemployment and low salaries; (2) oppression and exploitation such as low and delayed labour returns and arbitrary job terminations; (3) falling victim to crime when working as night watchman due to lack of security trainings and proper equipment.
- Maasai are able to competently deal with these threats by soliciting and utilizing mainly social and cultural capitals (mainly strong social networks among Maasai youth) and to lesser degree economic and symbolic capitals mainly at individual and community levels.
- However, hardly no structures exist that could support and build the resilience of Maasai youth on regional and national levels.

Significance for policy and practice

- ☞ National and international organisations need to include Maasai on their agendas.
- ☞ Development policies and land tenure policies deny Maasai full control over land for agriculture and livestock keeping leading to forced migration. A revision of these policies is strongly recommended.

Funding: Deutscher Akademischer Austauschdienst (DAAD)

Supervision: Prof. Dr. Rüdiger Glaser¹, Prof Dr. Axel Drescher¹, Dr. Constanze Pfeiffer^{2,3}

Institutions: ¹Institute of Geography, Albert-Ludwigs-University, Freiburg, Germany; ²Swiss TPH, Basel, Switzerland; ³University of Basel, Switzerland

References:

B. Obrist, C. Pfeiffer and B. Henley (2010). Multi-Layered Social Resilience: A New Approach in Mitigation Research, *Progress in Development Studies (PIDS)*, 10(4), 283-293, 2010.

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Adolescents, Sex and the City in Southern Tanzania

Richard F. Sambaiga, Swiss Tropical and Public Health Institute and Institute of Social Anthropology, University of Basel
RP7, JACS East Africa
Start date of PhD study: 01.02.2010

Young people constitute the majority of African societies. From the point of view of development experts and policy makers a key challenge is risks related to the sexual and reproductive health of young Africans. Focusing on a small but rapidly growing district capital in Southern Tanzania called Mtwara town, this study examines what dimensions of urban sexuality youth experience as risks and whether young women and men develop ways of anticipating, avoiding or overcoming and thus building resilience to these risks.

Background

Promoting the sexual and reproductive health (SRH) of adolescents in Africa especially of female adolescents, has moved to the top of the national and international development agenda. While many international and national organizations target adolescents with their interventions, surprisingly little is known about how these young people live their sexuality, particularly in rapidly changing urban contexts.

Research objectives

- 1.) To explore how adolescents in Mtwara town conceptualise and deal with their lived sexual and reproductive health risks.
- 2.) To describe and examine representations of adolescents and their sexuality in the changing contexts of Southern Tanzania.



Photo 1: Adolescents in one of the night clubs in Mtwara town
(Photo by R. Sambaiga)

Approach

This ethnographic study concentrates on young people in adolescence (aged 15-19 years) in Mtwara town and employs a mixed methods approach combining quantitative and qualitative methods. Quantitative methods entailed administering questionnaires to a total of 500 female adolescents. While qualitative methods included 20 female adolescents drawn from the main sample together with 20 male adolescents who were visited and interviewed every month over a period of 6 months.



Photo 2: A research assistant in an interview session with a respondent
(Photo by R. Sambaiga)

Progress and achievements

Completed both quantitative and qualitative fieldwork. Currently working on quantitative and qualitative data analysis. The thesis will be submitted by October 2013.



Photo 3: A 19 year old unmarried mother of two children who is 4 months pregnant in August, 2011 (Photo by R. Sambaiga)

Preliminary findings

- Sexuality is one of the key elements in the everyday life of adolescents in Mtwara town. Sex is not the only component of adolescent sexuality but it is considered to be crucial in sexual relationships. Almost half (48%) of the 500 interviewed female adolescents are sexually active and 15% had started child bearing.
- Being in a sexual relationship is conceived as critical aspect to the adolescents' sense of being and belonging even though it is not approved by significant others. Thus, most adolescents strive to conceal their sexual relationships and find it difficult to turn to parents for reproductive health information and support.
- Magazines, Radio and TV are seen to be key sources of reproductive health information because the media do not compromise adolescents' interests of keeping their sexual relationships secretive.
- Adolescents' agency reflected in their abilities to shift between identities enable them to practice and live their sexuality.

Significance for policy and practice

- ☞ Interventions towards improving sexual and reproductive health of the adolescents need to be sensitive to the everyday practices of the young people.
- ☞ Programmes targeting adolescents should not ignore their creative potentials.

Funding: Humer Foundation through the Centre for African Studies and Swiss Tropical Institute of Public Health, University of Basel, Switzerland.

Supervision: Prof. Dr. Brigit Obrist, Institute of Social Anthropology, University of Basel, Switzerland.

Project Leader: Dr. Constanze Pfeiffer, Swiss TPH, University of Basel, Switzerland.

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Dynamics of social relations and sexual practices in the context of HIV/AIDS in Ouagadougou, Burkina Faso

Schwärzler Patricia^{1,3}, Swiss Tropical and Public Health Institute (Swiss TPH), Basel – JACS WAF
Start date of PhD study: 19.11.2008 (association to NCCR North-South)

Sexual practices are social activities and thus are subject to social change and to negotiations of differing positions between both old and young, and men and women. In Ouagadougou different models of relationships and various discourses on and practices of sexuality coexist.

Background

Although West Africa has remarkably low prevalence rates, AIDS is a burning issue to the population in Ouagadougou, capital of Burkina Faso (national HIV prevalence 1.6%). National HIV/AIDS prevention campaigns are based on Euro-American representations of the body and society with the corresponding biomedical terminology and social and moral concepts. Due to a multitude of additional actors providing information (NGOs, religious communities, media), interpretations of HIV/AIDS are manifold and influence the thinking, speaking and acting of people about this illness.

Objective

This PhD project⁵ aims at a better understanding and contextualisation of the generation- and gender-specific narratives on social and heterosexual relationships of women and men in their confrontation with HIV/AIDS. An emphasis is placed on adolescents.



Youth in Ouagadougou (foto: PS)

Methodology

We have been working with residents of *secteur 29*, a peri-urban poor neighborhood of Ouagadougou. We opted for a triangulation of qualitative methods combining focus group discussions and in-depth interviews with members of the general population, interviews with representatives of religious communities and health facilities, and observation of and participation in social life in the neighborhood.

Keywords: medical anthropology, urban anthropology, social change, gender, HIV/AIDS

Funding: 50% employment within the NCCR North-South at the Swiss TPH, Basel; private funds and donation; scholarships from Swiss National Science Foundation, Bern, Max Geldner Foundation, Basel, and Graduate School Gender Studies, Basel

Supervision: Prof. Dr. Brigit Obrist^{1,2,3}, Prof. Dr. Elisabeth Zemp^{1,3}, Prof. Dr. Marcel Tanner^{1,3}

Institutions: ¹ Swiss TPH, Basel, ² Institute of Social Anthropology, Basel, ³ University of Basel

Related publications (published or in preparation)

- Schwärzler Patricia. 2010. *Sex and the City: Erzählungen alter Männer und Frauen über jugendliche Sexualität und AIDS in Ouagadougou, Burkina Faso*. In: H. Dilger & B. Hadolt, eds., *Medizin im Kontext: Krankheit und Gesundheit in einer vernetzten Welt*. Frankfurt am Main: 389-409.
- Schwärzler Patricia. 2010. *Sexe dans la Cité: Récits des vieilles et des vieux sur la sexualité des jeunes et le sida à Ouagadougou, Burkina Faso*. (French translation, accessible on NCCR North-South webpage)
- Schwärzler Patricia & Bila Blandine. 2011. Les ambiguïtés des filles urbaines dans la gestion de leur sexualité: un tour d'horizon anthropologique. Working paper. (accessible on NCCR North-South webpage)
- Schwärzler Patricia (et al.). 2012. Modèles et pratiques multiples des relations sociales et sexuelles des jeunes à Ouagadougou, Burkina Faso. (working title; paper planned to be published in *Revue africaine de la santé reproductive*)
- Schwärzler Patricia (et al.). 2012. Mythes et discours autour du préservatif à Ouagadougou, Burkina Faso. (working title; planned to be published in *Sciences sociales & santé*)
- Schwärzler Patricia. 2012. Dynamiques des relations sociales et pratiques sexuelles dans le contexte du VIH/sida à Ouagadougou, Burkina Faso. (working title, PhD thesis, to be published in French)

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Results

Elderly people refer to pre-colonial 'traditional' institutions controlling premarital adolescent sexuality. They complain about their decay when talking about current sexual practices of adolescents in the city. Most old people believe this decay is responsible for the spread of HIV, while especially blaming young girls.¹

For young girls and boys, their narrated models and practices – ranging from abstinence to multiple partnerships – are an expression of the quest for (new) representations of femininity and masculinity in the context of HIV/AIDS. Those are related to the customary, cultural, social, religious and economic context that encompasses abstinence, arranged marriage, polygamy and specific forms of socially acceptable extramarital relationships.^{2,3}

The reluctant use of condoms by the population is due to various reasons, among others, to myths built around this main instrument of HIV prevention.⁴



National prevention campaign (foto: PS)

Perspectives

The issues addressed can be adapted for applications in development projects. This study is further able to inform public health efforts in regards to family planning, sexually transmitted diseases and HIV/AIDS, as well as sex education for adolescents and even the application of the new family law in Burkina Faso.

Integrated planning of environmental sanitation management to mitigate urban waste syndromes in Yamoussoukro, Côte d'Ivoire

Kouame Koffi PARFAIT, Centre Suisse de Recherches Scientifiques en Côte d'Ivoire (CSRS), RP8, IP Eawag/Sandec
PhD study start: May 2010

In Côte d'Ivoire environmental sanitation issues are poorly managed despite continuous efforts made by stakeholders since many years. This study aims to develop a practical model for planning sustainable management of urban sanitation in Yamoussoukro, based on the combination between material flow analysis (MFA) and quantitative microbial risk assessment (QMRA) methods.

Background and rationale

The environmental sanitation issues are becoming more widespread recent years in developing countries. Indeed, in Yamoussoukro, the political capital of Côte d'Ivoire, the urban wastes are poorly managed. The wastewaters associated with solid wastes are being released into the lake system without treatment. Also, septic tanks and one-site-sanitation facilities are the most used. The lake waters are used for farming and fishing (photos 1). These shortcomings increase exposure routes and public health risks. An integrated approach is necessary for improving the sanitation sector in this District.



Photo 1: Potential health risks with crop washing in Yamoussoukro

Objectives

This study aims to develop a practical model for planning sustainable management of urban sanitation in Yamoussoukro, based on the combination between material flow analysis (MFA) and quantitative microbial risk assessment (QMRA) methods.

Specific objectives are as follows :

1. Assess the dynamic of the environmental sanitation by modeling nitrogen flows contained in solid wastes and wastewater in the city of Yamoussoukro ;
2. Assess the health risk in the city through the quantitative microbial risk assessment method ;
3. Identify through a multi-criteria analysis, the best planning options for sustainable sanitation integrating technical, economic, environmental and health aspects.

Methodology

This research combines integrated approaches. Starting by observations through exploratory visits (July and October 2010), the participatory workshop (February 2011) and household, sanitary, geographical and exposure surveys (July 2010 – August 2010). Other data were collected from scientific papers and organisms database. In addition, laboratory analysis undertaken (November 2011, December 2011, February 2012 and Mai 2012 to July 2012 (Figure 1).

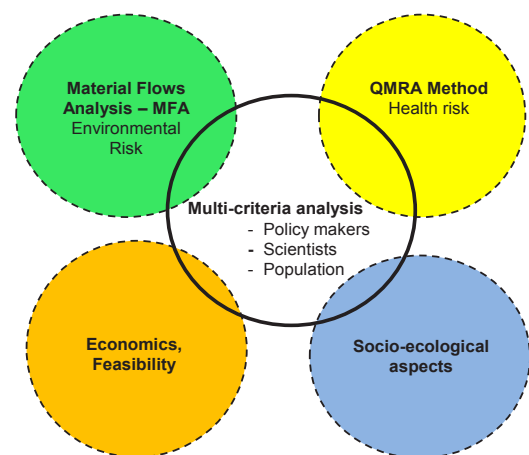


Figure 1: Sustainable environmental sanitation planning components : Case of the city of Yamoussoukro

Preliminary results

- 172 sites of solid waste deposits have been identified across the area study
- 6.4 ha of urban fields are irrigated by lakes water and 5.5 ha by wastewaters from channels
- A microbiological contamination of irrigated waters, fishes and crops (salads, onions) are observed. Main pathogens of concern are *Giardia lamblia*, *Ascaris lumbricoides* and hookworms.

Outlook

- Detail modeling of MFA and QMRA to assess environmental and health risk
- Organization of Multicriteria Analysis workshops, involving stakeholders in the District
- Valorisation of research results through:
 - Scientific publications
 - Policy briefs with key results

Performances of Constructed Wetlands in the Treatment of Leachate from faecal sludge dewatering beds: effect of Hydraulic Load

Soh Kengne E. et al., University of Yaoundé I- Cameroon, JACS WAF
Start date of PhD study: 18.02. 2010

Faecal sludge management remains a crucial health and environmental problem in Developing Countries (DC). However, the treatment of this special waste enable safe reuse of wastewater in agriculture. Vertical flow constructed wetlands in this regard has shown to be a good option if factors influencing the removal performances are well mastered.

Background & rationale

Anarchic faecal sludge discharge into the Environment represents a serious threat in DC as it shows a high concentration of parasites and pathogens (Kootatep et al., 2005; Kengne et al., 2009). Natural treatment systems are nowadays considered to be promising technologies to address the issues of wastewater treatment. How can some key factors influence the performances of constructed wetlands in refining leachate from faecal sludge dewatering bed, for the effluent to observe WHO's guidelines for discharge/reuse in agriculture?

Objective of the study

Assess the influence of Hydraulic load on the removal performance of vertical flow constructed wetlands (CW) used as second step for the treatment of leachate from planted dewatering beds in Cameroon.

Research questions

1. How effective can Vertical Flow Constructed Wetland achieve chemical and hygienic treatment of leachate (effluent from excreta treatment plant) for safe reuse in agriculture?
2. what operational conditions (hydraulic load, feeding frequency) can permit to achieve discharge/reuse guidelines ?

Methodology

1. Experimental Plant Design

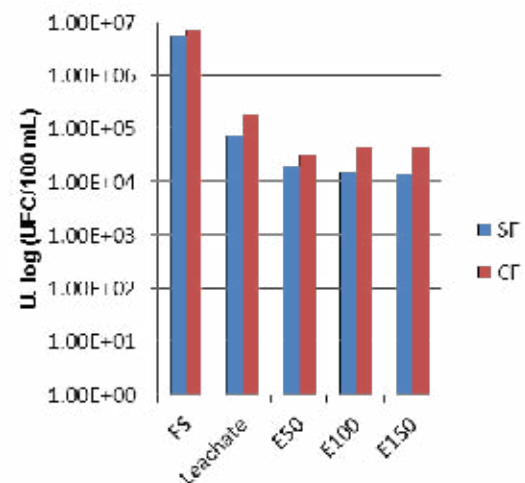
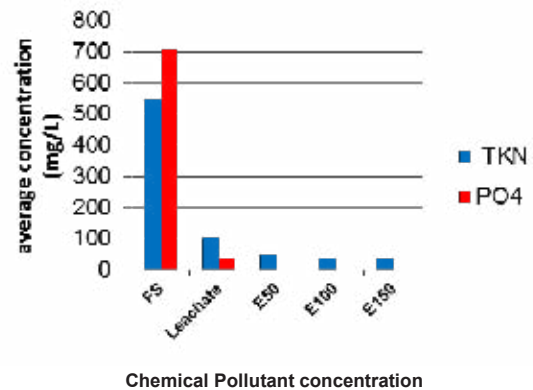


2. Operation of the System & Analysis

- ❖ Application of rough faecal sludge at 200 kg DM/m² on drying beds
- ❖ Collection of Leachate/percolate and their physicochemical and bacteriological characterization.
- ❖ Application of leachate on constructed wetlands planted with *Echinochloa pyramidalis* at the hydraulic loads of 50, 100 and 150 mm/d percolates.
- ❖ Collection of effluent and their physicochemical and bacteriological characterization .
- ❖ Assessment of the effects of hydraulic loads on the performance of VFCW.
- ❖ Assessment of macrophyte responses to the operational conditions.

Note: E50: Effluent at 50 mm/d; E100: Effluent at 100 mm/d; E150: Effluent at 150 mm/d; FC: Faecal Coliforms; FS: Faecal streptococci

Results



Conclusion

- Good physico-chemical removal performances with all the values observing the OMS guidelines for discharge and reuse in Agriculture;
- Good bacteriological removal performances (88.4% for FC and 93.7% for FS. However microbial quality not good enough for reuse or discharge;
- No significant differences of removal efficiencies at 50, 100 and 150 mm/day for almost all the parameters except for plant densities.

Perspectives

Can Waste Stabilization Ponds performs better in terms of Bacterial removal ? Investigations ongoing.

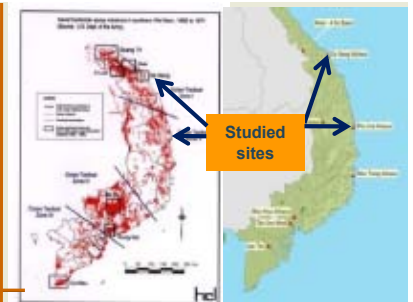
Dioxin exposure risk assessment and the sustainability of public health intervention at dioxin hot spots in Vietnam

Associated PhD study to RP8 Productive Sanitation. JACS SEA, IP Swiss TPH

Student: Tuyet-Hanh Tran Thi^{1,2}

Supervisors: Michael Dunne³, Fiona Harden³, Thomas Tenkate⁴, Vu-Anh Le^{1,2}

¹Hanoi School of Public Health, Vietnam; ²Vietnam Public Health Association (VPHA); ³The Queensland University of Technology, Australia; ⁴Ryerson University, Canada.



Picture 1. Aerial herbicide spray missions in southern Vietnam 1965-1971, current prioritized dioxin hot spots and studied sites

Abstract

Approximately 366kg dioxin as a by-product was present in 76.9 million liters of herbicides (mainly Agent Orange) being sprayed by American military over Central and South Vietnam during the Vietnam War. There are currently 28 identified dioxin hot spots in Vietnam, with the two most severe hot spots being Bien Hoa and Da Nang airbases (pictures 1, 2). Elevated levels of dioxin, especially 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) – the most toxic man-made substance ever in soil, sediment, some local foods, and human blood were recently reported in these areas. The first public health intervention to reduce the risk of dioxin exposure through the food chain for local people was implemented by the VPHA and its provincial branches in Bien Hoa (2007-2009) and Da Nang (2009-2011). This research project (2012-2014) aims to undertake dioxin exposure risk assessment and the sustainability of public health interventions at the two dioxin hot spots in Vietnam after 2.5 and five years since program ceased.

Rational and objectives

In Vietnam, EHRA is still a new approach. With serious environmental health consequences of dioxin in Agent Orange and other defoliants, together with the rapid trend of urbanization, industrialization, and the high population growth rate, Vietnam has been facing considerable “traditional” and “modern” environmental health risks. In recent years, attention to the sustainability of health intervention projects/programs has been increasing at the national and international levels. Maintaining the long-term benefits of health intervention programs is a significant challenge. This study aims to:

1. Assess and compare environmental health risk of dioxin exposure in two program wards near Bien Hoa Airbase and four program wards near Da Nang Airbase with two non-program wards near Bien Hoa Airbase in 2013.
2. Assess the sustainability of the Public Health Intervention Program implemented in four wards in Da Nang and two wards in Bien Hoa dioxin hot spots after 2.5 and five years of completion, respectively.
3. Identify factors affecting the sustainability of the Public Health Intervention Program implemented in Da Nang and Bien Hoa.



Picture 2. Bien Hoa, Da Nang dioxin hot spots and risk of dioxin exposure through consuming local dioxin contaminated foods

Materials and methods

- **EHRA of dioxin** at 4 program wards in Da Nang, 2 program wards and 2 control wards in Bien Hoa will be undertaken using the guidelines for quantitative health risk assessment proposed by Australian enHealth Council 2004 (See Figure 1), with the following steps: issue identification, hazard assessment (hazard identification and dose-response assessment), exposure assessment, and risk characterization. Stakeholders engagement, risk communication, and community consultation will be undertaken along the risk assessment process.
- **For assessing the Program's sustainability**, a composite framework will be developed and applied based on the original frameworks of Shediac-Rizkallah and Bone (1998) and Bamberger and Cheema (1990) taking into account the characteristics of the intervention programs (Figure 2).
- **Potential factors that may affect the Program's sustainability will be examined**, including three groups: how the program was designed and implemented; how the program was organized; and external factors operating at the local, national and international levels Bamberger and Cheema (1990).

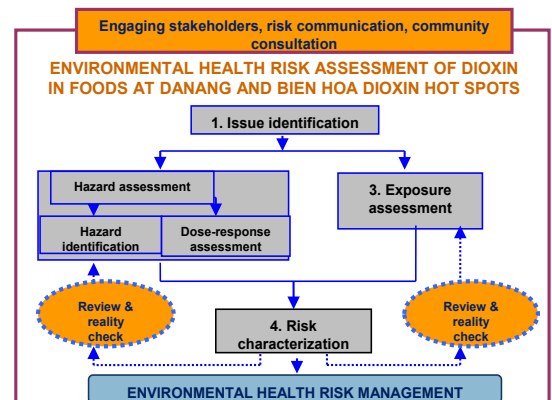


Figure 1. Steps of EHRA process (enHealth Council 2004)

Study subjects and sample sizes

- Food consumption frequency and Knowledge, attitude and practice survey at 1200 households at 6 program wards and 2 control wards.
- 44-61 food samples of 17 types of local foods will be taken and analyzed for dioxin concentrations
- 18 in-depth interviews and 6 focus group discussions.
- Secondary data on levels of dioxin in foods, soil, mud, water, air, breast milk and foods will be collected

Bamberger & Cheema (1990); Rizkallah & Bone (1998); Tuyet-Hanh et al. (2009)



Figure 2. Framework for assessing the Program's sustainability

Expected outputs/outcomes

The results of this research project will provide scientific evidence to inform dioxin risk management programs at the remaining dioxin hot spots in the country. The results will be reported to related ministries and shared with other institutions, organizations and scientists in applying EHRA and assessing program's sustainability to provide scientific evidences for sustainable management of dioxin and other environmental health risks in Vietnam.

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



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Excreta storage options and helminth egg die-off: an experiment in Vietnam

Vu Van Tu, Hanoi School of Public Health (Vietnam), RP8 Productive Sanitation, JACS SEA, IP Sandec/Eawag
Start date of PhD study: 01.04.2010

We studied the main environmental factors influencing the inactivation of *Ascaris lumbricoides* eggs during excreta storage period, following the current practice of farmers and other proposed options. The results show that the percentage of live *A. lumbricoides* eggs decreased from 76.7 % to 30.9 % after 3.5 months of storage. However, the effect of pH and temperature on the die-off of *A. lumbricoides* egg has not been clear in the first period of the experiment.

Introduction and study aim

The use of human excreta as fertilizer brings many benefits for farmers. However, it poses potential health risks if excreta is not properly treated. In Vietnam, farmers often use available materials (e.g., ash, lime and rice husk) to reduce its bad smell, moisture content, and to avoid flies during storage before using as fertilizer. These current practices are likely to increase the inactivation of helminth eggs, since dry conditions and increased pH positively affect pathogens die-off.

We studied the influence of different additive materials on helminth egg die-off. This might improve current handling practice of human excreta to provide safe fertilizer in agriculture.

Materials and method

We developed an experimental system including 24 vaults where air pipes were introduced into 12 vaults for accelerating aeration (Photo 1). Additive materials (lime, rice husks) were added to the excreta to increase the pH and temperature of the storage vaults (Table 1).

Table 1. Experimental plan of excreta storage, air pipes and additive materials

Vault option	Content	Air pipe	Number of vaults
11	Excreta (100kg) (control option)	No	3
12	Excreta (100kg)	Yes	3
21	Excreta (97kg) + lime (3kg)	No	3
22	Excreta (97kg) + lime (3kg)	Yes	3
31	Excreta (90kg) + lime (5kg) + rice husk (5kg)	No	3
32	Excreta (90kg) + lime (5kg) + rice husk (5kg)	Yes	3
41	Excreta (90kg) + lime (10kg)	No	3
42	Excreta (90kg) + lime (10kg)	Yes	3
	TOTAL		24



Photo 1. Different experimental storage vaults of human excreta

- The samples were collected once every two weeks, over 3.5 months (from T1 to T8) and pH, temperature and moisture content were recorded.
- A. lumbricoides* eggs were quantitatively analyzed by the Romannenکو method; live and dead eggs were counted. The percentage of live *A. lumbricoides* eggs were calculated by number of live eggs divided by the total number of eggs found.
- Linear regression was used in both uni- and multivariable analyses for the explanatory variables (e.g. time, pH, temperature) with the percentage of live *A. lumbricoides* eggs as the explained variable.

Preliminary results

The percentage of live *A. lumbricoides* eggs in the different storage vaults at T1 varied from 34.1% to 91.0% (mean: 76.7% ± 11.2). After 3.5 months, it significantly decreased compared to T1, varied from 47.1% to 85.6% (mean: 63.5% ± 8.5) (Figure 1).

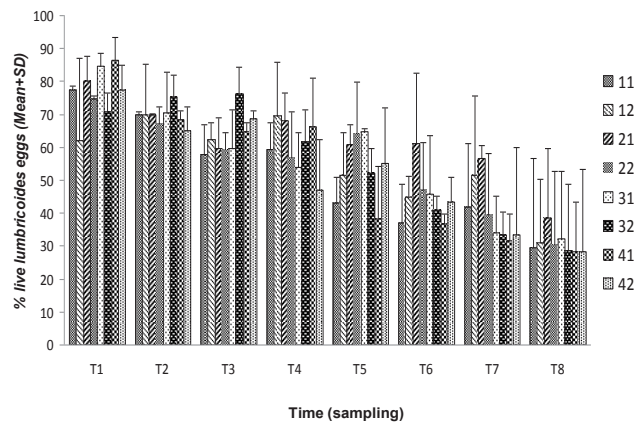


Figure 1: Percentage of live *A. lumbricoides* eggs in the vaults during the storage period of human excreta

The percentage of live *A. lumbricoides* eggs significantly decreased during the storage period from T3 ($p < 0.05$) and onwards ($p < 0.001$). However, the expected factors of pH and temperature in the different vaults were not associated with the inactivation of *A. lumbricoides* (Table 2). This result may have been due to the pH value in the vault mixed with lime decreasing rapidly (from 10.6 to 8.9; $p < 0.05$) after 1.5 months and the temperature also increasing slightly from 21°C to 30.1°C, corresponding with outside temperature.

Table 2. Relationship between percentage of live *A. lumbricoides* eggs and time, storage option, pH, and temperature

	Coef. [95% Conf. Interval]	P
Time (sampling)		
2 weeks (T2)	-0.042 [-0.129 -> 0.044]	0.337
1 month (T3)	-0.144 [-0.235 -> -0.053]	0.002
1.5 months (T4)	-0.173 [-0.266 -> -0.080]	< 0.001
2 months (T5)	-0.244 [-0.347 -> -0.142]	< 0.001
2.5 months (T6)	-0.369 [-0.526 -> -0.212]	< 0.001
3 months (T7)	-0.442 [-0.660 -> -0.225]	< 0.001
3.5 months (T8)	-0.532 [-0.739 -> -0.324]	< 0.001
Vault option		
12	0.029 [-0.045 -> 0.104]	0.434
21	0.091 [0.016 -> 0.166]	0.018
22	0.020 [-0.056 -> 0.096]	0.603
31	0.017 [-0.063 -> 0.098]	0.673
32	0.008 [-0.072 -> 0.089]	0.836
41	-0.024 [-0.116 -> 0.067]	0.599
42	-0.020 [-0.103 -> 0.063]	0.634
pH, temperature		
pH	0.007 [-0.011 -> 0.025]	0.417
Temperature	0.010 [-0.010 -> 0.031]	0.331

Outlook:

- Analyses of C, N, P, humidity in stored excreta to assess the impact of storage options on nutrient content.
- Continuation of helminth egg die-off analysis with time until 6th month.
- Identification of storage options which provide the best balance between helminth egg die-off and nutrient content for fertilizer use.



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Water management and contentious politics in Costa Rica (1821-2010)

PhD Student Felipe Alpizar, RP9 NCCR-FLACSO, Universidad de Costa Rica. felipealpizar@gmail.com
PhD Study start date: 01.10.2010.

Historically, Costa Rica has faced diverse challenges in water management (e.g. drinking water, sanitation). Recently, there has been a wide discussion about the reform of its water framework, with important political implications. This research analyses the main water management institutions and stakeholders from a political and democratical perspective.

- Background

The Human Development Report (UNDP, 2006) states the water management crisis of the world is determined by political factors. Recently, United Nations declared access to drinking water and sanitation a human right and urged the States and the international community to foster action in that sense. This research highlights that water management is an important political issue of great relevance for development.

Methodology

The research takes a qualitative approach complemented with quantitative data. The main sources of information are historical documents, official reports, laws and other legal documents, field work and interviews.

Map 1: 34 river basins in Costa Rica.



Source: Programa de Investigación en Desarrollo Humano Sostenible (ProDus) (2010).

Objectives

The research analyzes, with a historical-political perspective, the main water management institutions and stakeholders in Costa Rica.

Picture 1: Sanitation infrastructure at the Tiribí River, San José, Costa Rica. 2010.



Source: Unidad Ejecutora JBIC-AyA. Contraloría General de la República (2011).

Table 1: Access to drinking water by region, Costa Rica. 2010

Province	Access to water supply			
	Drinking water		Not drinking water	
	Population	%	Population	%
San José	1.554.156	96,7	69.647	4,3
Alajuela	767.151	87,2	112.858	12,8
Cartago	444.604	90,4	47.448	9,6
Heredia	347.807	90,0	38.765	10,0
Guanacaste	311.622	88,2	41.534	11,8
Puntarenas	384.269	87,5	54.771	12,5
Limón	285.579	86,4	44.830	13,6
Total	4.095.188	90,9	409.853	9,1

Source: Mora, Darner; Portuguez, Felipe; Mata, Ana (2011).

Picture 2: Source of water of a community owned supply system.



Source: Felipe Alpizar, 2012.

Progress/Provisional results

The historical analysis (1821-1982) shows us that there were strong pre conservationist discourses in CR since the 19th Century. It also finds a correlation between significant political transformations with changes in the water management framework. However, the current water management institutions (1982-2010) have not changed in their structural characteristics. They tend to be more complex and disperse and their results vary from high quality drinking water and coverage, to a very poor sanitation infrastructure. In the past ten years the Ministry of Environment and the epistemic community of water have tried to reform the water institutional framework, but other powerful actors have vetoed the process. At a different level many community-based initiatives are in charge of water management with small but relevant impact.

Sustainable environmental sanitation from a resilience perspective: the case of Costa Rica

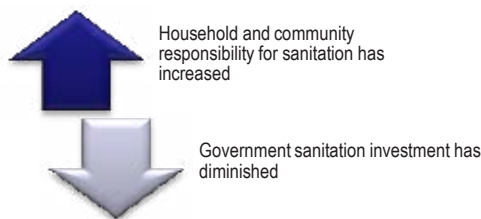
Cindy Calvo Salazar, University of Kansas- University of Costa Rica, JACS Central America
 Start date of PhD study: August, 2010.

Environmental sanitation is understood as the service provision of water for human consumption, rain water drainage, wastewater and solid waste disposal and treatment. Although Costa Rica has reached satisfactory environmental indicators and it is recognized by its "green-agenda," the country still faces serious environmental challenges in terms of planning, coordination, legislation, financing, operation, and proper maintenance of existing sanitation systems. This situation is also aggravated by a context where the responsibility for sanitation is increasingly left to the households and communities, which are not well prepared to assume such responsibility. Capacity building and promotion of resilience at all levels of the Costa Rican society is fundamental to achieve more sustainable environmental sanitation practices.

Background

In Costa Rica, due to environmental standards, sanitation systems such as sewage, septic tanks and latrines were promoted as the ultimate solution for sanitation management; however, other elements such as faecal sludge management, sewage treatment or hygiene and behaviour change have been largely neglected in the analysis of contemporary environmental health policy. Difficulties in coordination between sector institutions and weak government presence in supervision constitute serious problems to be considered in future actions for better environmental sanitation practices. Coupled with this, the role of households and communities has increased over time without strengthening of proper skills and resources.

Resilience-building processes may play an important role in understanding concrete sanitation practices and promoting positive change toward sustainability. Thus, the study of resilience directs attention towards the ways people manage their everyday sanitary decisions, as well as the potential to promote sustainable environmental sanitation conditions at different levels of society (e.g., household, community, and national levels).



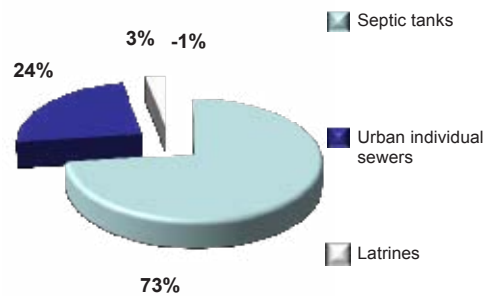
Research Questions

What are the environmental sanitation practices in Costa Rica and how can resilience-building processes play a key role in the promotion of sustainable sanitation practices?

Specific

- How resilient has the country been in addressing environmental sanitation policies and practices?
- What are the current environmental sanitation practices in three study sites and their challenges?
- What are the proactive and reactive capacities related to environmental sanitation practices in the three study sites?
- What are the interactions among household, community, and governmental levels that promote/impede sustainable environmental practices?
- What are recommendations to achieve more sustainable sanitation practices across all levels of society?

Sanitation coverage in Costa Rica



Research design

- **Case studies:**
 Three study sites with different indicators of access and quality of water provision.
- **Mixed methods data collection: Quantitative + Qualitative**
 Household surveys, qualitative focus-group interviews, individual semi-structured interviews, observation, and document analysis (householders, community leaders, and national authorities).



Local Governance for Improving Municipal Solid Waste Management in Thailand

Achara Taweasan, Asian Institute of Technology, JACS SEA:RP09
Start date of PhD study: 15.01.2009

Most developing countries suffer from municipal solid waste management (MSWM) problems, municipal waste is very often disposed of in uncontrolled dumpsites and/or burnt, causing water & air pollution. Thailand has also witnessed an accumulating problem of municipal solid waste management and disposal. Some local factors may make the problems of municipal solid waste management more difficult to solve in Thailand. Therefore, it is significant to analyze how they are managed in order to improve MSWM and the lessons learnt be transferred to other rapidly industrialising countries.



Figure 1: Dumping Site at Angthong Town Municipality © A. Taweasan

Objectives:

- 1) To assess the status of existing MSWM in Thailand;
- 2) To identify a variety of performance and governance indicators, and use them to assess MSWM;
- 3) To evaluate significant factors influencing performance of MSWM;
- 4) To obtain people's feedback and satisfaction regarding MSWM performance of local government authorities;
- 5) To provide recommendations for enhancing the performance of MSWM in developing countries.

Methodology:

- 216 out of a total of 695 Thai municipalities were selected to conduct face-to-face interviews, using standardised questionnaires on MSWM;
- 30 citizens per municipality were randomly chosen and interviewed to obtain feedback and satisfaction on MSWM performance of local government authorities;
- The tentative factor influencing MSWM performance, performance indicator and governance indicator for MSWM were analysed to assess MSWM.

Initial Results:

- For the City Municipalities (2), levels of participation was found to be high (0.81–1.00), while issues such as rule of law, accountability and transparency were found to be at good levels (0.61–0.80);
- For the Town and Tambon Municipalities, governance aspects were assessed at a satisfactory level (Figure 2).

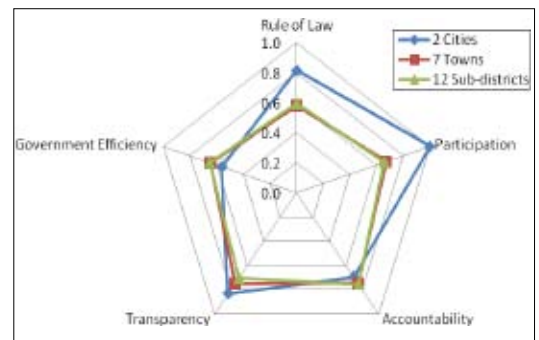


Figure 2: Spider diagram depicting mean values of governance performance results from key informant interviews.

Governance performance and MSWM performance indices show a positive correlation, shown below in the upwards sloping pattern of Figure 3.

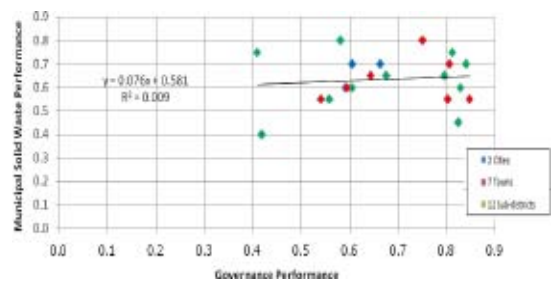


Figure 3: The Relationship between governance performance and MSW performance

Sanitation challenges in Kampala slums and intervening factors

Innocent K. Tumwebaze, University of Zurich, JACS East Africa
 Start date of PhD Study: September 2009

This presentation shares findings from a study conducted in 50 randomly selected slums of Kampala to ascertain the sanitation situation among urban slum dwellers. The findings are key for understanding the constraints affecting improved sanitation demand and behavior in use of sanitation facilities in such settlements.

Background and Rationale

The increase in Uganda's urban population has led to profound growth of informal settlements and declining access to improved sanitation especially in Kampala City. Inadequate knowledge about the magnitude of the sanitation challenge and mediating factors has limited the effect and visibility of most slum interventions. This study aimed to bridge the knowledge gap by producing empirical evidence that is of importance to all stakeholders to have interventions directed to defined challenges.

Methodology

- Cross-sectional study conducted in 50 randomly selected urban slums of Kampala city (2010).
- 1500 household respondents interviewed.
- Data collected using semi-structured household questionnaires, supplemented by an observational checklist.



Figure 2: Data collectors verifying a sanitation facility

Research Objectives

- Assess main sanitation challenges in Kampala's urban slum settlements.
- Determine the factors that influence households' demand and behaviour towards improved sanitation in Kampala's urban slum settlements.

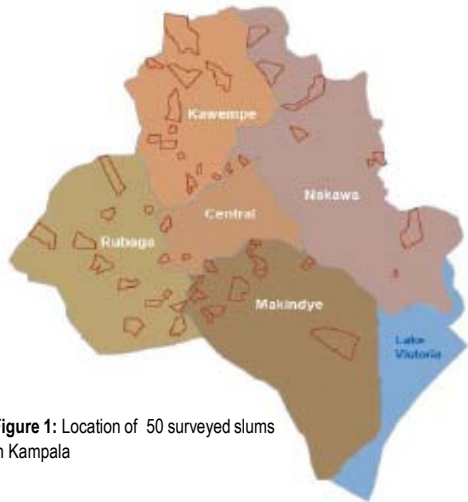


Figure 1: Location of 50 surveyed slums in Kampala



Figure 3: Aerial view of Butaka-Bukirwa slum

Key results

- 90% of the respondents had access to on-site sanitation facilities.
- 84% of slum households use shared toilets.
- About 70% of the facilities were traditional pit latrines with a slab.
- Only 47% of the facilities are clean enough to use
- 52% of the respondents not satisfied with the facilities they use.
- 41% of the traditional pit latrines with a slab serve had been in use for more than 5 years

2012/13 Research outlook

- Piloting of cleaning interventions, targeting users of shared facilities.
- Pre-intervention and evaluation surveys of the cleaning intervention.
- Dissemination of research findings in form of publications, policy briefs, conferences and workshops.

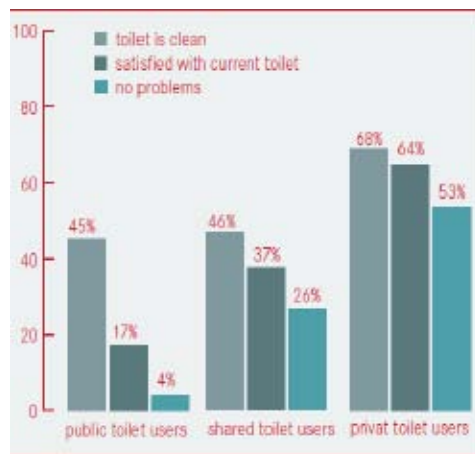


Figure 4: Satisfaction and cleanliness of sanitation facilities in Kampala's slums © Kampala Policy Brief, 2011

Demographic and health assessment of mobile populations and their livestock in Lake Chad area

Vreni Jean-Richard, Swiss TPH, JACS West Africa
Start date of PhD study: 01.01.2010

Mobile populations of several ethnic groups share the decreasing resources around shrinking Lake Chad. Demography and density of their communities and their livestock were assessed using mobile phone and GPS technology. Additionally, the occurrence of the liver fluke (*Fasciola* spp.) in slaughtered livestock was assessed with a transdisciplinary approach.

Background

Pastoralists in the Sahel are adapted to the special conditions of the semi-arid ecology, using mobility as an effective way to manage the uncertainty related to resource availability. However, mobility often hinders access to social and veterinary services and consequently there is a lack of basic data and information on demographic indicators of the human and livestock populations.

Objectives:

1. To assess the demography of mobile pastoralists camps and sedentary villages for people and livestock and to assess their local livelihood priorities
2. To test and evaluate a new approach to mobile demographic and health surveillance for mobile pastoralists and their livestock by means of mobile phone technology.
3. To assess the seasonality of *Fasciola gigantica* infections of livestock in slaughterhouses and to relate the prevalence to exposure risks of animals

Methods and results telephone study:

In south-eastern Lake Chad area (Figure 1), a cohort of 20 mobile pastoralists' camps was equipped with mobile phones. A pilot mobile demographic surveillance system was established covering 600 people and their livestock during more than one year, with regular telephone interviews with nomadic camps' heads and their wives (Figure 2). Female pregnancies were followed to establish miscarriage and infant mortality, which is difficult to do in retrospective studies. We also recorded travel routes (Figure 3). During the rainy season, mainly Gorane pastoralists left our study zone to go to the Kanem region. They returned in the dry season to the Lake area.

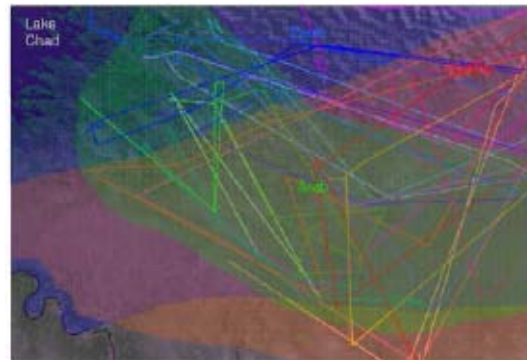


Figure 3: Travel routes of 20 camps of three ethnic groups of cattle breeders (8 Peulh, 7 Gorane, 5 Arabs) in south-eastern Lake Chad area May 2011 - May 2012

Figure 4: Spatial prevalences of *Fasciola* spp. in cattle (n=130), goats (n=616) and sheep (n=132). We see increasing prevalences with nearer distances to Lake Chad

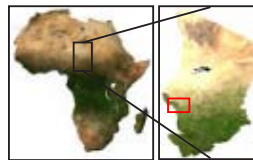
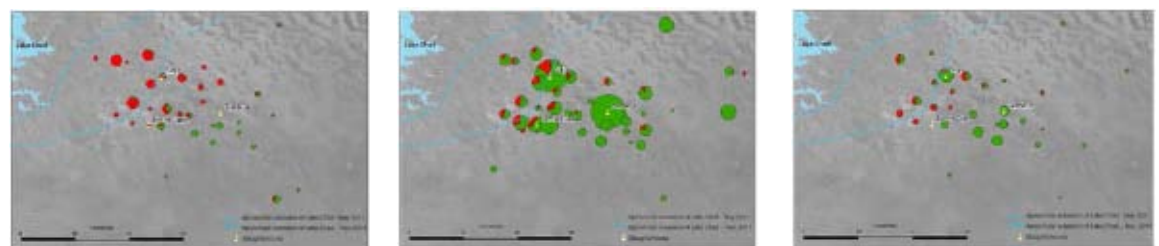


Figure 1 above: Study zone in Chad



Figure 2 right: Participant of the mobile demographic surveillance study with his wife and herd, ready to move to another pasture area

Transdisciplinary study of geospatial prevalence of *Fasciola* spp. in livestock

Background and method

We have assessed local livelihood priorities during the demographic and health study. After water and pasture availability, mobile communities perceived veterinary health as a greater priority than i.e. human health or access to schools. Camp leaders stated that animals feeding in Lake Chad water were often infected with liver-parasites (*Fasciola* spp.) and the decrease of milk caused by the disease was perceived as devastating, since it affects not only nutrition but also household-economy due to decreasing income of milk sales at markets.

To follow up on this information, all livestock slaughtered in 3 slaughterhouses in the zone was examined for presence of *Fasciola* spp. during one year (Dec 2010 – Dec 2011). Grazing patterns and origin of the animals were also recorded. Ongoing is the characterisation of the collected parasites (species by genetic methods).

Results and discussion

The slaughterhouse prevalence of *Fasciola* spp. was 68% in cattle, 12% in goats and 23% in sheep. A clear relation between grazing near the lake and *Fasciola* spp. infection was demonstrated. Highest prevalences were found in animals of the Peulh ethnic group, who stays close to the lake water or on islands far inside the lake during the dry season. In contrast, Gorane pastoralists usually do not arrive close to the lake. None of the Gorane cows had grazed in the lake. Of the 208 Gorane animals only one goat was infected with *Fasciola* spp. As expected, Arab seminomads animals showed a prevalence between that of the two other groups, since they only move towards the lake when pastures around their villages are finished. These results strongly suggest the Lake Chad as the source of infection.

Prediction of Soil Organic Carbon for Ethiopian Highlands Using Soil Spectroscopy

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1. Abstract

Rapid and efficient technologies such as soil spectroscopy could help Ethiopia achieve a break-through in monitoring soil organic carbon changes due either to environmental degradation or to sustainable land management. Soil spectroscopy was applied for various Ethiopian soil types, ecologies, and landscapes to predict soil organic carbon content (SOC). Soil samples were acquired from Ethiopia's National Soil Testing Centre and through intensive field sampling. 20% of the samples were set aside to test prediction; 80% were used to develop calibration and validation models. Depending on the number of samples per watershed, cross validation or test set validation was used. The stability of models was evaluated based on coefficient of determination (R^2), residual mean square error (RMSE), and ratio performance deviation (RPD). Overall, soil spectroscopy performance ranged from excellent to very good.

2. Introduction

Ethiopia requires efficient and reasonably priced technologies to help address environmental degradation and meet basic societal needs such as livelihood and food security. To successfully introduce or adopt sustainable land management practices developed elsewhere, a comprehensive and up-to-date analysis of environmental information (soil, climate, geology, etc.) is needed. However, financial and technical limitations often hamper the possibility of obtaining detailed environmental analyses, for example using current conventional soil analysis methods in Ethiopia. Soil spectroscopy is a fast and efficient approach capable of producing exhaustive soil evidence in a short time; it has not yet been used in the country. In view of the country's need for more efficient technologies and better knowledge of environmental conditions, a research project was carried out to evaluate the potential of soil spectroscopy for predicting soil organic carbon for Ethiopia.

3. Materials and Methods

The study area covers most of the Ethiopian Highlands' agro-ecology, soil, land use and farming systems. Wet chemistry and spectral analysis was done for 1159 soil samples. The Walkley-Black method was used for the wet chemistry analysis. Samples were scanned with Analytical Spectral Devices (350–2500 nm) using mug light. Each sample was scanned twice with 90-degree rotation and then the two repeated measures were averaged. The spectral data was compressed by taking the spectral data of every 10th reading. Data below 380 nm and above 2451 nm were removed because of low signals. For watersheds with few samples, models were developed with 80% using cross validation and tested with the remaining 20%. In the case of watersheds with a sufficient number of samples, the calibration set, validation set, and test sets were 60%, 20%, and 20% of the total soil sample, respectively. The partial least square regression (PLSR) algorithm was used for model development. Models were selected based on high values of R^2 and RPD with lower values of RMSE.

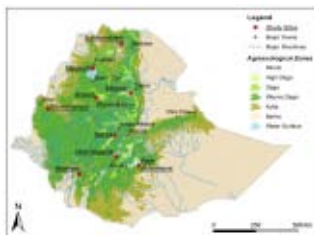


Figure 1: Map showing the study sites

4. Results

4.1 Soil organic carbon

Table 1: Statistical summary of the samples analysed for soil organic carbon content in %

Site	samples	Minimum	Maximum	Median	Mean	SD	1st quartile	3rd quartile
Anjeni	302	0.20	13.68	1.53	1.67	1.34	0.90	2.15
Bale	75	1.23	7.50	3.14	3.35	1.49	2.26	4.22
Basketo	102	0.28	8.05	2.18	2.30	1.60	0.94	2.77
Benishangul	78	0.10	5.46	0.70	1.19	0.98	0.49	1.80
Kersa	171	0.11	6.07	1.69	1.86	1.02	1.23	2.22
Kolatambien	65	0.28	4.59	0.83	1.10	0.86	0.53	1.29
Maybar	144	0.19	7.58	1.56	1.97	1.33	1.14	2.40
Megech	148	0.16	2.54	0.88	0.92	0.38	0.74	1.11
Wondogenet	74	1.23	8.29	3.1	3.37	1.38	2.34	4.21

- Soil organic carbon varies between and within sites, which is critically important for model development.
- It is within the range of research reports for the Highlands of Ethiopia, indicating dependable results and recommendations.

5. Conclusion and Recommendation

Based on the results of the study, soil spectroscopy is an efficient method for predicting soil organic carbon in the Ethiopian Highlands. For both calibration and validation sets the value of R^2 was $> 76\%$, with residual error mean square $< 0.6\%$, and RPD was > 2.5 for 78% of the sites, indicating that the models developed are stable. Thus soil spectroscopy should be promoted for routine applications for assessing SOC in the Ethiopian Highlands.

Acknowledgement

This study was supported by the NCCR North-South research programme. We wish to thank the Centre for Development and Environment (CDE), University of Bern, for providing the spectrometer. We would also like to express our gratitude to the Ethiopian National Soil Testing Centre for providing access to the soil archive. Thanks to the Amhara Regional Agricultural Research Institute (ARARI) for its support and facilitation. We further extend our gratitude to Mr Berhanu Debele and Mr Deresse Gebewold for their facilitation and administrative support. Finally, thanks to Mr Lorenz Ruth for his keen assistance with spectral measurement.

4.2. Spectral Pattern Recognition using Principal Component Analysis (PCA)

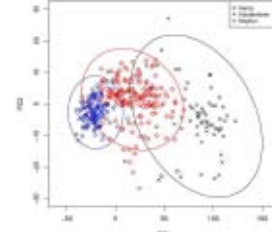


Figure 2: PCA plots of selected study sites

- The results showed that spectral values of different sites are clearly separated with only few overlapping, indicating independent model development for highly variable watersheds.

4.3 Model Calibration, Validation, and Testing

Table 2: Summary of model results

Study sites	Model	No. of samples	R^2	RMSE (%)	RPD
Anjeni	Cal.	145	90	0.46	3.1
	Val.	96	88	0.44	3.1
Bale	Cal.	59	93	0.42	3.7
	Val.	59	86	0.52	2.7
Basketo	Cal.	81	93	0.46	3.9
	Val.	81	89	0.57	3.0
Benishangul	Cal.	64	97	0.18	6.0
	Val.	64	91	0.30	3.4
Kersa	Cal.	135	90	0.35	3.2
	Val.	135	89	0.44	2.4
Kolatambien	Cal.	51	88	0.33	2.3
	Val.	51	75	0.44	1.9
Maybar	Cal.	115	87	0.53	2.8
	Val.	115	84	0.57	2.5
Megech	Cal.	118	94	0.11	4.0
	Val.	118	85	0.15	2.6
Wondogenet	Cal.	57	90	0.46	3.2
	Val.	57	86	0.52	2.7

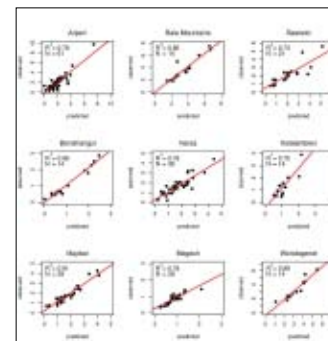


Figure 3: predicted vs measured

- Under all sites the results of calibration, validation, and testing model results were stable

Managing Groundwater in the Agricultural Zone of the Chui Valley in Kyrgyzstan – Example of the Lower Sokuluk River Basin

Mira Arynova, Institute of Water Problems, Kyrgyz Republic, RP11, JACS Central Asia
Start date of PhD study: 06.04.2011

The Chui Valley is the most inhabited and densely populated part of the Kyrgyz Republic. The main activity of the population living in the valley is agriculture. Currently, processes of land salinization and swamping that account for 17% of the total agricultural area are intensifying, mainly due to inappropriate water management as well as a lack of investment in the rehabilitation of existing irrigation and drainage systems.



Fig. 1: Destroyed irrigation canals have been causing salinization and spreaded reeds



Fig 2: One of the observation wells

Objectives

The purpose of the study is to analyse the current groundwater level (GWL) and its saline composition in the region with a view to help developing appropriate measures to mitigate the negative impact of anthropogenic factors and processes on the condition and productivity of irrigated land.

Methodology and methods

For comparative purposes, the study area is divided into three zones with selected case studies: an upper (Pervomayskoe village), a middle (Studencheskoe village) and a lower (Jangy-Jer village) zone.

The methods applied consist of:

- Field studies;
- Literature review and statistical analysis;
- Stakeholder surveys;
- Cartographic studies;
- Modeling and forecasting

Provisional results

An inventory of observation wells reveals that of 280 wells working in 1990, only 22 wells still existed in 2010 (8%).

A digital map showing the groundwater level in the lower part of Sokuluk River Basin has been elaborated (Fig. 3).

Table 1 shows that 38.5% of irrigated lands have an inadmissible groundwater level.

The dynamics of GWLs has been analyzed. It shows an increase in waterlogged settlements and areas of degraded lands, especially in 2003-2008. (Fig.4)

Table 1: Distribution of areas by height of groundwater level (GWL)

GWL, m	< 1.0	1.0 - 1.5	1.5 - 2.0	2.0 - 3.0	3.0 - 5.0	> 5.0
Area, ha	1,644	8,219	12,341	5,411	10,100	16,638
% of total area	2	7	1.5	28	25	36.5

Future steps

- To elaborate scenarios of groundwater level fluctuation and impact of fluctuations on the productivity of irrigated land;
- To elaborate recommendations for local water and land management institutions and farmers for appropriate groundwater use, with a view to improving irrigated agriculture in the Chui Valley and other comparable areas in Kyrgyzstan.

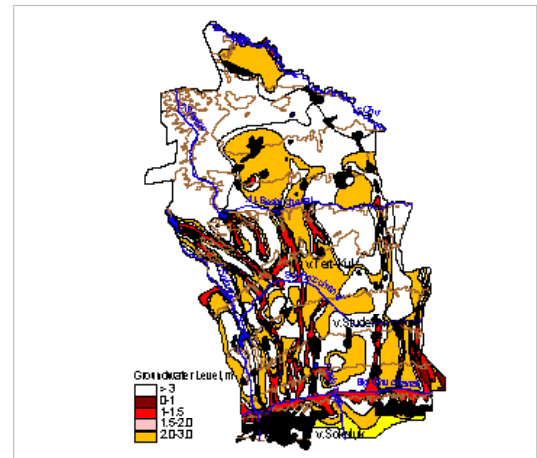


Fig 3. Groundwater level map

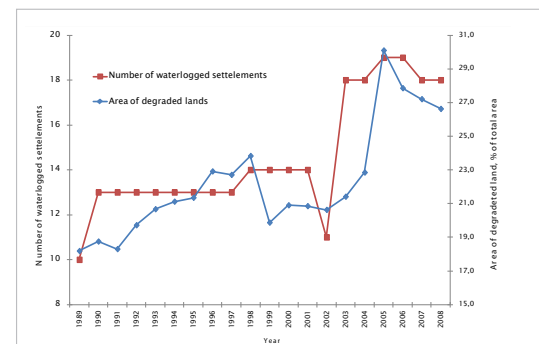


Fig. 4: Dynamics of degraded lands and waterlogged settlements

A Framework for Rapid Soil Organic Carbon Assessment

Christian Hergarten, PhD candidate, Centre for Development and Environment, University of Bern, Switzerland

Widespread soil degradation is a major problem for many developing countries. Soil loss and productivity decline on agricultural lands are the most severe consequences. Therefore, the development of appropriate monitoring and assessment tools ranks high on international agendas. Soil organic carbon (SOC) has been identified as an important indicator for soil quality. Precise prediction and mapping of SOC is crucial for planning of soil conservation measures and for the elaboration of future carbon refund applications.

Background and rationale

Land degradation is threatening the productivity and sustainable use of agriculturally used soils and has been acknowledged as a major concern for the sustainable management of land in many areas around the globe. There is a need for rapid and sufficiently accurate land and soil monitoring tools, providing synoptic and reliable measurements. Soil Organic Carbon (SOC) has been identified as a key indicator for soil health for many agriculturally used soils, controlling aggregate stability as well as nutrient cycling capacity. Therefore, this study investigates methods for efficient mapping, monitoring, and modeling of SOC levels, using satellite-derived land cover and land use information, field measurements, and carbon modeling approaches.

Study areas

The study sites for developing the assessment approach are located in western Tajikistan and in the Ethiopian highlands. Both regions are affected by land degradation such as soil erosion, productivity decline and nutrient depletion. Due to poor land management and economic pressure, cultivation of steep slopes is nowadays common in both regions, causing widespread soil erosion with highly negative impacts on soil quality and productivity. The Ethiopian study sites are all concentrated in the highlands of the country; an area that has been intensely used for centuries for agricultural production and is referred to as the bread basket of Ethiopia.



Figure 1: Degraded landscapes in Ethiopia (left) and in Tajikistan (right)

The Central Asian case studies are focusing on the foothills of the central part of Tajikistan, which are made up mainly of quite fertile though easily erodible loess soil deposits.

Methodology and approach

The envisaged assessment framework aims to focus on current soil organic carbon levels as well as on past changes in the land cover (LC) and land use (LU) history, indicating major shifts in the soil carbon budgets. The LC and LU change analysis is based on Landsat and CORONA satellite imagery, using a robust object-based classification approach. Major changes can be detected dating back to the 1960s or 1970s. Changes which happened prior to this can only be estimated, mostly based on photographs and expert knowledge.

The **assessment of current SOC** levels is a crucial and reliable parameter in such a framework. Infrared-based soil spectroscopy provides a powerful and yet affordable technology, replacing or complementing wet chemistry in many labs these days.

However, lab-based IR spectroscopy still relies heavily on sample processing. Therefore, field-based spectroscopy in conjunction with satellite-based imaging spectroscopy provides a more rapid approach to collecting the same information comprehensively, although limited to surface soils.

Results from selected studies in Tajikistan are given in Table 1. The calibration model developed from the lab measurements is clearly outperforming the models build from the field- and satellite-derived spectra, reflecting its much higher signal-to-noise ratio.

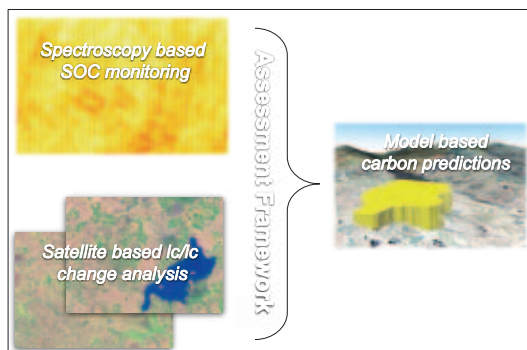


Figure 2: Soil organic carbon assessment framework

Spectra source	Spectral range	R ²	RPD
Lab spectroscopy	360 - 2470	0.79	2.31
Field spectroscopy	400 - 2450	0.69	1.70
Hyperion (satellite)	390 - 2440 (parts)	0.64	1.65
WorldView-2 (satellite)	All 8 bands	0.59	1.48

Table 1: Calibration model results from different spectra sources

Results and discussion

Past SOC dynamics have been shown to correlate closely with LC/LU history. Major changes, e.g. from forest to grassland, usually result in decreasing SOC stocks. However, smaller changes in land use often cause much less prominent variations in SOC stocks. Therefore, LC/LU-based past forecasts are usually fraught with uncertainties.

Assessing current stocks of SOC is comparatively easy; tools using infrared spectroscopy allow for sufficiently accurate assessments. As listed in Table 1, spectra can even be derived from satellites, although burdened with inferior signal to noise ratios (SNR).

SOC scenario models such as the Carbon Benefit Project approach are highly data driven and have to deal with many imprecise parameters for model calibration, which in turn makes them difficult to validate.

Challenges and recommendations

SOC stock estimates based on land cover and land use changes need to be done very carefully and are very difficult to validate, if no major land cover and land use changes can be identified.

Soil carbon mapping using satellite imagery is a very promising approach for rapid surface SOC assessments, but it currently suffers from poor data availability and low data quality. Due to its dependence on technology development, major improvements such as an enhanced SNR will be available only after the launch of new satellites.

Reliable SOC projections under various SLM scenarios are dependent on locally calibrated data. Therefore, this approach is very much data demanding and sensitive to the quality of the input data.

Acknowledgements: This study is supported by the NCCR North-South research programme. I wish to thank the Centre for Development and Environment (CDE), University of Bern, for providing the necessary equipment and support. I would also like to express my gratitude to the partner institutions in Tajikistan and Ethiopia – the National Soil Institute of Tajikistan as well as the Amhara Regional Agricultural Research Institute (ARARI) for providing logistical and administrative support.

A Soil Spectroscopy Library and its Application for Soil Fertility Assessments on Agricultural Lands of Tajikistan

Farrukh Nazarmavloev, Centre for Development and Environment (CDE), University of Bern, Switzerland, University of Central Asia
Start date of PhD study: 01.02.2012

Agricultural fields are very difficult to assess in the short term using conventional monitoring techniques, especially over a large scale. The traditional methods of soil properties analysis, which are time-consuming and involve cumbersome sampling and costly laboratory analysis, can be replaced by using modern technologies based on spectroscopic and electromagnetic methods. Mid- and Near-Infrared measurements provide an easy, cheap, and quick way to assess large numbers of soil samples in a short time, which can help to make relevant recommendations for land use, natural resource management, control of resources by farmers to obtain better results from agricultural land.

Background and rationale:

The need for better monitoring of natural resources is increasing, especially in developing economies that are dependent on their natural resources for much of their income. Low soil fertility and soil degradation in smallholder agricultural systems in the mountainous areas of Tajikistan present big challenges for food production and environmental sustainability. Reflectance spectroscopy in soil science offers great potential for soil properties analysis. This research study investigates methods to develop the Tajik national soil spectra library and its application at farmer level, based on key indicators for soil fertility. The spectral library will help to predict several soil properties with minimal sample preparation and in a cost effective and rapid way.

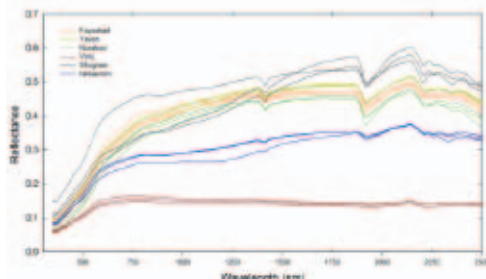


Figure 1: Soil reflectance spectrum. Samples from the Tajik national soil spectroscopy library

Objectives:

The main objective of this PhD research is to evaluate, adapt, and establish soil spectral library approaches and methods for impact assessment and monitoring of soil fertility, as well as for improving advisory services for farmers in Tajikistan. The research questions are:

- How can different laboratory techniques, analytical procedures, and laboratory measurements be integrated in a national soil spectral library?
- How can techniques and procedures be standardised at national level?
- How can regression models developed for one area be further elaborated to be applied in other areas?
- How can soil samples representing the soil variability of the country best be selected?
- What are suitable precision farming approaches for Tajik smallholders?
- What is the current status of soil fertility?
- How can soil spectroscopy be used for managing fertilizers?

Methodology and methods:

The planned study aims to assess and evaluate the existing soil spectral library of Tajikistan for further enrichment. The different measurement techniques and approaches will be compared considering the existing soil spectra. The applicability of the spectral library will be tested for fertilizer recommendations and decision making support at farmer level.

The methodology for soil sample collection will be developed taking into account the soil variability of the country. Additional data representing different soil types and land use practices at the farm level will be collected and measured. Various statistical packages available to manage the spectral data with different mathematical algorithms and chemometric tools such as Multiple Linear

Regression (MLR), Principal Component Regression (PCR), Partial Least Squares regression (PLS), Local Weighted Regression (LWR), Ridge Regression and regression methods based on Artificial Neural Network methodology (ANN) will be used. The most common pre-processing techniques for near-infrared spectra, scatter-correction methods, and spectral derivatives methods will be evaluated. Moreover, the performance of the different instrumental settings in the field and laboratory will be tested. The approaches of the different methods and different laboratories to the chemical analysis of the soil properties will be compared.



Figure 2: Soil spectral measurement in Soil Institute, Tajikistan. Photo F. Nazarmavloev 2012

Progress:

This study is at the initial stage and the full proposal is being finalized according to the NCCR North-South requirements.

Expected Result:

- Main indicators of soil fertility for crop production based on IRS
- Application of the spectral library for improving a fertilizer recommendation system
- Soil fertility map at small-farm scale for agricultural planning
- Implications for crop production, fertility management, and soil sustainability



Figure 3: Faizabad. Spectral measurement with ASD's FieldSpec. Photo F. Nazarmavloev 2010

Ecosystem Services: Quantification of Nutrients Production by Selected Large Herbivores in Laikipia, Kenya

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²Soil and Water Science Department, University of Florida, Gainesville, Florida, United States

JACS: East Africa, RP11; PhD start date: August 2008.

Large herbivores influence the carbon and nutrient production in tropical savanna through fecal matter deposition.

INTRODUCTION

•Wildlife and livestock co-existence is a common phenomenon in the African tropical savanna, where they share resources.

•Very little is known about nutrient production of large herbivores.

•Macro nutrients – especially N, P, and K – limit plant productivity in most of the African tropical savanna.

Objective:To determine C, N, P and K production in the fecal matter of browsers (camel, giraffe), mixed feeders (impala, elephant), and grazers (cattle, zebra).

Hypothesis: The browsers deposit higher amounts of C, N, P and K compared to grazers, due to feeding on nitrogen fixing acacia woody species with nutritious leaves and deep roots that easily scavenge for nutrients.

MATERIALS AND METHODS

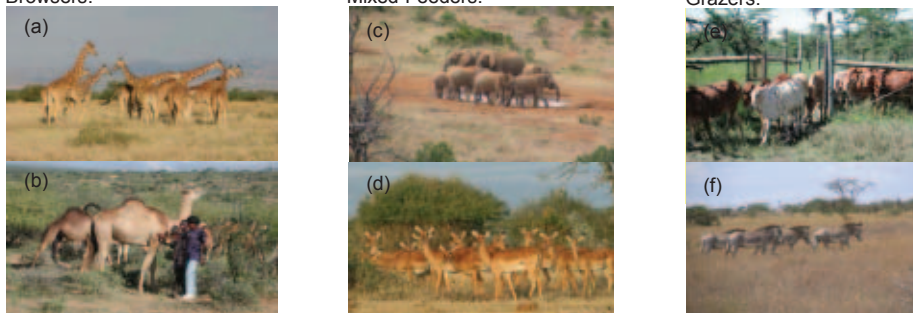
Study site: The research was conducted at Mpala Research Centre (MRC) and associated Mpala Ranch, which encompasses 190 km² of semiarid savanna within the Laikipia District of Rift Valley Province, Kenya.

Methods: Six composite samples of fresh fecal matter from different herds of each herbivore species were collected. Analysis was done for C, N, P, and K.

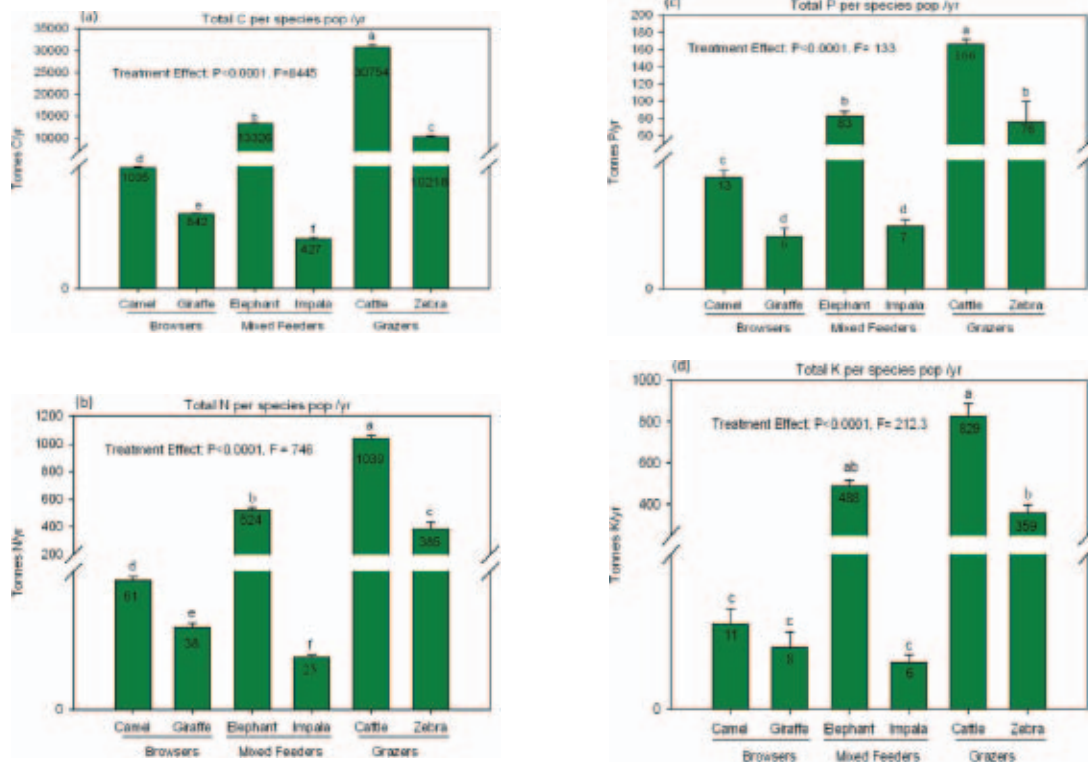
CONCLUSION

Large cattle and zebra populations and the daily high fecal matter production of elephants greatly influence the production of C, N, P, and K, while other species have a lesser influence.

Figures 1: Selected large herbivores: (a) Giraffe; (b) Camel; (c) Elephant; (d) Impala; (e)Cattle; (f) Zebra; in Laikipia



Figures 2: Fecal matter: (a) Carbon; (b) Nitrogen; (c) Phosphorus; (d) Potassium



Wind Erosion Effect on “Protected” and “Unprotected” Areas in Ishkashim, Tajikistan

Aslam Qadamov, Pamir Biological Institute, JACS CAS, RP11
Start date of PhD study: 01 January 2010

Due to rapid deforestation of shelterbelts in Ishkashim, eastern Tajikistan, the cultivated lands are in risk. During the last decades because of not regulate deforestation, most of the fertile lands affected by wind erosion. The results of the research shown that soil organic C, total N and total P decreased significantly with an increase in the eroded depth in the lightly and severely eroded sites compared with the protected sites. Total K, average soil water content, and the pH value in the severely eroded sites were significantly higher than those in the protected sites.



Figure 1. In protected areas soil deflation is low and soil fertility is high.



Figure 2. In unprotected areas soil deflation is so high that soils can no longer be used for agriculture.

Introduction

Agriculture is widespread in Ishkashim, eastern Tajikistan, where wind erosion of farmland is very common because of sandy soils and dry, windy weather. Because of the high level of poverty and fuel shortage, the local people destroyed the forest belts (created to protect the cultivated land from wind erosion). About 70 % of farmlands are degraded by wind erosion. However, there is no data available on the effects of wind erosion on soil properties, particularly on the effect of accumulated sand on the agricultural soil environment in semi-arid areas of Tajikistan. Thus, the object of the study is to analyze changes in the physical and chemical properties of agricultural soils due to long-term wind erosion and leeward sand accumulation, and to evaluate the relationships between different soil protective measures on soil properties and degradation processes.

Methodology

- Soil samples were taken from protected and unprotected areas to analyse the changes in soil properties.
- The intensity of the sand accumulating effect was examined by using gaging poles installed in selected sites.
- Standard WOCAT methodologies were used for documenting and determining the types of land degradation actually happening.

Progress

- 120 ha of degraded lands were surveyed using the WOCAT methodology and land degradation types determined.
- Soil samples were analysed and the changes in soil properties were identified .
- The intensity of wind erosion on differently covered soils was identified.
- The sand accumulation effect on cultivated lands and the relationships between and effects of different soil protective measures on soil properties and degradation processes were determined.

Results and conclusion

The data indicate that in arid and semiarid areas, soil protection is one of the most important factors influencing the storage of soil C, nutrients, and water in nutrient-poor sandy soils. In our study, soil organic C, nutrients, and soil moisture had decreased significantly compared to protected lands. Thus soil protection must be considered one of the main factors influencing plant productivity in some areas.

Type of lands	Organic C (mg/1kg)	Total N (mg/kg)	Total P (mg/1kg)	Total K (mg/1kg)	pH
Protected	35	40	45	40	7.2
Unprotected	10	18	7	55	8.6

Figure 3. Changes in soil properties due to wind erosion and protection measures.

Assessing soil erosion using radionuclide Cs137 techniques in the Bodomo watershed, Tajikistan

Hasan Safarov, PhD student Moscow State University / JACS CAS
Start date of PhD study: 01.11.2009

Soil erosion and land degradation are considered to be the most acute problems for Tajikistan in the agricultural sector today, which require development of soil conservation technologies for reducing current dynamics of soil erosion and loss of soil organic matter. The big demographic growth in the Republic, has led to insecure access to irrigated areas per capita, despite intensive development of new irrigated lands over the last 50 years. Besides, in the Republic there is 236'400 ha of non-irrigated arable land, where erosion processes are widespread. If soil loss on these lands is approximately equal to 30 t/ha then the total annual soil loss results in around 7,9 million tonnes. The overall goal of the proposed study is to determine the impact of sustainable land management system for reducing soil erosion in loess hills in central Tajikistan.

METHODS: Erosion processes are difficult to quantify due to high spatial and temporal variability of closely interlinked factors. The isotope Cs137 was applied as erosion marker. Using the Cs137, the sheet and rill erosion rate at representative sites within the watershed was determined. For detection of Cs137 activity in the soil gamma-spectrometric analysis was conducted. Using the result of this FRN (fallout radio nuclide) method, it is the aim to calibrate the USLE (universal soil loss equation) for the study watersheds and to determine the individual erosion factors. The USLE is defined by $A=RKLS\text{C}P$ (A- is the average annual soil loss (t/ha/year), R- the rainfall erosivity index, K- the soil erodibility factor, L- the slope length factor, S- the slope gradient factor, C- the vegetation cover factor, and P- the soil protection factor. The results of the FRN method provides us with annual soil loss rates A. As a basis for the calculation of the C and P factors, the different land use systems of Bodomo watershed were mapped based on a WorldView2 satellite image recorded on 2 July 2010.

Study area:



Bodomo watershed:

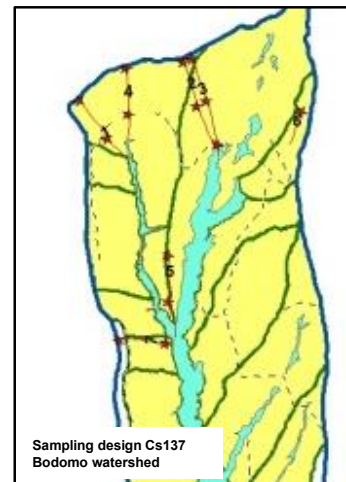
area: 87ha
RS-data: WV-2
Location:
N38°35'344
E069°19'919
District: Faizabad



RESULTS:

QUANTITATIVE ASSESSMENT OF SOIL LOSS PER HA IN BODOMO WATERSHED - EROSION, + ACCUMULATION

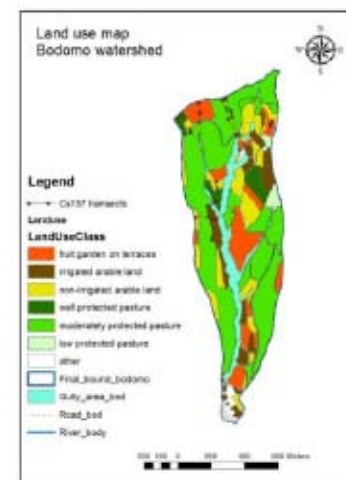
TRANSECT ON THE MAP	LAND USE SYSTEM	EROSION RATE	AVERAGE SOIL LOSS (T / HA)	STEEPNESS (Degree)
1	WELL PROTECTED PASTURE	-3,1 - -5,0	-4,0	2-36
2	MODERATELY PROT. PASTURE	4,3 - -19	-6,0	2-36
3	LOW PROTECTED PASTURE	-2,9 - -23,2	-11,6	2-27
4	IRRIGATED ARABLE LAND	-32,0 - -107,0	-59,6	3-10
5	NON-IRRIGATED ARABLE LAND	-40,6 - -66,9	-53,7	10-15
6	FRUIT GARDEN ON TERRACES	-15 - -119	-67,2	6-8



- The case study showed that high erosion rates are prevalent on cultivated plots of Bodomo watershed. The FRN model showed that land use systems showing high soil erosion rates are linked to land cultivation.
- On the steep slopes pastures are located. The FRN model indicates low annual erosion rates for well, moderately and low protected pastures, with 4, 6 and 11,6 t/ha, respectively.
- Accumulation processes within the watershed are not constant. The seasonal rainfall is a reason for soil erosion and accumulation in lower zones. The result of this study showed that the accumulation rate in the deposition zone is >1cm per year.
- Gully formation processes are intensively increasing. The gully formation is a indicator of the prevailing land management and farming practices.

Acknowledgements:

The research for the present study was conducted within the framework 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 (SNSF), the Swiss Agency for Development and Cooperation (SDC), and the participating institutions.



Detecting Landscapes Dominated by Shifting Cultivation at Different Scales in the Lao PDR

Kaspar Hurni, Centre for Development and Environment (CDE), University of Bern, Switzerland, JACS SEA, RP12
 Start date of PhD study: 01.12.2009

Shifting cultivation landscapes in northern Laos have been subject to transformations over the last decade. Information on the dynamics of these landscapes is scarce. To provide information on the policy-relevant mesoscale we present two approaches allowing the detection of shifting cultivation landscapes on national to province level and on district to local level.

Background and rationale

In the Lao PDR shifting cultivation is still a widespread and important subsistence agriculture system. Over the last decade the landscapes dominated by shifting cultivation in the northern Lao PDR became more and more subject to transformations.



Conversion of a formerly shifting cultivation area to a rubber plantation

Among the main factors influencing landscape dynamics are market liberalisation and policies targeting shifting cultivation. Commonly used approaches to map shifting cultivation landscapes using remote sensing images are not appropriate to provide information on the dynamics at the policy relevant mesoscale. To overcome this gap we present two approaches that allow the detection of the landscapes dominated by shifting cultivation and its dynamics at national to province level and at district to local level.

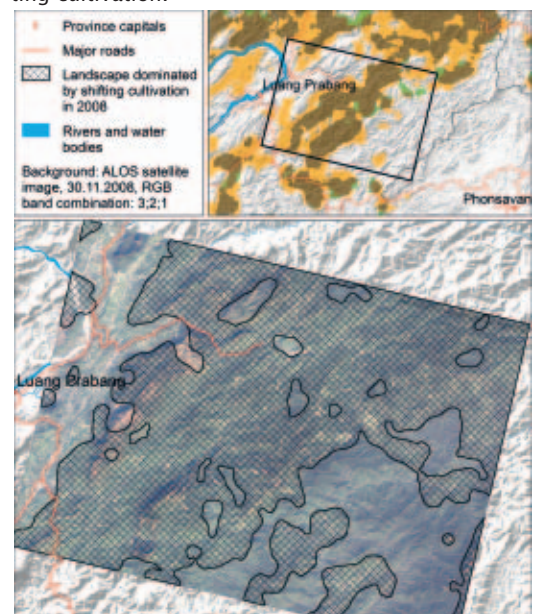
Approaches

For the area of northern Laos (national to province level) the detection of the landscape dominated by shifting cultivation was performed using MODIS EVI time series data. We mapped the shifting cultivation plots over ten years. To delineate the area and dynamics of the landscape dominated by shifting cultivation we assessed the co-occurrence of the plots cleared in the different years for two time steps using landscape metrics.



Dynamics of the landscape dominated by shifting cultivation in the northern Lao PDR between 2000-2006 and 2003-2009

The spatial co-occurrence of cultivated plots with the different stages of fallow vegetation creates a specific pattern that allows the detection of the shifting cultivation landscape without using time series images. However, in mountainous regions the classification of different stages of fallow vegetation shows low accuracies due to terrain shadows. Using very high resolution images and an object-oriented classification approach including texture allowed to overcome this limitation. Landscape metrics were used to assess the spatial pattern of the land cover classes in order to delineate the landscape dominated by shifting cultivation.



Comparison of the shifting cultivation landscape derived from the MODIS images (national to provincial level) and from the ALOS image (district to local level)

Conclusions

Political and economic pressure on the shifting cultivation farming system make discussions on shifting cultivation in Laos recurrent. However, up to now spatial information on the dynamics was only available from a limited number of local case studies. The two approaches presented bear the following potential:

- The assessment on national to province level provided for the first time spatial information on the dynamics of the landscape dominated by shifting cultivation for the area of northern Laos. This enabled a socio-economic analysis of the dynamics providing insight into the underlying drivers of the changes.
- The delineation of the shifting cultivation landscape at district to local level is based on a single satellite image, reducing the workload that comes with common approaches using time series of satellite images. Planning and decision-making can be more evidence-based as information on the dynamics at national to province level and a simplified approach to assessing dynamics at district to local level are provided.

Evaluating the Extent and Efficiency of Soil and Water Conservation Structures in the Ethiopian Highlands

Asnake Mekuriaw, PhD student, University of Bern, Switzerland. JACS: HOA; RP 12
Starting date of PhD study: 01.04.2010

Summary: A study was conducted to evaluate the impact of Soil and Water Conservation (SWC) structures that have been practiced on cultivated land in the Ethiopian Highlands since the mid-1970s. To achieve the objective, satellite data interpretations, field observations, key informant interviews and focus group discussions were used. Preliminary results show that the impact of SWC structures may be lower than anticipated due to a variety of reasons.

Background and rationale

In the Ethiopian Highlands the increasing human and livestock populations have exerted pressure on the country's land resources, and soil erosion has become the most serious environmental problem (see Fig. 1).



Fig. 1. Some highly visible signs of soil degradation in Gojam (Photo Asnake Mekuriaw, April 2012)

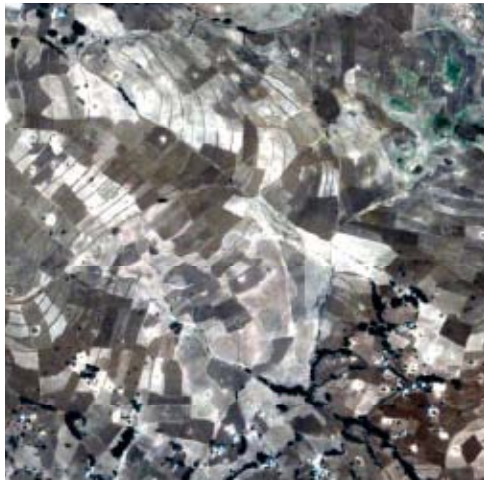


Fig. 2. The SWC structures of a case study site can be identified by eye on satellite imagery.

In order to reduce land degradation and enhance food security, SWC measures were introduced about 40 years ago and have been practiced in the Ethiopian Highlands since then. However, the spatial extent and efficiency of SWC structures and their main constraints have not been investigated in detail for a variety of reasons.

Objectives of the study

- Improve knowledge of the spatial extent of SWC structures in the Highlands of Ethiopia;
- Identify factors influencing the efficiency of SWC structures.

Methodology

To assess the extent of SWC structures and to identify the factors influencing their efficiency the following procedures were used:

- First, areas for which very high spatial resolution satellite data (about 1 m) is available were identified and case study sites selected.
- Second, for each case study site, the SWC structures were mapped in the field.
- Third, the same SWC structures were identified on satellite imagery using analytical algorithms for their extraction (see Fig. 2).
- Fourth, persisting SWC structures were assessed in the field, and
- Fifth, factors determining their efficiency were identified based on field observations, key informant interviews, and focus group discussions.

Results

In various districts farmers have been involved in SWC over the last 30-40 years. Although SWC measures have been practiced for many years and landholdings are small even when including communal and grazing lands, many areas are still exposed to soil erosion. Besides, the majority of farmers partially or totally demolished the field terraces that were constructed on their cultivated lands, as they believe that terraces put large areas of land out of production. This implies that the efficiency of SWC structures is low. Some possible factors are shown in Fig. 3 below.

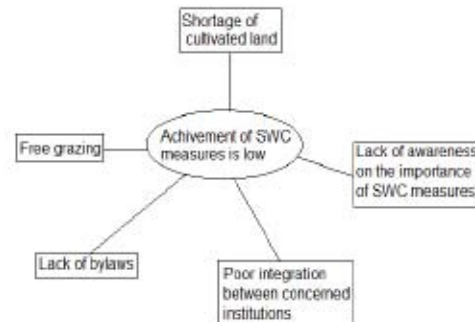


Fig. 3. Factors leading to low effectiveness of SWC measures

Dynamics of Land Use and Stakes in Peatlands of Riau Province, Indonesia

Nova Primasari, University of Bern, Switzerland, JACS SEA
Start date of PhD study: 30.02.2011

Indonesia stores a lot of carbon through its peat. Unfortunately this capacity is sinking drastically because of anthropogenic activities. Quantitative and qualitative information about peatland dynamics is key to determining management strategies. In addition, it is also important to map stakeholder dynamics to see why this destruction continues day after day. A comprehensive discussion on the dynamics of peat from sustainability and livelihood perspectives will enrich the study with information from the field.

Background and rationale

In spite of their high value, peatlands in Riau are continuously being degraded and deforested. Riau Province in the eastern coast of Sumatra, Indonesia, has been chosen as a research site because of the dynamics of changes in quantity and quality of this vulnerable carbon sink. The drivers of these changes are mostly the conversion of peatlands into palm oil plantations, pulp and paper plantations, mining areas by foreign and national investors, and small-scale plantations by the local farmers. This study aims generally to provide the local authorities with scientific data for a better management of peatlands in Sumatra.



Figure 1: Healthy peat swamp forest in Kampar Peninsula (left), destroyed peat swamp forest (right) and a canal (middle) for the preparation of an acacia plantation. (Air photo from Greenpeace, 2008)

Objectives and guiding research questions

(1) What are the spatio-temporal dynamics of peatland use in Riau? The assessment of spatio-temporal dynamics will be based on the existing assessment and will be updated to the possible latest state, the peat dome will be investigated and its volume estimated to establish the amount of carbon storage and its level of reduction through land use change.



Figure 2: Map of palm oil plantations and peat swamp forest in Riau from Jikalahari in 2009 combined with peatland data from Wetlands International research in 2002

(2) Who are the stakeholders, how do they impact on land use change (with regard to the assessment in the first objective), and how do different stakeholders responsible for peatland changes interact with each other? The core approach for this research question will be a spatio-temporal mapping of stakeholders that allows identifying inclusion/exclusion processes.

(3) How can the observed dynamics and stakeholder interactions be evaluated from a sustainability and local livelihood perspective?

Approach and methodology

Quantitative: Peatland areas will be determined by looking at the peat dome using SRTM data. Two to three places will be chosen as case studies and the spatio-temporal dynamics of peatlands will be determined by land cover classification using Landsat satellite images.

Qualitative: Stakeholder mapping will be developed on the basis of interviews, discussions with key-informants, and focus group discussions. Based on the results of the first and second objectives and on existing studies a comprehensive but qualitative sustainability assessment will be done. The results will then be discussed again with relevant stakeholders and decision makers.



Figure 3: Different stakeholders (government officers, members of international donors and NGOs, and local people) sitting together to discuss problems related to peatland management in their village in Rokan Hilir Riau in 2009

Progress and expected outcomes

The PhD outline was accepted by the NCCR Board and the full proposal is being developed. The expected outcomes will be three scientific papers:

- (1) Quantitative map of peatland dynamics in sites
- (2) Stakeholder map showing their interaction
- (3) Comprehensive discussion on the dynamics of peat from sustainability and livelihood perspectives including the perspective of land grabbing on peatland.

Assessing Key Factors and Reciprocal Processes Shaping Large-scale Land Acquisitions in Laos and Cambodia

Oliver Schönweger, Centre for Development and Environment (CDE), University of Bern, Switzerland, JACS SEA, RP12
 Start date of PhD study: 15.11.2011

The high heterogeneity of development contexts in terms of economic, environmental, and socio-cultural characteristics leads to dissimilar outcomes of land acquisitions from one place to another, making generalizations and out-scaling of insights very difficult. When trying to out-scale, there is a missing link between the different processes of large scale land acquisitions (LSLA) and the local development contexts in which they typically occur.

Background and rationale

Because of the heterogeneity of transformation processes in Laos and Cambodia, political regulations based on mass solutions and a degree of standardization do not make it possible to solve all the problems related to LSLAs. While LSLAs are transformation processes triggered by the integration of both countries into regional markets, when policies are implemented at province or district level the ultimate decision about what will happen with the land on the ground depends on a complex system in which different actors and different factors and processes at different levels interact at different times. No operational solutions exist so far in closing the gap between local case studies and nationwide data (on e.g. on poverty, accessibility, land cover) and thus it is necessary to find a way of providing the necessary information on transformation processes, leading to the identification of patterns in how LSLAs are selected, granted, and implemented, and which impacts they may have.

Objective and guiding research questions

The overall objective of this research is to contribute to an evidence-based debate on LSLAs and their role for sustainable rural development. The study aims at developing a methodological framework allowing the assessment of key context factors at several levels that influence processes of LSLAs and ultimately lead to a certain outcome for the various stakeholders and the transformation of land and natural resources. As it is a worldwide phenomena, certain key factors defining LSLA implementation processes must be traceable, leading to cause-impact-cause cycles, creating certain patterns which can be generalized beyond the specific local context and therefore up-scaled.

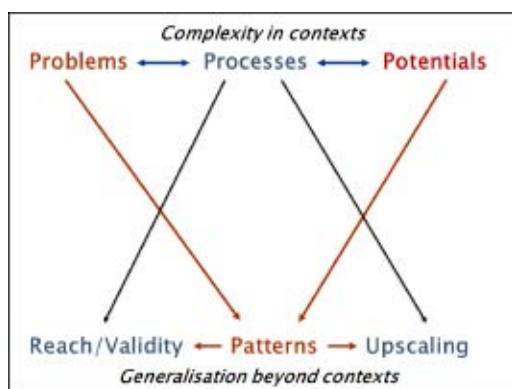


Figure 1: New pathways towards generalization (Source: Wiesmann U. et al, 2008)

This research intends to address the scientific community on the one hand, and the community of policy and decision makers influencing sustainable rural development on the other; it will address the following core research question: What are the development contexts and processes among various actors and institutions across different administrative scales that are determining the negotiation and implementation of land acquisition?

Research approach and methodology

This research strives for an in-depth understanding of LSLAs and their underlying development contexts. During an initial phase, integrated analysis of LSLAs, policies, and legal frameworks at a regional to national and provincial level will be conducted. An overview of ongoing LSLAs in Laos and Cambodia will be established, in parallel with overview maps indicating spatial patterns of LSLAs within different socio-economic and land use contexts. The second phase comprises in-depth vertical analysis in both countries to determine key factors within the local context of decision-making and implementation. Selected case studies will be based on an actor-oriented approach and will analyze organizational actors as stakeholders involved in land investment, their agendas, means, and activities, as well as their formal and informal networks. Methodologically, this research step will pursue a case study and interdisciplinary approach combining qualitative with quantitative methods. During a final phase the focus will be on out-scaling and generalizing results to produce spatiotemporal typologies of development contexts, adaptation strategies, and policy and legal mechanisms.

Progress and provisional results

Some very first results have been achieved through an analysis of national concession data in Laos in combination with other data layers to pin-point underlying spatial patterns, trends, and characteristics. For example:

- The average poverty rate in villages where land concessions were granted is below the national average, but still 30% of the villages are severely poor and are mainly impacted by forestry plantations.
- Across all regions, land within protected forest has been rented out disproportionately compared to its share of total forest area across Laos, the most dramatic being in the North accounting for 94.6% of all forest area rented out.

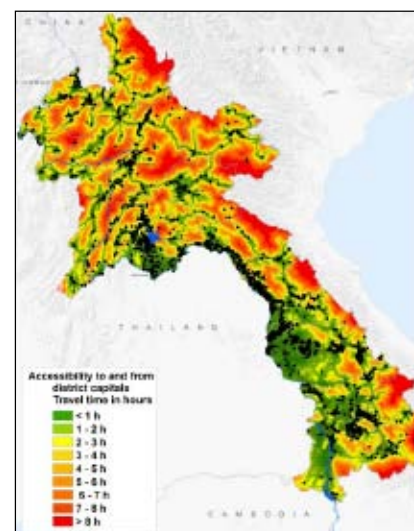


Figure 2: Contexts of concessions in Laos – Accessibility

Effects of Market Integration on Land Use and Welfare in Xayaburi, Lao PDR

Puwadej Thanichanon, Centre for Development and Environment (CDE), University of Bern, Switzerland
PhD start date: 1 July 2009, RP12&14

As the market is often a factor inducing rapid changes in land uses and people's lifestyles, particularly in rural developing countries, this PhD research investigates effects of market integration on land use and welfare in Xayaburi province, Laos, where trading channels lie along the border shared with Thailand. The analysis of relationships between market, land use, and welfare is expected to identify factors for access to market and impacts on actors' land use and welfare.

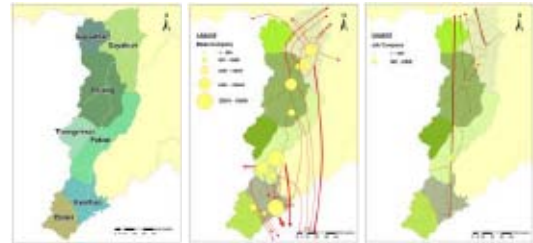
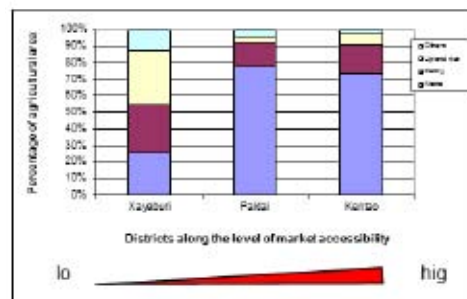
The PhD research studies market integration, focusing on agricultural markets in 7 districts of Xayaburi province, Lao PDR, along the border with Thailand, with a hypothetical gradient of market integration from low in the North to high in the South. The research interprets its findings spatially and analyses the geographic relationship of market integration, land use and welfare along this gradient. 15 villages were selected along the gradient of market integration for in-depth analysis of actors' access to markets. The concluding research synthesis analyzes the effects of market integration on land use and welfare.

Research objectives

1. Assess the characteristics of markets and their functions in the study area
2. Assess stakeholders' involvement and their roles in markets, as well as related policies and institutions, and interpret these spatially
3. Assess and characterise the spatial manifestation of different land use systems
4. Identify the role of market access on land use and welfare

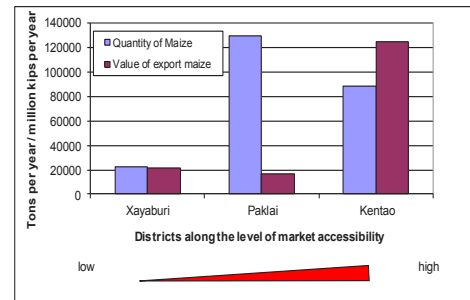


Many rural accessibility improvement projects have been developed and market channels have emerged especially along the border area. There have also been changes in land use practices with cash crop plantations, particularly maize, a crop with high demand in Thailand, replacing upland rice shifting cultivation particularly in the southern districts (which are well accessible from Thailand), indicating a change from subsistence to commercial land use systems (chart 1). Maize area has increased more than 7 times from 2003 to 2010, with an area now higher than 50,000 ha while other cash crop areas have not changed much. This reflects a significant expansion of agricultural area, probably into forest area.



Map 1 shows the administrative divisions of the study area.
Map 2 shows market orientation of maize at the company level
Map 3 shows market orientation of jobs at the company level

Paklai district, the middle part of the study area, represents the biggest producer of maize. However the value of trading export products in Paklai is low (chart 2), because maize produced in Paklai was transported to be exported in Kentao at the Thai border pass (maps), reflecting higher trading and greater market accessibility around the border channel. With the increasing demand for jobs from China, a Chinese company set up a factory in the area, creating better channels and opportunities for people particularly in the north.



Southern districts, although remote in terms of travel time from the provincial centre, are relatively wealthier, likely due to better market access particularly around the southern border, as well as due to the strong influence of trading with Thailand. Therefore the influence of market on land use and welfare is obvious.



Higher market accessibility also makes the area more sensitive to market change. The surveys in 2012 reveal that cassava and rubber plantations have replaced some of the maize fields due to higher demand and support for cassava from the new Chinese starch factory that was built in the area, as well as due to investment in rubber concessions by foreigners.

Irrigation Management Transfer: Questions of Sustainability of WUAs in Ferghana Valley

Oyture Anarbekov, CDE, University of Bern jointly with IWMI Central Asia Office, JACS CAS. Start date of PhD study: 01.06.2012

Participation and involvement of water users in the governance and management of irrigation systems have become an important aspect of irrigation reforms in recent years. This process has also occurred in Central Asia. In order to operate and maintain on-farm irrigation systems, the Governments of Central Asia have boosted the process of establishment of Water User Associations (WUAs). Over the last decades WUAs have been operating, however the sustainability of operations is under question. This research will focus on understanding key problems of WUAs in Ferghana Valley associated with poor operations and on assessing the role of institutions (formal and informal) in overcoming the problems of collective action in the governance and management of on-farm irrigation.

Background and rationale

- Transition from the centrally planned to a market economy,
- Wide-scale decentralization of many sectors of the economy.
- Water allocation among countries and inside each country.

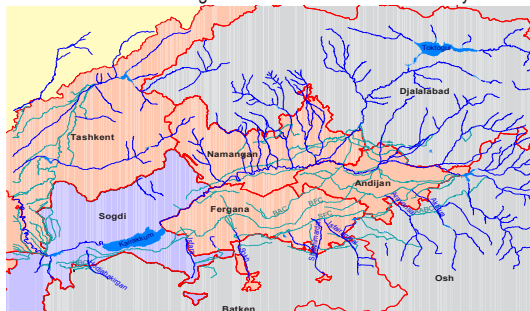


Figure 1: Map of Ferghana Valley.

The countries of Central Asia have been experiencing major changes since the 1990s. One of the sectors inevitably affected by these changes is irrigation. When government support significantly diminished and on-farm irrigation management became complex, and when collective farms were dismantled following land privatization, continuing irrigation management through the old system was no longer feasible in countries of Central Asia. Thousands of new smallholder farming units that emerged after land privatization significantly increased the pressure on water allocation and delivery. Therefore, provision of irrigation water services greatly declined.



Table 1: Dynamics of irrigated area in the Aral Sea basin, thousand ha.

The problem worsened with outdated and deteriorated on-farm irrigation infrastructure that was constructed during the 1960s and 70s. There have been intensified problems with regard to land salinization and water-logging.

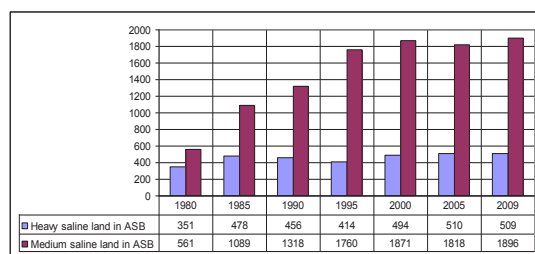


Table 2: Saline land in the Aral Sea basin, in thousand ha. Source: ICWC

In 1997, the decision was made by the Governments to transfer the management of on-farm irrigation systems to water users associations.

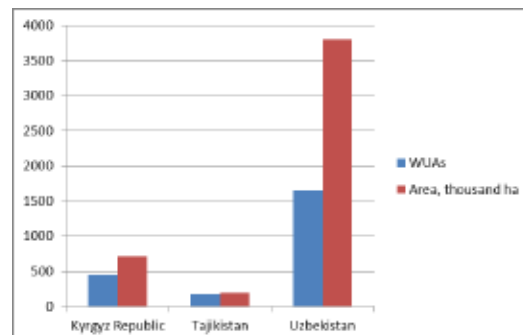


Table 3: Number of established WUAs between 1996-2008.

This rapid institutional change in the irrigation sector, however, opened up substantial weaknesses as well. Despite the fact that new institutions (e.g. establishment of WUAs, introduction of irrigation service fee and decentralization of water management) were introduced several decades ago, these formal institutions are still not well accepted by the resource users (e.g. individual farmers), they are undermined by informal institutions (e.g. local traditions, culture, habits) and are still in weak condition.

Objectives

Understand key problems of WUAs in Ferghana Valley associated with poor operations and assess the role of institutions (formal and informal) to overcome the problems of collective action in the governance and management of on-farm irrigation systems. This refers to the institutional and economic environment where the WUAs are operating and implies identifying what kind of rules, capacities, mechanisms and norms should WUAs possess in order to operate viably. The efficient use of irrigation lands requires not only the formation of different forms of ownership but also the development of appropriate institutions (i.e. sets of rules) and good governance structures.

Methodology and methods

In order to accomplish this task, the author will employ Collective Action theory to understand what the key factors are that prevent resource users from maintaining their infrastructure as a collectively managed common pool resource. In addition, the research will be also based on the theory of New Institutional Economics and Common Pool Resources Management by D. North, Ensminger /Haller, and Elinor Ostrom, who improved understanding of the importance and the role of institutions in economies, and have elaborated the first widespread critique of the transition paradigm. The following methods will be used: The comparative case study approach, Semi-structured interview approach, and Quantitative data collection.

Proposed field locations and benefits

This research aims to contribute to on-going and future projects for water resource management improvement in Ferghana Valley, potentially projects of CGIAR and SDC. The following field locations in Ferghana Valley have been suggested: a) Two WUAs from Osh Province, Kyrgyz Republic ; b) Two WUAs from Sogd Province and c) Two WUAs from Andijan or Ferghana Provinces.

Expected time frame of PhD Research: June 2012 – May 2015.

World Heritage – Protection vs. Promotion?

Katharina Conradin, Centre for Development and Environment, JACS Alps (k.conradin@gmail.com)
 Start date of PhD study: 22.06.2011

During the past four decades, both the significance of the World Heritage convention and the meaning of the World Heritage status have changed notably. This poster presents some highlights of a quantitative study of World Natural and Mixed Heritage sites (WHS) - showing that the growing attractiveness of WHS as tourism hotspots can contribute to their conservation.

Background & rationale

The World Heritage status has so far been attributed more than 900 times in order to enhance the protection of sites with an “outstanding and universal value”. However, attaining WH status has also become an attractive goal in order to boost tourism – despite the fact that effects induced by WHS denomination have so far not been consistently researched.

The PhD thesis hence focuses on the following question: **Which effects do NWHS have in terms of sustainable development today?**

First results suggest that effects depend strongly on what aims were pursued with WH status application.



Figure 1: Mt. Kilimanjaro WHS (K. Conradin)

Methodology

The core of the study is an online survey sent to all natural and mixed WHS in May 2012 (211 sites). Out of these, 85 had participated up to May 26th (still ongoing). Respondents were asked questions based on a framework of indicators valid in the conservation – development context (Fig. 2) and always had to judge the impact of WHS listing:



Figure 2: In the questionnaire, step (1) included the assessment of the current status in a given area. In a second step (2) respondents were asked to assess the WH status' impact on these areas.

Preliminary results

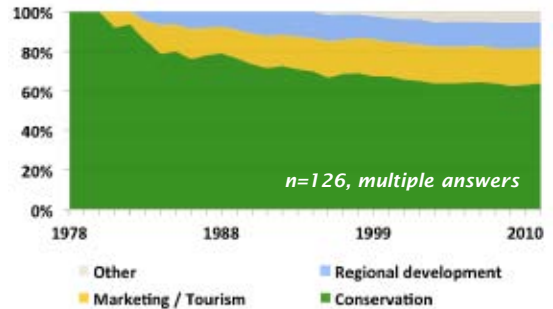


Figure 3: Motivations for WH status application (according to WH managers).

Preliminary results (Fig. 3) show that the motivations for WH status application has changed in the course of time: From a strong focus on conservation in the past to a wider array of expectations today.

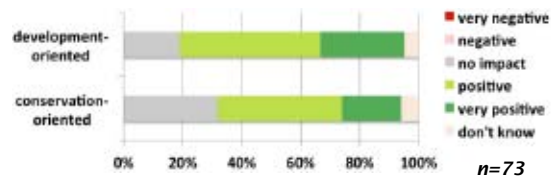


Figure 4: Overall impact of WHS listing on regional development.

Not surprisingly, of those sites who “utilise” the label in a development-oriented way, WHS listing was more frequently perceived to have a positive impact on regional development (Fig 4).

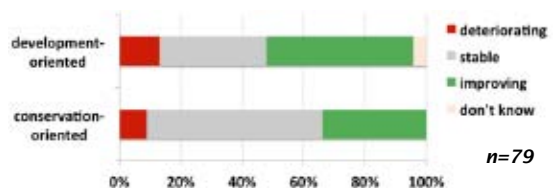


Figure 5: Perceived trends in the condition of the WHS.

However, development-oriented WHS are also those who perceive an improvement in the condition of the site. These findings are corroborated by the fact that most managers indicated that tourism is contributing valuable funding to maintain conservation – funds that would otherwise be lacking.



Bottom-up Institution Building Initiatives for Sustainable Land Governance

Helen Gambon, Centre for Development and Environment CDE, JACS SAM, RP13
Start date of PhD study: 01.02.2012.

22 of the 94 million hectares of agricultural and forest land in Bolivia have been titled as collective property of indigenous and peasant communities (as of 2009). These collective tenure systems are complex, flexible and persistent and allow varying forms of organization (e.g. communal vs. individual access to land) according to requirements. Collective property is not immovable, but adaptable to livelihood strategies of the families.

Locally crafted institutions are of utmost importance for sustainable land governance.

Collective land tenure systems are dynamic and balance external conditions with the meanings, norms and values of the peasant communities.

Property rights are tied to obligations within the community and are structured by social institutions rooted in reciprocity relationships among the involved parties. A range of both bureaucratic (rather "formal") and socially embedded (rather "informal") institutions are co-existing and allow the dynamic regulation of access to land and natural resources.

Prevailing patterns of land tenure and related institutions are often marked by «inter-legality» and result from dynamic *bricolage* processes of collective action by combining different legalities. They bridge the gaps between formal legislation and customary law related to land tenure, and are thus both a result of and a solution to legal uncertainty (e.g. insufficient knowledge about laws and their implementation; slow implementation procedures; mismatch between laws and traditional forms of territorial organization).

The **constitutionality approach** aims at developing a theoretical framework for understanding and acting upon successful bottom-up dynamics of institution building for land and natural resources governance.

It hypothesizes that successful initiatives aiming for more sustainable governance of natural resources are triggered by:

- a sense of ownership in institution building by local actors;
- a direct influence on livelihood outcomes and natural resource sustainability; and
- strong collective action and high bargaining power by local actors with the ability to challenge weak state structures.

Theoretical approaches

Constitutionality builds on approaches such as New Institutionalism, Political Ecology, Social Learning and Social Capital Theory, Theory of Practice, and Legal Pluralism (Haller 2010).



Figure 1: Family plots on communally owned land in the agricultural expansion zone of a peasant community in Cochabamba (Gambon 2009).

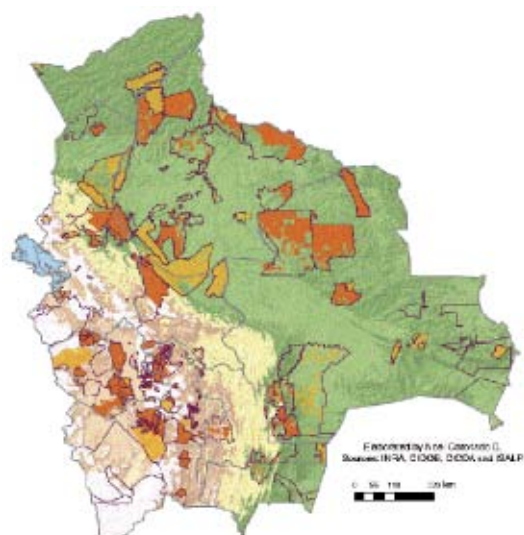


Figure 2: Indigenous Community Lands (TCOs/TIOCs) in Bolivia (Danida 2010).

Objectives of the PhD research

The main goal is to investigate how Indigenous Community Lands (*Tierra Comunitaria de Origen TCO* or *Territorios Indigena Originario Campesino TIOC*) can be understood in terms of constitutionality. This means:

- 1) Analyzing a concrete case of bottom-up initiatives for community-based resource governance through the lens of constitutionality, and assessing factors that enabled or hindered such a process;
- 2) Assessing the impacts of a concrete case of constitutionality on society-nature relationships and the sustainability of resource use;
- 3) Assessing the key concepts underlying the potentials and constraints of the empirical case and their relation to the emerging body of established (meta)-theories of constitutionality.

Methods

A mixed methods approach based mainly on qualitative research methods will be applied.

References:

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Farm Resilience in Different Cocoa Production Systems in the Yungas, Bolivia

Johanna Jacobi, Centre for Development and Environment, University of Bern, JACS-SAM, RP13, start date of PhD study: 30.10.2009

Background & rationale: Cocoa-based small-scale agriculture is the most important income source for most of the ~8000 families in the region of Alto Beni in the sub-humid foothills of the Andes. Cocoa cultivation is affected by various climate impacts, soil degradation, pests and plant diseases, fluctuating market prices and a difficult transport situation. Farm resilience is thus an important feature of sustainable regional development. Although results from research and development projects agree that agroforestry-based organic cocoa production is the best way to deal with the fragile ecosystem, cocoa monocultures and annual crops are common. This study compares farm resilience of monoculture and agroforestry cocoa farms and evaluates the role of regional cooperatives for the livelihoods of local families and for sustainable cocoa cultivation.



Fig.1 (from left to right) Cocoa flower, cocoa pod, cocoa monoculture, agroforestry system, the research area (Yungas)

Objectives & guiding research question: What is the contribution of organic cocoa agroforestry to farm resilience?

This study evaluates farm resilience in different cocoa cultivation systems and the role of organic certification and local organizations such as cooperatives for building of ecological and socio-economic resilience, referred to as "farm resilience".

- **Compare** cocoa cultivation in monocultures and agroforestry, focussing on soil fertility, biodiversity aspects, yield, carbon sequestration
- **Determine** the role of local organizations working with organic agriculture for the families' livelihoods and resilience
- **Understand** rationales behind decision making regarding how to cultivate cocoa and possible incentives for agroforestry

Theoretical & conceptual approach

Components of farm resilience: Buffer capacity (e. g. biodiversity), self organization (e. g. in cooperatives), and adaptive capacity (e. g. training courses, access to knowledge).

→ Interfaces of environmental services and socio-economic benefits of agroforestry cocoa cultivation

Approach: Cocoa cultivation as a livelihood strategy, taking into account activities and external influences (ecological and socio-cultural, according to Wiesmann 1998), perceptions and ambitions of actors (Baumgartner and Högger 2004)

→ Farmer/family as actor(s) at the centre of the framework



Fig.2 Concept of farm resilience. Milestad and Darnhofer 2003, modified

Research & methods

1st phase: Soil analysis, biodiversity and biomass sampling
March – December 2010, in cooperation with students, Facultad de Agronomía, UMSA, La Paz.



Fig.3 Cognitive mapping and participant observation

2nd phase: Socio-economic assessment of cocoa cultivation in agroforestry and monocultures (April-December 2011 in cooperation with Masters' students, CDE, University of Bern)

→ Participant observation, cognitive mapping, and semi-structured interviews with families with and without affiliation to different local organizations and cooperatives

Progress & preliminary results

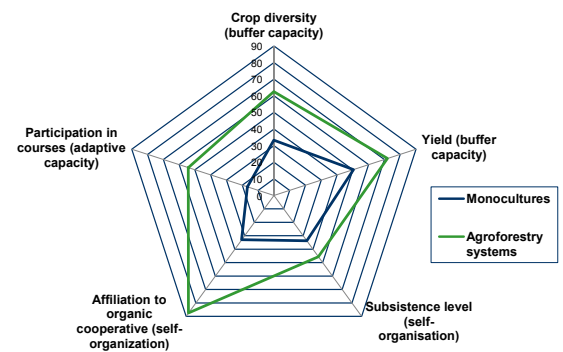


Fig.4 Preliminary comparison between some farm resilience indicators in cocoa farms

→ **Indicators of farm resilience are higher in agroforestry plots that are mostly organic**

→ **Organic cocoa agroforestry systems are efficient, diverse and self-sufficient**

→ **Preliminary livelihood analysis shows that social capital and local organizations play a crucial role in cocoa production**

→ **Diversification and capacity building enhance farm resilience**

→ **Local cocoa cooperative as a knowledge resource centre**

The role of local institutions for livelihoods and farm resilience:

The preliminary comparison of farm resilience parameters (Fig. 2) shows that agroforestry systems are more resilient when facing disturbances and are a viable alternative to conventional slash-and-burn monoculture practices regarding yields. Local institutions working on organic certification enhance a socio-cultural process of family integration into cooperatives and towards organic principles with important ecological implications. Therefore, the best way to enhance farm resilience is to strengthen these organizations and their integrative function in linking their work to the families' needs.

- References:
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Multifunctional Farming Systems and Organic Food Production for Regional Markets in Western Mexico



Norma Helen Juarez
Universidad de Guadalajara

Start date of PhD study 30/5/2011, JACS CCA, RP13

Introduction

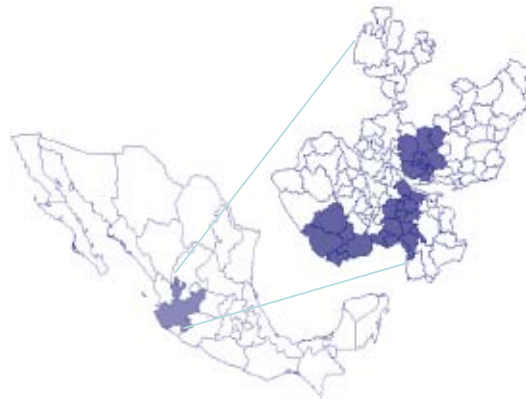
In Mexico, since the 1980s, trade liberalization of agricultural commodities, imports, higher prices for production inputs, low grain prices on the international market and rising prices of agricultural inputs, have transformed agricultural production into an expensive and unprofitable activity for most farmers. However, in recent years the international demand for food free of contaminants, besides the ecological, social and economic problems associated with conventional farming, has encouraged the flourishing of organic agriculture, which is seen as an economic alternative on local markets and as a strategy to restore soil fertility and productivity.

Objectives

This research aims to analyze and identify key factors associated with the development of sustainable and multifunctional farming systems in the center and south of Jalisco, western Mexico.

Methods

In the first phase of the study, we designed an ethnographic research strategy and the application of interviews and meetings with various stakeholders (farmers, officials, members of civil society organizations, academics, etc.). We also consulted various sources (local and national databases).



Preliminary results

According to our data, the first initiatives to spread organic agriculture in Jalisco started in early 1990 as a reaction to: low corn prices, high costs of agricultural inputs and a deterioration of the land because of intensive agrochemical usage. We estimated that the current number of organic producers in Jalisco is over 1000. Close to 74% of them are in the region of this study.



About 70% of producers interested in organic farming substitute chemical inputs with organic inputs, some produced by the farmers themselves.



Less than 20% of organic farmers develop diversified farming systems and multifunctional agriculture.



Periurban agriculture, is becoming an important source of income for small farmers who want to preserve a farm activity.



56% of the people who are currently producing organic food are women, the production is mostly for family consumption. Only 13% have a steady income from the sale of their products.

The main reasons why farmers have become interested in organic food production are:

- a) Lower costs of production,
- b) Prevent land degradation and restore soil fertility.
- c) Preventing health risks and environmental impacts of conventional food production.
- d) Take advantage of the international and local market.

Some problems to move towards sustainable farming systems are:

- a) The lack of adequate urban planning in rapidly growing cities.
- b) There is no policy to promote sustainable production systems.
- c) It requires more support and technical advice for farmers in transition.

Although the organic farming systems have become an important option for ~1000 producers, there are no government initiatives promoting and developing sustainable agriculture and organic food production. In the last 20 years, advances in this sector are due to the training of civil organizations, NGOs, and academic and religious institutions.

Improved Governance of Rangelands in the Western Pamirs: Implications for Common Property Management of Scarce Pasture Resources in the Mountain Regions

Alisher Shabdolov, Centre for Development and Environment, CDE, University of Bern. Start date of PhD study: 03.09.2012

People's livelihoods and the biophysical condition of rangelands in the Pamirs are closely interrelated, as overgrazing of pastures, lack of winter fodder and extraction of shrubs on mountain slopes causes widespread land degradation and inadequate livestock production. The current situation shows that outdated institutional arrangements, obscure property rights, weak government capacity and unclear mandates of local community resource users lead to inadequate management of common land resources and therefore do not ensure sustainable land management.



Figure 1. Pasture in the Rivak Valley of Western Pamir's. (Photo: Sulaymon Shobek).

The overall objective of the research is to analyze the role and impact of common property management regimes on increasing the sustainability of use of scarce pasture resources in mountain regions. The study will address how the scarce pasture resources of the Western Pamirs have been managed during the transition and until today. The implications for common property resource management as an alternative approach towards sustainable management of rangelands will be defined. The main hypothesis of the research is that sustainable management of scarce pasture resources requires well-established institutional arrangements that function based on secured common property rights, decentralization and extensive autonomy for the community users of the resource.

Specific objectives

Objective 1: To analyze the state of rangeland management and tenure regimes and institutional developments in the post-Soviet years in Javshangoz Valley, Western Pamirs.

Objective 2: To analyze the economic and environmental consequences of rangeland management in the transition economy with distorted institutional arrangements and property rights regimes.

Objective 3: To define the main advantages, limitations and challenges of collective action toward sustainable management of scarce pasture resources in the mountain regions of Tajikistan based on common property resource management principles.

Methodology

Qualitative research (Case study approach)

- Analysis of secondary data
- Semi-structured interviews
- Focus group discussions
- Participant observation
- Participatory GIS

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Analysis of the situation through...

- Institutional Analysis and Development Framework (IAD) (Ostrom 2009)
- The Land Governance Framework (World Bank 2012)
- Framework for Analyzing Sustainability of Social-Ecological Systems (Ostrom 2009)
- Eight "design principles" of stable local common pool resource management (Ostrom 1990)
- WOCAT mapping questionnaire on SLM (WOCAT 2008)

Theories

- Institutional theory (New Institutionalism)
- Adaptive and reflexive governance
- Change management theory

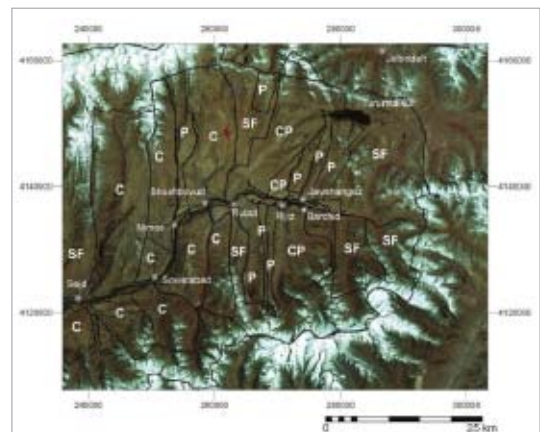


Figure 2. Diverse forms of pasture tenure in Javshangoz Valley, Western Pamirs (Adapted from Robinson 2009)

Legend

- C** Land used by collective *dehkan* (peasant) farms from adjacent communities under long-term use contracts of 25 years
- P** Land incorporated into individual *dehkan* farms
- CP** Land used by collective *dehkan* farms from remote communities that is currently in a process of privatization
- SF** State land fund: rented out on an annual basis, in a process of privatization or abandoned

Implementation of the REDD+ Scheme – An Evaluation Based on a Multi-Criteria Framework

Cristian Vergara, Centre for Development and Environment, CDE, University of Bern. RP13. Start date of PhD study: 20.09.2011

The idea of Reducing Emissions from Deforestation and Forest Degradation (REDD) as a means of mitigating the impacts of climate change has been developing since 2005. The success of the implementation of REDD+ projects depends on the legitimacy, validation, and transparency of the process and on how stakeholders are integrated in decision making.

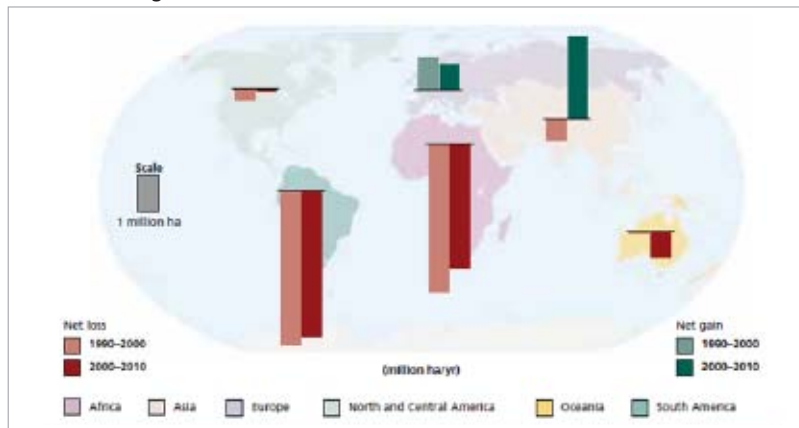


Figure 1.- Annual change in forest area by region, 1990-2010

REDD+ is a new approach to halt deforestation and degradation of forests around the world. The aim of this international scheme is to avoid the 17.3% (IPCC, 2007) of global greenhouse gases emitted by deforestation and degradation and promote potential co-benefits in biodiversity conservation and poverty alleviation. Criticism against REDD+ is focusing on its extremely top-down approach, the lack of information about the social consequences, and potentially severe restrictions of development of forest users.

Decision making on problems characterized by high uncertainty and conflicting values, as is the case of deforestation, need to be tackled using new tools going beyond the traditional cost-benefits analysis. The Multi-Criteria framework which is a non-monetary evaluation and decision making tool, based on a mixture of social methods and mathematical modeling, has been proposed as an alternative to guide decisions on environmental policies (Munda, 2004).



Figure 2. Biosphere Reserve Pilon Lajas (Photo: Alexander Jung)

Aims of the project

1. Exploring the relevance of the mathematical modeling process for the evaluation of REDD+ projects and identification of possible conflicts and solutions regarding the most plausible policy option to be applied to Pilon Lajas, Bolivia.
2. Assessing the potentials and limitations of social multi-criteria analysis to promote social learning, find agreement and create space for collaboration among stakeholders.
3. Providing evidence-based recommendations for decision makers.

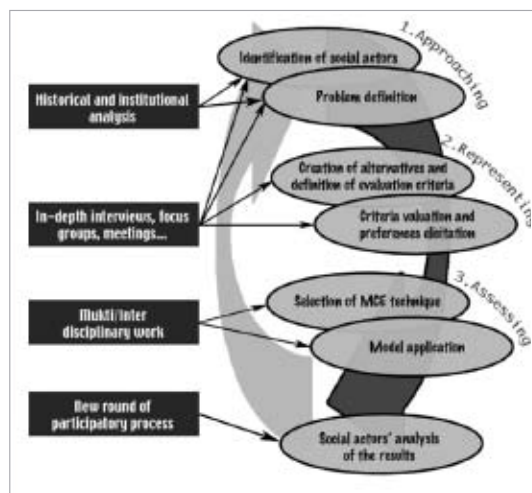


Figure 3. The social multi-criteria evaluation approach (Source: Gamboa, 2006)

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POVERTY AND ACCESS TO PRIMARY EDUCATION IN TANZANIA

P. Dimoso, University of Dar es Salaam, Tanzania, JACS East Africa, RP14, Started November 2010

The relationship between poverty and access to education has been a recurring topic in the media and various forums. Poverty is considered to be a constraint to educational achievement, and at the same time, education is considered to be a poverty reduction strategy. This study is designed to investigate implications of income poverty on access to primary education in Tanzania.

Background and rationale

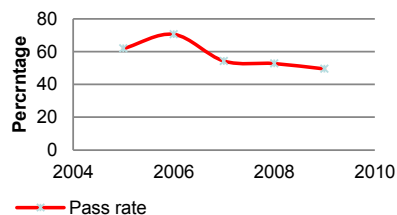
Tanzania has been making various efforts to increase access to education, especially for the poor. The efforts include abolishment of primary school fees, compulsory primary education, introduction of school feeding programs and construction of more schools and classrooms. However, these efforts have not generated the expected results. Reports from the Ministry of Education and the National Examination Council indicate that the education sector is still facing many problems, inter alia, non-enrolment, low attendance, drop-out and poor learning outcome. Literature suggests that children from poor households appear to suffer most from these problems.

Education facts:

- Regional net enrolment rates range from 45.1% to 98.6%
- Primary school completion rate is 69%

These key figures indicate the current education access situation in Tanzania. Enrollment rates show big variations among the different regions, and is below 50% in some coastal areas. The pass rate is on a downward trend (Figure 1).

Figure 1: Primary school pass rate trend since 2005



Studies in the fields of poverty and education in Tanzania have concluded that poverty hinders access to education. Solutions like free education and capitation grants have been put in place for over 5 years, but access to education among the poor has remained low. This calls for scientific inquiry into the effects of income poverty on access to education in Tanzania.

The results of this study are expected to be useful in formulating targeted and effective policies for enabling poor to access education in Tanzania.

Research questions:

What is the effect of income poverty on access to primary education?

1. What is the extent (significance) of variation on access to primary education across different income groups?
2. What determines poor people's allocation of resources to education?
3. What are the factors that hinder or facilitate access to education among different income groups?
4. What is poor households' perception of access to education?

Methodology

The design of this study is cross sectional.

Data:

The study uses both primary and secondary data.

Primary data are being collected from pupils, teachers and parents/ guardians. Data are collected using questionnaires and checklists. Checklists are used to guide interviews and observations.

Secondary data have been accessed through household budget surveys and poverty and human development data sets.

Analysis:

Both quantitative and qualitative

Data related to location will be analyzed using GIS

Research progress and initial results

This study is at the data collection stage, leading to the following initial results for the study:

- Regarding factors that hinder or facilitate access to education, the research findings revealed that for the poor to access education, other services must be easily available. Limited access to necessary services like water reduce access to education, especially for girls. Figure 2 shows children busy fetching water during school hours.

Figure 2: School children fetching water during school hours



- Regarding poor households' perception of access to education, the research findings revealed that the poor do not consider primary education as instrumental for poverty reduction. The perception is that no relevant skills are gained at school and that there are no better chances for employment after school completion.

Outlook

Data collection is expected to be completed by October 2012.

Analysis and publication of results is foreseen to be done by December 2013.

Water, Environment, and Health in an Urban Ecosystem: A Geographical Approach to Nouakchott in Mauritania

Doulo TRAORE (PhD Student), INRSP Nouakchott-Mauritanie / JACS WAF / RP14
 Start date of PhD study: 01.01.2010

The drinking water supply in Nouakchott is characterised by differences in quantity, quality, and price. Moreover, much of the wastewater is discharged anarchically in the city without a sewer system, with a negative impact on the urban environment. These factors, combined with people's hygiene practices and behaviour, are major risks for public health.

Background and rationale

Nouakchott is a city located in the Sahelian semi-arid area and characterised by a striking lack of water, with available resources unevenly distributed across the urban space. This problem of unequal water distribution combined with poor access to basic services such as sanitation, and poor hygiene practices, result in urban environmental pollution. The rate of access to basic services is at a very low level (drinking water, sanitation and solid waste collection). In parallel, diseases related to sanitary practices are common (diarrhea, intestinal parasites, skin diseases [MSA 2005]).



Preliminary results

In the city, only 25.6% of households in 2009 had an improved source of supply (private tap, neighbour's tap) while the vast majority (74.4%) of residents had only unimproved sources (resellers, carters, or water tanks) (Fig. 1). The analyses conducted at 150 public water distribution points (points and fountains), show that 93% of them are contaminated. At the same time the prevalence of diarrhea averages 9.3%, with a relatively high morbidity in the municipality of Sebkhha (16.9%) and low in the municipality of Tévragh Zeina (2.5%). The combination of findings on the source of supply and water quality explains the level of prevalence of diarrhea (Fig. 2).

General objective

Contribute to a better understanding of the relationship between water, environment, and health through a study of diarrhea in child and adolescent populations of Nouakchott.

Specific objectives

- ❖ To determine the epidemiological situation of diarrhea in child and adolescent populations of Nouakchott and define risk areas;
- ❖ To analyse the relationship between the distribution of the prevalence of diarrhea and associated risk factors;
- ❖ To study the links between environmental disparities (flood areas, sandy areas, etc.) and unequal access to water, sanitation, and health in the city;
- ❖ To develop a theoretical model to explain and predict health risks associated with environmental factors in Nouakchott.

Methodology and methods

The main existing demographic, socioeconomic, environmental, and health indicators of Nouakchott city are mobilized through national surveys (EPCV 2008, ONS, 2009), research reports (Water quality, CUN, 2009), and routine data (registers of consultation, DRAS, 2009). These indicators will be completed by data from the multidisciplinary survey conducted among 5000 households spread across different areas of the city. By combining statistical and mapping analysis in the form of spatial correlations, the links between water, sanitation, and health will be explored.

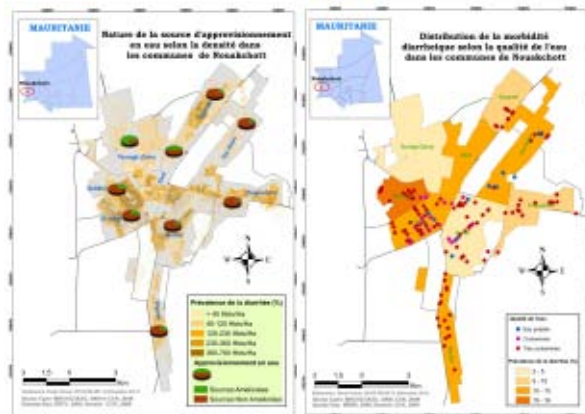


Fig. 1: Nature of water sources according to the density of communes in Nouakchott

Fig. 2: Distribution of diarrheal morbidity according to water quality in Nouakchott communes

Not surprisingly, the matrix of intermediate correlations shows that where the source of supply is less safe (SNA), more water is of poor quality (EC) and the prevalence of diarrhea (PD) increases (Table 1).

Table 1: Matrix of intermediate correlations

Variables	SA	EP	SNA	EC	PD
SA	1				
EP	0.782	1			
SNA	-1.000	-0.782	1		
EC	-0.782	-1.000	0.782	1	
PD	-0.301	-0.630	0.302	0.630	1

SA: Improved Source, SNA: No improved Source, EP: Supply Water, EC: Contaminated Water, PD: Prevalence of Diarrhea

However, results show that depending on the commune and social categories, the prevalence of diarrhea varies a great deal. These trends from the combination of different secondary data will be validated (confirmed or refuted) by the results of the May 2012 survey with 5000 households in the city.

Household Welfare Impacts on Access to Health Services in Rural Kenya

Samuel Kipruto, University of Nairobi, Kenya
 JACS EAF, RP 14

This PhD project aims at assessing the impact of spatial, economic, and social factors that limit people's access to health services and the impact on household welfare by applying spatial-statistical models using statistical census and household surveys datasets.

Introduction and rationale

The United Nations Millennium Development Goals (MDGs) are dominated by health matters. Three out of the eight MDGs are about health, the fourth, fifth and sixth all are concerned with the issue of access to health services. Goal four is concerned with the reduction of child mortality by two thirds, between 1990 and 2015, goal five is mandated with provision of adequate maternal health so as to reduce by three quarters the maternal mortality ratio and achieve universal access to reproductive health; and finally, goal six is concerned with combating HIV/AIDS, malaria and other diseases [UN, 2000]. Achieving these goals is dependent on access to effective and equitable health services. Access to health care is an important component of an overall health system which has a direct impact on the burden of disease that affects many countries in the developing world [Ebener et al, 2005]. Accessibility to health services is concerned with the ability of a population to obtain a specified set of health services. The rural social landscape in Kenya is made up of actors of different social and economic status. This unequal distribution of social and economic power among the different actors in the rural areas lead to unequal opportunities for accessing the health services. Households facing the need for health services may reduce their food consumption requirements and thus pushing the household in abject poverty. This study seeks to understand the relationship between access to health services and household welfare.

Objectives of the study

- To examine how factors such as: availability of services and financial and social-cultural barriers limit access to health in rural areas of Kenya
- To identify the impacts of varying levels of access to health services on household's welfare in rural areas of Kenya
- To assess how geographical accessibility, and infrastructural and environmental factors account for the spatial variation in access to health services across rural areas of Kenya
- To produce accessibility maps based on health indicators

Methodology

The study area for this research comprises the entire rural area of Kenya as defined by the Kenya National Bureau of Statistics.

The methodology adopted for this study builds on two distinctive analytical techniques, the small area estimation method and the spatial weighted local regression models.

The small area estimation uses two datasets, usually a survey and census data sets. Each data set is individual and has its own advantage over the other. The survey data is rich in terms of the information collected while the census is rich in terms of coverage. In this study I will utilize a household budget survey as well as the census for estimating per-capita household expenditures (see Table 1) as proxy for household welfare, using this methodology of small area estimation. The accuracy of the estimates can be accessed by the inspection of the standard (see Table 1).

Regression models will be applied to quantify the influence of accessibility to health education services. The function of estimating the impacts of accessibility will be:

$$\log(y_i) = \alpha + \beta X_i + \epsilon_i$$

where ϵ_i is the error term, y_i is real per capita consumption and X_i are a vector of explanatory variables (α =household and β =access variable). The vector X is the access dimension variables of accessibility, acceptability, availability, and affordability.

Figure 2: Conceptual Framework (adapted from Welfare impacts of access to services and natural resources at meso-scale)

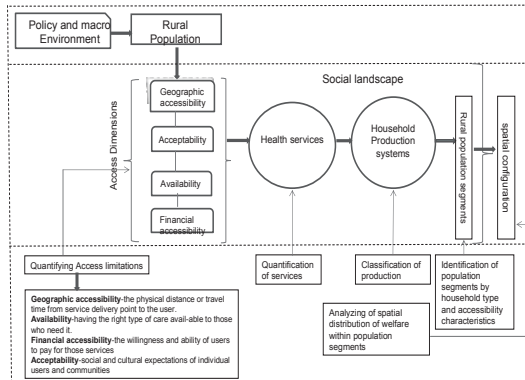


Figure 1: Patients seeking treatment at a health facility (GoK 2007 Kenya Malaria Indicator Survey, Pg 21)

Progress/Provisional Results

This poster presents the preliminary results based on the estimation of the households' welfare at the household level in rural Kenya, using the technique of small area estimation as outlined in Elbers, Lanjouw and Lanjouw (ELL) methodology. Table 1 shows the estimate of the number of households, number of individuals and headcount ratio together with its standard errors in Kubo division Kwale District in the Coast province of Kenya. Kubo division is a rural residence as per the Kenya National Bureau of statistics (KNBS) definition.

Table 1: Distribution of poverty rates at sublocation level in Kubo Division Kwale Rural (own calculations using Small Area Estimation)

Administrative Unit	Number of HH's	Individuals	Headcount Ratio	SD Error
Sublocation	444,199	1,189,787	66.8	4.2
Kubo	133,038	317,207	66.2	4.2
Sublocation	1,720	4,207	73.7	3.7
Ng'amboni	415	1,054	73.5	3.7
Kipamboni	494	1,247	73.7	3.7
Kajiamboni	811	2,006	73.7	3.7
Mukolela	274	713	66.0	5.1
Mukolela	274	713	66.0	5.1
Mukolela Hills	418	1,054	67.1	4.4
Lukolela	662	1,655	61.7	5.5
Lukolela	662	1,655	61.7	5.5
Makunguni	1,987	4,918	64.8	4.9
Makunguni	1,987	4,918	64.8	4.9
Mkongani	7,541	21,077	76.7	3.0
Mkongani	1,871	4,717	64.2	4.7
Mkongani	1,054	2,674	68.1	4.6
Uthila	1,474	3,719	67.8	4.6
Mwakaupamba	2,052	5,120	73.0	3.0
Mwakaupamba	485	1,247	64.0	4.9
Mwakaupamba	2,187	5,443	67.8	4.6
Mwakaupamba	404	1,020	69.6	4.8
Mwakaupamba	450	1,120	69.7	4.0
Mwakaupamba	481	1,210	67.8	4.6

The table shows that the poverty headcount ratios vary within the location as well as in the sub locations. The highest poverty incidence stands at 76.8 % compared to 66.2 % in the whole of Coast province with a standard error of 4.2 %. Looking closely at the results one may conclude that the standard errors increase as one goes up the administration hierarchy.

This stage of the research is now completed; in the next stage, spatial regressions will be done involving the estimated household welfare and health indicators.

Socio-political Change and Development Interventions in Laikipia County, Kenya

Paul Roden, Heidelberg University, 01.06.2009, JACS EAF, RP14

Dynamic socio-political conditions in Laikipia County, Kenya, have had an impact on the incidence of development interventions taking place in the County. This project attempts to relate the effects of these socio-political changes to the spatio-temporal distribution of development interventions.

Rationale and Objective

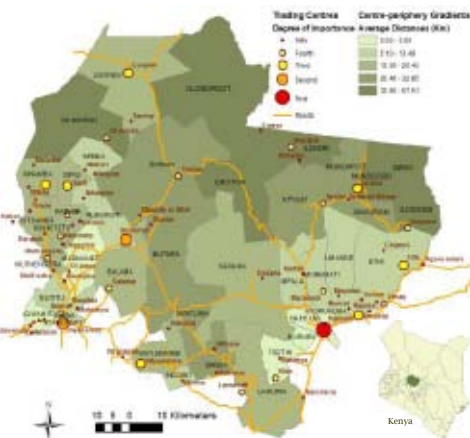
There is a need to improve the targeting of development interventions so that they more accurately complement the socio-economic conditions of local populations.

By determining the socio-political geographies of interventions, this study aims to provide decision makers with information to help them better target their activities.

Approach

This study takes a dual approach in identifying the causes of the distribution of development interventions across space. These are: socio-political change and distance of place along a centre-periphery gradient.

An inventory of development interventions collated from administrators at the second from lowest administrative level (Location) in the County (42n) forms the primary database.



Map 1: Laikipia County: Locations and Centre-periphery Gradients

The main actors responsible for the implementation of an intervention are categorised broadly into state and non-state actors. The presence and absence of these development actors are indicative of changing socio-political conditions.

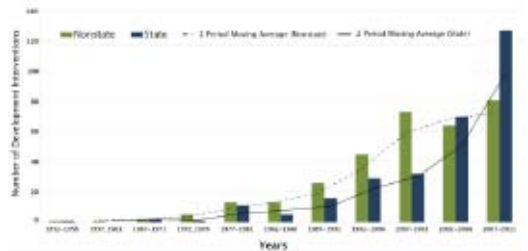
Proximity to central places is determined through an analysis of where local populations in each Location travel to in order to access a wide range of goods and services (Map 1).

Relative weights of importance for each trading centre (75n) were determined, and average distances to these centres clustered into five distinct categories.

Preliminary Results

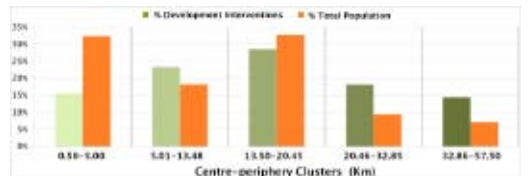
649 development interventions were identified, with the earliest implemented in 1952.

The results show that, overall, both state and non-state development interventions' incidence has increased over time, with a relatively large increase by state actors; resulting in them becoming the principal implementers by 2011 (Graph 1).



Graph 1: Development Interventions Overtime: Funding Actors

67% of interventions occurred within the first three centre-periphery clusters (Graph 2). An inclusion of the total populations living within each cluster shows that in fact, the furthest two centre-periphery clusters had a higher incidence of interventions per capita.



Graph 2: Development Interventions: Centre-periphery Gradients Clustered

Discussion and Conclusions

National policy to devolve financial resources from the central government to the local level through Community Development Funds (CDF) has led to state-actor funded interventions taking the lead in 2005 (Graph1).

Some of the Locations in the furthest two clusters (Graph2) were set aside for indigenous settlement (year: 1911) during the British Protectorate period. These areas have a longer record of development interventions; early assistance came from the church, while most recent projects were community implemented.

Other Locations in the County were settled largely during the post-colonial period, and have experienced a 3-fold population rise since 1979. It can be deduced that the rate of development incidence did not match the rate of population growth.

Integrating Farmers into Development and Implementation of Climate Change Interventions: Experiences from Kenya

Sarah Ayeri Ogalleh^{1,2} (RP15; start of Phd study: 13.10.2009 | sarah.ogalleh-ayeri@boku.ac.at), Lorenz Probst²

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²Centre for Development Research | BOKU - University of Natural Resources and Life Sciences, Vienna.

Climatic variability in Kenya puts the natural resource base of farmers at risk. It is therefore important to identify and evaluate sources of knowledge of agricultural practices and climate change adaptation. We suggest that farmers need to be integrated in the process of development and implementation of adaptation interventions to further increase adaptive capacities and resilience of farmers.

Background and Rationale

The interest in agricultural extension as a knowledge broker for farmers in Kenya is rooted in the strategic importance of agriculture for national development. Research has shown that agriculture will be highly impacted on by climate change affecting e.g. precipitation and temperature.

In Laikipia County (Kenya), agriculture is the main pillar of livelihoods, yet today climatic variability puts the natural resource base of farmers' livelihoods at risk. This increases poverty and environmental degradation.

To mitigate these risks, farmers rely on various sources of knowledge that inform the adaptation of farming strategies. However, the dwindling performance of agriculture in Kenya in recent years calls for a critical examination of these knowledge sources.

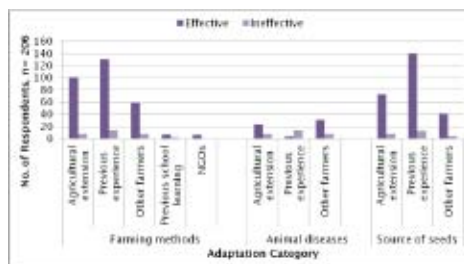


Figure 1: Sources of knowledge of farming methods and animal diseases, source of seeds

Objective & Research Questions

Identify the sources of knowledge pertinent to agricultural adaptation by small-holders in Laikipia County of Kenya.

- What sources of knowledge of agricultural practices exist?
- Which sources of knowledge are most effective in improving agricultural practices and adaptation to climate variability?
- What makes these sources of knowledge effective?

Methods

The study used qualitative methods such as informal and key informant interviews and focus group discussions. Quantitative data were collected by administering a pre-tested household survey questionnaire to 206 households.

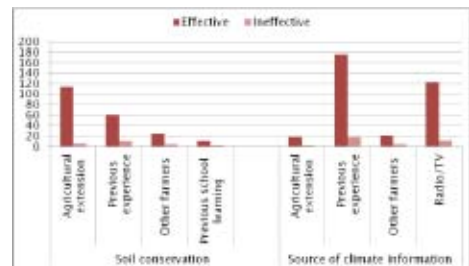


Figure 2: Sources of knowledge of soil conservation and climate

Results

The results confirm the importance of farmers' own and shared experiences for their choice of farming strategies (seed variety selection, livestock management, cropping). Farmers also use this knowledge to adapt their farming practices to climatic variability (Figure 1).

Knowledge of soil conservation strategies (terracing, tree planting) was sourced from agricultural extension officers. Although farmers report their experiences as a major source of climatic information, the role of radio and TV is considered effective in disseminating information for adaptation (Figure 2).



Photo 1: Woman farmer in Laikipia showing how she bales hay for transport. (Photo: Sarah Ogalleh Ayeri, May 2011)

Conclusion and Recommendations

Considering the central role of experiential learning in farmers' adaptations to climate change, farmers need to be integrated in the process of development and implementation of adaptation interventions.

Thus, national programs can take advantage of farmers' experiences as a source of knowledge and promote farmer-to-farmer networks for successful adaptation at local level.

Political, institutional and financial support for such a process is of the utmost importance to further increase adaptive capacities and resilience of farmers in Laikipia County and beyond.

The Role of Social Capital in Social Learning Processes for Soil and Water Management Innovations in Kenya

Edward Bikketi, Centre for Development and Environment (CDE) & The Institute of Social Anthropology, University of Bern, Switzerland. Starting Date June 2010, JACS East Africa; RP15

Background

Natural Resource Management innovations in Kenya continue to be hampered by poorly understood socioeconomic, socio-cultural, institutional, and organisational arrangements. These challenges are associated to the little attention given to 'Social Capital' (the ability to obtain benefits from the use of social relations expressed in networks, local institutions, and organisations). Social capital is a co-determining dimension of social learning processes along with emotional, cognitive, and social competences. Social learning represents a participatory process of social change involving integrating the knowledge of different actors in a deliberative process to change their understanding of complex issues. In this regard, this study hypothesises that in addition to risk, both insecurity as well as cost-benefit calculations (Groups and Social Networks, Trust and Solidarity, Collective Action and Cooperation, Social Cohesion and Inclusion, Reciprocity and Exchanges, Empowerment and Political Action, Information and Communication of smallholders) play a catalytic role in overcoming the acceptance and spreading of new innovations through motivation, awareness, development, and application through Farmer Field Schools (FFS).



Members of Kabugurii FFS attending a weekly meeting in Mbeere South

Objectives

- To characterise the peasants in both regions, involved in FGs and FFS, based on their farming systems, socioeconomic, and sociocultural characteristics in their life-worlds.
- To investigate the peasants' various strategies of action and implications thereof on taking up innovations through social learning processes in FGs and FFS in both regions.
- To investigate the types of social capital among participants of FFS in both regions in terms of productive and perverse social capital.
- To identify the various dimensions of social capital within the types of social capital in both regions and their implications on social learning processes related to soil and water management technologies in the FGs and FFSs.



Water retention ditches in Eshiyunzu, Kakamega Central District

Methodology

Fieldwork was conducted in Mbeere South (lowland) and Kakamega Central (highland) districts from July 2010 to March 2011 and from March 2012 to June 2012 using a mixed methods approach. Qualitative data is drawn from methodology in social anthropology such as participant observation, different interview techniques, case histories, and focus group discussions, while the quantitative data is drawn from household surveys and secondary data in both districts.

Preliminary results

- Disconnection between the FFS rationale and the rationale of actors' livelihood strategies: farmers in the highland context have resorted to contracted sugarcane farming while in the lowland context they have resorted to Khat production.
- Social capital plays an important role in the diffusion of SWC technologies among members and non-members of FFS through technology spillovers in various group associations.



Stone bunds in Kiambeere, Mbeere South District

Progress

One paper completed, one BSc on Landsat and Land cover change completed, two more papers in progress along with the thesis write-up.

Perception of climate change's impacts on environment and cultural practices in northern Côte d'Ivoire

Boko Nadège Koiadia, Centre Suisse de Recherches Scientifiques en Côte d'Ivoire, JACS WAF, RP15, Start date of PhD study (NCCR associated PhD): 02 March 2009

People's life depends on the environment and the environment depends on their behavior. By destroying the environment, man destroys himself. This study aims to explore the impacts of climate change and variability on cultural practices in the city of Korhogo, northern Côte d'Ivoire

Background

According to panel's researchers (GIEC 2007, Levy Jacques 2008, ...), climate change is provoked by overpopulation, urbanisation, industrialisation and deforestation. As everywhere in the world, Korhogo is facing the global change:

- Drought in 2004-2005 followed by flood in 2006-2007, with human death and agricultural damage.
- These climatic events have touched not only the natural resources (fauna, flora, water...), but also the local socio-cultural habits.



Drought in Korhogo (2004-2005)



Flood in Korhogo (2006-2007)

Objectives

Main Objective

- Contribute to saving cultural practices in Korhogo through the understanding of populations' perception on climate change's impacts on environment.

Specific Objective

- To Present the environmental changes observed
- To Identify sociocultural practices related to environmental resources and climate change's impacts on them.
- State the challenges to overcome

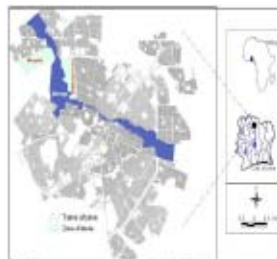
Methodology

Study area

- Located in Northern Côte d'Ivoire.

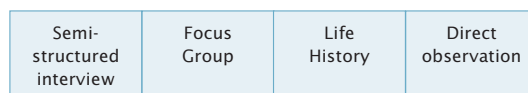
- Population ~ 300 000 habitants (INS 2010)

- People living around Korhogo's water Supply dam as well as Periurban populations



Theoretical approach

- Method: qualitative
- Functionalist and constructivist approach with historical and comprehensive method of explanation
- Tools:



Chiefs of village, land and sacred groves, elderly non-intellectual, farmers, traditional hunters, traditional healers, fishermen, rainmakers, sculptors, local and international NGOs, departmental directors of governmental agencies, intellectual adults, young people, market gardeners (women)

Results

Perception of the environment change

Rain and dry seasons before 1980 years: Duration: SIX (6) months	Rain and dry seasons after 1980 years: Both the rainy and dry seasons are very disturbed and complex as the periods and the duration are changing along with years	<ul style="list-style-type: none"> ▪ Degradation of vegetation, soils and advance of desert. ▪ Extinction of flower and fauna species ▪ Drying and disappearance of water resources and water bodies
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Sociocultural Practices Related to Environment

- Traditional hunters: brotherhood of "DOZOS"
- Traditional medicine: use of flora
- Sculptors artisans: making masks and musical instruments;
- Agroforestry: Néré, karité and baobab trees;
- Worship and adoration: rivers, land, trees, animals

Impacts on Environment and Cultural Practices

- Disappearance or drying of large trees and rivers once worshipped;
- Traditional healers and artisans struggle to find plants and trees;
- Brotherhood of Dozos recycled into agents of security companies;
- Sacred grove, refuge of the "poro" and cultural identity of Senoufo 's people, undergoes an extensive degradation ; risk of disappearance of that capital cultural practice.

Challenges

- Progressive lost of traditional spiritual features
- Disappearance of medical rare tree species
- Damage of sacred grove
- Alteration of ecological awareness
- Redefinition of dozo chiefs role and importance
- Adjustment of people consciousness

Conclusion

To safeguard cultural heritage, people need to be sensitized, informed, educated. There is a need to communicate about CC



Figure: Chiefs of DOZO

Acknowledgement: NCCR North South, IDRC through CSRS-CRDI project on Adaptation to climate changes

Biofuel Production: Linking Global Discourses to National Policies and Local Realities

Brigitte Portner, Centre for Development and Environment, University of Bern; Annika Salmi, Institute of Sociology, University of Basel
Start date of PhD studies: 01.01.2009

Rising oil prices, a growing concern about energy security, and climate change have led to a massive interest in liquid biofuels. This project seeks to improve understanding of the relationship between facts and values in biofuel production, by linking the global debate with local realities.



Figure 1: The sorghum field of this Ethiopian farmer is bordered by a *Jatropha curcas* hedge. The shrubby biofuel crop serves as a soil and water conservation measure that helped to accumulate over one meter of alluvial sediments over time.
Photo by Portner 2009

Global Debate

The global debate over biofuels displays radical differences in the actors' perception of sustainable development. Proponents vote for large-scale biofuel production to secure rising energy needs; opponents demand food sovereignty through local small-scale farming. The debate is nourished by various development and environmental discourses, mirroring the actors' value basis.

National Policies

In 2007, Ethiopia released a biofuel strategy that takes up the perception of global biofuel advocates and focuses mainly on large-scale plantations. The government declared 24 million ha suitable for biofuel production, which is about 25% of the country. Regulations in Ethiopia are very investor-friendly, but after initial incentives there is a lack of legal guidelines and monitoring.

Local realities

For small farmers, biofuel feedstock is a risky crop and only the better-off venture to participate in outgrower schemes as there is no ready market. More promising are hedges that are not occupying land used for food or feed and have the additional advantage of a life fence or a soil and water conservation measure.

Conclusion

The global debate is shaped by opposing perceptions on how to achieve a sustainable development but local reality needs an integrated approach that goes beyond these worldviews. For biofuels to contribute to local energy supply, a needs assessment prior to implementation and precise, all-embracing policies are essential. Biofuel production is most promising if it is built on existing local systems.



Figure 2: Mr Biofuel. From Mr Food to Mr Energy.
Cartoon by Popa Matumula 2012

Growing up amidst the garbage: the construction of youth identities in Reconquista Area

Ada Freytes Frey, Universidad Nacional de Avellaneda, JACS SAM
Start date of PhD study: 01.07.2007

The thesis explores the processes of identity construction of young men and women who live in extremely poor neighbourhoods located in the environs of Buenos Aires' major sanitary filling. The research intends to contribute to theoretical discussions about the subjective consequences of desinstitutionalization as well as to youth social policies.

Objectives

- Analyzing the processes of identity construction of young women and men who live in Area Reconquista neighborhoods, exploring the gender roles and stereotypes as well the individualization dynamics.
- Exploring the role that the traditional socializing institutions and the spaces of young sociability play in the production of such stereotypes and dynamics.



Partial view of a slum neighbourhood in Reconquista Area

Main results

Even though clear individualization dynamics have been observed in the processes of youth identity construction in the "Reconquista Area", this does not convey a widening of human agency, but reflects weak institutional resources and supports. Indeed, identity construction is strongly conditioned by the specific characteristics that socializing institutions presents in a context of poverty and territorial segregation.

- Contrary to familiar "desembedding" suggested by Beck, familiar ties are very important. Familiar representations and values operate as a strong referential frame, affecting youth decisions, present actions and projects for the future. Familiar referential frames and livelihoods influence young men's and women's experiences in other traditional socialization institutions, such as school and labour. Families also play an important role in the intergenerational transmission of gender representations and stereotypes.



Reconquista Area:

It is a group of slum neighbourhoods located in the environs of Buenos Aires's main sanitary filling. Before its occupation in the late 90s, this land was used as an illegal dump. Therefore, life conditions in these neighbourhoods are precarious and insanitary, given the level of soil pollution and the lack of basic infrastructure (sewage, water, electricity).

Many of the young men and women who live in these neighbourhoods participate in residues gathering in the sanitary filling, as a personal or familiar income strategy.

Methodology & methods

Triangulation of different qualitative techniques and diverse data sources:

1. participant observation in spaces of youth, familiar and labour sociability in the neighbourhoods;
2. in depth interviews to young men and women, from 15 to 25 years old, in order to reconstruct "life accounts";
3. in depth interviews with fathers, mothers, teachers and local leaders in order to obtain information about the specific characteristics of socialization in family, school and neighbourhood.
4. workshops or "discussion groups" with young men and women from "Reconquista Area"
5. workshops or "discussion groups" with teachers in five secondary schools.



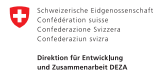
Young people working with waste, in a waste sorting plant.

- Peer group is an important sphere for identification and self-exploration. Youth sociability is territorially defined. Gender inequities are reinforced by peer relationships, since there are different dominant models of youth sociability for men and women. "The street" is mainly the territory of the first, while "the household" is the place of encounter for the latter.
- Labor is the realm where individualization is deeper. It appears as an individual endeavor, oriented to satisfy personal and familiar needs. For most of the young men, working is of central importance for the construction of a male positive self image. The subjective meanings of labor for young women present great variation.



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3rd International Conference on Research for Development Research for Global Transformation

Programme

Monday 20 August 2012

From 07:30	Registration, issuing of conference documents and coffee/tea Room: Foyer UniS					
08:30 - 10:00	Plenary session, Theme 1: Tackling Global Change: Enhancing Positive and Minimising Negative Effects Welcome by: Prof. Hans Hurni, Centre for Development and Environment and Director of the NCCR North-South Moderation: Berhanu Debele, NCCR North-South Regional Coordinator, Horn of Africa - Keynote: Prof. Peter Verburg, Institute for Environmental Studies, University of Amsterdam, Netherlands - Discussant: Prof. Hans Hurni, Centre for Development and Environment and Director of the NCCR North-South - Keynote: Dr. Allan Lavel, Director of the Risk Prevention Program, General Secretariat of FLACSO, Costa Rica - Discussant: Prof. Guéladio Cissé, Swiss Tropical and Public Health Institute Room: A 003					
	Coffee/tea break					
10:30 - 12:00	Parallel workshop sessions 90'			Parallel workshop sessions 180' (to be continued in the afternoon)		
	Session 2: Bioenergy Room: A 301	Session 3: Green Economy Room: A 022	Session 11: Highly Skilled Migrants Room: A 201	Session 27: Impact of Knowledge Room: A 027	Session 5: Adaptation to Climate Change Room: A-126	Session 1: Water and Sanitation Room: A-122
	Lunch break Room: Foyer UniS		From 12:30 Poster session Room: Corridor ground-floor			
13:30 - 15:00	Parallel workshop sessions 90'			Parallel workshop sessions 180' (continuation of the morning sessions)		
	Session 6: Mountain Development Room: A 027	Session 9: Landscape Transformation Room: A 301	Session 17: Labour Market Room: A 201	Session 25: Showcasing Re- search Products Room: A 022	Session 5: Adaptation to Climate Change Room: A-126	Session 1: Water and Sanitation Room: A-122
	Coffee/tea break					
15:30 - 17:00	Plenary session, Theme 4: Enabling Research in Global Transformation: Learning from Current Experiences Moderation: Dr. Peter Messerli, Director of Centre for Development and Environment, University of Bern - Keynote: Vet M.B. John Young: Director of Impact Assessment, Partnerships and RAPID, ODI, United Kingdom - Discussant: Prof. Urs Wiesmann, Centre for Development and Environment and Director of the NCCR North-South Future Earth Initiative - Presentation by: Dr. Christoph Ritz, Executive Director of ProClim-Forum for Climate and Global Change, Swiss Academy of Sciences - Plenary discussion Room: A 003					

Tuesday 21 August 2012

08:30 - 10:00	Plenary session, Theme 2: Reducing Disparity: Narrowing Regional, Social and Individual Inequalities Moderation: Dr. Boniface Kiteme, Director of CETRAD and NCCR North-South Regional Coordinator, East Africa - Keynote: Dr. Abid Qaiyum Suleri, Executive Director of Sustainable Development Policy Institute, Pakistan - Discussant: Prof. Ulrike Müller-Böker, Director of Development Study Group Zurich and Member of the NCCR North-South BoD - Keynote: Dr. Shahra Razavi, Senior Research Coordinator, United Nations Research Institute for Social Development (UNRISD), Switzerland - Discussant: Dr. Bishnu Raj Upreti, NCCR North-South Regional Coordinator, South Asia Room: A 003					
Coffee/tea break						
10:30 - 12:00	Parallel workshop sessions 90'			Parallel workshop sessions 180' (to be continued in the afternoon)		
	Session 16: Inequalities in Metropolis Room: A 027	Session 12: Livelihood Futures Room: A 301	Session 7: Land Grabbing Room: A 022	Session 23: Research Partnerships Room: A 201	Session 10: Beyond MDGs Room: A-126	Session 13: Sanitation-Health Nexus Room: A-122
Lunch break Room: Foyer UniS			From 12:30 Poster session Room: Corridor ground-floor			
13:30 - 15:00	Parallel workshop sessions 90'			Parallel workshop sessions 180' (continuation of the morning sessions)		
	Session 15: Society, Equity and Health Room: A 301	Session 8: Water and Land Management and Governance Room: A 022	Session 24: Technology Transfer Room: A 201	Session 22: No session	Session 10: Beyond MDGs Room: A-126	Session 13: Sanitation-Health Nexus Room: A-122
Coffee/tea break						
15:30 - 17:00	Plenary session, Theme 4: Enabling Research in Global Transformation: Learning from Current Experiences Moderation: Prof. Thammarat Koottatep, Asian Institute of Technology, NCCR North-South Regional Coordinator, Southeast Asia - Keynote: Dr. Hassan Mshinda, Director General, Tanzania Commission for Science and Technology, Tanzania - Discussant: Prof. Marcel Tanner, Director Swiss Tropical and Public Health Institute and member of the NCCR North-South BoD					
	Sustainable Development Goals - Presentation by: Dr. Michael Gerber, Head of Analysis and Policy Division, Swiss Agency for Development and Cooperation - Plenary discussion Room: A 003					
ICRD 2012 group photo Reception Room: Foyer UniS						

Note: Room: A-126 is located in the basement

Wednesday 22 August 2012

08:30 -	Plenary session, Theme 3: Enhancing Diversity: Fostering Cultural and Natural Heritage Moderation: Marian Perez, NCCR North-South Regional Coordinator, Central America and the Caribbean - Keynote: Prof. Peter Edwards, Head of Department of Environmental Systems Science, ETH Zurich, Switzerland - Discussant: Christian Zurbrügg, Director of Water and Sanitation in Developing Countries (SANDEC) and Member of the NCCR North-South BoD					
10:00	- Keynote: Prof. Luis Tapia, Coordinator of the Doctoral Program on Interdisciplinary Development, CIDES, Universidad Mayor de San Andres, Bolivia - Discussant: Prof. Brigit Obrist, Institute of Social Anthropology, University of Basel Room: A 003					
Coffee/tea break						
10:30 -	Parallel workshop sessions 90'			Parallel workshop sessions 180' (to be continued in the afternoon)		
	12:00	Session 29: Publishing Transdisciplinary Work Room: A-122	Session 4: Environmental Conflicts Room: A-126	Session 26: Integrated Devel- opment Research Approach Room: A 027	Session 19: Parks and Peoples Room: A 301	Session 20: Bio-Cultural Diversity Room: A 201
Lunch break Room: Foyer UniS		From 12:30 Poster session Room: Corridor ground-floor				
13:30 -	Parallel workshop sessions 90'			Parallel workshop sessions 180' (continuation of the morning sessions)		
	15:00	Session 14: Rural Women Room: A-122	Session 18: Statebuilding vs. Peacebuilding Room: A-126	Session 21: Legal Pluralism Room: A 027	Session 19: Parks and Peoples Room: A 301	Session 20: Bio-Cultural Diversity Room: A 201
Coffee/tea break						
15:30 -	ICRD 2012 Research Agenda Moderation: Prof. Hans Hurni, Centre for Development and Environment and Director of the NCCR North-South - Presentation by: Dr. Thomas Breu, Deputy Director of Centre for Development and Environment, Coordinator NCCR North-South, and Director of the IGS North-South					
17:00	Panel Discussion: - Prof. Bassirou Bonfoh, Director of CSRS and NCCR North-South Regional Coordinator, West Africa - Prof. Roger Jeffery, University of Edinburgh and Member of the NCCR North-South Review Panel - Dr. Michel Mordasini, Assistant Director-General and Head of the Directorate Global Cooperation, Swiss Agency for Development and Cooperation - Prof. Laurent Goetschel, Director of Swiss Peace Foundation, Member of the NCCR North-South BoD - Further panalist(s) from conference Room: A 003					

Note: [Room: A-126](#) is located in the basement

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The 3rd International Conference on Research for Development (ICRD 2012) – organised by the Swiss National Centre of Competence in Research (NCCR) North-South – will bring together more than 300 researchers and representatives from development agencies, civil-society organisations, and the private sector. The objectives of the ICRD 2012 are to share the most recent insights on development-oriented research conducted in North-South partnerships and to outline an agenda for research partnerships with developing and transition countries in support of equitable and sustainable global transformation. The present pre-conference proceedings contain abstracts of all keynote speeches and presentations to be given at the conference, along with the conference programme and an overview of sessions and presentations.

The NCCR North-South Dialogue Series presents reflections on research topics of concern to programme members throughout the world.

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