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Focus on the Horn of Africa



Bale Mountain National Park in the Ethiopian highlands. An increase in the number of people permanently settled there is putting unprecedented pressure on its resources. Photo: Rea Tschopp

Addressing environmental degradation, conflict, and disease

Degradation of natural resources threatens human health and security in the Horn of Africa. The effects of climate change – such as intensifying droughts – worsen matters. Farmers and pastoralists in the region are at the front lines. They must find ways to restore soils and avoid conflicts over resources like water.

NCCR North-South researchers in Ethiopia are assessing degradation and helping to create environmental observatories to guide land and water use towards sustainability. Others are investigating how pastoralists sidestep resource conflicts by renegotiating access rights.

Researchers in South Sudan have also examined how “traditional” mechanisms of conflict resolution – particularly chiefs’ courts – become linked to the formal state judicial system in the process of state-building.

Infectious diseases are another research topic in the region. Researchers have studied how tuberculosis is transmitted back and forth between livestock and their keepers. Another project sought to find ways of reducing pastoral communities’ vulnerability to HIV infection.

Editorial



Berhanu Debele

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Since the early 1970s, the Horn of Africa Region has been known for drought, famine, and conflict. These are the results of misuse of land resulting in natural resource degradation which contributed to climate variability and a decline in productivity and production. Inappropriate government policies, poor governance, and the changing world order add to this list. These and other factors constituted the core problems hindering the development of the region, and were therefore identified as areas of research of the NCCR North-South Programme. Sixteen institutions (13 from the region and three from Switzerland) collaborated in research on natural resources, conflict, and health. A total of 10 senior researchers, 26 PhDs (16 regular and 10 associated) and 60 master's students constituted the research team.

Impressive research output, capacity development (institutional as well as individual) and community empowerment – objectives of the NCCR North-South – were achieved. The research outputs revealed that the main cause of land degradation is Ethiopia's dramatic population growth – from 28 million in 1970, to around 86 million in 2012. This rise in the number of inhabitants led to a shortage of land for cultivation, subsequent deforestation, and the cultivation of steep slopes without proper conservation measures. The conflict over the use of the waters of the river Nile can be traced back to colonial times, to the days of Anglo-Egyptian Sudan. Moreover, the concerned states have fixed political positions, aggravating the conflict. The research revealed that river water users simply aren't aware of the problems facing the concerned upstream and downstream countries, and that dialogue can ease the tension and lead to fair sharing arrangements. Elsewhere, it was proved that the mechanism of community conversation can help to raise the level of people's understanding about the spread of HIV/AIDS, and can also help to enforce social laws that would help lower the risk. Finally, the bovine to human and vice versa transmission of tuberculosis was found to be a clear concern to be dealt with urgently.

We believe these research results will significantly contribute to the alleviation of the problems of development in the region. We are also confident that the multi- and transdisciplinary approach will be continued in the future.

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Focus on the Horn of Africa

Adapting to environmental change in the lowlands of Ethiopia

In the lowlands of Ethiopia, climate change is leading to unplanned mass migration that has the potential to cause conflict over resources. However, case studies in the area have shown that conflicts due to climate-change induced migration have rarely been violent, and remained at a local level. In an attempt to find out why, researcher Allemmaya Mulugeta investigated how local people in lowland pastoralist areas are adapting to the effects of climate change.



*Climate change is causing the loss of grazing land in the Upper Middle Awash Valley, Ethiopia.
Photo: Allemmaya Mulugeta*

Preliminary results from the study show that local people living in an extremely variable environment have their own mechanisms for adapting to environmental change: on the one hand, they are rapidly transforming their land use (e.g. from grazing to farming crops like cotton); on the other, they are changing the way they interact with different actors sharing the same resources. This element of human agency has so far been neglected in policy and scholarly debate.

Mulugeta's team identified the changes in strategic interaction as one major reason for the reduction of conflict. An example of the changes is the reorganisation of local leadership relevant to the distribution of resources such as land. Clan leadership, which had previously assumed the entire responsibility for land distribution, is gradually including local state authorities in dealing with land distribution and governance, and changing its views on restrictive communal property ownership. Such changes and social adaptation do not apply to all lowlands in Ethiopia but are becoming a trend that requires attention particularly because of its relevance for the mitigation of conflicts in the lowlands.

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Monitoring and mitigating soil degradation

In Ethiopia, land degradation and particularly soil erosion by water have not only reduced the productivity of the land but also worsened the effects of drought. Farming communities have made efforts to mitigate land degradation by developing local practices such as terracing to conserve soil and water.

To help determine the impact of sustainable land management on degraded areas, NCCR North-South researchers are supporting the development of efficient, relatively inexpensive ways of measuring and monitoring soil health. They have focused on application of soil spectroscopy, a novel technology that can be used to accurately measure the amount of organic carbon in soils, a key indicator of soil health and potential productivity. Used in combination with geographic information systems, soil spectroscopy may provide an efficient means



*PhD researchers (NCCR North-South), directors of partner institutions, and scientists at ICRAF, Nairobi.
Photo: NCCR North-South.*

of long-term, large-scale monitoring of surface soils in Ethiopia and elsewhere.

The researchers' analyses show that practices of sustainable land management have significantly increased the amount of soil organic carbon, from 1.11% on unconserved to 1.67% on conserved lands in certain areas. In the Anjeni watershed, for example, farmers were able to grow more crops requiring better soil fertility – such as maize and wheat – after improving their practices of sustainable land management between 1997 and 2010.

NCCR North-South researchers have helped to implement a partnership programme to promote soil spectroscopy and the potentials of carbon sequestration among researchers, policymakers, and development practitioners in Ethiopia and Tajikistan, Central Asia. In addition to roundtable discussions with policymakers, soil scientists and lab practitioners paid a visit to the soil spectroscopy laboratory ICRAF in Nairobi which uses state-of-the-art infrared spectroscopy technology. The visit aimed at honing the skills of the participants from Ethiopia and Tajikistan, allowing them to gain more practical experience with the new technology and data processing.

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Expansion of housing programmes towards fertile agricultural lands in Addis Abeba. Photo: Gete Zeleke



Chinese investors recently established this big cement factory in the middle of agricultural land. Photo: Gete Zeleke

Meso-scale landscape transformation in Ethiopia

Ethiopia's economy has so far been dominantly agrarian, providing a livelihood for 84% of the total population of about 86 million in 2011. Urbanisation has remained low (about 16%), which is lower than the Sub-Saharan average of 30-40%. This left the agrarian sector unconnected to urban centres, with minimal to no service provision. It is widely believed that landscape transformation during the past millennia has been unidirectional, converting the natural landscape into subsistence and rainfed primary production. However, a meso-scale landscape transformation study of the NCCR North-South has shown that this is not always true. Within the last two decades, other forms of change have started taking shape mainly along major development axes. Urban centres have expanded and both secondary and tertiary sectors emerged from a once totally agrarian environment. So far, the magnitude of these changes in space and time, their implications on key ecosystem functions and services, as well as the driving forces behind these changes have not yet been explored.

To properly document these emerging changes and associated impacts, a detailed study was conducted along five major development axes with a 20 km radius from the centre of the main road originating from Addis Abeba. A spatiotemporal analysis of physical changes was conducted and supplemented by a detailed GPS transect and socio-economic survey.

The results show that most of the existing larger urban centres have been expanding at a very rapid rate within the last decade: for in-

stance, Addis Abeba has been 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 also showed a similar trend, particularly within the 40 km² radius around Addis Abeba.

Sector-based investment maps were also produced along each development axis. The result reveals many undisclosed issues that need policy directions such as industrial clustering, payment for eco-system services, enforcing implementation of environmental safety actions, and, above all, strategic planning on where to put which industry.

The study further identified hotspot areas where substantial conversion of the 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, as a result of massive land rehabilitation programmes. Further analysis is currently underway to capture additional implications of landscape transformation processes on the environment and people's livelihoods, and on identifying the key driving factors behind such processes.

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Post-conflict state-building in South Sudan

After 20 years of conflict, the northern-based government of Sudan and the southern-based Sudan People's Liberation Movement/Army (SPLM/A) finally signed a comprehensive peace agreement in 2005. Then, in July 2011, South Sudan became officially independent after a majority voted for self-rule in a referendum earlier that year.

Since 2005, a process of (re-)building government institutions has been underway there. Few resulting institutions are built from scratch – most draw on identifiable pre-existing structures and are forged in contested local political arenas by various competing actors. These include traditional authorities, former and current government officials or SPLM/A members, returnees, and women's and youth groups. They vie for influence over the ongoing state-building processes, struggling to reassert themselves in the shifting context. Differing notions of authority, legitimacy, and statehood are contested in negotiations over resources and power.



This litigant is elaborating his view of a conflict over cows in a customary law court in Wanyjok. The sticks on the ground in front of the litigant symbolise cattle. Aweil East County, South Sudan. Photo: Martina Santschi

Chieftaincies and chiefs' courts are key "traditional" structures subject to negotiation and institutionalisation in the newly independent South Sudan. Having emerged in the colonial era, they are considered legitimate by many communities and play a crucial role in the rule of law, service delivery, and governance at the local level. But the precise jurisdiction of individual chiefs' courts and their linkage to the South Sudanese judiciary remains unclear. Meanwhile, local chiefs compete over who gets

to hear cases and collect fees and taxes. NCCR North-South Research has focused on the changing role of chieftaincies and chiefs' courts in this context.

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Researching extra-pulmonary Tuberculosis in Ethiopia

Tuberculosis (TB) is a key health problem in Ethiopia. Researchers Rea Tschopp and Balako Gumi, associated to the NCCR North-South and members of a Wellcome Trust-funded research consortium, investigated why Ethiopia reports high proportions (higher than the estimated 15% worldwide) of human tuberculosis cases that are not pulmonary TB.

The extra-pulmonary forms are rarely diagnosed and patients go untreated, and the main cause was believed to be cattle transmitting bovine TB to people. The majority of Ethiopians consume raw milk products or have direct contact to cattle. However, after thorough testing of 1,000 pulmonary and extra-pulmonary TB patients from different health centres in the country, this link was shown to be negligible.

Still, human TB and livestock TB remain important. In cattle, the occurrence was <2% in small-holder systems and up to 7% in pastoralist systems. The highest occurrence (30-80%) was observed in high milk yield imported dairy cows kept around the capital Addis Abeba. The research team was able to make recommendations on how to improve the skin test – the most common test to diagnose livestock TB. An economic analysis showed that it is beneficial to eliminate bovine TB around the capital, but not in more remote regions. A worrying finding was that human strains were isolated from cattle, goats, and camel. Thus it seems that while bovine tuberculosis is not an important source of human tuberculosis, people with tuberculosis might cause the disease in livestock, who, in return, could infect people.

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Factors of vulnerability to HIV infection among Borana pastoral communities

Vulnerability to HIV infection is a major challenge in settings where gender-based violence, discrimination, and power differentials between men and women prevail. Yet, there are gaps in determining which specific factors play a pivotal role in exposure to HIV infection among pastoral communities. The objective of this study was to determine factors that are perceived as making the Borana pastoral community in southern Ethiopia vulnerable to HIV infection, and which section of the community is most vulnerable and why.

The study showed that there is no one specific factor that makes the Borana pastoral community vulnerable to HIV infection, but that different factors play a role. First, awareness about HIV and AIDS was generally found to be weak, and the available information was too general, as it was developed at a central level without considering the local context. According to researcher Mirgissa Kaba, "For Borana, information on abstinence and faithfulness do not make much sense. Girls are expected to remain chaste until they marry and once they marry their engagement in extramarital sexual relations is tolerated." Second, men and women in the community have specific roles. The men's domain is outside the home and linked to migration in search of pastures, water, markets for livestock, the defense of Borana land, and hunting. The women's domain on the other hand is in and around the home, with responsi-

bilities including construction of the house and looking after children, the elderly, and small animals. The men's role in finding and going to new markets was perceived to make it easier for men to meet and engage in sexual relations with other women, putting both partners at risk of HIV infection. Third, despite recognition of the links to HIV infection, there is still an extramarital sexual practice (jaala-jaalto) in Borana that is tolerated among both men and women. This practice has social and economic implications, explains Kaba: "socially, failure to have such a partner is a mark of unwantedness, while economic transactions between the partners which often extend to their respective families are valued in the community." In sum, vulnerability to HIV infection in Borana is driven by various factors related to sexuality, gender, and lack of awareness. Successful interventions should address all the factors together rather than piecemeal.

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In a nutshell: NCCR North-South Horn of Africa

For the 12-year span of the NCCR North-South – 2001-2013 – the Regional Coordination Office in Addis Ababa coordinated research activities in the Horn of Africa. The research involved 13 institutions in the region, and covered issues of natural resources (degradation and management), conflict (over resources use as well as political), state building and governance, and health.

The NCCR North-South Horn of Africa partnership region originally encompassed five countries with ecological and socio-economic commonalities: Djibouti, Eritrea, Ethiopia, Somalia, and Sudan. However, the difficult security situ-

ation in the region in general meant the NCCR North-South was forced to concentrate its activities in areas most conducive to conducting research, in Ethiopia and Sudan.

Research in the region addressed the three main objectives of the NCCR North-South – research output, capacity building, and community empowerment – and, for each of them, remarkable achievements were recorded. Most of the research results led to the production of policy brief documents which were discussed with practitioners and policymakers in joint sessions such as the Science Policy Forum with the researchers.

Alumni Interview

Amare Bantider Dagnev, Director for Research, Dissemination and Community Services at Dilla University, Ethiopia, completed his PhD within the NCCR North-South. At Dilla University, he also holds the position of Assistant Professor of Geography and Sustainable Land Management, and was instrumental in setting up a graduate programme in sustainable natural resource management.

What did you do your PhD on? The title of my PhD is "Landscape transformations and opportunities for sustainable land management along the Eastern Escarpment of Wello, Ethiopia". There, I analysed the landscape dynamics mainly since the 1950s and investigated the best possible options for sustainable land management. The research attempted to quantify the rate of land transformation and to identify its driving forces. It sought to identify core problems of land management, to analyse the impacts of landscape transformation on the biophysical environment and on the livelihoods of the farming households, and to appraise options of land management technologies and approaches from a sustainability perspective. The research successfully applied combinations of social science and natural science research methodologies.

What has your career path been after leaving the NCCR North-South? Right after finishing my studies, I went back to my former institution, Dilla University, and joined the Department of Geography and Environmental Studies as Assistant Professor. At first I worked only as a lecturer; now I also have managerial responsibilities. As my first managerial assignment, I served as head of the planning and programming department of the university. In 2010, I became Director for Research, Dissemination and Community Services of the university.

How has your research made a difference – can you give a concrete example? My research makes a real difference compared to the situation before. A year after completion of my PhD study, I together with colleagues from the department, developed a curriculum for a graduate programme entitled "MSc in Sustainable Natural Resource Management". This is the first concrete outcome of my PhD training and research on sustainable land resource management. Currently I teach at MSc level and advise MSc and PhD theses in the broad field of sustainable natural resource management (such as watershed management, land use and land cover change, resource governance,

soil and water conservation, and water resource management). From 2009 to June 2012 I actively participated in a collaborative research and capacity building project entitled "integrated river basin management" with eight Ethiopian universities and a consortium of institutions from The Netherlands. I also coordinated and participated in a research project that was run by Dilla University and The Norwegian University of Science and Technology between 2008 and 2011.

What are you currently working on? Today, I am a lecturer on the graduate programme, researcher on issues related to sustainable land resource management (watershed management, land use/land cover studies, wetland resources, and natural resource governance) and Director for Research, Dissemination and Community Services of the university.

What, for you, are the greatest challenges in your current work? Concerning research and academic affairs, my current challenge is a lack of enough time to do extensive research, and financial constraints to establish standard research and monitoring watersheds equipped with the state-of-the-art instruments in the area where I am currently working. Thus, we are unable to scientifically monitor the long-term changes in the agricultural landscape of the southern part of Ethiopia.

What would you change, if you could? My dream is to fully devote my time to research on searching for alternatives for sustainable land and water resource management.

Where do you see yourself in ten years? A very difficult question! Currently I am working in the field of academia, which I foresee to stay in. As a vision, I have a wish to be among the leading researchers and scientists who could have an impact on policies and practices in resource management which aim at improving people's livelihoods and at the same time reducing unsustainable development.



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NCCR North-South News

NCCR North-South policy briefs

Several new regional and global editions of evidence for policy have been published recently. To date, six policy briefs have been released that focus on the Horn of Africa:

- “Khat in Ethiopia: finding a balance between positives and negatives”
- “Chiefs, state-building, and development in independent South Sudan”
- “Tailoring HIV interventions in Ethiopia to suit the local context”
- “Transboundary waters and conflict transformation in northeastern Africa”
- “Understanding new sources of conflicts in the lowlands of Ethiopia”
- “Improving ecosystem services for food security in Ethiopia”

These and others are available for download at: <http://www.north-south.unibe.ch/content.php/page/id/305>

Outcome Highlights

Visit <http://www.north-south.unibe.ch/content.php/page/id/315> to download the NCCR North-South's Outcome Highlights series. One edition of Outcome Highlights spotlights the Horn of Africa: “Shared learning via community conversations: HIV prevention among Ethiopian pastoralists”

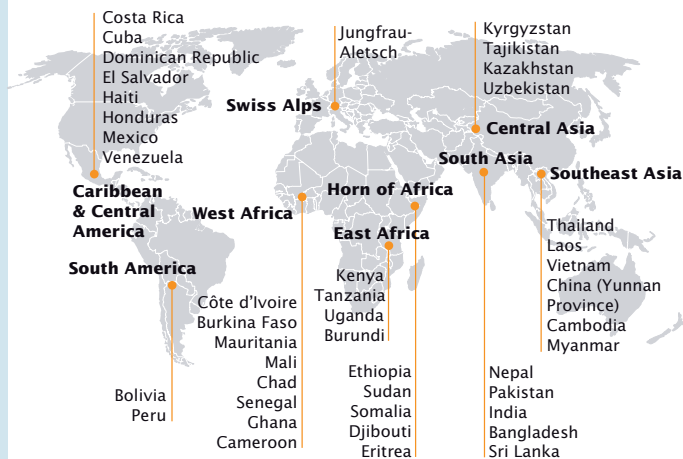
The NCCR North-South draws to a close

The following events mark the end of the NCCR North-South:

Research partnerships with the global South – A paradigm shift for Swiss research policy and development cooperation? Tuesday, 4 June 2013, 5 pm – 7:30 pm, University of Bern, UniS, Room 003. At the programme's final policy event, politicians and researchers will comment on the potential of North-South research networks and discuss the role of politics vis-à-vis successful development cooperation.

Research Fair: Wednesday 5 June 2013, 9 am – 3 pm, at SDC headquarters in Bern. The fair will promote mutual learning by bringing together researchers and practitioners involved in international cooperation to present, share, and discuss promising and innovative results, processes, and products from research partnerships with developing countries.

Partnership Regions



Swiss Partner Institutions

- Centre for Development and Environment (CDE) University of Bern
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- Development Study Group (DSG)
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Programme Management

- The NCCR North-South is directed by a board made up of representatives from the Swiss Partner Institutions together with the Regional Coordinators. It is headed by programme directors Hans Hurni and Urs Wiesmann, and coordinated by Thomas Brey.

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