



Zentrum für Entwicklungsforschung  
Center for Development Research  
University of Bonn

# ANNUAL REPORT 2014/2015

## Focus: Migration



## Abbreviations

**BMBF** German Federal Ministry of Education and Research

**BMZ** German Federal Ministry for Economic Cooperation and Development

**CGIAR** Consultative Group on International Agricultural Research

**DAAD** German Academic Exchange Service

**DLR** German Aerospace Center

**ECOWAS** Economic Commission of West African States

**FZJ** Research Centre Jülich, Germany

**IFPRI** International Food Policy Research Institute, Washington D.C., USA

**RLC** Right Livelihood College

**FAO** Food and Agriculture Organization of the United Nations

**UNU-EHS** United Nations University - Institute for Environmental and Human Security, Bonn, Germany

**WASCAL** West African Science Service Center on Climate Change and Adapted Land Use

**WHO** World Health Organization

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For an overview of ZEF's staff and its departments please have a look at [www.zef.de](http://www.zef.de)





# 1

## RESEARCH FOR A MOBILE WORLD

Introduction by ZEF's directors

In a globally entangled world not only goods, information and ideas move beyond national borders but also people increasingly want and need to do so. The impacts of climate change and land degradation as much as the results of wars and conflicts far away in Africa and Asia suddenly become imminent and personal in the western world when people flee from these areas to conflict-free places nearby.

As you can read in the Lead article on the next pages, ZEF has been conducting research on different aspects of migration and mobility since its start in 1997. Moreover, our efforts and activities in the realm of institutional and academic capacity development in developing countries have addressed root causes of forced migration. Around 80 percent of our PhD students return to their home countries in Africa, Latin America and Asia after finishing their degree to re-invest their skills in developing institutions and shaping policies in their societies.

ZEF's research agenda is based on long-term research perspectives and goals. Over the past two years ZEF's International Advisory Board, directors, researchers and partners have developed a newly realigned research agenda that is more deeply integrated, and adjusting to new demands, filling critical research gaps in the latest development policy agenda as set

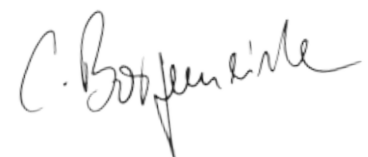
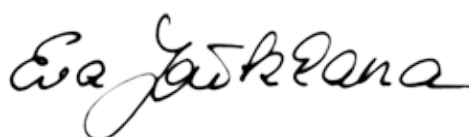
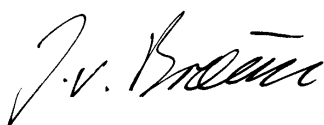
by the newly adopted Sustainable Development Goals (SDGs). Find a preview of ZEF's new strategy on page 37. The full version is available on ZEF's website at [www.zef.de](http://www.zef.de).

ZEF will continue to engage in developing capacities in and for the developing world. Our most recent initiatives in this context range from a German-Bolivian University Partnership on biodiversity over our achievements to assist in the establishment of the West African Science Service Center for Climate Change and Adapted Land Use (WASCAL) to a new partnership program with the International Program in Agricultural Development Studies (IPADS) at the University of Tokyo.

Besides intensified investments in capacity development, ZEF has been able to consolidate and extend its research activities in Africa, Asia and Latin America. A recent highlight in this respects is the large new ZEF "Program of Accompanying Research for Agricultural Innovation (PARI)", funded by the Ministry for Economic Cooperation and Development (BMZ). Africa is increasingly emphasizing the role of innovation in development. Innovation for sustainable and pro poor agricultural growth forms an important part of the Science, Technology and Innovation Strategy for Africa 2024. The German Government has acknowledged

this innovation potential and wants to support the improvement of food and nutrition security and sustainable agricultural value chains through Agricultural Innovation Centers in twelve African countries and in India. ZEF through the PARI program offers independent scientific advice to support these Innovation Centers. ZEF's expanding research on bio-economy is also cutting-edge.

ZEF has continued to be highly successful in acquiring funds on the competitive market for research grants. More than 80 percent of ZEF's overall budget derives from such competitive project funding. We would like to express our deep gratitude to all our donors, whose continuous and indispensable support has made the achievements documented in this Annual Report possible. Among them are the German Federal Ministry of Education and Research (BMBF), the German Federal Ministry for Economic Cooperation and Development (BMZ), the State of North Rhine Westphalia, the German Academic Exchange Service (DAAD), the Robert Bosch Foundation, the Bill and Melinda Gates Foundation, the Foundation fiat panis, the Thyssen Foundation, Bayer AG, the Volkswagen Foundation, the Dreyer Foundation, Union Investment, to name a few as well as various governments who grant specific support to ZEF PhD students.





## ADDRESSING THE ROOT CAUSES OF FORCED MIGRATION

Lead article by Eva Youkhana, Joachim von Braun and Christian Borgemeister

According to the UN Refugee Agency UNHCR, almost 60 million people had been forcibly displaced globally by the end of the year 2014. Root causes of migration and flight range from wars over destabilized regions to economic, political and social asymmetries. They make people search for a perspective for survival and for secure living conditions. The total number of displaced persons is made up of internally displaced persons (38.2 million), refugees (19.5 million), as well as asylum seekers (1.8 million). Although the large majority (86 percent) seek refuge in neighboring countries, many individuals and families take high risks to find secure destinations in far-away countries. The pathways to security and better living conditions force thousands of people to travel either in ramshackle boats across the Mediterranean Sea, as human cargo in overcrowded and stifling trucks or as stowaways on train routes such as the notorious “La Bestia”, carrying Central Americans from southern to northern Mexico. In recent years the industrialized countries of Europe and North America have pursued politics of compartmentalization (e.g. the Dublin Regulations stipulating that asylum seekers can only apply for asylum in the first EU member state they enter) and of installing restricted border regimes, resulting in a lethal refugee smuggling business. Recently, these policies have been partly revised but no coherent framework has been established so far. The countries of the

Global North must therefore engage in creating legal refuge and secure escape routes in order to avoid becoming complicit in the present refugee crisis.

The reasons why people are forced to migrate are multiple and relate to a complex system of interconnected economic, institutional, environmental, social, cultural and political processes and causalities. Since ZEF started its research activities in 1997, it has been studying the causes of migration and displacement, and identifying policy options for changing the situation in different contexts. ZEF researchers have been conducting noted theoretical analyses on migration and relative deprivation in countries of the Global South to find evidence-based solutions for issues such as the role of food and health insecurity, and of environmental stress, such as water pollution and climate change in the context of migration.

According to the International Association for the Study of Forced Migration, environmental degradation and climate change are important causes of migration. People leave their homes temporarily or permanently to escape from environmental disruption, often caused by climate change, land use changes, pollution, and over-exploitation of natural resources that can trigger natural disasters like floods, droughts, hurricanes, etc. Refugees and internally displaced people who flee for environmental reasons are often and wrongly identified as

economic refugees – an argument used in the destination countries to de-legitimize their reasons for fleeing. In addition, people moving due to climate change and hunger do not fall under the 1951 Refugee Convention. However, they should be protected in the same way as marginalized groups belonging to a certain race, religion, nationality, or social or political group. This point was also highlighted in the context of the recently ratified Sustainable Development Goals (SDGs), where a target under goal 10 (reduce inequality) states: “Facilitate orderly, safe, regular and responsible migration and mobility of people, including through the implementation of planned and well-managed migration policies”. Moreover, the world community is called upon to take urgent action to combat climate change (SDG 13) and to protect the environment (SDG 15).

Identifying the causes of forced migration requires in-depth analyses, sometimes covering long periods of time. In Latin America, for example, the taxation of agriculture, the privatization of communal lands and forests in addition to the failure of national governments to provide adequate public services undermined rural livelihoods in the 1970s and 1980s – with continuing effects, even after these policies changed in the 1990s. This led to rapid urbanization, high unemployment rates in urban and rural areas as well as the growth of the informal sector. Colonial trajec-

tories and economic dependencies have affected many Central American countries as much as armed conflicts and guerrilla warfare and still traumatize their citizens today. Exploitation, violent conflicts and wars cause high emigration rates and refugee movements via Mexico to Canada and the US. The current refugee crisis in Europe is also related to a multiplicity of processes involving geostrategic interests, environmental stress, supposedly ethnic and religious conflicts resulting in violence and wars in northern Sahel, North Africa, the Middle East and (Central) Asia. After experiencing the Soviet intervention in Afghanistan (1979), the overthrow of the Taliban regime in 2001, the revolution in Iran (1978), and the three Gulf Wars (1980-1988, 1990-1991, 2003), these regions are in addition now suffering from the effects of the civil wars in Libya, Syria, and Yemen.

The German Government supports refugees through UN and NGO programs in Turkey, Jordan and Lebanon, for example, with food, education and potable water - in addition to the funds it provides for the United Nations Children's Fund's (UNICEF) program "No lost generation", which strives to create future perspectives for young people in Africa. These are urgently needed steps to support communities in the camps and to address the basic needs of refugees. However, there is a lack of research providing guidance on sound action in and around camps.

Future research on migration and development needs to address the root causes of migration as well as the role migrants play in development. Future research should focus more on the resilience and adaptation capacities of socio-ecological systems in the refugees' countries of origin, such as the political and economic indicators of ethnic conflicts, processes of urbanization, land pressure and socio-cultural changes. Potential conflicts in communities of destination and the role migration can play in creating future societies should also be studied. In 2008, the International Organization for Migration established the International Migration and De-

velopment Initiative to better facilitate the transfer of remittances from migrants. For example, by creating tax incentives for development projects or by organizing labor migration in a more structured way. Furthermore, the Global Migration Group (GMG), an inter-agency group bringing together several UN agencies such as the World Health Organization (WHO), the International Labor Organization (ILO), the United Nations Food and Agriculture Organization (FAO) and the World Bank to promote migration for development acknowledges "the important contribution made by international migration to development in countries of origin, transit and destination" (GMG 2015). Development here is also understood as a consequence of people's own initiatives, of the (human) capital and know-how accumulated by migrants and returnees. Remittances support the livelihoods of entire communities by channeling resources into housing and development initiatives as well as health and education. Yet, large shares of these remittances are not invested productively because of deficient banking and advisory capacities, as studies on the effects of remittances in Mexico and Bangladesh have shown.

Development research and policies must address forced migration and drivers of migration in their diverse contexts. The respective investments need to be scaled up while considering the issues listed below. These issues need evidence-based research for implementation and context-specific strategies:

- The plight of refugees from war and conflict zones must be addressed everywhere in accordance with the 1951 Refugee Convention. This applies both to developing countries, which should be supported through development assistance, and to destination countries such as countries in the EU. Accompanying research involving civil society and migrant organizations could assist in this context.
- Work opportunities in developing countries need to be expanded by investing in infrastructure and rural

development programs, including large-scale employment programs such as are in place in India and used to exist in China in the 1980s and '90s. Research into the labor markets of forced migrants would be important for guiding respective policies and programs.

- Research needs to test low-cost but effective (possibly IT-based) education and training programs for migrants to improve their education and skill base.
- Nutrition and the health of migrants and refugee children are crucial. Targeted programs are needed in the countries of origin, but also along the entire escape and migration routes. Research is needed to deal with the challenge of flexible nutrition and health interventions.
- Investment opportunities and incentives for remittances as a means for development should be strengthened. Migrant organizations can be partners in development cooperation and related research.
- Labor markets with a high proportion of migrants such as care industries and household services need to be regularized to ensure fair employment conditions.
- The European border regime as well as asylum and immigration laws need to be revised at national levels and coordinated at European level to ensure safe escape routes.
- Social, economic and human rights aspects should be considered jointly in immigration laws and regulations, given the overlap of poverty, environmental stress, and violence leading to displacement and migration. Related legal innovations and institutional research would need to identify implications.

Interdisciplinary and transdisciplinary research on and with migrants will be essential to improve the evidence base of causes of forced migration and develop solutions. By considering migrants' contributions to development in research agendas, innovative participatory research can help to give migrants a voice, visibility and agency.





## ZEF'S RESEARCH AGENDA

We conduct development-oriented research contributing to reducing poverty, enhancing sustainable development and improving development-related policy making. To achieve this, we conduct research on issues relevant to development and we collaborate with international researchers, in particular from Africa, Latin America and Asia. Above all, we educate up-and-coming

researchers from all over the world in our Doctoral Studies Program. ZEF's research concept is based on trans-disciplinarity: We strive to bridge the gaps between academic disciplines, between research and policy, and between research and practice. We focus on a set of "core themes" (listed in the middle of the diagram below) supported by ZEF's "disciplinary

capabilities" of the three research departments (depicted in the three outer circles). This report covers a selection of themes according ZEF's agenda so far (see also [www.zef.de/researchareas.html](http://www.zef.de/researchareas.html)).

Please note that ZEF published its updated strategy in November 2015. More information on page 37.



## 3.1 SCIENCE POLICY

### WASCAL

The **West African Science Service Center on Climate Change and Adapted Land Use (WASCAL)** is a research-focused international organization of West African states. WASCAL's overall aim is to help enhance the resilience of human and environmental systems to climate change and variability in West Africa. Since 2010, ZEF has been supporting the coordination and development of WASCAL and heading the research consortium of German universities and research institutions working with and for WASCAL. From the beginning, WASCAL has aimed to establish a long-lasting and sustainable research infrastructure in West Africa in close cooperation with regional policy-makers and scientists. Thus, ministries of the West African member states have been closely involved in the process of creating the program. WASCAL's research foci and priority areas were generated and agreed upon during several workshops with regional stakeholders to ensure that WASCAL addresses the region's most urgent needs. Based on this participatory planning process, WASCAL is built on three institutional pillars, all located in West Africa: a **Climate Service Center** to provide evidence for science-based policies on adaptation and mitigation (based in Ouagadougou, Burkina Faso); a **Research Program** to generate continuous and high quality data (based

in Accra, Ghana); and the **Graduate Studies Program** for strengthening academic and human capacities (master's and doctoral studies programs in the ten WASCAL member states). (Find more information about the Graduate Studies Program in this Annual Report in chapter 4.3, page 27). Ten countries in West Africa are currently involved in WASCAL: Benin, Burkina Faso, Côte d'Ivoire, The Gambia, Ghana, Mali, Niger, Nigeria, Senegal, and Togo. After the majority of the WASCAL member states had ratified the WASCAL cooperation agreement, **WASCAL became an official regional international organization in 2013**. In cooperation with the Economic Commission of West African States (**ECOWAS**) WASCAL is currently negotiating to invite Cape Verde, Guinea, Guinea-Bissau, Liberia and Sierra-Leone to join so WASCAL's mandate region could be expanded to the whole ECOWAS region.

#### *Selected events mid 2014-mid 2015*

Ministers and other high-level government officials of the ten WASCAL member-countries and Germany, as well as representatives of the ECOWAS-commission met in Berlin on July 9, 2015 to discuss future collaboration on WASCAL. The ministerial meeting took place at the invitation of the Federal Minister of BMBF, Prof. Johanna Wanka, and was the **WASCAL Ministerial Council's** second meeting. The first meeting was held in Lomé in February 2012, where the WASCAL member countries signed

the cooperation agreement. It was agreed upon that the member states are to finance and operate WASCAL with their own means in the future. Representatives of Guinea-Bissau and Guinea were also attending the meeting in Berlin to discuss a future membership in WASCAL.

**Project coordination** (in Germany): Christian Borgemeister (cb@uni-bonn.de) and John Lamers (jlamers@uni-bonn.de)

**Funding agency:** German Federal Ministry of Education and Research (BMBF)

Website: [www.wascal.org](http://www.wascal.org)

**Main cooperation partners in Germany:** Department of Geography, University of Bonn; Faculty of Agriculture, University of Bonn; Department of Geography, University of Augsburg; Institute of Biological Sciences/Botany, University of Rostock; Faculty of Biology, University of Würzburg; Department of Geography and Geology, University of Würzburg; The German Climate Computing Center, Hamburg; German Aerospace Center (DLR) – Earth Observation Center, Oberpfaffenhofen; Research Centre Jülich (FZJ); Institute of Meteorology and Climate Research, Atmospheric Environmental Research, Karlsruhe Institute for Technology, Garmisch-Partenkirchen; Institute for Environment and Human Security, United Nations University (UNU-EHS);

**Website:** [www.wascal.org](http://www.wascal.org)





## German-Bolivian partnership for integrating biodiversity measures in environmental impact assessments

Bolivia belongs to the top ten countries with the highest species richness in the world - located on only 0.2% of the earth's surface. Even though the remoteness and inaccessibility of many places and a relatively low human population density has prevented over-exploitation of natural resources in the past, Bolivia's biodiversity, is facing multiple threats. Despite its abundant natural resources Bolivia remains the poorest country in South America. The strong political focus on economic growth has led to increasing pressures on natural ecosystems and other serious threats to the environment and biodiversity. As many other countries, Bolivia has reacted towards increasing environmental pressures by **conducting Environmental Impact Assessments (EIAs)**. These assess and evaluate the environmental consequences of investments and development activities before their implementation – with the goal of minimizing negative impacts on the environment. EIAs in Bolivia are usually carried out by environmental engineers. Although these experts are highly professional in their own field, the access to appropriate tools and methods to account for

biodiversity in the EIAs is often insufficient. Thus, Bolivia's great diversity of ecosystems and outstanding natural capital calls for a stronger consideration of biodiversity-related indicators in EIAs that need to be adapted to local conditions and requirements.

### *Capacity development*

This project will initiate a long-term partnership between the Universidad Católica Boliviana in Cochabamba (Bolivia) and ZEF. The aim is to jointly work on a better appreciation and a more appropriate implementation of biodiversity accounting in the Bolivian EIAs. Beyond, we want to minimize the gap between academia and practice by strengthening the science-policy interface.

### *Research activities and strategy*

- Joint development of a concept for the integration of biodiversity aspects into Bolivian EIAs based on consolidation and adaptation of existing tools and guidelines to Bolivian conditions.
- Joint development of a curriculum for the integration of biodiversity-related EIAs as part of the regular environmental engineering curriculum.
- Development of a compendium and a webinar both for lecturers and students of the Universidad Católica Boliviana. The project will

engage in contacting conservation practitioners, members of local conservation agencies and NGOs, in order to provide regular communication between academic research institutions and practitioners.

- Junior researchers from Bolivia are invited to apply for participation in the doctoral program at ZEF with a topic related to EIAs.

**Project coordination:** Vanesa Rodríguez Osuna (vanesa@uni-bonn.de) and Christian Borgemeister (cb@uni-bonn.de)

**Main funding agencies:** German Academic Exchange Service (DAAD) with funds from the Federal Ministry for Economic Cooperation and Development (BMZ)

**Main cooperation partners:** Universidad Católica Boliviana, Cochabamba, Bolivia.



## 3.2 GOVERNANCE

### Food price volatility

Volatility describes price fluctuation around a long-term trend. After a long period of low and stable prices, food-price levels increased in 2007 and 2008 and have remained volatile since. Excessive volatility – sudden and extreme food price shocks – threatens food security, in particular of poor people who spend 60-70% of their income on food. The research group at ZEF analyzes the drivers of food prices and price volatility (ranging from speculation, storage and trade, production and demand shocks), its impacts on food security, health and food production as well as policy and risk-management strategies to reduce volatility and better deal with volatile prices. The research focuses on international commodity markets and case studies in selected countries. The aim of the project is not only to better understand causes and impacts of price shocks and price risk but also to develop and provide tools for identifying upcoming crises (early warning system). The findings are used to inform decision-makers in ministries, international organizations and companies.

#### *Research activities mid 2014-mid 2015*

**Jan Brockhaus** worked at the Chinese Academy of Sciences in Beijing, China, as a visiting researcher. He collaborated with local researchers on the topic “Agricultural supply response in the major provinces of China” (October 3-7, 2014).

In September 2014, **Bernardina Algieri and Matthias Kalkuhl** analyzed the predictability of commodity futures markets, that is, the difference between realized and estimated spot-prices and the influence of various factors on the prediction error. It was detected that short-term speculations disturb the information building process at commodity future markets

and increase the prediction error.

**Jan Brockhaus and Matthias Kalkuhl** analyzed in a model study various policy instruments, amongst others, subvention of private grain storage, setting up a federal grain emergency reserve, and anti-cyclical trade policies. Small-scale federal emergency reserves appear to have the largest impact on avoiding extreme price amplitudes. These reserves work even better when they are coordinated with other countries which are linked through trade relationships.

A study conducted at ZEF addressed the advantages and cost-savings of such a joint regional emergency reserve for the **ECOWAS and the Association of Southeast Asian Nations regions**. The work is part of the doctoral theses of **Lukas Kornher and Irfan Mujahid**.

**Marta Kozicka** analyzed the Indian agricultural policies while focusing on the purchase of wheat and rice by the state, on storage, governmental redistribution of basic foods, and trade. The research identifies various market-distorting factor and shows that the Indian governments exerts a strong influence with it regulations on the listed factors. The discussion paper is available at [http://bit.ly/ZEF\\_DP197](http://bit.ly/ZEF_DP197)

**Irfan Mujahid** identified the most important markets in Indonesia and showed that price movements in these markets can be used to predict those in other markets.

#### *Events mid 2014-mid 2015*

2nd International ZEF-IFPRI (International Food Policy Research Institute) workshop on “Food Price Volatility” (July 8-9, 2014) in Bonn. Presentations by: **Jan Brockhaus**, “Drivers of Grain Stocks. Deriving and testing a reduced form storage equation”; **Mekbib Haile et al.**, “Short-Term

Acreage Forecasting, and Global Supply Response to Prices and Price Variability”; **Mekbib Haile and Matthias Kalkuhl**, “Price Expectation Formation of Smallholder Farmers in Ethiopia: The Role of Information”; **Matthias Kalkuhl**, “Price Transmission, Vulnerability Mapping and Early Warning”; **Lukas Kornher and Matthias Kalkuhl**, “Assessing the Costs and Benefits of Storage Coordination”; **Marta Kozicka**, “Modeling Indian Rice and Wheat Sector Policies”

**Marta Kozicka** took part in the meeting of the Agriculture and Applied Economics Association in Minneapolis, USA, and gave a presentation on “Modeling Indian Rice and Wheat Sector Policies” (July 26-30, 2014)

**Matthias Kalkuhl** participated in a panel discussion on the launch of the Price Warning Tool for the “Global Information and Early Warning System on food and agriculture” of the FAO (September 24, 2014)

**Mekbib Haile** contributed to the “Information for Meeting Africa’s Agricultural Transformation and Food Security Goals” in Addis Ababa, Ethiopia, by presenting his paper “Access to information and smallholder farmers price expectations: evidence and policy implications” (October 1-3, 2014)

Content-related organization of a **round table on early-warning systems and responsible investment** together with partner organizations such as IFPRI, FAO, and the World Food Programme as well as NGOs and representatives of the private sector at BMZ (November 17, 2014), Bonn, Germany

**Marta Kozicka** presented research on “Food Policies in India – Implications for Stocks and Fiscal Costs” (December 4-5, 2014) at the international conference of the Institute of Economic Growth (IFPRI) conference “Innovation in Indian Agriculture: Ways Forward” in New Delhi, India.



## 3.3 WATER RESOURCES

**Lukas Kornher** participated in the 2nd Bordeaux workshop on “International Economics and Finance: Price risk management of agricultural commodities in developing countries” and gave a presentation on “Recent Trends in Food Price Volatility in Developing Countries” (December 5, 2014)

### *Doctoral students*

**Jan Brockhaus.** Reducing food insecurity by improving transparency, storage, and trade on agricultural markets (ongoing).

**Mekbib Haile.** Volatility of International Food Prices: Impacts on Resource Allocation and on Food Supply Response (graduated in 2015).

**Lukas Kornher.** Food price volatility: the role of stocks and trade (graduated in 2015).

**Marta Kozicka.** Evaluation of Food Price Stabilization Policies in India, with Special Emphasis to Public Stocking Policies (ongoing).

**Irfan Mujahid.** Assessing the Role of Trade and Reserve Cooperation in the Food Price Dynamics: Indonesia in the Regional and Global Economic Architecture (ongoing).

**Regine Weber.** New Data Sources for Food Security Monitoring in Developing Countries: Exploration, Validation and Implementation (ongoing.)

**Project coordinator:** Matthias Kalkuhl (mkalkuhl@uni-bonn.de)

**Main funding agencies:** BMZ; European Commission (FOODSECURE project)

**Main cooperation partners:** IFPRI, Washington; Indian Council for Research on International Economic Relations, New Delhi; Ethiopian Economics Association, Addis Ababa; Institute of Statistical, Social and Economic Research, Accra; Center for Chinese Agricultural Policy, Beijing;

**Website:** [www.zef.de/volatility.html](http://www.zef.de/volatility.html)

### **Integrated Water Resources Management in the Olifants Basin in South Africa**

The water research work of ZEF in the Olifants basin in South Africa focuses on enhancing the value flow of water utilisation including the development of virtual water and water footprint concepts. Moreover, ZEF coordinates activities related to capacity building. What problems should be solved?

The first problem is related to water quantity. Since South Africa is a **water scarce country**, it is interesting to better understand how different end-users (farmers, mines, households and ecosystem services) may benefit from the limited available amount of water. The second problem is related to water quality, since **poor water quality** affects crop yields negatively and increases the costs of water treatment. The following research questions are addressed:

- identify and assess the transaction costs inherent to the implementation of water policy in considering heterogeneity between water users (farmers, mines, households)
- determine the marginal values of water in different sectors (agriculture, industry, services) and assess the impacts of water use on water quality for different locations and times in the Olifants basin
- evaluate the costs and benefits of water treatment and assess the potential for addressing water scarcity through virtual water trade

- set up a contract between a regulator and selected farmers to investigate the conditions under which farms invest in abatement efforts to reduce water pollution.

### *Doctoral students*

**Georgina Wambui Njiraini.** The role of institutions, policy and Information and Communication Technologies in management of a water stressed basin, the case of Olifants basin, South Africa (ongoing).

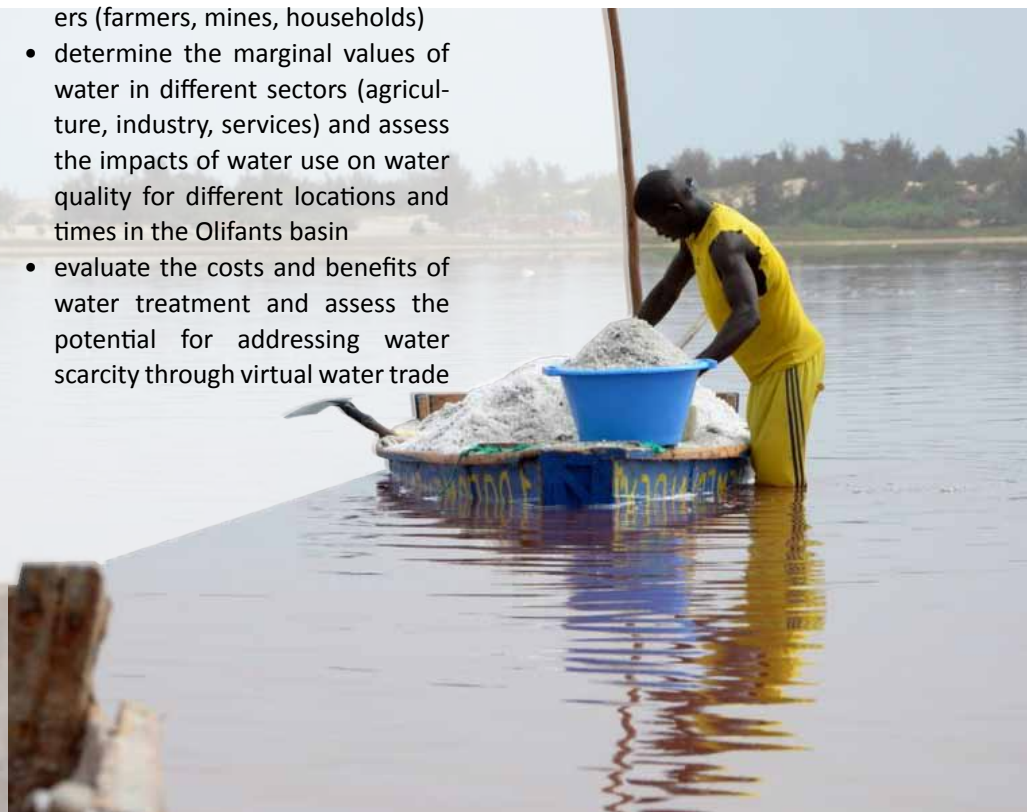
**Phillipa Kanyoka.** Addressing sectoral water values in an integrated hydro-economic water modeling framework: Olifants river basin (ongoing).

**Project coordinator:** Djiby Racine Thiam (dthiam@uni-bonn.de)

**Funding agency:** BMBF

**Cooperation partner:** Rashid Hassan (Center for Environmental Economics and Policy in Africa, University of Pretoria, South Africa)

**Website:** [www.iwrm-southafrica.de/start.html](http://www.iwrm-southafrica.de/start.html)



Salt mining in West Africa.



## 3.4 HEALTH AND SANITATION

### WATSAN

Water, Sanitation and agriculture (WATSAN-AGRICULTURE) is a project on guiding pro-poor investments in the **nexus of domestic water quality and quantity, sanitation and hygiene, and agriculture**. Bottom-up research is conducted in the four case study countries Bangladesh, India, Ethiopia and Ghana.

The goal of the WATSAN-agriculture project is to identify trade-offs, synergies, and thresholds among water quality and quantity, sanitation and hygiene, and agriculture as well as their implications for investment priorities and better health and nutrition outcomes. The project also aims at strengthening the capacity of households and communities to monitor and manage their own water and sanitation environment.

**Water, sanitation, and hygiene** are key elements for improving the nutritional status of households. Unsafe drinking water and inadequate water and sanitation conditions are widely known as the major causes of diarrhea, tropical enteropathy, and intestinal worms. Diarrhea is a leading cause of death among children under-five. Around 2 billion people across the globe are affected by parasitic infections and around 4.5 billion people are at the risk of being infected. The WHO/United Nations Children's Fund Joint Monitoring Program for Water and Sanitation 2013 reported that in **2011, 768 million people lacked access to improved drinking water**, while the sanitation coverage in 2011 was 64%, far below the sanitation target of 75% set in the Millennium Development Goals. The report further documents that 15% of the global population practiced open defecation. Water and sanitation challenges are exacerbated by population growth, rapid urbanization and climate change.

### *Research activities mid 2014-mid 2015*

Data collected from various modules at community and household levels (agricultural water uses by types, drinking water by sources, sanitation infrastructures, behavior, health and nutrition), and sampling and lab testing of water at sources and in household storage have been completed in all four countries. In Bangladesh, the implementation of randomized control trials was hindered due to an unstable political situation caused by massive demonstrations in early 2015.

During a project workshop at ZEF on September 8-9, 2014, recent research findings collected in the four countries and respective datasets and analytical approaches, as well as strategies on harmonizing assessments of impacts were discussed. Project partners attended the workshop as well as researchers from the University of Bonn and a representative of the Sustainable Sanitation Alliance.

Former project coordinator **Evita Pangaribowo** visited BRAC, Bangladesh, in January 2015 to facilitate the launch of the agricultural hygiene and food-hygiene messages intervention. During the visit, a package of agricultural hygiene and food hygiene promotion measures was produced and introduced.

**Nicolas Gerber** visited project partners at the Institute of Statistical, Social and Economic Research in Ghana in April 2015. PhD student Charles Okyere presented his work and recent findings from his fieldwork.

### *Presentations at international conferences:*

**Usman M.A.**, "The impact of drinking water quality on child health: evidence from Rural Ethiopia", Poster presentation at the 6th European As-

sociation of Agricultural Economists PhD Workshop in Rome, Italy, June 8-10, 2015

**Usman M.A., Pangaribowo E.H.**, "Exploring the trade-offs between irrigation and drinking water supply under multi-use water system in Ethiopia", Poster presentation at the International Water Resources Association World Water Congress XV in Edinburgh, Scotland, May 25-29, 2015.

### *Doctoral students*

**Muhammed Abdella Usman.** Leveraging water, sanitation, and hygiene nexus: synergies, thresholds, and trade-offs for a better nutrition and health outcome in Ethiopia (ongoing).

**Charles Okyere.** Strengthening the capacity of households and communities for an improved monitoring of water and sanitation environment: experiments with school children in Ghana (ongoing).

**Ruchi Vangani.** Exploring the links and dynamics therein for WATSAN and irrigation agriculture for a better nutrition and health outcome (ongoing).

**Florence McBain.** Can improved water-sanitation conditions together with health insurance effectively reduce poverty? (ongoing).

**Timo Falkenberg.** Health dimensions of wastewater-irrigated urban agriculture in Ahmedabad, India (ongoing).

**Mohammad Monirul Hasan.** Investment in health within the AG-WATSAN nexus for rural households in Bangladesh (ongoing).

**Project coordinators:** Nicolas Gerber (ngerber@uni-bonn.de) and Samantha Antonini (santonini@uni-bonn.de)

**Funding agency:** Bill and Melinda Gates Foundation

**Main cooperation partners:** Ethiopian Economic Association, Ethiopia; Institute of Statistical, Social and Economic Research, Ghana; Indian Institute of Public Health Gandhinagar, India; Bangladesh Rural Advancement Committee, Bangladesh.

**Website:** [www.zef.de/watsan.html](http://www.zef.de/watsan.html)

### Improving risk assessment strategies for public health care in Uzbekistan (HEALTHCAP)

HEALTHCAP addresses two major goals of the Volkswagen Foundation's initiative in Central Asia: to stimulate and encourage German scientists to engage in public health research with Uzbek scientists; and to improve conditions for research and higher education for public health care in Uzbekistan. HEALTHCAP is a science-based capacity building project to address the growing threat from **water-related diseases in Uzbekistan by improving risk-assessment strategies**. The exploratory and explanatory research aims at improving health and well-being of the people at local and regional levels. Prevention plays a key role. HEALTHCAP carries out risk analysis and risk characterization through scientific engagement between Uzbek and European researchers. It unravels the interconnections between socio-economic, institutional, ecological and epidemiological factors influencing water-related diseases. It also investigates the link with health policies, often ignored in public health research.

### Research activities mid 2014-mid 2015

ZEF doctoral student Ms **Minjung Cho** conducted training to master students from the Tashkent Medical Academy on research methods and the application of an Open Data Kit for carrying out computer-assisted surveys.

We conducted a field survey from March until August 2015 using computer-assisted surveys in two districts (Olmalik and Kibray) of Tashkent province, covering about 400 households.

The **Tashkent Medical Academy** and the Tashkent Institute of Post-graduate Medical Education have shown interest to collaborate in jointly writing research papers under the project.

### Doctoral students

**Minjung Cho, Feruza Alimova and Lola Isakova** (all ongoing).

**Project coordination:** Saravanan Subramanian ([subraman@uni-bonn.de](mailto:subraman@uni-bonn.de))

**Main funding agency:** Volkswagen Stiftung

**Main cooperation partners:** International Centre for Integrated Assessment and Sustainable Development, Maastricht University, The Netherlands; Research Institute of Sanitation, Hygiene and Occupational Diseases, Tashkent, Uzbekistan; Hydrometeorological Research Institute, UzHydromet, Tashkent, Uzbekistan; Research Institute of Irrigation and Water Problems at Tashkent Institute of Irrigation and Melioration, Tashkent, Uzbekistan.

### BiomassWeb

BiomassWeb has the overall goal to improve food security in Africa through harnessing productivity and efficiency gains in the whole biomass-producing, processing and trading system. The project aims to contribute to **preparing Africa to create bio-economies** in the face of a rising regional and global demand for biomass uses such as food, feed, fiber and fuel. This rising, multiple demand is creating additional challenges for Africa's agricultural sector.

**BiomassWeb** addresses all determinants of food security: 1) food availability through enhanced productivity; 2) access to food through income generation from non-food biomass production, processing and trading; 3) use of food through increased nutritional quality; and 4) food stability through more efficient land use. The system's complexity is captured by the methodological framework of biomass-based value webs, i.e., interlinked value chains in which food and non-food biomass are produced, processed and traded.

Research activities in **22 work packages** target the different aspects of biomass-based value webs with modular innovations. Study countries are Ghana, Nigeria and Ethiopia; the model crops are cassava, maize, plantain, banana, enset and bamboo. BiomassWeb is currently establishing a web-based expert network called "**BiomassNet**" to enhance stakeholder engagement and interaction and to ensure that the project findings are going to be disseminated.

### Research activities mid 2014-mid 2015

Stakeholder workshop on the participatory modeling of biomass-based value webs in Accra (Ghana), September 24-26, 2014 and Addis Ababa (Ethiopia), September 29-October 1, 2014.



Rural scene in India.



Series of stakeholder workshops, farmers' field days and trainings on push-pull technology in Bedele in Oromia, Ethiopia, October 3, 2014, Bako Tibe, Yayu, Tolay, und Jimma Arjo, Shewarobit districts, October 14-24, 2014, and April 2015, Ethiopia.

**BiomassWeb doctoral students** attended a project meeting at the University of Hohenheim, March 26-27, 2015, where they presented their research ideas and progress.

**Detlef Virchow** gave a presentation on "A biomass-based value web as analytic approach to optimize the agricultural sector's efficiency and resilience" at Building Resilience for Food and Nutrition Security – IFPRI 2020 Conference, May 15-17, 2014, Addis Ababa, Ethiopia.

**Francis M. Mwambo** won the prize for the best paper on "Assessing the ecological-societal impacts of West African farming practices by means of energy efficiency" presented at the conference on "Ethics of Food Security in a Changing Society – Learning from the Past to Shape the Future" in Windsor Great Park, UK, on September 24, 2014.

#### *Events mid 2014-mid 2015*

**Tina Beuchelt** presented BiomassWeb at the Tropentag - International Conference on Research on Food Security, Natural Resource Management and Rural Development on "Bridging the gap between increasing knowledge and decreasing resources", September 17-19, 2014 in Prague, Czech Republic.

**Tina Beuchelt** gave a presentation on biomass use and the right to adequate food at the congress "10 years voluntary guidelines for the right to adequate food", on November 11, 2014 in Berlin.

**Manfred Denich** presented BiomassWeb at the plenary session of the "Plant 2030" conference of BMBF,

March 4-6, 2015 in Potsdam, Germany.

**Tina Beuchelt** participated at the 23rd European Biomass Conference and Exhibition in Vienna, June 1-4, 2015, with the presentation "How to increase resource efficiency in an emerging bio-economy: Moving from value chains to biomass-based value webs".

**Detlef Virchow** presented BiomassWeb at the 1st Bioeconomy Congress Baden-Württemberg, October 29-30, 2014 in Stuttgart, Germany.

**Detlef Virchow** presented BiomassWeb at the Dresden Nexus Conference, March 25-27, 2015 in Dresden, Germany.

BiomassWeb has been present at: 20th **Conference of the International Federation of Operational Research Societies** IFORS, Barcelona, Spain, July 13-18, 2014; International Conference on Enhancing Resilience to Climate and Ecosystem Changes in Semi-Arid Africa, Tamale, Ghana, August 6-8, 2014; 28th International Conference on Informatics for Environmental Protection (EnviroInfo 2014), Information and communication Technology for Energy Efficiency, Oldenburg, Deutschland, September 10-12, 2014; 3rd Annual Conference: Universities, Entrepreneurship and Enterprise Development in Africa, November 14, 2014 in Rheinbach, Deutschland.

#### *Doctoral students*

**Getachew Legese Feye.** Family Farming and Food Insecurity in Ethiopia: The Role of Risk Perceptions of Family Farmers in Maize Biomass-Based Value Webs in Jimma area (ongoing).

**Omarsherif Mohammed Jemal.** The Role of Agroforestry Systems to Enhance Household's Food Security: a Case Study in Yayu area, Illuababora zone, South West Ethiopia (ongoing).

**Marcos Jimenez.** Temporal Dynamics of Biomass Provision from Agricultural and Agro-Forest Land Use Types at Landscape Scale (ongoing).

**Francis Mwambo.** Energy Efficiency Analysis of Biomass Production. Considering African landuse schemes, human labour and draft animals (ongoing).

**Isaac Mbeche Nyang'au.** Boundary Work and Agricultural Innovation Systems: Developing a Conceptual and Methodological Framework for Science-Practice Interaction and Knowledge Generation using an example of Push-pull Technology in Ethiopia (ongoing).

**Daniel Akoto-Sarfo.** Bamboo agroforestry for household energy and food security in Ghana: An exploratory study (ongoing).

**Gerba Leta Dufera.** The Ethiopian Agricultural Extension System and its role as a "Development Actor": the case of Bako and Yem Woredas, South-western Ethiopia (ongoing).

**Project coordination:** Manfred Denich (m.denich@uni-bonn.de), Tina Beuchelt (beuchelt@uni-bonn.de) and Christine Schmitt (cschmitt@uni-bonn.de)

**Funding agencies:** BMBF, additional funding by BMZ

**Main cooperation partners:** University of Bonn; University of Hohenheim; FZJ; Forum for Agricultural Research in Africa; International Centre of Insect Physiology and Ecology; International Institute of Tropical Agriculture; International Network for Bamboo and Rattan.

**Website:** [www.biomassweb.org](http://www.biomassweb.org)





## Economics of Land Degradation

The main objective of ZEF's research on the economics of land degradation (ELD) is to build a global coalition of different stakeholders analyzing the economics of land degradation, i.e. its global social costs, and to use the results of this analysis to determine cost-effective actions against land degradation. The project is based on the following strategies:

- Conducting a global assessment of the economics of land degradation. This is the major activity of the multi-disciplinary ELD scientific consortium. The assessment is based on 'the cost of action vs. inaction' approach in selected case study countries. Using spatial analysis approaches, the case study results will be interpolated to the global level by establishing links between local, on-the-ground analysis and global land degradation indicators.
- Initiating and informing the policy debate and dialogue on land degradation at regional and global levels.
- Forming an open consortium, with participation based on scientific quality and credibility that leads the research on ELD internationally.
- Peer-reviewing the ELD assessment is undertaken by renowned scientists not involved in the actual research of the project but with global academic reputation.
- Communicating results to increase awareness and invoke commitment to take action against land degradation.
- Interacting with policy makers and stimulating their support for ELD by providing empirical evidence to decision-makers and stakeholders at national, regional and international levels.

### Activities mid 2014-mid 2015

Research on the costs and causes of land degradation and the benefits of

addressing it at the global level, as well as case studies in 12 countries have been completed. The results were compiled in a peer-reviewed book to be published by Springer. Studies on rangeland bush encroachment in Ethiopia have been launched. Participation in several events and presentations of the results of the ELD research, such as at the German Development Institute's 8th Water and Land Dialogue, at the annual conferences of German and Nordic associations of development economists, etc.

### Doctoral students

**Oliver Kirui.** Economics of Land Degradation, Sustainable Land Management and Poverty (ongoing).

**Evelyn Kihui.** Enhancing Pastoral Practices and Institutions for Sustainable Rangeland Management and Improved Livelihoods (ongoing).

**Project coordination:** Alisher Mirza-baev (almir@uni-bonn.de)

**Main funding agency:** BMZ

**Main cooperation partners:** Consultative Group on International Agricultural Research (CGIAR); ELD Initiative; IFPRI; Indira Gandhi Institute of Development Research; International Center for Agricultural Research in the Dry Areas; Kenya Agricultural Research Institute; United Nations Convention to Combat Desertification; Swiss Federal Institute of Technology; Ministry of Natural Resources and Sustainable Development of Argentina; Center for Chinese Agricultural Policy of the Chinese Academy of Sciences; Eurasian Center for Food Security; Ethiopian Economics Association/Ethiopian Economic Policy Research Institute; National Institute of Agricultural Research of Niger; national partners in case study countries.

**Website:** [www.zef.de/eld.html](http://www.zef.de/eld.html)

## FOODSECURE

ZEF is part of the 18-member international consortium "FOODSECURE" which aims to design effective and sustainable strategies for assessing and addressing the challenges of food and nutrition security. The project provides a set of analytical instruments to experiment, analyze, and coordinate the effects of short and **long-term policies related to achieving food security.** FOODSECURE develops a knowledge base to support policy makers of the European Union and other stakeholders in the design of consistent, coherent, long-term policy strategies for improving food and nutrition security.

### Research activities mid 2014-mid 2015

Under FOODSECURE, ZEF is engaged in a partnership with the Indira Gandhi Institute of Development Research. The aim of the two institutes is to review and assess two of India's main social safety nets: the national rural employment guarantee act and the national food security act. The latter is evaluated in terms of one of its major elements, the public distribution system. The national rural employment guarantee act in particular is considered as the largest safety net program in the world, the national food security act not far behind. As such, the two programs are set to shape the worldwide discussion on social safety nets. Using national level data sets, the first report under the partnership maps the patterns of participation in the programs associated with these two acts, with a particular focus on the potential for synergies. In the second report we use district level data on the implementation of the safety net programs to understand the nature of correlation with selected health indicators.

FOODSECURE has been organizing a number of key-presentations and

meetings with stakeholders at and outside the European Commission. The first one took place June 3-4, 2015 during the European Development Days at the premises of the European Commission in Brussels. FOODSECURE organized a Brainstorming Lab. During this Lab a 'visioning session with youth and stakeholders at the European Development Days' took place. Four ZEF doctoral students participated in the Lab.

**ZEF and FOODSECURE** organized several symposia at the **29th tri-annual International Conference of Agricultural Economists at the EXPO** in Milan, August 8-14, 2015, attended by more than 1200 researchers from about 70 countries.

FOODSECURE researchers presented work at a pre-conference organized by the **European Commission on Global Food Security Challenges on August 7-8, 2015**.

FOODSECURE researchers participated in more than 30 sessions at the ICAE, with presenting papers, chairing sessions and taking part in panel debates. Two ZEF junior researchers won prestigious prizes for best contributed papers in both categories of oral and visual presentations.

**Project coordination:** Nicolas Gerber (nngerber@uni-bonn.de)

**Funding agency:** European Commission, Framework Programme 7

**Main cooperation partners:** University of Wageningen, The Netherlands

**Website:** [www.foodsecure.eu](http://www.foodsecure.eu)

## NutriHAF-Africa

Overall goal of this research is to diversify agriculture for balanced nutrition through fruits and vegetables in multi-storey cropping systems in Ethiopia and Madagascar. This research and capacity building project explores and integrates appropriate fruit and vegetable crops into multi-storey cropping systems to increase (micro-) nutrition security, diversify and intensify agriculture to reduce pressure on natural habitats in biodiversity hotspots. The project will take the needs and preferences of smallholder farmers into account, so the options developed in the project can actually be adopted in the end. This will be

done by utilizing a gender-sensitive participatory research approach, by increasing knowledge about appropriate fruits and vegetables as well as about food behavior and constraints with regard to the adoption of measures. Furthermore, capacity building is to play a major role in terms of raising awareness and increasing knowledge of farmers, consumers and decision-makers about balanced diets, nutritional values of different foods, fruit and vegetable production and processing, food preparation and quality. Finally, the project will sensitize extension services and policy-makers about the importance of nutrition-diversified agriculture, explicitly incorporating nutrition objectives into agricultural programs, projects and policies.

The project will make use of different research methods and strategies such as:

A mainly qualitatively, gender-disaggregated **analysis of the farming system, livelihoods, food-growing and consumption behavior of farmers and consumers** in the nearest market place;

- A quantitative gender-disaggregated survey with male and female household members;
- On-farm or community trials integrating fruits and vegetables in multi-storey cropping systems;
- Desk studies to assess agricultural requirements of high-priority species;
- Policy dialogue at local and regional levels through targeted information and round-table forums;
- Best-practice workshops for smallholder farmers and extension services aiming to increase food quality and reduce food waste;
- Promoting of and training in fruit and vegetable processing.

**Project coordinator:** Christine Husmann (husmann@uni-bonn.de)

**Team at ZEF:** Detlef Virchow, Christine Husmann, Sarah Nischalke and Anke Reichhuber.

**Main funding agency:** German Federal Ministry of Food and Agriculture

**Main cooperation partners:** The World Vegetable Center; Forestry



Rice planting in Burkina Faso.

Research Center from the Ethiopia Institute of Agricultural Research; Centre National de la Recherche Appliquée au Développement Rural, Madagascar; Horticulture Center of Competence, Germany; International Centre for Sustainable Development at the University of Applied Sciences Bonn-Rhein Sieg, Germany; University of Antananarivo, Madagascar; Association for Strengthening Agricultural Research in Eastern and Central Africa; Food, Agriculture and Natural Resources Policy Analysis Network; The Global Horticulture Initiative; Environment and Coffee Forest Forum, Ethiopia; Horticulture Innovation Lab; Welthungerhilfe, Madagascar.

## Developing food and nutrition security criteria for biomass standards and certifications (ESSZert)

There is a worldwide trend to shift from petroleum-based to biomass-based economies. Consequently, global biomass demand and trade are increasing, especially for non-food uses, which causes potential trade-offs for food security. Concerns about how sustainable biomass production is and ought to be have led, for example, to the development of environmental regulations for bioenergy in the European Union. Private certification standards for biomass such as REDcert, International Sustainability and Carbon Certification, RSB or Bonsucro are a response to these concerns too, but performance levels regarding environmental and social criteria vary. Food security aspects are hardly addressed in these standards and there is a lack of practical indicators, verifiers and hence measurability. ESSZert has been developing a set of suitable criteria and indicators to protect and ensure the Human Right to adequate Food while producing different types of biomass. ESSZert is highly transdisciplinary through its





intense cooperation with the German NGO “Welthungerhilfe” and the involvement of practitioners, politicians and representatives of standard organizations. The developed indicators provide guidance for voluntary sustainability certification systems for all types of biomass supply chains.

### Results

ESSZert developed its own conceptual framework, which is based on the four dimensions of food and nutrition security (access, availability, utilization, stability) and the Right to adequate Food. We made use of the “**Voluntary Guidelines**” to support the progressive realization of the Right to adequate Food in the context of national food security” of the FAO. The framework led to the selection of 14 out of the 19 voluntary guidelines which fall within the responsibility of an enterprise. For each selected guideline at least one indicator was developed resulting in a total of 41 indicators. Wherever possible, existing indicators were used to ensure a smooth integration in existing standards. A screening of the sustainability standards showed that there is some overlap with our indicators which is positive as adoption will be easier. The suggested indicators are applicable to all biomass types and uses, for different biomass standards, farm sizes and business types.

### Lessons learned and recommendations

The indicators represent an ideal set to protect the Right to adequate Food at local level when producing and trading biomass. As the indicators were developed via a multi-stakeholder process they are feasible and measurable. They therefore can and should be included as a whole set in existing sustainability standards and certifications to guarantee the Right to adequate Food and thus food security of those involved in the certified

biomass production. We still propose to carry out a field-testing phase of the set of indicators and to write a handbook which specifies the verification guidelines. After a successful test, we recommend to integrate the rights-based food security indicators in all biomass sustainability standards as well as in the European Renewable Energy Directive to foster local food security in food insecure regions

### Activities mid 2014-mid 2015

Panel session organized at the Global Forum for Food and Agriculture, January 16, 2015, Berlin, on the topic of “Primacy of food security in bio-economies - an illusory precondition?”

Two multi-stakeholder workshops on the conceptual framework, the developed criteria and indicators with more than 35 participants from NGOs, enterprises, research and ministries organized at ZEF, May 19, 2015 and at World Wide Fund for Nature, Berlin, July 14, 2015.

**Tina Beuchelt, Anna Mohr, Rafael Schneider and Detlef Virchow** participated in “Solving Trade-Offs between Food Security and Biomass Use: Rights-Based Food Security Criteria for Biomass Sustainability Standards and Certifications”. 23rd European Biomass Conference and Exhibition, June 1-4, 2015, Wien, Austria.

**Tina Beuchelt, Anna Mohr, Rafael Schneider and Detlef Virchow** participated in “Developing Food and Nutrition Security Criteria for Biomass Standards and Certifications”. Contribution accepted for presentation at the Tropentag International Conference on Research on Food Security, Natural Resource Management and Rural Development on “Bridging the gap between increasing knowledge and decreasing resources”, September 17-19, 2014, Prague, Czech Republic.

**Project coordinator:** Tina Beuchelt (beuchelt@uni-bonn.de)

**Main funding agency:** German Federal Ministry of Food and Agriculture (BMLE)

**Main cooperation partner:** Welthungerhilfe

**Project team @ ZEF:** Anna Mohr, Tina Beuchelt and Detlef Virchow

### Program of Accompanying Research for Agricultural Innovation (PARI)

Governments and civil society in Africa are increasingly recognizing the role that innovation plays in sustainable development. Thus, innovation for sustainable agricultural growth forms an important part of **Science, Technology and Innovation Strategy for Africa 2024**. The German Government has acknowledged the continent’s potential for innovation and wants to offer support especially with regard to improving food and nutrition security and sustainable agricultural value chains. To this purpose, Agricultural Innovation Centers in twelve African countries and in India are being set up. ZEF’s Program of Accompanying Research for Agricultural Innovation (PARI) offers independent scientific advice to support these Innovation Centers.

PARI’s main goal is to contribute to sustainable agricultural growth and food security in Africa and India. It does so by supporting the “scaling” of proven innovations in the agricultural-food sector in collaboration with all relevant actors. PARI accompanies specified innovations with ex-ante impact research and identifies further innovation opportunities, including those expressed by end users of research in collaboration with the multi-stakeholder innovation platforms. PARI also fosters synergies with and links to existing innovation systems in Benin, Burkina Faso, Cam-



eroon, Ethiopia, Ghana, India, Kenya, Malawi, Mali, Nigeria, Togo, Tunisia and Zambia.

PARI's work consists of two main components: To conduct accompanying research with future-oriented impact analyses, including the development of a methodology and concept for strategic analysis and visioning; modeling the direct and indirect impacts of potentially promising innovations; and an institutional analysis of the innovation centers in the context of their national agricultural innovation systems.

The second objective is to steer research-based design and assessment of technological and institutional innovations, including identification of promising innovations from research organizations ("top-down" innovations) and innovations generated by farmers and other actors in the value chains ("bottom-up" innovations).

**Project coordination:** Detlef Virchow (dvirchow@uni-bonn.de)

**Main funding agency:** BMZ

**Main cooperation partners:** Forum for Agricultural Research in Africa; African Growth and Development Policy Modeling Consortium; Institute of Crop Science and Resource Conservation, University of Bonn; School of Life Sciences Weihenstephan at the Technical University of Munich; University of Hohenheim; Natural Resources Institute Finland.

**Team @ ZEF:** Joachim von Braun, Detlef Virchow, Christine Husmann, Justice Akpene Tambo and Heike Baumüller.



## 3.6 ENVIRONMENTAL AND CLIMATE CHANGE

### WASCAL Research Program

*Climate change in West Africa – strengthening adaptive capacity and resilience in social-ecological systems*

Analyzing the impact of climate change and developing effective adaptation strategies requires an interdisciplinary research approach. Only thus we can understand the linkages between global-scale changes and the local dynamics of human-environment interactions. For a profound understanding of these complex linkages, the **WASCAL Core Research Program is organized in six research clusters:** Climate and Weather, Landscape Dynamics, Agricultural Systems, Markets and Livelihoods, Risk Management, and Integrated Assessment.

WASCAL's perception is that human and ecological systems are linked. Given the complexity of such social-ecological systems and the uncertainties surrounding climate change projections, forecasting their future dynamics in West Africa is challenging. WASCAL is working on improving models for long-term climate projections for West Africa, but also works on short-term **climate forecasting**. The latter is important because a large part of the population in West Africa depends on rain-fed agriculture for generating their income. Thus, farmers can benefit from information on the onset of the rainy season or the optimal time for planting. This can reduce the risk of crop failure due to water-stress occurring after planting. This information is crop-specific and highly variable on spatial and temporal scales.

*Research outcome and highlights mid 2014-mid 2015*

The climate research group developed a tool for choosing an optimal time-window for planting. Another research group looks into the question how optimal planting dates may



change in the future and how this will impact future crop production. This research corresponds with research on how innovations can enhance the resilience of social-ecological systems. If developed under local conditions, innovations may have the advantage of fitting better to the needs and constraints of local smallholders than in a conventional research setup. This is based on the presumption that farmers may adopt innovations which have been developed by other farmers more readily than those developed by research organizations.

WASCAL has initiated a so-called **Farmers' Innovation Contest** which aims to identify locally-evolved innovations and innovation potentials in Ghana. The local agricultural extension service of the Ghanaian Ministry of Food and Agriculture supported the contest. So far, three contest rounds (2012, 2013, 2014) have been organized while round four is currently in preparation. The total number of eligible applications by 2014 was 222. Each year, a committee selects three winners. **Contact:** Tobias Wünscher (tobias.wuenscher@uni-bonn.de)

Within WASCAL, a large number of heterogeneous data has been collected from different research activities. A spatial data infrastructure called **WASCAL Data Infrastructure** facilitates the acquisition, provision, integration, management and exchange of these heterogeneous data resources within a scientific and non-scientific multi-user environment [https://icg4wascal.icg.kfa-juelich.de/wascal\\_searchportal2/index.jsp](https://icg4wascal.icg.kfa-juelich.de/wascal_searchportal2/index.jsp)

**WASCAL Conference of the Social Sciences on Climate Change in Africa** - Negotiations, Translations and Socio-Political Implications: Approximately 50 participants from national and international universities, and organizations such as the Togolese



Red Cross attended this conference held at ZEF (September 10-11, 2014). The regional scope of the conference exceeded the WASCAL region and included presentations on South Africa, Namibia, Cameroon, and Cape Verde.

**Project coordinator:** John Lamers (in Germany) (jlamers@uni-bonn.de)

**Funding agency:** BMBF

**Website:** [www.wascal.org](http://www.wascal.org)

## Research on afforestation in Central Asia

Three research projects covered research on and in Central Asia about the following issues:

- “Opportunities for climate change mitigation and adaptation through afforestation of degraded lands in Central Asia”.
- “Mapping of forest cover in Central Asia using satellite remote sensing”.
- “Landscape salinity and water management for improving agricultural productivity”. A case study in Northern Uzbekistan.

These three research projects worked out environmentally-balanced and economically-competitive agroforestry options in Central Asia. The projects also looked into policy incentives that can stimulate the adoption of such options.

### *Research activities mid 2014-mid 2015*

The project team conducted a **remote-sensing assessment of forest resources in Central Asia**. It turned out that only about one percent of the territory was covered with forests, with large variations among the countries. This is a clear indication of the need for improved forest management as well as for an enhanced role of trees within the agricultural landscape. We developed **assessment tools** and generated maps

based on satellite-imagery data of different spatial resolution. These tools and maps enabled us to assist in assessing landscape productivity of the irrigated agricultural region in the lower Amudarya River Basin. By revealing the spatial distribution of unproductive croplands, we were able to advise in regional-scale rehabilitation planning processes. In addition, we could support field-scale decisions by providing spatial details. **We identified degraded cropland parcels on about 20% of the total cropland**, which can be considered for alternative use such as afforestation.

We also conducted **Geographic Information System-based multi-criteria analyses**, which took into account water availability and other growth constraints. They suggested that much of the unproductive cropland areas would be suitable for planting salt-tolerant tree species that are capable of drawing on saline groundwater. We also carried out a soil-carbon survey that indicated that **afforestation trials and traditional agroforestry-systems could play a role as carbon sinks**. Their capacity as a storage for soil-carbon largely exceeds that in cultivated croplands and was comparable to the stock in native riparian forests

We also estimated the potential impact that afforestation measures have on local farmers’ revenues. Our assessments revealed that afforestation could be **financially attractive** because agricultural farm production faces considerable constraints so farmers would benefit of land-use diversification. In particular, the use of irrigation water could be reduced or even avoided when crops on marginal farmland are replaced with trees that use saline groundwater. This would enhance the cultivation of commercial crops on productive lands, thus increasing farm-income. However,

non-irrigated tree plantations relying entirely on groundwater accumulate salt over time, which may jeopardize their long-term sustainability. This can be coped with by salt-leaching.

Besides the environmental benefits and financial attractiveness, the adoption of tree farming in degraded cropping-areas requires **policy support**. The results of our policy analyses showed that about half of the farming population would be motivated to initiate tree planting on degraded farmlands by the following set of policies: exempting unproductive croplands from annual cropping in favor of afforestation; securing long-term land tenure; and providing forestry training.

### *Selection of invited talks and lectures*

Khamzina A., Djalilov B., Djanibekov U., Dubovyk O. on “Afforestation planning in rehabilitation of degraded agricultural landscape in Central Asia”. Invited talk at the 9th International Association of Landscape Ecology World Congress 2015, Symposium Applications in Forest Landscape Ecology: Evolution, Progress and Challenge. July 5-10, 2015. Portland, Oregon, USA.

Khamzina A. on “Enhancing dryland agro-ecosystem resilience through forestry”. Invited talk at the First OJERI Symposium Resilience Thinking in a Changing World dedicated to the launch of Ojeong Eco-Resilience Institute (OJERI), Korea University. May 7-8, 2015. Seoul, South Korea.

Khamzina A. Invited participation in the 9th Berlin Debate on Science and Science Policy Lost in Translation? How to Meet the Challenges of Interdisciplinary Research, Policy Advice and Implementation. November 8, 2014. Berlin, Germany.

Khamzina A. on “Agroforestry strategies for mitigation and adapta-

tion to environmental change". Invited talk for the School of Natural Science, National University of Ireland. August 29, 2014.

#### *Other selected presentations*

Kumar N., Khamzina A., Tischbein B., Schorcht G., Conrad C., Lamers J.P.A., Voigt H. Impacts of afforestation on regional water balances in irrigated farming systems in Uzbekistan, Central Asia. Oral presentation. Conference on Desertification and Land Degradation (DesertLand) II. June 17-18, 2015. Ghent, Belgium.

Voigt H., Matkarimov N., Khamzina A. Water use of multi-purpose tree plantations on salt-affected croplands in the lower Amudarya Basin. Oral presentation. Conference on Desertification and Land Degradation II. June 17-18, 2015. Ghent, Belgium.

Yin H., Martius C., Jakob A., Khamzina A. Forest cover mapping in Central Asia using multi-resolution remote sensing imagery. Oral presentation. The 36th International Symposium on Remote Sensing of Environment. May 11-15, 2015. Berlin, Germany.

Yamaç S.S., Webber H., Khamzina A. Process-based modeling of biomass growth in a multi-species afforestation system in Central Asia. Poster presentation. HYDRUS Short Course/Workshop. March 24-26, 2015. Prague, Czech Republic.

#### *Doctoral students*

**Tilman Schachtsiek.** Exploring the potential of multipurpose tree species for revegetating abandoned cropping sites in the lower Amu Darya Basin (graduated in 2014).

**Sophia Baumert.** Life cycle assessment of carbon and energy balances in *Jatropha* production systems of Burkina Faso (graduated in 2014).

**Utkur Djanibekov.** Trees, crops and rural livelihood: Afforestation on marginal croplands in Uzbekistan (graduated in 2014).

**Florent Anguilles Noulèkoun.** Afforestation for rehabilitation of degraded cropland in Sudano-Sahelian zone of northern Benin (ongoing).

**Mariama Nouhou Koutcha.** Hydrology of the planting zai pit for rainwater harvesting in agroforestry

schemes for climate change adaptation in Sudano-Sahelian zone of Niger (ongoing).

**Ephraim Sekyi-Annan.** Performance evaluation of reservoir-based irrigation schemes in the Upper East Region of Ghana (ongoing).

**Tigist Araya Gessesse.** Above- and belowground carbon stocks in semi-arid land-use systems under integrated watershed management in Gergera, Ethiopia (ongoing).

**Begzod Djalilov.** Agent-based modeling of policy impacts on farmers' adoption of afforestation on degraded croplands in Uzbekistan (ongoing).

**Holm Voigt.** Quantifying water fluxes in mixed-species afforestation system in irrigated lowlands of Uzbekistan (ongoing).

**Project coordinator:** Asia Khamzina (asia.khamzina@uni-bonn.de)

**Main funding agencies:** Robert Bosch Foundation, Center for International Forestry Research

**Main cooperation partners:** Institute of Crop Science and Resource Conservation, University of Bonn; Center for Remote Sensing of Land Surfaces, Germany; Department of Geography, University of Würzburg, Germany; United Nations Educational, Scientific, and Cultural Organization office in Uzbekistan; Urgench State University, Uzbekistan; Khorezm Rural Advisory Support Service, Uzbekistan; State Agency of Environment Protection and Forestry, Kyrgyzstan; Center for



International Forestry Research; International Atomic Energy Agency.

#### **Websites:**

1. [www.zef.de/project/agroforestry](http://www.zef.de/project/agroforestry)
2. [www.zef.de/project/forest\\_CA](http://www.zef.de/project/forest_CA)
3. [www-naweb.iaea.org/nafa/swmn/crp/swmcn-landscape-salinity.html](http://www-naweb.iaea.org/nafa/swmn/crp/swmcn-landscape-salinity.html)

### **Shaping environmental policies for sustainable tropical forest bio-economies in Brazil, Peru, Ecuador**

This research project aims at understanding how and to what extent countries can influence tropical forest bio-economy pathways through the integration and informed design of environmental policy instruments. Its ultimate objective is to facilitate the formulation and implementation of environmental policies that contribute to the sustainable use of forest resources and related locally and globally valued ecosystem services.

#### *Research activities mid 2014-mid 2015*

A series of papers published early in 2015 shows how specific elements of the Brazilian forest conservation policy-mix have contributed to a sharp drop in Amazon deforestation rates after 2004. This work has raised attention both in international media and among partners in the Brazilian research and policy spheres.

Early in 2015, the research group coordinated the nomination of a Brazilian partner for the Alexander von Humboldt Foundation's Georg Forster Award. Prof. Soares Filho from the University of Minas Gerais will receive the award in March 2016.

From December 2014 and February 2015, the research group hosted a visiting PhD student (Felipe Fogliano) from Brazil to collaboratively work on analyzing expenditure accounts of public forest conservation policy in Brazil. This topic is a missing link in explaining the recent forest conservation success in Brazil and has received attention by the Brazilian Ministry of Environment.

Vanessa Rodríguez Osuna was selected as Lead Author for the regional assessment on Biodiversity and Ecosystem Services for the Americas Region of the Intergovernmental Plat-



form on Biodiversity and Ecosystem Services.

In August 2015, Elías Cisneros received the TW Schulze Award for the best contributed paper at the International Conference of Agricultural Economists, Milan, Italy.

#### *Events mid 2014-mid 2015*

##### **Jan Börner:**

- Invited panel speaker. University of Bonn, Lecture Series “Buen vivir – vom ‚Guten Leben‘: Neue Perspektiven auf ein altes Thema”, January 2015, Bonn, Germany.
- Interdisciplinary Research in Tropical Forest Conservation (invited panel speaker). European Association of Development Research and Training Institutes Conference, June 23-26, 2014, Bonn, Germany.
- Conference paper presentation in self-organized side event: Cost and equity implications of integrating conservation sticks and carrots in national conservation programs in Brazil and Peru. International Society for Environmental Epidemiology Conference 2014, August 13-15, 2014, Iceland.
- Environmental Governance in the Global Bioeconomy: An emerging research agenda (Invited keynote address). Regional Workshop on Institutions and Organizations, Pirassununga, São Paulo, Brazil, October 13-14, 2014.

##### **Elias Cisneros:**

- Paper presentation of “Forest law enforcement through district blacklisting in the Brazilian Amazon”, co-authors L. Zhou, J. Börner. Internal Seminar Institute for Economic Research/ Department of International Economic Policy, University Freiburg, March 13, 2015, Germany.

##### **Johannes Schielein and Elias Cisneros:**

- Invited presentation of modern empirical conservation impact evaluation techniques and discussion about application potential for the Amazon Fund of the Brazilian Development Bank.

##### **Hugo Rosa da Conceição:**

- Oral presentation: Political and institutional determinants of policy design in incentive-based forest

conservation: evidence from Brazil, Ecuador, and Peru. Workshop organized by the Consultative Group for International Agricultural Research, Washington, DC, USA, October 27-29, 2014.

##### **Javier Miranda:**

Oral presentation: “Towards a Spatially Explicit Model of Deforestation in Brazil: Methods, results and ideas of integration with partial and general equilibrium analyses” at an IFPRI workshop on Understanding and Managing the Drivers of Land Clearing and Land Use in the Tropical Forest and Savannah Areas of Brazil and Argentina: Economy-wide and Global Perspectives. Washington, DC, USA, December 2014.

*During 2014/15 Jan Börner and collaborators were successful in securing two new research grants and two international collaboration grants:*

**2015 Seed fund proposal for the “NRW-Strategieprojekt BioSC”,** Biomass flows and technological innovation in the bioeconomy: A global scenario analysis (EUR 150k). This project was written in collaboration with Prof. Bröring (Institute for Food and Resource Economics, University of Bonn) and Prof. Schurr (FZJ),

**2015-2017 BMZ, Forests in the global bio-economy: Developing multi-scale policy scenarios** (1.2 million EUROS). This project was written in collaboration with the International Center of Forestry Research, the University of Sao Paulo (Brazil), and the Agricultural University of Bogor (Indonesia), and extends the work planned in the BioSC Seed Fund proposal by detailed country case-studies on agricultural and forest biomass value chains in Indonesia and Peru.

**2015 DFG starter grant.** The grant supports the initiation of international collaboration in the triple Amazon frontier region of Brazil, Peru and Bolivia and was led by researchers from the Universität Koblenz-Landau and Freie Universität Berlin.

**Vanessa Rodríguez Osuna and colleagues obtained a DAAD/BMZ grant** for a university cooperation project with the Universidad Católica Boliviana for the period between 2015 and

2018. Cooperation will focus on the topic “Greening environmental impact assessments in Bolivia”.

#### *Doctoral students*

**Elias Cisneros.** Impact evaluation of tropical forest conservation policies in the Brazilian Amazon (ongoing).

**Hugo Rosa da Conceição.** Public choice and incentive-based forest conservation in the Amazon region (ongoing).

**Johannes Schielein.** Land-use forest policy and economic development in the Brazilian Amazon Region (ongoing).

**Javier Miranda.** Modelling tropical conservation policy mixes in the Amazon region (ongoing).

**Gerson van Luijk.** Vegetation response to climate change and land use in the Amazon region (ongoing).

**Renzo Guidice Granados.** Measuring the effectiveness of incentive-based conservation policies in the Peruvian Amazon (ongoing).

**Project coordinator:** Jan Börner (jborner@uni-bonn.de)

**Main funding agency:** Robert Bosch Stiftung

**Main cooperation partners:** Center for International Forestry Research; German Corporation for International Cooperation; Fundação Amazonas Sustentável; Instituto de Pesquisa Ambiental da Amazônia; Universidad Autónoma de Barcelona; Biodiversität und Klima Forschungszentrum, University of Frankfurt.

**Website:** [www.zef.de/envpol.html](http://www.zef.de/envpol.html)

## 3.7 RENEWABLE ENERGY

### The water-energy-food nexus in the Ethiopian Nile basin

The overall goal of this project is to manage natural resources in a more sustainable way, to increase food security and reduce poverty among the rural poor in the Eastern Nile Basin. As many regions in the world, the Eastern Nile Basin also faces a rapidly rising demand for agricultural, water and energy resources. The research contributes to the **Consultative Group on International Agricultural Research (CGIAR) Program on “Water, Land and Energy”** specifically on the topics “improved land, water and energy productivity in rain-fed and irrigation agroecosystems;” and “increased ability of low-income communities to adapt to environmental and economic variability, demographic shifts, shocks, and long-term changes.” The project will develop policy options that aim at reducing the costs of trade-offs and promoting positive synergies across the water, energy and food security nexus.

Research will be carried out at local and regional levels in the Eastern Nile Basin in Ethiopia through several case studies, complemented by insights from global assessments. The project will be based on the following five main strategies to accomplish its objectives:

To assess linkages, tensions and trade-offs across the water-energy-food nexus using global, basin (Eastern Nile) and local case studies (Ethiopia) identified with partners.

To generate alternative water, energy, and food management, technology and governance options that sustainably increase resource use efficiency for the rural poor.

To develop win-win-win water, energy and food security strategies with partners as well as local and national governments in the Eastern Nile region.

To develop and strengthen regional institutional capacities in the Eastern Nile area working on nexus issues and

To disseminate research results across a wide range of stakeholders; and engage in global water-energy-food nexus initiatives.

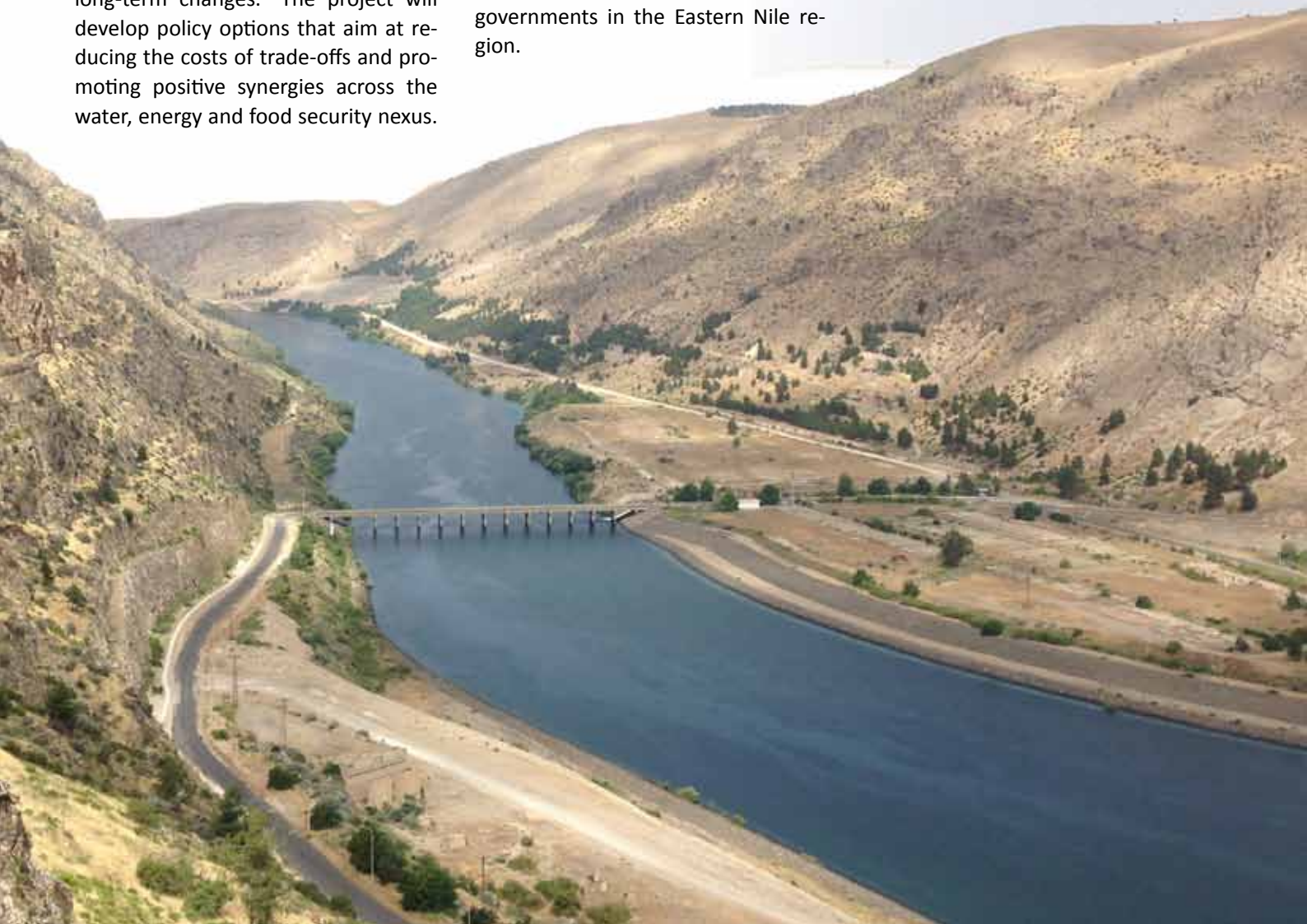
Events: The project inception workshop was held in Addis Ababa, Ethiopia, on March 31- April 01, 2015.

#### *Doctoral students*

Helen Berga. Modeling the Nexus between Water, Energy and Food in Eastern Nile (ongoing).

**Project coordinator:** Alisher Mirza-baev (almir@uni-bonn.de)

**Main funding agency:** BMZ





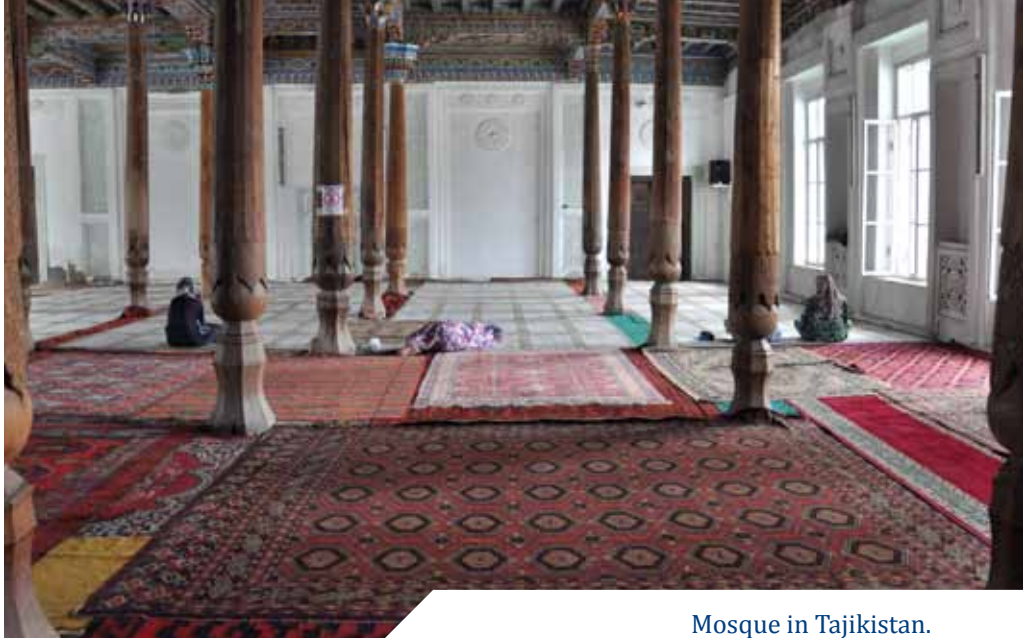
## 3.8 MOBILITY AND MIGRATION

### Crossroads Asia

The globalized 21st century is characterized by flows of people, goods and ideas on multiple scales. How scholarship in and about particular regions and places ought to be conducted in this context is the subject of ongoing debates in international social sciences and humanities. Traditional “Area Studies” have been rightly criticized for limiting their inquiries into fixed territorial ‘containers’ and imposing a ‘Western’ worldview, as well as for neglecting to engage with the so-called systematic disciplines such as economics, sociology and anthropology.

The competence network Crossroads Asia calls for and tries to generate **novel perspectives on inter-disciplinary Area Studies research**. Comprised of half a dozen research institutions with regional expertise covering Afghanistan, Iran, Kazakhstan, Kyrgyzstan, Nepal, Northern India, Pakistan, Tajikistan, Uzbekistan and Xinjiang, the network aims to further an understanding of the **interactions of individuals with a connection to places from eastern Iran to western China and from the Aral Sea to northern India**. In doing so, it tries to help overcome the neglect of non-‘Western’ epistemologies, insights and forms of knowledge generation, as well as to close gaps between systematic disciplines and Area Studies.

The research within the network has centered on the concept of so-called “figurations”. These are defined as specific causal and functional connections making up a constellation (e.g. familial, religious, or economic networks). During the first funding phase of the project (2011-14), micro-level empirical research focused on figurations related to three thematic concepts: conflict, migration and development. Since early 2015, the net-



Mosque in Tajikistan.

work has begun synthesizing earlier research into an in-depth analysis of how spatial realities are constructed precisely by the movement of people, goods and ideas, as well as how these constructions enable and constrain mobility – both physical mobility and social mobility. Our overarching research questions include: What makes borders and boundaries take on significance; why is their meaning altered or even lost? Within and across these limiting components – which can be not only geographic, but also political, socio-cultural and ethnic borders and boundaries – which factors contribute to mobility or immobility?

Based on this research and analysis, we are aiming to collectively develop a “**Crossroads Perspective**” to understand complex webs of ties and their spatial dimensions. The Crossroads Perspective will consist of a methodological approach (**‘Follow the Figuration’**), as well as an ethical component, to guide Area Studies researchers in reflecting on their position in relation to their subjects, as well as the tangible impacts of the research they conduct. The Crossroads Perspective should also contain a tool-kit of concepts which have proven resilient in our empirical analysis of, for example, bordering processes in Kashmir; cross-border bazaar trade between Kyrgyzstan, Kazakhstan and China; and Balochi networks rooted in Afghanistan, Pakistan and Iran.

#### *Events mid 2014-mid 2015*

4th Crossroads Asia Conference: Crossroads Studies - Mobilities, Immobilities and the Issue of Positionality for Rethinking Area Studies, University of Bonn, November 27-28, 2014.

**Project coordination:** Nelli Nokalla (nelli.nokalla@uni-bonn.de) and Claus Bech Hansen (chansen@uni-bonn.de)

**Main funding agency:** BMBF

**Main cooperation partners:** Bonn International Center for Conversion; Zentrum Moderner Orient; Department of Social and Cultural Anthropology, University of München; Central Asian Studies, Humboldt University Berlin; Centre for Development Studies, Free University of Berlin; Institute for Oriental and Asian Studies, University of Bonn.

**Website:** <http://crossroads-asia.de/en/home.html>



# 4

## CAPACITY DEVELOPMENT

### 4.1 ZEF'S DOCTORAL STUDIES PROGRAM

ZEF's doctoral studies program offers an interdisciplinary and international three-year doctoral education. Since its inception in 1999 around 630 students from 90 countries have participated in the program.

#### *Interdisciplinary training*

Addressing development problems requires thinking and analyzing beyond the boundaries of individual disciplines. ZEF's doctoral studies program therefore offers its students a combination of inter-disciplinary education and disciplinary research. We educate the students in so-called T-shaped skills: Students acquire specialized knowledge and expertise in their disciplinary fields in a broad inter-disciplinary setting. These combined skills enable them to work in multi-disciplinary teams and to draw on different approaches.

#### *Leadership training for sustainable development*

The interdisciplinary training at ZEF prepares the doctoral students for working in interdisciplinary and international teams to work on international partnerships for sustainable development. The program's curriculum entails ethics of science, ethical culture of transparency, accountability and social responsibility, in addition

to leadership skills. Courses on intercultural and leadership training, as well as workshops on „Politics and Science“ and “Ethics in Science” are conducted with the financial support of DAAD and Foundation fiat panis. More information at: [www.zef.de/index.php?id=2360](http://www.zef.de/index.php?id=2360)

#### *Research ethics*

Conducting field research in a developing country is a fixed part of ZEF's doctoral studies program. ZEF has set up its own ethical clearance procedure to ensure that the young researchers reflect upon their planned research activities with respect to 1) **the safety and well-being of research-participants** (respondents, locally-hired research assistants, the public, the environment and other researchers in the host region/country), and 2) **confidentiality and security of collected data**. Feedback analysis is also part of the process: graduates are to explain to their respondents and other participants how their research findings will be made use of and shared. The graduates are also instructed about the range of possible risks and impacts of their research.

#### *Highlights mid 2014-mid 2015*

The paper on “Economics of land degradation and improvement in

Eastern Africa: The case of Tanzania and Malawi” by **Oliver K. Kirui**, ZEF junior researcher from Kenya, was among the shortlisted best papers submitted to the Annual Global Development Conference held in Casablanca, Morocco on June 11-13, 2015. A total of 466 papers were submitted. Only 23 papers were shortlisted for the Conference 2015, eight of them in the category “best papers from researcher from developing countries”.

**Navneet Kumar**, graduated doctoral student from India, received a “Foreign Scholar Award” for the 9th International Association for Landscape Ecology World Congress in Portland, Oregon, USA, on July 5-10, 2015. He presented a paper on “Land use change analysis and its impact on water resources of Upper Kharun Catchment, India”.

**Jose Estuardo Jara Alvear**, ZEF junior-researcher from Ecuador, has been awarded a scholarship for training in Disaster Risk Management at the Seminar for Rural Development in Berlin.

**Rapti Siriwardane**, graduated doctoral student from Sri Lanka, has been awarded a Carlo-Schmid-Scholarship for a six-month internship at the United Nations Framework Convention for Climate Change in Bonn.

Welcome to new doctoral students at ZEF

ZEF welcomes this year's batch of new doctoral students. 25 students from 19 countries started into the three-year doctoral program at ZEF, where they will strengthen their interdisciplinary and disciplinary skills. In addition, they will conduct one year of practical field research in a developing country or context.

For general information on ZEF's doctoral program and its application and registration procedure please look at :  
[www.zef.de/doctoralprogram.html](http://www.zef.de/doctoralprogram.html)

In the picture below:  
ZEF's doctoral students "batch" 2015.

## Commemoration

March 24, 2015. Maria del Pilar Tejada Ocampo, a student who joined us at ZEF in October 2014, died tragically in the accident of the German Wings airliner en route from Barcelona to Düsseldorf.

## 4.2 DOCTORAL DEFENSES MID 2014 - MID 2015

10-Sep-14

**Navneet Kumar (India)**

Impacts of climate change and land use change on the water resources of the upper Kharun Catchment, Chhattisgarh, India.

31-Oct-14

**Christine Husmann (Germany)**

The private sector and the marginalized poor An assessment of the potential role of business in reducing poverty and marginality in rural Ethiopia.

12-Dec-14

**Rivayani Rivayani (Indonesia)**

Three essays on Indonesian political economy: Elite capture, corruption, and female policy makers.

09-Feb-15

**José Luis Viveros Anorve (Mexico)**

The opportunity cost of financing Oportunidades: a general equilibrium assessment for poverty reduction in Mexico.

11-Mar-15

**Monica Gruezmacher (Colombia)**

Understanding social ecological change through palm use and management.

12-Mar-15

**Michael Simon (Germany)**

Resource allocation for health in Tanzania Determinants and development implications.

17-Mar-15

**Dawit Diriba Guta (Ethiopia)**

Bio-based energy, rural livelihoods, and energy security in Ethiopia.

22-Apr-15

**Thi Phuong Linh Huynh (Vietnam)**

State-Society interaction in Vietnam: The everyday-dialogue of local irrigation management in the Mekong Delta.

24-Apr-15

**Tania Gabriela Osejo Carrillo (Nicaragua)**

Costs and effectiveness of REDD policies: Insights from Biosphere Resele, Nicaragua.

27-Apr-15

**Ildephonse Musafiri (Rwanda)**

The determinants of long-term growth in smallholder agriculture in Rwanda: An intergenerational analysis.



27-Apr-15

**Yessengali Oskembayev (Kazakhstan)**

International analyses of natural resource curse and Kazakhstan's related economic performance with special attention to its wheat and energy sectors.

27-Apr-15

**Jin Zhang (China)**

Crop management options to reduce nitrogen pollution in Liangzihu lake basin, Central China.

28-Apr-15

**Mekbib Gebretsadik Haile (Ethiopia)**

Volatility of international food prices: Impacts on resource allocation and on food supply response.

05-May-15

**Justice Akpene Tambo (Ghana)**

Farmer innovation in rural Ghana: Determinants, impacts and identification.

07-May-15

**Siwei Tan (Singapore)**

Wastewater management in the industrial zones of the Vietnamese Mekong Delta: A socio-spatial analysis of environmental management in a transition economy.

03-Jun-15

**Valerie Graw (Germany)**

Interlinkages of land degradation, marginality and Land Use Cover Change in Kenya Development of an interdisciplinary framework using remote sensing and GIS.

15-Jun-15

**Heike Baumüller (Germany)**

Agricultural innovation and service delivery through mobile phones: Analyses in Kenya.

16-Jun-15

**Rapti Lalana Siriwardane (Sri Lanka)**

Sambandam: Cooperation, contestation and coastal life-worlds in post-war Sri Lanka.

06-Jul-15

**Abu Hayat Md. Saiful Islam (Bangladesh)**

Impact of technological innovation on the poor: integrated aquaculture-agriculture in Bangladesh.

06-Jul-15

**Lukas Kornher (Germany)**

Food price volatility: the role of stocks and trade.

07-Jul-15

**Tamer Eshtawi (Palestine)**

Integrated hydrologic modeling as a key for sustainable development planning of urban water resources in the semi-arid watersheds of the Gaza Strip.

08-Jul-15

**Sarah Winands-Kalkuhl (Germany)**

International cooperation for the conservation and sustainable and fair use of biodiversity.

10-Jul-15

**Yang Haoran (China)**

Land rental market and rural economic development: Evidence from rural Chongqing, China.

10-Jul-15

**Yi Zhang (China)**

Impacts of rural-urban migration on demographic transition, human capital investment and agricultural productivity in China's rural areas.

13-Jul-15

**Muntaha Rakib (Bangladesh)**

Gender differentiated asset dynamics in Bangladesh: Individual adaptation and potential for group based approaches in the context of climate change.

22-Jul-15

**Ben Dandi (Tanzania)**

Foreign aid, economic growth, and poverty reduction in Tanzania.

10-Aug-15

**Hendricus Andy Simarmata (Indonesia)**

Locally embedded adaptation planning: A trilogy on the adaptation of flood-affected people in Kampung Muara Baru, Jakarta.

12-Aug-15

**Julia Schöneberg (Germany)**

NGOs Development actors as agents for alternatives to development? Exploring the role of the privileged in regard to post-development theory by looking at cooperation and partnerships between Haitian organisations and international NGOs.

18-Aug-15

**Tigabu Degu Getahun (Ethiopia)**

Inter-sectoral linkages, clustering, productivity growth and poverty in Ethiopia.

19-Aug-15

**Sonam Tashi (Bhutan)**

The prospects of organic farming in Bhutan.

27-Aug-15

**Stephen Adaawen (Ghana)**

Migration from and to the North of Ghana: Historic paths in confrontation with environmental risks.



## 4.3 CAPACITY DEVELOPMENT IN ASIA AND AFRICA

### The WASCAL Graduate Studies Program

WASCAL established and supports ten Graduate Research Programs in West Africa on selected priority areas of climate change. Each Graduate Research Program focusses on specific climate change-related areas and challenges for West Africa. Aiming at educating the next generation of climate change scientists in West Africa, WASCAL's Graduate Studies Department in Accra has been supporting **98 PhD students and 60 MSc students since its start in 2012. Since 2014, 19 Master and 25 doctoral students successfully graduated** from the programs. The six Doctoral Programs are located in Benin, Côte d'Ivoire, Ghana, Mali, Senegal and Nigeria. Four Master's Programs are based at universities in Togo, The Gambia, Niger and Nigeria. The students come from the ten WASCAL member countries, whereas lecturers and supervisors represent at least 22 West African and six German universities. ZEF researchers supervise students and give courses.

ZEF-staff are also members of the science boards of the graduate schools. The four Master's Programs focus on relations between climate change and education, energy, land use and human security. WASCAL graduate students are encouraged to spend up to six months abroad, to gather additional data or discuss their findings and work with their supervisors. **In Germany alone, there are 17 scientists at 11 partner universities or institutions involved in the program.**

#### *First batch of PhD students graduated in Dakar, Senegal*

Six PhD students from six different West African countries celebrated their graduation at the Climate Change Economics School at **the University Cheikh Anta Diop in Dakar,**

Senegal. The official ceremony, which was attended by ZEF-director Joachim von Braun, high-ranking Senegalese officials and the German Ambassador was broadcast on national TV.

#### *Doctoral students with the WASCAL Graduate Program based at ZEF*

**Stephen Adaawen.** Migration from and to the North of Ghana: Historic paths in confrontation with Environmental Risks (graduated in August 2015).

**Jan-Niklas Bamler.** Value for the vulnerable. Value chains of Jasmin rice, chilli and tomatoe, and interventions in agricultural markets in Northern Ghana (ongoing).

**David Boansi.** Agricultural Impacts of Climate Extremes: Case of some selected countries in the Sudan-Sahel Region of West Africa (ongoing).

**Gebrelibanos Gebremedhin Gebremariam.** Sustainable Agricultural Intensification Technologies in Upper East Region of Ghana: Impacts on Deforestation and Welfare (ongoing).

**Aminata Germer.** Food security under climate change. Farmers' perceptions and responses in Ioba Province, Burkina Faso (ongoing).

**Mouhamed Idrissou.** Modeling the availability of surface and groundwater resources in inland valleys, Dano, Burkina Faso (ongoing).

**Justice Nana Inkoom.** Interactions of Agricultural Land uses and their impacts on Ecosystems Services (ongoing).

**HongMi Koo.** Agricultural land use planning for enhancing ecosystem services using scenario-based assessment: Cases of Bolgatanga and Bongo districts in the Upper East Region, Ghana (ongoing).

**Janina Kleemann.** Expert-based modeling approaches of agricultural land use change in Upper East Region,

Ghana (ongoing).

**Michael Mensah.** Modeling the impact of gender differences and land tenure dynamics in the resilience of Veve Catchment, Ghana (ongoing).

**Nicholas Moret.** Status of biodiversity as an indicator of ecosystem resilience in West Africa (ongoing).

**Ephraim Sekyi-Annan.** Performance evaluation of reservoir-based irrigation schemes in the Upper East Region of Ghana (ongoing).

**Karsten Schulz.** From adjustment to transformation. Exploring institutional pathways to climate change adaptation in Ghana (ongoing).

**Wenceslas Somda.** Adaptation strategies to climate and land use changes in inland valleys in Dano (ongoing).

**Kokou Adambounou Amouzou.** Dynamics of macronutrient balances under the impact of climate change and agricultural land use in the West African Sudan Savanna (ongoing).

**Florent Noulèkoun.** Afforestation for rehabilitation of degraded cropland in the Sudano-Sahelian zone of Northern Benin: Experimentation and Modeling (ongoing).

**Project coordination:** Niclas Hallmann (nhallman@uni-bonn.de)

**Main funding agency:** BMBF

**Website:** [www.wascal.org](http://www.wascal.org)

### Center of Excellence in Ghana: The Ghanaian-German Centre for Development Studies

The Ghanaian-German Centre for Development Studies (GGCDS) was established in 2008 in collaboration with the Institute of Statistical Social and Economic Research at the University of Ghana. The program aims at training dedicated and innovative future leaders from Ghana and other African countries who commit them-

selves to the development of their countries and can contribute to the strong partnership between Germany and Africa. The GGCDs rests on five pillars: the enhancement of research infrastructure (offices, IT facilities and software, library) in Ghana, capacity building through co-teaching and staff training, research visits and conference funding, academic networking through workshops and joint research planning, and last but not least a PhD-program in development studies. The PhD program combines methodological and theoretical course work, a summer-school at ZEF, an internship program, field research, data analysis and thesis writing up to final graduation. So far, 50 PhD students have been admitted and 14 students have graduated.

#### *Activities mid 2014-mid 2015*

After a successful evaluation of the GGCDs in 2012/2013, funding for a **second project phase until 2018 has been granted** by the DAAD and the German Federal Foreign Office. In the second project phase the partnership will be expanded to the University of Development Studies in northern Ghana. In 2015, the GGCDs was able to acquire additional funding from the regional state of North Rhine-Westphalia (Engagement Global) for the construction of a PostGraduate Center at the University for Development Studies.

In June and July 2015, a **group of eight PhD-students from the University of Ghana** participated in the 2015 GGCDs **summer-school at ZEF**. During their visit, the students received training in quantitative and qualitative research methods, data analysis and software programs. Guided by ZEF-scientists they explored literature and prepared preliminary research proposals in a workshop. Apart from receiving disciplinary training they participated in a varied cultural and socio-political program. High-light was a **visit to Berlin** – where the students discussed the upcoming German-Ghanaian governmental negotiations on development cooperation with representatives of BMZ and the Ghanaian ambassador and her team.

In addition, the students went on a guided tour at the large open-pit lignite mine in Garzweiler, where they could learn how extractive industries operate, environmental conflicts are negotiated, and re-naturation processes work in Germany.

**Project coordination:** Wolfram Laube (wlaube@uni-bonn.de)

**Main funding agencies:** DAAD, German Federal Foreign Office

**Website:** [www.zef.de/project/ggcds](http://www.zef.de/project/ggcds)

### **The power of PAUWES: building pan-African capacities for energy, water and climate change**

PAUWES, the Higher Education Cooperation Project with the Pan African University, Institute of Water and Energy Sciences is based in Tlemcen, Algeria.

PAUWES' main objectives are:

- developing and sharing concepts, tools and experiences for education in the Master's study program,
- expanding and intensifying existing networks of the partners for cooperating with the Pan-African University and PAUWES,
- establishing a 'Community of Practice',
- providing support to establish a future PhD-program at PAUWES,
- cooperating in the process of identifying research priorities relevant for Africa, preparing and conducting joint research with PAUWES,
- fostering technology transfer/exchange, entrepreneurship and joint ventures between German and African actors (including public private partnership).

These objectives are to be achieved by organizing joint workshops, exchange of students and staff, laboratory courses and Summer Schools, developing teaching modules and writing joint Master theses. In addition, institutional cooperation is a key element of the PAUWES endeavor. Therefore,

ZEF, the Institute for Environment and Human Security at the United Nations University in Bonn and the Institute for Technology and Resources Management in the Tropics and Subtropics at Cologne University of Applied Sciences form a German consortium cooperating with PAUWES to utilize synergies in and for Africa.

#### *Activities mid 2014-mid 2015*

- Coordination meetings December 9-12, 2014 and February 28-March 5, 2015 including workshops on Water and Energy.
- Contribution to the symposium 'State of the Art – Challenges and Trends in Water and Energy in Africa' (organized by PAUWES and the United Nations University as a starting-point for establishing the Community of practice).
- PAUWES' first batch of students attended workshops and a summer school on water, energy and climate change in Cologne and Bonn. The 26 students from 12 African countries were attending courses at ZEF and the Institute for Environment and Human Security at the United Nations University in Bonn from July 27-July 31, 2015.

**Project coordination:** Christian Borgemeister (cb@uni-bonn.de) and Difuza Djumaeva (dela@uni-bonn.de)

**Main funding agency:** DAAD

**Main cooperation partners:** Pan African University, Institute of Water and Energy Sciences (including climate change) PAUWES; Pan African University; Institute for Technology and Resources Management in the Tropics and Subtropics, Cologne University of Applied Sciences; Institute for Environment and Human Security, United Nations University; German Corporation for International Cooperation.



## 4.4 THE RIGHT LIVELIHOOD COLLEGE (RLC)

The Right Livelihood College (RLC) is a global education and research initiative of universities and the **Right Livelihood Award (RLA)**, also known as the “**Alternative Nobel Prize**”. The RLC offers trans-disciplinary education and research and promotes cooperation and synergies between development research institutes, “Alternative Nobel Prize” Laureates, civil-society organizations and an interested public.

The RLC comprises a **worldwide network of seven campuses**, based at: ZEF in Bonn, Tata Institute of Social Sciences in Mumbai, India, College of Development Studies, Addis Ababa University, Ethiopia, Centre for Sustainability Studies, University of Lund, Sweden, Universidad Austral Valdivia, Chile, University of Port Harcourt, Nigeria, and University of California, Santa Cruz, USA.

The RLC Campus at ZEF was established in 2011 as an integrated capacity building program. Supported by the **DAAD and the University of Bonn**, and working together with many Laureates of the “Alternative Nobel Prize” as well as with partners in Bonn and worldwide, the RLC Campus at ZEF provides and delivers **trans-disciplinary education and research** in the fields of poverty alleviation, environmental sustainability and social justice.

In addition, the RLC Global Secretariat has been located at ZEF since 2014. It was moved from the Universiti Sains

Malaysia, Penang, to ZEF. The Global Secretariat coordinates and supports the international RLC activities. In 2015, the Global Secretariat started the new Global RLC Network Project, supported by the Robert Bosch Foundation.

### *Activities mid 2014-mid 2015*

Empirical doctoral research projects in Kenya and India on environmental sustainability and social justice.

### *Highlights mid 2014-mid 2015*

RLC Workshop at ZEF on “Food security and sustainable agriculture: The future of smallholder farmers?”. Public panel discussion at City Hall in Bonn with **RLA Laureate Hans Herren** on “Who will feed the world? Global Agriculture between Population Growth, Business, Sustainability, and Poverty”, May 30 -June 4, 2015

**Asian RLA Laureates** Conference and Global RLC Network Meeting of all RLC Campus coordinators and RLC Steering Committee members, Mumbai, India, March 3-8, 2015

Launch of the new Global RLC Network Project, supported by **Robert Bosch Foundation**, February 10, 2015

Participation in the **United Nations Day** in Bonn, October 25, 2014

Training Workshop on “Empowering Research Methodologies”, ZEF, August 28-31, 2014

RLC Workshop with RLA Laureate

**Amy Goodman** and international PhD students in cooperation with the Deutsche Welle Global Media Forum, ZEF and Bonn World Conference Center, June 28 -July 3, 2014

### *Doctoral students*

**Juliet Wanjiku Kamau.** Productivity and sustainability of ecological organic agriculture systems in Kenya (ongoing).

**Willis Okumu.** Cattle raids, violence and institutional change among pastoralists in northern Kenya the case of Samburu and Turkana communities (ongoing).

**Divya Swaminathan.** Land use and agricultural transformation in the Soliga indigenous communities in Southern India (ongoing).

**Lai Wan Teng.** We come. We work. We relate: The migrant laborers in Penang, Malaysia (ongoing).

**Project coordinator:** Till Stellmacher (t.stellmacher@uni-bonn.de)

**Main funding agencies:** DAAD, Robert Bosch Foundation, University of Bonn

Main cooperation partners: RLA Foundation, Stockholm; Tata Institute of Social Sciences, Mumbai; Addis Ababa University; University of Lund; Universidad Austral Valdivia; University of Port Harcourt; University of California; City of Bonn; Deutsche Welle.

**Websites:** www.rlc-bonn.de; www.rlc-blog.org

RLC-student Divya Swaminathan (right) during her field research. Students at ZEF discussing with RLC-laureate Hans Herren.





# 5

## BUDGET 2014/2015, ZEF'S FUNDING PARTNERS

Indirect Support*)	in Euro	in %
German Academic Exchange Service (DAAD) / German Federal Ministry of Economic Cooperation and Development (BMZ)	529,755	60,8
German Academic Exchange Service (DAAD) Regional Program / German Foreign Office (AA)	66,420	7,6
Own funds of students	58,900	6,8
China Scholarship Council	57,600	6,6
Katholischer Akademischer Ausländer-Dienst (KAAD)	41,100	4,7
CONICYT, Chile	22,300	2,6
SENESCYT, Ecuador	12,500	1,4
Evangelisches Studienwerk e.V. Villigst	12,000	1,4
Friedrich-Ebert-Stiftung	12,000	1,4
Hanns-Seidel-Stiftung	12,000	1,4
Landesgraduiertenförderung Hamburg	11,400	1,3
Government of Iran	10,800	1,2
COLFUTURO, Columbia	10,000	1,1
Ministry of Education, Indonesia	8,550	1,0
IPSWAT (BMBF)	6,300	0,7
<b>Total</b>	<b>871,625</b>	<b>100</b>

\*) Scholarships directly funded by the donors.

External Funds**)	Projects	in Euro	in %
German Federal Ministry of Education and Research (BMBF) via		4,500,918	36,2
<ul style="list-style-type: none"> <li>German Aerospace Center (DLR), or</li> </ul>	Analysis Uzbekistan Crossroads-Perspektive Innovative Technologies for multidimensional special development International Project Office (IPO), Global Water Systems Project (GWSP) Science and Technology Cooperation with Uzbekistan WASCAL project, West Africa		
<ul style="list-style-type: none"> <li>Forschungszentrum Jülich (FZJ)</li> </ul>	GlobE: BiomassWeb; Olifants, South Africa		
<ul style="list-style-type: none"> <li>Forschungszentrum Karlsruhe (FZKA)</li> </ul>	International Conference: SDGs: A water perspective		
German Federal Ministry of Economic Cooperation and Development (BMZ)	Bioenergy, Bioeconomy & Food Security Economics of Land & Soil Degradation Excessive Price Volatility I & II Accompanying Research for Agricultural Innovation (PARI)	3,896,284	31,3
German Academic Exchange Service (DAAD)		1,403,189	11,4
<ul style="list-style-type: none"> <li>German Academic Exchange Service (DAAD) / African Union</li> </ul>	Cooperation Water-Energy (PAUWES-ZEF-UNU-ITT)	769,816	
<ul style="list-style-type: none"> <li>German Academic Exchange Service (DAAD) / German Foreign Office (AA)</li> </ul>	DAAD/ZEF Centre of Excellence, Ghana RLC Campus II	448,925	
<ul style="list-style-type: none"> <li>German Academic Exchange Service (DAAD)</li> </ul>	International Doctoral Studies Intercultural Weekend Seminar Leadership Development Seminar	136,562	
<ul style="list-style-type: none"> <li>German Academic Exchange Service (DAAD)</li> </ul>	Greening Environmental Impact Assessments in Bolivia	47,886	
Robert Bosch Foundation (RBS)	Junior Professorship, Prof. Börner Junior Professorship, Prof. Khamzina RLC Network	496,453	4,0
Bill and Melinda Gates Foundation	AG-WATSAN-Nexus TIGA	419,137	3,4
German Federal Ministry of Food and Agriculture (BMEL) via		387,052	3,1
<ul style="list-style-type: none"> <li>Federal Office for Agriculture and Food (BLE)</li> </ul>	NutriHAF Africa	308,820	
<ul style="list-style-type: none"> <li>Coordinating Institution in the field of renewable resources (FNR)</li> </ul>	EssZert Regiopower – Part 1	78,232	
European Commission (EU)	FoodSecure PROIntens	341,163	2,7
Volkswagen Foundation (VW)	Conversion of Scientific Relations, Tadchikistan Research Funds Biber-Freudenberger(Fellowship) Research Funds Laube (Fellowship) Healthcap	217,793	1,8
CIFOR	Forests in the Global Bioeconomy Mapping of forest cover, Central Asia	139,956	1,1

\*\*) Third-party projects of ZEF. Funds budgeted i.a.w. annual financing plans.

Northrhine Westfalia via		132,461	1,1
• BioSC, c/o FZ Jülich	Strategy project BioSC, Researcher Bruckner Strategy project Econ-BioSC, Researcher Cloutier	93,315	
• Engagement Global GmbH	Construction of a doctoral center in Northern Ghana	39,146	
Fiat Panis Foundation	Dr. Hermann Eiselen Doctoral Program	110,915	0,9
International Food Policy Research Institute (IFPRI)	Water-Energy-Food Nexus	105,321	0,8
Third-Party Project Fund available after Project End	Third-Party Project Fund available after project End	76,576	0,6
Future Earth	Future Earth contributions to GWSP	47,985	0,4
ICIPE	Strengthening citrus production systems in Kenya and Tanzania	41,300	0,3
ICRAF	Decision analysis workshops in West Africa	39,847	0,3
UNEP	UNEP contributions to GWSP	19,922	0,2
International Center for Agricultural Research in the Dry Areas (ICARDA)	Wheat for Asia	18,033	0,1
AVRDC	GlobalHort	15,818	0,1
IGBP	IGBP contributions to GWSP	10,290	0,1
German Technical Cooperation (GIZ)	Zukunftscharta	7,066	0,1
Stiftung Internationale Begegnung der Sparkasse Bonn	Contribution to GWSP	5.000	0,0
IALE-D Conference	Participant Fees for IALE-D conference	400	0,0
Participant Fees	Participant Fees for GWSP conference	195	0,0
<b>Total</b>		<b>12,433,074</b>	<b>100</b>
<b>Core Funds***)</b>		<b>in Euro</b>	<b>in %</b>
Personnel Costs		1,437,117	62,3
Administrative Costs		283.530	15,2
BMBF & DFG Overhead Shares****)		439,584	22,5
<b>Total</b>		<b>2,160,231</b>	<b>100</b>
<b>Indirect Support &amp; External Funds &amp; Core Funds</b>		<b>15,464,930</b>	<b>Euro</b>

\*\*\*) University of Bonn, State of North-Rhine Westphalia funds for ZEF.

\*\*\*\*) Partial BMBF & DFG Overhead Shares.



**Ending hunger:** ZEF-director Joachim von Braun appeals to representatives of G7-Food Security Working Group in Bonn. March 2, 2015.

ZEF again among top of international think tanks in “go to” ranking 2014 ZEF is among **top 3 in Science and Technology Think Tanks** and top 20 of Best University Affiliated Think Tanks. ZEF has been listed for five consecutive years.

Lecture on The Essential Role of Science Academies in Society by ZEF Board member **Mohammed Hassan**. September 16, 2015.

Lecture on **Africa on the Move:** Catalyzing and Sustaining an Agricultural Transformation. Agnes Kalibata, President of the Alliance for a Green Revolution in Africa (AGRA). July 20, 2015.

**Biodiversität im Kontext Menschlicher Entwicklung:** Wie kann Nachhaltigkeit gelingen? (BION-Ringvorlesung). By ZEF senior researcher Lisa Freudenberger. June 23, 2015.

The story of adaptation to climate change in the UNFCCC. **Risk and Uncertainty lecture.** By Saleemul Huq. June 24, 2015 .

Book launch: **Handbook of Multi-level Finance.** By Ehtisham Ahmad. June 23, 2015.

**Water Lecture on Changing water politics in the Nile basin:** A more equitable order emerging or a conflict delayed? By Rawia Tawfik. June 17, 2015 .

**Who will feed the world?** Public panel discussion on Global Agriculture between Population Growth, Business, Sustainability, and Poverty. June 1, 2015.

ZEF at **DIES Academicus** (Bonn University) on Agricultural innovations for poverty reduction. May 20, 2015.

Tackling Food and Nutrition Insecurity in Middle Income Countries. By **Shenggen Fan, Director General of IFPRI**. May 18, 2015.

ZEF workshop at **Bonn Conference on Facilitating Global Transformation:** Insights from interdisciplinary development research. May 13, 2015.

Public Lecture on Fluid Politics of Viability: **Conflict over more than water in Central Iran.** By Ehsan Nabavi. April 29, 2015.

**Relative Deprivation and World Migration** by Oded Stark, ZEF Distinguished Fellow. April 9, 2015

**World Water Day 2015:** Water Lecture on Positioning water and capacity development in the SDGs with Uta Wehn, UNESCO-IHE. March 19, 2015.

Book Launch: **Rural development. Knowledge and expertise in governance.** With co-author and ZEF-director Anna-Katharina Horndige and Christoph van Assche. March 10, 2015.

Lecture on The **UN’s post-2015 Agenda for Sustainable Development:** Positions, Suggestions and Insights from a German NGO Point of View. By Jürgen Maier, Forum on Environment and Development. February 19, 2015.

Research efforts to narrow the gap between scientific knowledge and policy-making in ecosystems. By **Yowhan Son, Korea University**, February 19, 2015.

**Lampedusa in Berlin.** Film screening at ZEF with film director Mauro Mondello. February 18, 2015.

A First Step up the Energy Ladder? **Low-cost solar kits and households’ welfare in rural Rwanda.** By Michael Grimm, University of Passau. February 5, 2015.

Crossroads Asia Lecture on A **Crossroads perspective on migration patterns in Eurasia.** By ZEF-senior researcher Markus Kaiser. January 28, 2015.



## SELECTED PUBLICATIONS

For a detailed overview of all ZEF-publications please look at: [www.zef.de/publications.html](http://www.zef.de/publications.html)

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### Water resources

Hassan, R. and Thiam, D.R. 2015. Im-

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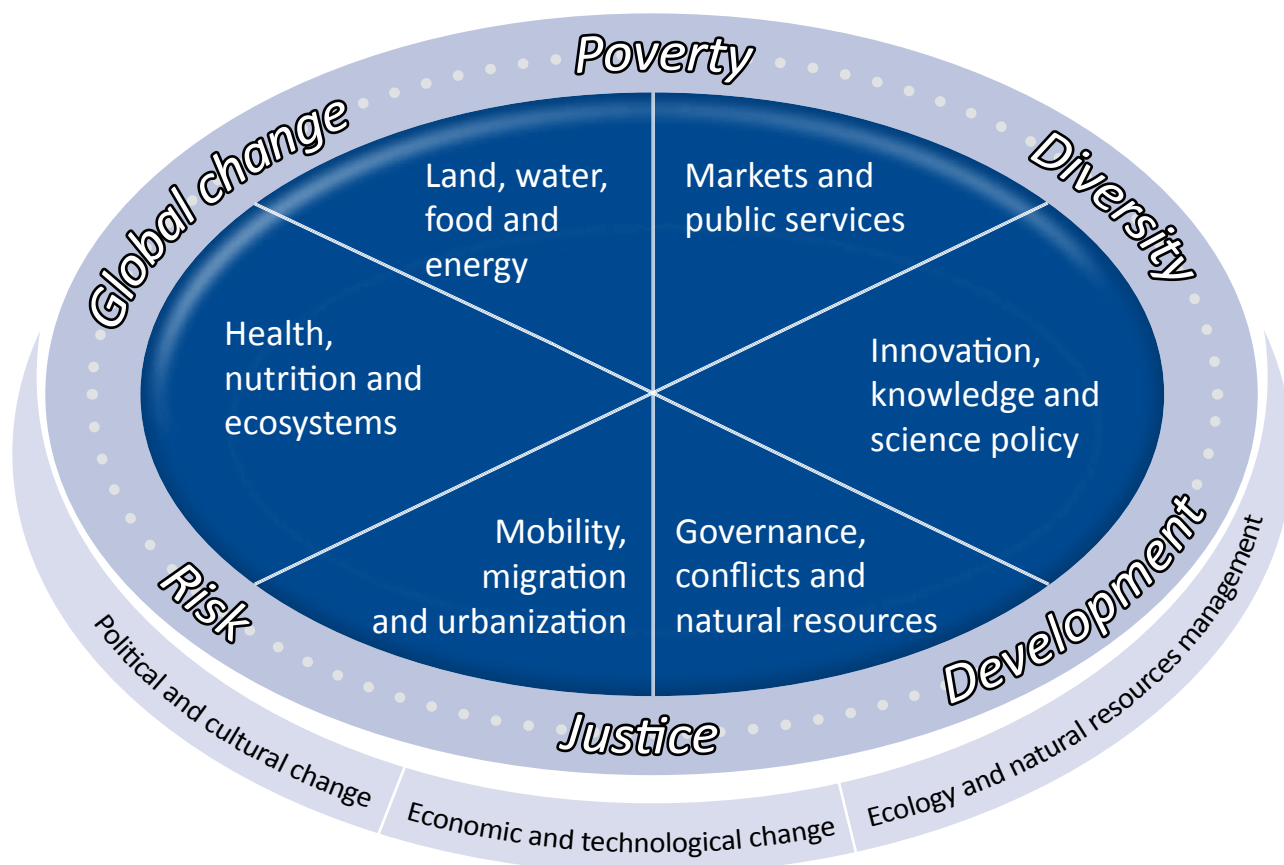
ZEF is dedicated to development research in its different and inter-linked components. The Center's core research areas are based on the disciplinary strengths of our three departments, as well as on our interdisciplinary expertise. In addition, we aim to ensure transdisciplinary stakeholder involvement across all research activities, i.e. in the definition of research topics and the perception of scientific findings at different levels with a view to their technical, political and societal implementation.

ZEF's six core research areas take the emerging United Nations post-2015

agenda into account which is succeeding the 2000-2015 Millennium Development Goals. In this regard, the six core research areas ensure the full thematic integration of ZEF's science program and contribute in a sustainable way to the Center's global Research and Development objectives which focus on global change, poverty reduction, justice, maintaining diversity, and risk management. ZEF's objectives are to be implemented via inter- and transdisciplinary research, emphasizing gender issues.

The manifold aspects of global change such as continued human

population growth, climate change and geopolitical developments build an overarching frame under which the research agenda has been developed. As such, each of the six core research areas relates to the overall sustainable development agenda, while accentuating a specific bundle of topics on which a particular focus is set. All areas are closely interlinked and sometimes overlap thematically, also allowing for the continuous amplification of thematic arrangements beyond the given frame of the individual research area. *In the graph below: ZEF's new thematic clusters.*





# 9

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# 10

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