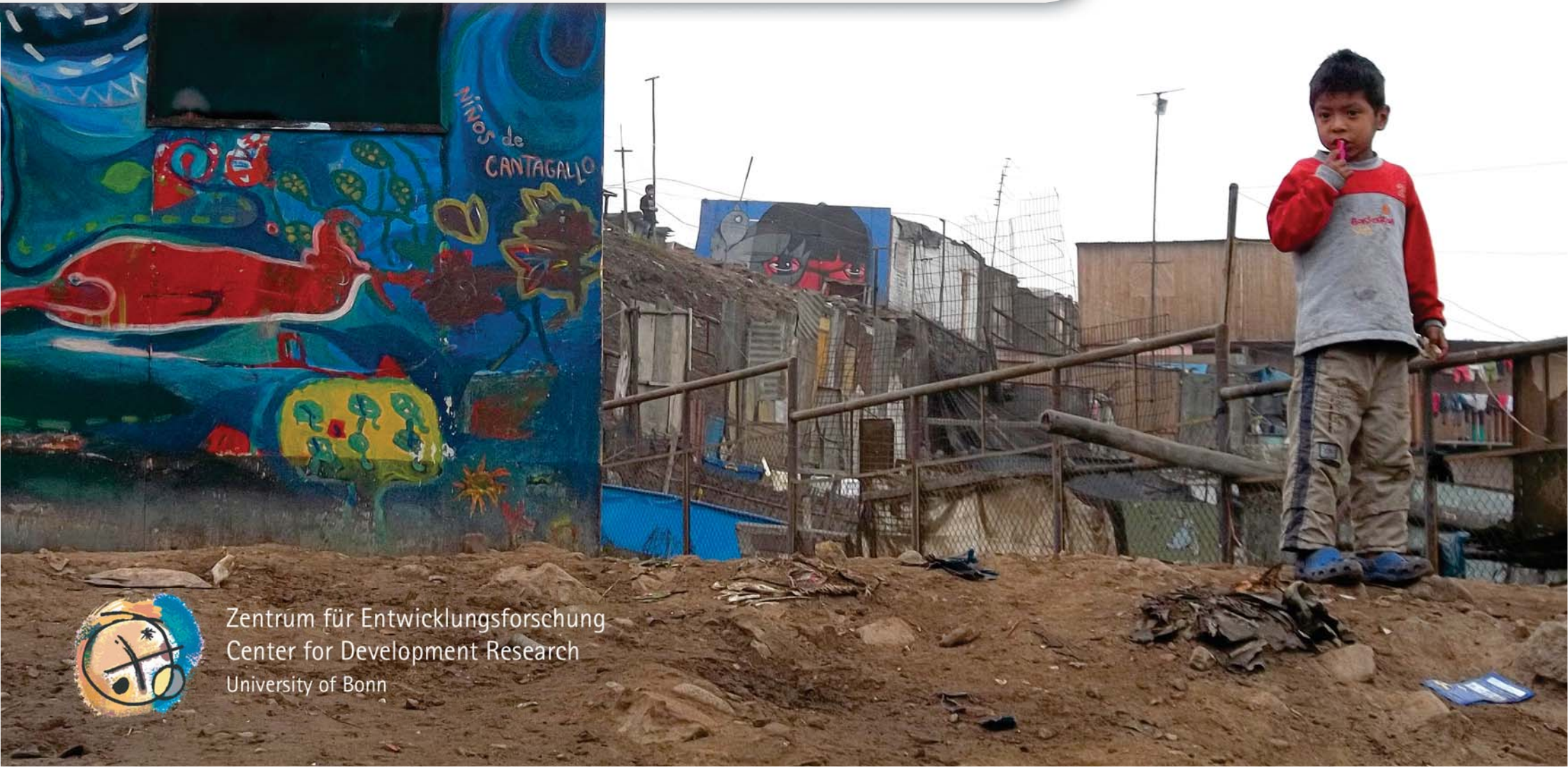


Annual Report 2012/2013

Focus: One health



Zentrum für Entwicklungsforschung
Center for Development Research
University of Bonn

Cover: Photo by Anna Schwachula. Child in Peru.

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For an overview of ZEF's staff and its departments please have a look at www.zef.de/staff1.html.



1

Introduction

by ZEF-directors

ZEF's research agenda is driven by a set of core topics related to human and sustainable development. Though ZEF takes by nature a mid to long-term perspective on development issues, conducting research in a meaningful and trans-disciplinary way always implies being open-minded to new demands coming in from politics and practice.

This is why ZEF has put questions like "What development goals will we tackle after the MDGs?" and "Which role will research play in this respect?" on its agenda in the past year. ZEF board members, representing international agencies of science and development as well as high-ranking representatives from the relevant German ministries, discussed these questions at ZEF events in 2012 and 2013 - therewith offering Bonn-based audiences opportunities to address the "Sustainable Development Goals (SDGs)". ZEF will continue to engage with its research inputs in these development goal debates in the coming years.

ZEF has been able to consolidate its research agenda covering its core research themes by running long-year programs from Central Asia over India and Pakistan to Vietnam and Brazil as well as East and West Africa. At the same time, the institute has been generating new initiatives in the past year, for example in the fields of bio-energy (BiomassWeb, see page 10) and health (see our lead article).

In addition to our own research, developing human and institutional capacities for research is an integral part of all of our major research efforts. In this report you can read about several capacity building-projects, for example in Pakistan, carried out in close cooperation with local partners and supported by the German Academic Exchange Service (DAAD).

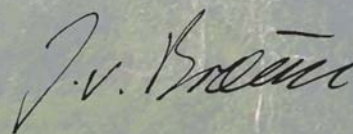
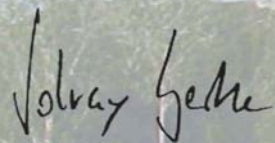
The West African Science Service Center (WASCAL) constitutes ZEF's major capacity development endeavor in West Africa, involving ten regional countries and their governments and been setting up ten graduate schools. A pivotal role in building capacities is taken on by ZEF's doctoral program, which has - to date - been preparing successfully more than 500 doctoral students for international careers in a development-oriented context since its start in 1999. In November 2013, DAAD decided to extend its funding of ZEF's doctoral program for the coming eight years.

The number of articles in peer-reviewed journals and other scientific publications remains a classical and important indicator for the scientific success of our institute. ZEF is proud of the quality and quantity of the publications written or edited by its researchers.

Located in the midst of Bonn, ZEF has the opportunity to attract international audiences in the region to our lecture series, events and scientific conferences and to collaborate closely with other Bonn-based

international organizations such as the United Nations University (UNU) or the Bonn International Conversion Center (BICC). In addition to the long-year formalized relationship with UNU Bonn and its Vice Rector, we are happy that 2013 also the head of BICC accepted our invitation to join ZEF's directorate. Thus, ZEF continues to combine global activities with local connectivity in suitable ways.

ZEF has continued to being highly successful in acquiring funds on the competitive market for research grants. More than 80 percent of ZEF's overall budget of 17€ million euros derives from such competitive project funding. We would like to express our gratitude to all our donors whose continuous and indispensable support have made the achievements, as 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 DAAD, the Robert Bosch Foundation and the Bill and Melinda Gates Foundation, the Foundation fiat panis, Thyssen Foundation, Bayer AG, Volkswagen Foundation, the Dreyer Foundation, Union Investment, and many more organizations as well as various governments through support to some of our PhD students.



2

Lead article

One health, one world: A holistic approach to human, animal, plant and environmental health

by Christian Borgemeister, Joachim von Braun and Solvay Gerke

Practiced since thousands of years by pastoralists, the health of humans and their livestock were always treated as one. Similarly the Egyptians in their mythology saw humans and animals often as chimeric creatures, and early papyri simultaneously refer to human and animal diseases. And the notion of reincarnations between humans and animals strongly influenced the concept of medicine in India. However, in Europe during the middle ages human and animal health started to develop into different directions. Only in the 19th century with the advent of modern medicine scientists like Rudolf Virchow, the 'father of modern pathology' and one of the strongest advocates for public health in his times, favored closer links between veterinary and human medicine [and may be not coincidentally Rudolf Virchow's great grand nephew is a senior scientist at ZEF]. However, the great discoveries in the bio-sciences during the 20th century led to an ever increasing specialization and compartmentalization of the health disciplines. Yet, towards the end of the century the inherent inter-linkages between the health of humans and animals became more prominent in the scientific discourse. Calvin Schwabe, a US American veterinarian and epidemiologist, inspired through his work

with Dinka pastoralists in Africa, became one of the most vocal proponents of a 'one medicine'. This initially more clinical approach developed into a more encompassing 'one health' primarily spurred by the great outbreaks of zoonotic (i.e. animal-born) diseases in the late 20th and early 21st century. Especially the severe acute respiratory syndrome or SARS epidemic and the rapid spread of the H5N1 strain of avian influenza significantly changed the health landscape, leading to alliances like the one health commission of the US American human and veterinary health associations (www.onehealthcommission.org) and a recent tripartite agreement between WHO, FAO and OIE, the World Animal Health Organization.

Nearly three quarters of all emerging human infectious diseases in the past three decades were zoonotic. For example, Rift valley fever is a viral disease transmitted by mosquitoes that affects both livestock and humans. Similarly, trypanosomes, transmitted by tsetse flies, cause Human African Trypanosomiasis or sleeping sickness and nagana in livestock. A particularly telling example is West Nile virus, another mosquito

transmitted disease. Prior to its arrival in North America in the late 20th century, West Nile was a rather obscure and ill studied disease, occurring sporadically in Central Africa. The zoonotic nature of West Nile, i.e. that it is primarily a bird disease, was only discovered after it was reported in the greater New York area.

In parallel to this convergence of human and animal health sciences under the one health umbrella, recently a broader, more holistic approach to health and its interdependence with the environment emerged, often coined *eco-health*. Here ecological interactions but also participation and transdisciplinarity are key characteristics.

Especially the effects of environmental degradation and agricultural intensification on the health of the environment in general, and that of humans in particular have been illustrated in key *eco-health* case studies.

For instance deforestation can have a huge impact on the spread of infectious diseases, as shown for malaria in the Peruvian Amazon. As a

consequence of road construction small water bodies along the road sides are created which are ideal breeding grounds for mosquitoes. Additionally, these activities expose previously isolated communities to the outside world, often leading to the introduction of infectious diseases like malaria into these villages. To prevent misunderstandings: road infrastructure is of utmost importance for rural development.

In the highlands of Ecuador farmers routinely apply the insecticide carbofuran, one of the most toxic carbamates, for pest control in potatoes. In one of the earliest eco-health studies it could be shown that frequent exposure to the pesticide not only can lead to acute intoxication but

results in long-term cognitive impairments of farmers as well as their families. Elucidating this relationship between agricultural practices and human health greatly increased the adoption rate for potato integrated pest management (IPM) in the affected regions of Ecuador.

Aflatoxin contaminations of crops such as maize and groundnuts caused by an infection of the fungus *Aspergillus flavus* can have serious health impacts in humans as they are associated with increased risks of liver cancer and impaired growth in young children, often leading to the development of kwashiorkor. In a study in the Kindia region of Guinea improved post-harvest practices significantly reduced the aflatoxin contamination in groundnuts, leading to a considerable decrease in the aflatoxin-albumin concentration in the blood of children, exemplifying that agronomic interventions can have cascading effects, and in this case substantially lower the disease burden caused by chronic aflatoxin exposure.

Especially the latter two cases illustrate how inter-linked agriculture and agricultural practices and the health of humans, as producers as well as consumers, are, exemplifying the need to 'think' *one health*. Moreover, it shows that technical interventions at one end of the value chain can have cascading effects at the other end by ameliorating the wellbeing of men.

Among the most important common denominators of the *one medicine, one health* and *eco-health* initiatives is a holistic understanding of health, necessitating inter- and transdisciplinarity and participation as key elements to such approaches. In particular a close collaboration of natural and social sciences is pivotal here.

As you will see in this annual report, ZEF is increasingly engaged in this field of research. For instance the EU-supported FOODSECURE program looks at the drivers of food and nutrition security. Under this program, for instance the linkages between agricultural innova-

tion, service delivery and child nutrition are analyzed, and policy options for action explored. About 45 percent of mortality of children under 5 years of age, i.e. about 3 Million deaths per annum, are caused by nutrition related causes, and the linkages of this global problem to agriculture and food security are strong. The water, sanitation and health or WATSAN project, supported by the Bill and Melinda Gates Foundation, investigates pro-poor investments in the nexus of domestic water quality and quantity, sanitation and hygiene, and agriculture from the bottom-up. Studies in India, Bangladesh, Ghana, and Ethiopia under this program with local communities address opportunities to overcome the complex burden of disease problems arising from the unhealthy set of nexus problems, especially in peri-urban contexts. Funded by the EU and DFG, the health impact of water access in urban China and India project looks at the relation between water management, health issues, and urban planning in the context of fast-expanding and globalizing tourism-based economies in China and India. The study advocates an integrated urban planning approach and a decentralized or hybrid sanitation system. Also supported by DFG the health and water in India project looks at the role urbanization plays in water resources management and its implications on human health, using the city of Ahmedabad in Gujarat as a case study. The study takes a systems perspective on water-and vector-borne diseases by assessing how the flow of urban water, influences the power dynamics among diverse institutions breeding water-and vector-borne diseases among urban population.

These examples illustrate how close collaboration between the natural and social sciences can overcome the traditional 'silo' mentalities of the respective disciplines, leading to a more all encompassing understanding of health. Because of its inherent interdisciplinary nature ZEF is in a prime position to continue and expand making substantive contributions *to one health in the one world*.



3 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 young-and-upcoming 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" (in the midst of the graph right) supported by ZEF's "disciplinary capabilities" of the three research departments depicted in the three circles in the corners of the graph below.

For detailed information on our research (themes) please have a look at our website www.zef.de. This report covers a selection of themes.

For a complete overview of ZEF's research areas and themes please have a look at:

www.zef.de/researchareas.html



ZEF's core research themes – a selection

3.1 Science policy

Introduction

Science policy and innovation are central to development. ZEF research focuses on science policy in an interdisciplinary approach, bringing together economics, political, social and natural sciences.

The main questions that science policy research at ZEF aims to answer are: What science policy enhances sustainable development, including its socio-political, economic and environmental dimensions, and how can science investors enhance their impact?

WASCAL as a science policy initiative

The West African Science Service Center on Climate Change and Adapted Land Use (WASCAL) is a regional research-focused program designed to help enhance

ZEF has been conducting research in West Africa for more than a decade.



the resilience of human and environmental systems to climate change as well as increased climate variability. It does so by strengthening the research infrastructure in West Africa related to climate change and by pooling the expertise of ten West African countries and Germany. Funded by the German Federal Ministry of Education and Research (BMBF), WASCAL is coordinated by ZEF, and is implemented in a collaborative effort by West African and German partners. WASCAL is built on three pillars, all based in West Africa:

- The Climate Service Department, which collects, integrates and analyzes data and generates policy advice from these.
- The Research Department, which seeks ways and means to generate resilience in cultural landscapes.
- The Graduate Studies Department, strengthening human capacity through partnerships with universities in the region.

Through the recognition of WASCAL by six of the member states as confirmed by the Economic Community of West African States (ECOWAS), WASCAL has officially become a regional international institute in May 2012. Following Benin, Burkina Faso, Ghana, Niger and Togo, The Gambia was the sixth country to approve the constitution of WASCAL. The establishment of WASCAL as an international institute is an important step towards the goal regional climate service center. Moreover, by recognizing the WASCAL agreement, the participating West African countries will start to contribute financially to WASCAL's budget from 2013 onwards.

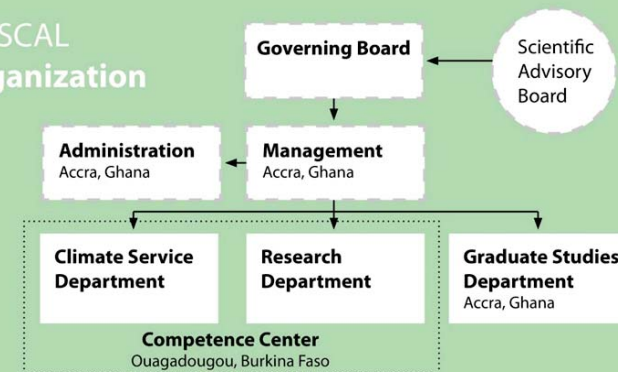
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Funder: German Federal Ministry of Education and Research (BMBF)

Website: www.wascal.org

WASCAL Organization



WASCAL was proclaimed officially an international organization of West African countries in 2013.

Higher education in post-conflict societies

Since 2012, ZEF researchers began exploring a new area of research: the politics and social dynamics of rebuilding systems of higher education to support peacebuilding after armed conflicts and crises. Through the pilot project entitled "Contested knowledge", ZEF set up partnerships to support future research in North Africa (Libya), Central Asia (Tajikistan), and Southeast Asia (Cambodia, Thailand and Myanmar/Burma). The Department of Political and Cultural Change is gearing up for a more comprehensive future project, including a cohort of PhD students, to conduct a cross-region comparison of efforts to re-envision and reconstruct systems of higher education and a culture of academic excellence. In this, our research seeks to understand how a strong academic culture can be incubated in university spaces, given the unique challenges faced by university administrators in conflict regions. We also look at higher education as a new arena, in which diplomacy, cultural integration, and regional (or international) cooperation are increasingly negotiated in a global world. As an institute intimately involved in

capacity building for higher education in many countries, the ZEF has already been contributing to these processes – now we are beginning to study them more intensively.

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Innovations for nutrition security

Under the project “FOODSECURE – Exploring the future of global food and nutrition security”, ZEF collaborates with 18 partners across Europe and the world to identify the determinants of food and nutrition security (FNS) and predict FNS internationally in the short and long term.

One of ZEF’s main research tasks is to investigate the food and nutrition security impacts of technological and institutional innovations. In doing so, we are also aiming at describing and assessing the systems which generate such innovations, at the farmers, national and international levels. ZEF’s assessments of the science and innovation systems will support the

FoodSecure modeling teams to develop long term scenarios of technological change and thus inform the process of forecasting food and nutrition security in the medium to long term.

ZEF will also aim at supporting local science policy decision-making in developing countries, highlighting in particular the links between FNS and socio-economic and environmental sustainability. In 2013, ZEF has already compiled a substantial database of FNS-relevant institutional and technological innovations, in order to start the mapping of innovations, their FNS impacts and the systems which produced them.

The FNS impacts have been drawn from an extensive literature review and informed by an online stakeholder consultation, revealing interesting perceptions of the relative impacts of innovation types. Such results have been very useful in informing our future work on science policy for FNS, to be carried out in 2014-2015.

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Involving local stakeholders and conducting surveys is part of ZEF’s research concept.

3.2 Governance

Marginality

Development research addresses ecology, exclusion and poverty to contribute to improving the lives of, among others, marginalized rural populations. The purpose of the research program on marginality is therefore to analyze the nature and drivers of marginality and reveal the hidden potentials of the marginalized poor in order to match them with suitable investment and development opportunities.

Research

During a preparatory phase from 2010-2012 a research concept and framework have been elaborated for the marginality research program at ZEF. A book has been edited by Joachim von Braun and Franz Gatzweiler and published by Springer which addresses core dimension of Marginality: Poverty, Exclusion and Ecology: link.springer.com/book/10.1007/978-94-007-7061-4/page/1

A follow-up project on “*Technology assessment and farm household segmentation for inclusive poverty reduction and sustainable productivity growth in agriculture*” (TIGA) identifies areas and people with potential and crop technology innovations as levers for unleashing them in order to increase the productivity of rural smallholders.

The TIGA project works in India (Orissa, Bihar), Bangladesh, Ethiopia and Ghana. Specifically, the project seeks to create a thorough understanding of the inter-

actions between technology needs, farming systems, ecological resources and poverty characteristics in the different strata of the poor, and to link these insights with technology assessments in order to guide action to overcome current barriers to technology access and adoption. In support of the objective to enable all segments of the poor to benefit from crop technology innovations (directly or by secondary growth linkages) the project also aims at identifying technology choices in combination with additional institutional innovation measures for reaching all strata of the rural poor.

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Activities 2012-2013

The TIGA research community met in Addis Ababa from April 18-20, 2013. The meeting was organized by Ethiopian Economic Policy Research Institutes at the Ethiopian Economic Association (EEA) in Addis Ababa. The purpose of the workshop was to: 1) Discuss the state of research activities and approaches followed by partners of the TIGA project, and present progress made to date, 2) Present and discuss different methods chosen for study site selection and segmentation and agree on next research activities.

TIGA Meeting, September 13-14, 2012, Bonn (organized by ZEF.) The project partners from Bangladesh, India, Ethiopia and Ghana and the distinguished Project advisors presented and discussed the state-of-the-art in agricultural technology and productivity in their countries and different methodological approaches to be taken for assessing (ex-ante) technology innovations for inclusive growth in agriculture.

Publications marginality/TIGA

Von Braun, J. and Gatzweiler, F. (eds.) 2013. Marginality. Addressing the Nexus of Poverty, Exclusion and Ecology, Springer Open

Diffusing knowledge and innovations in post-Soviet southern Caucasus and Central Asia

This pilot study deals with agricultural knowledge systems in Georgia and Tajikistan. The project "Epistemic Cultures and Innovation Diffusion in post-Soviet Southern Caucasus and Central Asia" addresses the crucial role of generating knowledge and innovation for socio-economic and political development, including the adaptation to transformation processes. The newly formed states of Central Asia and Caucasus, currently in the midst of these socio-economic processes of transformation have not been able yet to fully reach their development objectives in the area of market liberalization, livelihood and energy security. Instead, and due to limited resources and wide-spread poverty, agriculture plays a central role in the systems of livelihood provision in all states of Central Asia and Caucasus. Here, knowledge generation and the development of locally adapted agricultural innovations, matching the legal and financial 'windows of opportunity' of local farmers to innovate, is crucial. This pilot project aims to create the conceptual basis for (a) further development and diffusion of (external and local) agricultural innovations in cooperation with local farmers as well as adaptation to the local situation; and (b) their out-scaling through local channels of innovation diffusion.



ZEF investigates the innovation potential of local farmers in Central Asia.

Events

International Academic Conference on Agricultural Knowledge and Knowledge Systems in post-Soviet Societies. Bonn, September 12 – 13, 2013.

See www.zef.de/1548.html?pk=4002&ref=199&view=latest_news&start=0

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Publications on knowledge

Van Assche, K., Shtaltovna, A., Hornidge, A.-K. 2013. "Visible and invisible informalities and transformation. Lessons from transition countries: Georgia, Romania, Uzbekistan' In: Informality in Eastern Europe: Structures, Political Cultures and Social Practices. Interdisciplinary Studies on Central and Eastern Europe, Peter Lang, Frankfurt, pp. 89-118.

Shtaltovna, A., Van Assche, K. & Hornidge, A.-K. 2012: Where Did This Debt Come From? Organizational Change, Role Ambiguity and Development in Rural Khorezm, Uzbekistan. In: Internationales Asienforum, 43:3-4, 179-197.

Conversion of knowledge in post-Soviet agriculture

This research investigates the functional relations between local governance and agricultural knowledge management to understand how local governance arrangements enable and constrain farmers' handling (access, usage, creation, amplification and dissemination) of knowledge. With the horticultural sector in Tajikistan as an example, we study how the assumed governance-knowledge nexus influences the farmers' ability to innovate (e.g. production and commercialization) and how natural resources are distributed. The research compares two horticulture production zones in, respectively, Zerafshan valley and Shahritus district.

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3.3 Water resources

The purpose of Integrated Water Resources Management: Middle Olifants South Africa (IWRM – MOSA) project is to investigate potential policy instruments and organizational settings, which might contribute to (a) improving water allocation and (b) mitigating water quality. This project is applied to the Olifants, one of the most water scarce region in South Africa. The overall aim is to integrate the quality aspect into an IWRM system and to evaluate the impacts of water policy on farmers' livelihoods. On the other side, the project identifies and assesses the transaction costs inherent to the implementation of water policy while considering heterogeneity of water users (farmers, mines, households).

The following research questions are tackled: What are the marginal values of water in different sectors? What are the impacts of water use on water quality for different locations and times in the Olifants basin? Is there potential for addressing water scarcity through virtual water trade? What are the costs and benefits of water treatment? How effective are different water policies as well as community involvement in enhancing water conservation in the Olifants basin? What are the welfare impacts of different water policies (compulsory licensing, water trade, effluent discharge permits and water tariffs) on households/firms? What are the transaction costs associated with implementation and compliance to water management policies in the Olifants basin? What do water users and managers

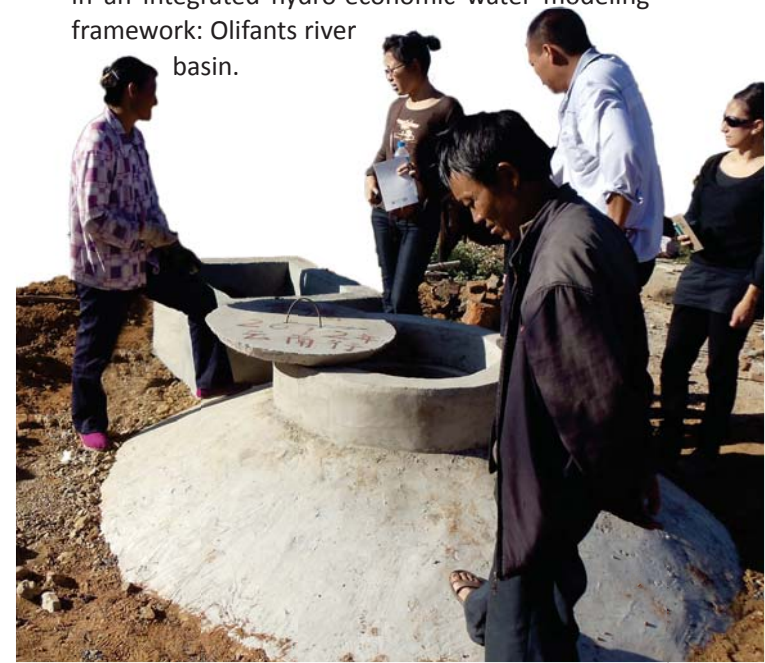
employ ICT for, and what are the linkages between use of ICT, TCs, and compliance to water management policies in the Olifants basin?

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Funder: The IWRM – MOSA project, phase II (2012-2015) is funded by the German Ministry of Education and Research (BMBF)
Website: iwrm-southafrica.de
Main cooperation partners: In Germany: the University of Witten/Herdecke, Ruhr University of Bochum and seven industrial partners. In South Africa: University of Pretoria, the Water Research Commission, Department of Water Affairs and Council for Scientific and Industrial Research.

Doctoral research on water resources

Njiraini Georgina Wambui. The role of institutions, policy and ICT in management of a water stressed basin: The case of Olifants, South Africa.

Philippa Kanyoka. Addressing sectoral water values in an integrated hydro-economic water modeling framework: Olifants river basin.



3.4 Land use and food security

Food price volatility

This research group at ZEF is investigating the drivers and causes of price volatility and its impact on (poor) farmers and consumers. Also explored are options for regulatory instruments to reduce and cope with volatility. Investigations carried out by ZEF showed that speculation on corn, wheat and soybeans contributed to the severe price increases in the years 2007 and 2008, which cannot be explained solely by global demand and supply mechanisms. However, other factors such as storage and trade also contribute to price volatility and nutrition security. Current field research in Ghana and India focuses on the role of storage and trade for stabilizing prices in developing countries.

The impacts of volatility on production risk and food supply are studied on a global scale as well as on the country level (smallholder farmers in Ethiopia). Further survey data from Ethiopia revealed the impacts of short-term price spikes on food consumption and food security.

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Funder: German Federal Ministry for Economic Cooperation and Development (BMZ), Union Investment, BayerCrop Science AG

Main cooperation partner: IFPRI

Website: www.zef.de/volatility.html

Doctoral research on food price volatility

Mekbib Haile: The volatility of international food prices: impacts on resource allocation and on farmers' supply responsiveness

Lukas Kornher: Empirical tracking of the relationship between stocks and prices and policy responses to reduce food price volatility.

Marta Kozicka: Evaluation of food price stabilization policies in India, with special emphasis to public stocking policies

Irfan Mujahid: Trade Cooperation and Food Price Volatility: Indonesia in the Regional and Global Economic Architecture

Jan Brockhaus: Transparency and cooperation on the international grain market to reduce food price volatility

Publications on food price volatility

Haile, M.G., Kalkuhl, M. (2013). Agricultural supply to international food prices and price volatility: a crosscountry panel analysis. AAEA Conference paper 2013

Tadesse, G., Algieri, B., Kalkuhl, M., J. von Braun. (2013). Drivers and triggers of international food price spikes and volatility. Food Policy, 5 October 2013, Elsevier: www.sciencedirect.com/science/article/pii/S0306919213001188

Food security

ZEF is one of the 19 partners in FOODSECURE, an international consortium aiming to design effective and sustainable strategies for assessing and addressing the challenges of food and nutrition security. The research addresses in particular EU policy makers.

Since its start in 2012 the research teams in FOODSECURE have been revisiting the common understanding of the drivers and indicators of food and nutrition security and the potential linkages between economic,



Food price volatility mainly affects the poor and vulnerable.

social and environmental factors of risk to food and nutrition security, or FNS in short. Research results so far have provided a set of definitions and policy strategies, and insights on short and long-term FNS indicators. A database with partly new country-level information on indicators of FNS and potential causes is developed by the project team and will contribute to assessing the impacts of the different drivers of FNS in the short medium and long term, such as local and EU policies, development aid, the evolution of commodity markets and prices, or environmental change. The project team will also deliver a preliminary assessment of agricultural innovations and scenarios of their adoption, informed by stakeholder consultation. This will guide the effort to endogenize innovation processes in FNS and agricultural modeling.

The current building blocks will be integrated into a framework that connects FNS indicators to their drivers of change. A major achievement will be to quan-

tify drivers of change and to set up a modeling toolbox which can quantify food security drivers in the short term and in the long run (scenarios 2020-2050). The long-run toolbox will be supported by the development of exploratory scenarios in cooperation with stakeholders of the food system, and will rely on the existing major global models of agricultural and environmental change.

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Main cooperation partners: LEI-WUR, IFPRI, INRA, KU Leuven, CCAP, IAE, IHEID, IIASA, EC JRC, PBL, Prospex, SAU, URoma 3, IDDRI, EEPRI, EMBRAPA, CIRAD.

Doctoral research on food security

Daniel Ayalew Mekonnen. Aspirations, adoption of agricultural innovations, and household food and nutrition security: Case of Ethiopia

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

Publications on food security

Tim Wheeler and Joachim von Braun. Climate Change Impacts on Global Food Security. Science 2 August 2013, Vol. 341 no. 6145 pp. 508-513.

Economics of land degradation (ELD)

The purpose of ELD research is to conduct an integrated global assessment of the costs of action and inaction on land degradation. Land degradation is a critical global problem, affecting especially the poorest land-users.

This research initiative emphasizes the need to invest

in combating land degradation. Decision-making on action against land degradation is guided by its social costs – broadly defined as loss of human welfare, including on-site and off-site costs and benefits of actions against land degradation. Such actions can be taken after a careful assessment of the extent and severity of land degradation, its drivers, its effects on human welfare, as well as the expected returns on investments. ELD research is based on representative case studies in Argentina, Niger, Senegal, Kenya, India, Uzbekistan and other countries.

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Funder: German Federal Ministry of Economic Cooperation and Development (BMZ)

Website: www.zef.de/eld.html

Main cooperation partners: UNCCD, IFPRI, ICAR-DA, ELDI

Doctoral research on economics of land degradation

Oliver Kirui. Economics of Land Degradation, Sustainable Land Management and Poverty.

Evelyn Kihii. Enhancing Pastoral Practices and Institutions for Sustainable Rangeland Management and Improved Livelihoods

Publications on economics of land degradation

Land Degradation, Poverty and Marginality. (by Gerber, Nicolas, Ephraim Nkonya, and Joachim von Braun, 2014. Marginality. Springer Netherlands, 181-202.)

Global extent of land degradation and its human dimension. In Principles of Sustainable Soil Management in Agroecosystems, ed. Rattan Lal, and B.A. Stewart. Boca Raton, FL, US: CRC Press (by Nkonya, E. Joachim von Braun, Jawoo Koo, and Zhe Guo. 2013).

Rattan L., K. Lorenz, R.F. Hüttl, B.U. Schneider, J. von Braun (Eds.) 2013.

Ecosystem Services and Carbon Sequestration in the Biosphere. Springer Netherlands. DOI 10.1007/978-94-007-6455-2. Ref ID: A064

Highlights 2012-2013

April 9-12 2013. ZEF participated in the 2nd Scientific Conference of the UNCCD (United Nations Convention to Combat Desertification) on the „Economic assessment of desertification, sustainable land management and resilience of arid, semi-arid and dry sub-humid areas“.

November 2012. ZEF co-organized a session on „The economics of land degradation“ with the German Federal Ministry for Economic Cooperation and Development (BMZ)/GIZ at the first Global Soil Week held in Berlin.

A methodological peer-reviewed paper on conducting case studies on Economics of Land Degradation was developed: www.zef.de/fileadmin/webfiles/downloads/zef_dp/z

BiomassWeb

Increasing global demand for food, but also for feed and biomass-based raw materials, e.g. fuel and fiber crops, has increased pressure on the agricultural sector and food production in the past decade, especially in Africa. Concepts to increase food security while addressing growing demands for non-food biomass and developing alternative biomass sources are still in their infant stages. The recently (mid 2013) started ZEF-led research project "Improving food security in Africa through increased system productivity of biomass-based value webs (BiomassWeb)" aims therefore at contributing to food security in sub-Saharan Africa by focusing on biomass-based value webs. The overall goal of BiomassWeb is to raise food security in Africa through har-



nessing productivity and efficiency gains in the whole biomass-producing, processing and trading system by increased integration of all value web components and the cascading utilization of biomass. Besides identifying innovation opportunities in pre- and post-harvest production technologies, institutional settings and governance structures, the project will focus on developing capacities at different levels (including doctoral training). BiomassWeb expects to contribute to enhancing African capacities to participate in the emerging regional and international bio-economy. Focus countries are Ghana, Nigeria and Ethiopia. It is planned, however, to establish a pan-African network ("Biomass Network") consisting of biomass experts and other actors in sub-Saharan Africa's biomass sector as a stakeholder platform for biomass-related discussions and activities in the coming decades.

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European Land-use Institute (ELI)

ELI was founded in 2011 as a multinational cooperation platform with to date 67 partners in 21 countries. ELI builds a sustainable and long lasting partnership in research, development, and capacity development in integrated land use. Since 2012, ELI has acted as European Nodal Office of the Global Land Project (GLP) bundling research in land management, land use planning and land use policies. ELI strives to bring together excellent R&D partners that are dealing with land use, land management and landscape planning covering research in agriculture, forestry, water management and urban systems from ecological, economic, political and technical point of view. Foci of the platform are (a) to develop approaches how to further evolve interdisciplinary research in integrated land use, and (b) to provide a trans-disciplinary platform for training and consultation.

Research topics addressed in a number of cooperation projects are related to scaling issues and cross-sectoral knowledge integration. Technical and scientific development topics that we address in SME-oriented cooperation activities comprise innovative technologies in land-management and resource processing.

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Website: www.eli-web.com;
european-nodaloffice.eli-web.com

3.5 Renewable energy

Bioenergy, bioeconomy and food security

This initiative conducts development research and policy advise on the nexus of energy, food, water and land. Sustainable development will strongly depend on secure and safe availability of food, water, energy, and industrial raw materials, which are increasingly to be based on renewable resources. In this rapidly evolving context, the fundamental challenge is to frame the reliance on biomass without undermining the long-term productivity of agriculture and other ecosystems, and also through providing opportunities for achieving win-win outcomes in terms of economic development, energy security and food security for the poor.

To achieve the main objective of this project – to provide evidence-based analytical support for national and international policies promoting technological and institutional innovations in the bio-economy, especially in developing countries - the project conducts NEXUS research activities at two levels: global and local in carefully selected case study countries.

The project is constructed around the following specific activities: 1) informing the policy debate and dialogue, 2) conducting the global and national level analysis, 3) Communication to increase awareness and action.

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Website: www.zef.de/bioenergy.html

Doctoral research on renewable energy

Sophia Baumert. *Jatropha curcas*: Sustainable biofuel production in Burkina Faso? - Carbon balance and Economic costs and benefits as sustainability indicators.

Dawit Guta. Bio-based energy in rural Ethiopia.

Utkur Djanibekov. Trees, crops, and rural livelihoods: Afforestation of marginal croplands in Uzbekistan.

Olena Dubovyk. Remote sensing based assessment of land suitability for afforestation of the degraded land in the downstream of the Amu Darya River, Uzbekistan.

Qiu Chen. The impacts of biomass energy on rural livelihood in China.

Jose Jara Alvear. Sustainability assessment of decentralized rural electrification in the Ecuadorian Amazon.

Varun Gaur. Barriers to Renewable Power Development in India and lessons from international national success stories.

3.6 Environmental and climate change

Climate change in Central Asia

The project "Opportunities for climate change mitigation and adaptation through afforestation of degraded lands in Central Asia" explores the role of small-scale agroforestry for ecological restorations and rural livelihoods, in response to growing water scarcity and cropland degradation exacerbated by climate change.

Main research activities in 2012-2013

Remote sensing studies combined with field observations in two irrigated regions in the lower Amu Darya River Basin revealed a decline in cropland productivity of significant spatial extent. The detected decline was most strongly associated with reduced cultivation, and thus with the abandoned cropland in areas presumably less suitable for farming. The afforestation of such areas affected by soil salinity and lack of water for remedial salt leaching was assessed as financially attractive to farmers - due to production of fruit, fuel-wood, fodder, and carbon sequestration under low irrigation inputs.

The current carbon price per se would be insufficient to trigger afforestation efforts by local farmers. However, modeling analysis performed at the farm scale indicates that the adoption of agroforestry practices would be beneficial without carbon payments. Given the modest irrigation needs of tree plantations in comparison to annual crops, they could lead to higher income for farmers in water-scarce years. Thus,

introducing trees on marginal farmland would mean saving irrigation water which would allow cultivating more commercial crops on productive lands, enhancing the total income of farmers. The combined findings of screening legal documents, conducting semi-structured interviews, a focus group discussion and a survey among farmers indicated the need for a set of policy measures. These should aim at stimulating the adoption of afforestation on degraded cropping sites for rehabilitating agro-ecosystem services and improving local incomes. These would include, among others, increasing land tenure security, flexibility in choice of crops, provision of ownership rights over tree plantations, awareness raising on and training in agroforestry, and institutional capacity building for coordinating a collective action of farmers to be able to participate in carbon sequestration projects through afforestation.

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Publications on climate change in Central Asia

Schachtsiek T., Lamers J.P.A., Khamzina A. (in press). Early survival and growth of six afforestation species on abandoned cropping sites in irrigated drylands of the Aral Sea Basin. *Arid Land Research and Management*.

Dubovyk O., Menz G., Conrad C., Thonfeld F., Khamzina A. 2013. Object-based identification of vegetation cover decline in irrigated agro-ecosystems in Uzbekistan. *Quaternary International* 311: 163-174

Djanibekov U., Djanibekov N., Khamzina A., Bhaduri A., Lamers J.P.A., Berg E. 2013. Impacts of innovative forestry land use on rural livelihood in a bimodal agricultural system in irrigated drylands. *Land Use*

Policy 35: 95-106.

Dubovyk O., Menz G., Conrad C., Lamers J.P.A., Lee A., Khamzina A. 2013. Spatial targeting of land rehabilitation: a relational analysis of cropland productivity decline in arid Uzbekistan. *Erdkunde* 67: 167-181.

Dubovyk O., Menz G., Conrad C., Kan E., Machwitz M., Khamzina A. 2013. Spatio-temporal analyses of cropland degradation in the irrigated lowlands of Uzbekistan using remote sensing and logistic regression modeling. *Environmental Monitoring and Assessment* 185: 4775–4790.

Lal R., K. Lorenz, R. F. Hüttl, B. U. Schneider and J. von Braun. Ed. 2012. *Recarbonization of the Biosphere. Ecosystems and the Global Carbon Cycle*. Dordrecht Heidelberg New York London: Springer [dx.doi.org/10.1007/978-94-007-4159-1](https://doi.org/10.1007/978-94-007-4159-1)

Doctoral research on environmental change

Begzod Djalilov: Exploring policies and institutions on supporting adoption of afforestation on degraded land in Uzbekistan: Multi-agent system modeling approach.

Utkur Djanibekov: Trees, crops, and rural livelihoods: Afforestation of marginal croplands in Uzbekistan.

Tilman Schachtsiek: Exploring the potential of multi-purpose tree species for revegetating abandoned cropping sites in the lower Amu Darya Basin.

Olena Dubovyk: Multi-scale targeting of land degradation in northern Uzbekistan using satellite remote sensing

Holm Voigt: Hydrological dimensions of dryland afforestation in degraded agricultural areas in north-west Uzbekistan

Eight master theses: Sujan Maharjan, Inken Rabbel, Nizomjon Matkarimov, Julia Tüshaus, Alfredo Jakob, Suman Ghimire, Laura Kaiser and Theresa Fabian.

Economics of sustainable natural resource use and bio-economy

The Robert Bosch Junior-professorship on “Economics of Sustainable Natural Resource Use and Bio-economy” started operating at ZEF in August 2012. The research group focuses on measuring and modeling the effects of forest conservation policies on land use, economic development, and benefits sharing, particularly in the Amazon region. Through a partnership with the Center for International Forestry Research (CIFOR) the group is also increasingly involved in thematically related research activities in Indonesia.

Since August 2012, two doctoral students have started their research. Work in progress was presented at the 14th International Conference of the International Association for the Study of the Commons (IASC), June 3-7, Japan, and the 69th Annual Congress of the International Institute of Public Finance (IIPF), August 22-25, Italy. At the same conference, a paper on the effect of anti-corruption measures on deforestation in the Brazilian Amazon, presented by Elías Cisneros Tersitsch, won a public policy award: www.iipf.org/ppaw13.html

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Funder: Robert Bosch Foundation

Doctoral research on bio-economy

Hugo Rosa da Conceição: Political and institutional scope for incentive-based forest conservation policies in the Amazon region: Marco Elias Cisneros Tersitsch: Impact evaluation of forest conservation measures in the Brazilian Amazon.

Johannes Schielein. Land use change and ecosystem services dynamics in the Amazon region.

Publications on bio-economy

Duchelle, A. E., M. Cromberg, M. F. Gebara, R. Guerra, T. Melo, A. Larson, P. Cronkleton, J. Börner, E. Sills, S. Wunder, S. Bauch, P. May, G. Selaya and W. D. Sunderlin (in press): *Linking Forest Tenure Reform, Environmental Compliance, and Incentives: Lessons from REDD+ Initiatives in the Brazilian Amazon.* *World Development*.

Börner, J. and S. Vosti (2013). *Managing Tropical Forest Ecosystem Services: An Overview of Options. Governing the Provision of Ecosystem Services*. R. Murradian and L. Rival, Springer Netherlands. 4: 21-46.

Börner, J. and S. Wunder (2012). „The Scope for Reducing Emissions from Forestry and Agriculture in the Brazilian Amazon.“ *Forests* 3(3): 546-572.

Börner, J., Wunder, S. (2012): Mitigation options from forestry and agriculture in the Amazon. In Wollenberg, E., Nihart, A., Tapio-Biström, Grieg-Gran, M. (ed): *Climate Change Mitigation and Agriculture*. Earthscan.

Börner, J., S. I. Higgins, S. Scheiter and J. Kantelhardt (2013). „Approximating numerical solutions to bio-economic systems: how useful is simulation optimization.“ *Quarterly Journal of International Agriculture* 52(3): 179-198.

Conservation auctions: Application and challenges in developing countries

Payments for ecosystem services (PES) are an increasingly popular market-based instrument to preserve ecosystems and their services. Ensuring the efficiency of PES schemes is important for the future success of PES schemes. In this respect, it is an important task for buyers of ecosystem services to reduce producer surpluses by making payments that are aligned with actual provision costs. Conservation auctions can help reduce surpluses through competitive bidding. While auctions

are being applied successfully in developed countries such as the US and Australia, their use in developing countries is limited to few examples of pilot research. The objective of this project therefore is to assess the applicability of auctions in the context of rural areas in the developing world and test the efficiency of alternative auctions designs.

In this research program, we apply economic experiments in the laboratory and field. Study area is the Kapingazi watershed close to Embu, about 130 km North of Nairobi, Kenya. We test the influence of i. various degrees of information disclosure (service scores and targeting criteria) as well as ii. performance-based vs. action based payments on auction efficiency. In a field trial, reforestation contracts are auctioned as a proxy for PES contracts. Laboratory results from Germany are compared to those in Kenya.

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Funder: German Federal Ministry for Economic Cooperation and Development (BMZ) through Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)

Website: www.zef.de/1917.html

Doctoral research on conservation auctions

Lucie Andeltova. The Role of Risk and Trust in Conservation Auctions for Performance Based Payments for Environmental Services and the Cost Effectiveness Implications: Experiments in Rural Kenya.

Climate change and adapted land use in West Africa (WASCAL)

WASCAL conducts a regional research and capacity-developing program to improve the use of land resources through better technologies, policies, institutions and management. WASCAL also provides advisory services on adaptation measures to stakeholders from all sectors of society.

The overall aim of WASCAL is to identify resilient and adaptive land use systems and develop measures to conserve or restore functional ecosystems that support sustainable human development, while preserving the natural resource base for future generations. The West African research community working with WASCAL will have access to the expertise and computing facilities existing in Germany in order to strengthen West Africa's ability to assess the impact of land management policies on the well-being of its people now and in the future. WASCAL's specific objectives: Significantly improve the climate change research infrastruc-

ture and maintenance capacity in West Africa; explore science-based scenarios and options for enhancing the resilience of socio-ecological systems on which current and future generations depend, in the face of climate change. Objectives: Assist policy and decision makers to design and implement land use patterns that ensure the provision of essential ecosystem services while supporting the livelihoods of local communities; Help educate the next generation of scientists and policy makers by providing intimate knowledge of climate-related issues, thereby enabling them to develop suitable coping strategies and to participate in international climate change policy discussions with evidence-based strength; Setting up a research station for climate data collection in Ghana.

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Doctoral research in the picture: Climate change in Central Asia

This doctoral research conducted at ZEF evaluated the potential impacts of climate volatility and change on agriculture and rural livelihoods in Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan. The results showed that poorer agricultural households are more vulnerable to the impacts of weather shocks and climate variability than richer rural households. This is the case because their food consumption depends to a large extent on income that is derived from climate-sensitive agriculture. This still applies even after taking into account potentially positive effects of higher prices due to reduced agricultural supply after weather shocks. These price increases may alleviate the impacts of weather shocks and can even improve the livelihoods of some households. The analysis shows that key policy actions could include: i) increasing awareness among agricultural producers about climate change impacts and adaptation technologies and ii) improving rural financial intermediation. The general message of the adaptation analysis in this study is that most institutional and technological options suggested as measures for climate change adaptation in the region are useful for regional agricultural development even with perfect climate change mitigation. These measures may include the adoption of resource-conserving technologies, new drought-resistant crop cultivars, and sustainable land management practices.

Doctoral researcher: Alisher Mirzabaev. After graduating at ZEF he has been involved in research on 'Economics of Land Degradation' (see page 11 in this report and www.zef.de/eld.html). The doctoral research was funded by the Federal Ministry of Education and Research (BMBF).

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3.7 Mobility and migration

Crossroads Asia

The research network Crossroads Asia: Conflict, Migration, Development comprises seven research institutes in Germany at the verge of area studies, i.e. Central Asian, South Asian and Iranian Studies, and systematic disciplines, i.e. Sociology, Geography and Political Sciences. Within this network of different disciplinary and regional competencies, the researchers aim at studying specific causal and functional connections – figurations – which are localized in, but can stretch beyond the geographical area extending from eastern Iran to western China and from the Aral Sea to northern India. Based on the empirical research in Afghanistan, Iran, Kazakhstan, Kashmir, Kyrgyzstan, Nepal, Northern India, Pakistan, Tajikistan, Turkmenistan, Uzbekistan and Xinjiang, it is the aim to (a) study emic concepts of space and based on this, (b) question conventional approaches to area studies by taking into account the mobility of people, products and ideas shaping the everyday life experiences along Asia's crossroads.

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Funder: German Federal Ministry of Education and Research (BMBF)

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Conferences, lectures and events 2012-2013

"Mobilizing Religion: Networks and Mobility": This second major conference of Crossroads Asia took place at

the Institute of Oriental and Asian Studies in Bonn, July 18-19, 2013.

July 17, 2013. "Social Mobilization, Migration and Citizenship". Workshop of the Research Networks Latin America and Crossroads Asia.

July 3, 2013. "The contemporary Uzbek nation-state and national identity: Soviet legacy and post-socialist developments". Crossroads Asia Lecture by Alisher Ilkhamov (SOAS London).

April 13, 2013. "The Long Journey. Geographic and Social Mobility along the Example of Bukharan Jews in the 20th Century". Crossroads Asia Lecture by Thomas Loy (HU Berlin).

April 4, 2013. "Encountering modernity: Mountain communities, irrigated agriculture and development trajectories in the valleys of the Pamir, Karakoram and trans-Himalaya" by Joe Hill given at the 8th Annual HSS Conference 'Asian Ecologies: Capitalism, Modernity and the Environment', at the Lahore University of Management Science (LUMS), Pakistan.

For a full list of lectures see: crossroads-asia.de/termin-archiv/page-1.html

Mobility and migration are among ZEF's core research themes.





3.8 Health and sanitation

Water, sanitation and health

The “WATSAN” project stands for guiding pro-poor investments in the nexus of domestic water quality and quantity, sanitation and hygiene, and agriculture from the bottom-up. Poor environmental health as well as a bad condition of water and sanitation, are the key cause of diarrhea. The issues of water and sanitation become more complicated with the multi-purpose characteristics of water. In areas with limited rainfall and brackish groundwater conditions, there is growing competition of water use for irrigation on the one, and domestic water supply and sanitation on the other hand. To address these challenges, ZEF has started a new project to identify the critical sets of the tradeoffs between and synergies among domestic water quality and quantity, sanitation and hygiene and agriculture irrigation systems. The project also aims to enhance investments in technological and institutional solutions for improving capacities of rural and peri-urban communities with regard to multi-purpose water systems; and to strengthen the capacity of households and communities in monitoring and managing their own water and sanitation environment.

The project will be carried out in four countries in Africa and South Asia: Ethiopia, Ghana, India, and Bangladesh. These countries have been selected because of their relevant water and sanitation features: drinking water, sanitation services, and hygiene conditions are seriously deficient, and health and nutrition situations are particularly adverse.

Besides migration forced by natural disasters or wars, ZEF investigates networks of labor migration.

Publications on mobility and migration

Hill, J. 2013. The role of authority in the collective management of hill irrigation systems in the Alai (Kyrgyzstan) and Pamir (Tajikistan). *Mountain Research and Development*, 33 (3): 294-304.

Hornidge, A.-K., L. Oberkircher, A. Kudryavtseva (2013): “Boundary Management and the Discursive Sphere – Negotiating ‘Realities’ in Khorezm, Uzbekistan”, *Geoforum*, 45, pp. 266–274.

Kim, E. A., A.-K. Hornidge, C. Schetter (2013): “Gender Effects in Uzbekistan’s Agrarian Policy Reforms”, in: Bisailon, Laura (ed.) “The Impact of Public Policy on Everyday Life: The Policy Stories that People tell”, Springer.

Mielke, K.; Schetter, C. 2013: Pakistan – Land der Extreme. *Geschichte, Politik, Kultur*. München: C.H.Beck.

Schetter, C. (ed.) 2013: *Local Politics in Afghanistan. A Century of Intervention in the Social Order*. London: Hurst & Company.

For all Crossroads Asia peer-reviewed publications look at crossroads-asia.de/veroeffentlichungen/zeitschriftenartikel-buchkapitel.html



Mining in Mongolia: A blessing or a curse?

Doctoral research on health and sanitation

Charles Yaw Okyere. Strengthening the Capacity of Households and Communities for an Improved Monitoring of Water and Sanitation (WATSAN) Environment: Experiments with School Children in Ghana

Florence Mc Bain. Can improved water-sanitation conditions together with health insurance effectively reduce poverty? (India).

Muhammed Abdella Usman. Leveraging Water, Sanitation, and Hygiene (WATSAN) Nexus: Synergies, Thresholds, and Trade-offs for a Better Nutrition and Health Outcome in Ethiopia

Timo Falkenberg. Health Dimensions of Wastewater-Irrigated Urban Agriculture in Ahmedabad, India

Ruchi Vangani. Exploring the Links and Dynamics therein for WATSAN and irrigation agriculture for a Better Nutrition and Health Outcome in Gujarat, India.

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Health impact of water access in urban China and India

In 2012-13, various surveys were conducted in collaboration with the Ladakh Ecological Development Group (LEDeG) in order to assess the water and health situation in Leh Town, Ladakh, India: analysis of government health data, questionnaire survey of 200 households and 320 tourist accommodations, and mapping new hotels, guesthouses, and point sources of water pollution was finalized. The project finds that water-related

health risks in Leh may intensify in the future due to increase in climate-change related water scarcity. The project is in the process of designing an integrated geographic information systems-based multicriteria decision-support tool.

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Funders: European Commission (Marie Curie Programme), German Research Foundation (DFG)
Website: www.zef.de/1804.htm
Team: Adris Akhtar (ZEF/ZFL), Jenny Kebschull (ZFL), Sven Nussbaum (ZFL)

Publications 2012-2013

Gondhalekar, D., S. Nussbaum, A. Akhtar, J. Kebschull, P. Keilmann, S. Dawa, P. Namgyal, L. Tsultim, T. Phuntsog, S. Dorje, P. Namgail and T. Mutup. (2013). Water-related health risks in rapidly developing towns: the potential of integrated GIS-based planning. Special Issue in Water International. 38(6).

Saravanan, V.S and D. Gondhalekar. (2013). Water Supply and Sanitation as a “preventive Medicine” Running Uphill in Rapidly Growing Economies. Special Issue in Water International. 38(6).

Gondhalekar, D., P.P. Mollinga and V.S. Saravanan and (2013). Towards Systematic Comparative Water and Health Research. Special Issue in Water International. 38(6).

Gondhalekar, D., A. Akhtar, P. Keilmann, J. Kebschull, S. Nussbaum, S. Dawa, P. Namgyal, L. Tsultim, T. Phuntsog, S. Dorje, P. Namgail and T. Mutup (2013). Drops and hot stones in the desert: towards integrated urban design in terms of water scarcity and health issues in Leh Town, Ladakh, India. In M. Gislason (ed.). Ecological Health, Vol. 15 of the Advances in Medical Sociology Series, DOI: 10.1108/S1057-6290(2013)0000015012

Urbanization and health in India

In a project on "Urbanization, water management and human health in Ahmedabad city, India", ZEF researchers have been investigating since January 2012 the role urbanization plays in water resources management and its implications on human health from an integrated perspective. The research takes a so-called "systems" view to understand the impact of urban water management on human health, using a combination of research methods and geospatial analytical tools. The ZEF study found a significant correlation between poor water infrastructure and water-borne diseases, confounded with socio-economic factors (like household income) and hygiene practices in the household. The ZEF-researchers carried out a detailed analysis of the water infrastructure in parts of the city and combined the socio-spatial characteristics of the settlements (who lives where and what strategies are used to gain urban citizenship?) in the case study with social-epidemiological (who has what diseases?) ones to understand the complex set of urban factors influencing human health. For this, the researchers plotted water leakages, checked water quality complaints collected by the City Engineering Office, and mapped the actual occurrence of water-borne diseases in 2011/12. Further analyses will be conducted in these hot-spots to understand the socio-economic, health, demographic and hygiene behavior of the households. This could be useful for identifying the potential causes of diseases and for enhancing their surveillance and monitoring.

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Funder: German Research Association (DFG)

Website: www.zef.de/1967.html

Main cooperation partner: Indian Institute of Public Health, Gandhinagar



Health, environment and household income are directly interlinked.

Conferences, lectures and events 2012-2013

'Are we getting crowded, thirsty and sick? Urbanization, water management and human health', ZEF-IIPHG Workshop on January 23, 2013.

'Urbanizing Diseases: Complexity of water-and vector-borne diseases'. Lecture given by V.S.Saravanan, at Tata Institute of Social Sciences, Mumbai January 28, 2013.

'Urbanization, Water Management and Human Health in Ahmedabad', presentation before the Ahmedabad Municipal Corporation, Ahmedabad, April 4, 2013.

Publications on health in India

Saravanan.V.S and Daphne Gondhalekar. (2013). Water Supply and Sanitation as a "preventive Medicine" Running Uphill in Rapidly Growing Economies. Special Issue in the Water International. 38(6).

Saravanan.V.S. (2013) Urbanizing Diseases: Contested

Institutional Terrain of Water-and Vector-borne Diseases in Ahmedabad, India. Water International. 38(6).

4

Capacity development

4.1 ZEF's Doctoral Studies Program

ZEF's Doctoral Studies Program

ZEF's doctoral studies program offers an interdisciplinary and international three-year doctoral education. Since its inception in 1999 more than 560 students from 80 countries have participated in the program.

Flavia Feitosa, a previous ZEF junior researcher from Brazil, has been awarded the Michael Breheny 2013 Prize for the Best Paper in the UK journal "Environment and Planning" for a paper based on her doctoral research entitled "Countering urban segregation in Brazilian cities: policy-oriented explorations using agent-based simulation" (co-authored with Le Q B, Vlek P L G, Monteiro A M V, Roseback R). (www.envplan.com/abstract.cgi?id=b38117).

Nina Langen, a former ZEF junior researcher from Germany, and a Robert Bosch Fellow received an award for her dissertation on "Ethics in Consumer Choice: An Empirical Analysis Based on the Example of Coffee". Her dissertation on consumer behavior was recognized because of its significance for practice and research, its originality and convincing theoretical and empirical research.

Leadership training for sustainable development

The participants of the ZEF Doctoral Studies Program are trained as so-called change agents. They are stimulated to share their experiences and their newly acquired knowledge with others and participate actively in international networks as multipliers. As a result, they should initiate and support medium-and long-term development processes in their home countries and thus contribute to achieving the UN-Millennium Development. Particularly popular is the annual "Intercultural weekend seminar" which is professionally organized and funded by DAAD to strengthen the students' intercultural competencies.

Since 2011, the ZEF Doctoral Studies Program has been collaborating with the Food Security Center (FSC) at the University of Hohenheim. The joint program has organized three block courses in Hohenheim, Bonn and Berlin for students of both institutions. It is supported by the Foundation fiat panis. One block course on "Politics and science" provided students with strategies and methods for applied research: How can students involve local representatives from government, research and the German development cooperation scene in their own research? In 2013 the workshop was held in Berlin, where the students were able to exchange

ideas directly with politicians, parliamentarians and other stakeholders. Another block course dealt with the topic of "leadership" and included topics such as motivation and team building, change management, communication and conflict and "You as a leader." The third block course dealt with "Ethics in Development Research". Please find more information at: www.zef.de/867.html

Welcome to new doctoral students at ZEF

ZEF welcomed this year's batch of new doctoral students in August 2013. Thirty students from 20 countries have started into the three-year doctoral program at ZEF, where they will strengthen their interdisciplinary and disciplinary skills. Moreover, they conduct one year of practical field research in a developing country.

For general information on the ZEF doctoral program, its application and registration procedure please look at www.zef.de/doctoralprogram.html

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ZEF doctoral students batch 2013.

4.2 Capacity development in Africa

The WASCAL Graduate Studies Program

The Graduate Studies Department in Accra is currently supporting 98 PhD students and 60 MSc students in six Graduate Research Programs, located in Benin, La Côte d'Ivoire, Ghana, Mali, Senegal and Nigeria. The programs focus on areas related to West African climate change system, climate change and land use, biodiversity, water resources, economics and agriculture. Students are coming from the ten WASCAL countries, whereas lecturers and students' thesis supervisors represent at least 22 West African and half a dozen German universities.



WASCAL workshop in Kumasi, Ghana.

Four Master's Programs have also been established in the universities of the Gambia, Niger, Nigeria and Togo. The programs focus on relations between climate change and land use, human security, education, and energy. Around 60 students have enrolled in the master's programs.

WASCAL envisages running a total of ten Graduate Research Programs in West Africa on selected priority areas of the climate change - land use nexus. The graduate program on "Climate Change Economics" at the Cheikh Anta Diop University in Dakar is currently selecting the third batch of students. The second batch has just finalized the course work. A batch consists of 10 students representing each WASCAL West African partner country. ZEF- researchers supervise students and give courses in this graduate program on topics such as "Economic choice under uncertainty" (with GAMS exercises), "Economics and Finance of Climate Change" and more.

Contact WASCAL Graduate Programs: Minnitalah Boutros, boutros@uni-bonn.de

Contact Graduate Program in Dakar: Tobias Wünschler and Marc Müller, tobias.wunschler@uni-bonn.de, marc.mueller.zef@uni-bonn.de

Funder: German Federal Ministry of Education and Research (BMBF)

Website: www.wascal.org

The ZEF-led DAAD Center of Excellence in Ghana

The Ghanaian-German Division of Development Studies (GGDDS) of the Centre of Excellence for Development Studies and Health Research at the University of Ghana in Accra, established in 2008, aims at training dedicated and innovative future leaders who commit themselves to the development of their country and

can contribute to the strong economic and political partnership that Ghana and Germany have developed over time. Students conduct research on a wide range of development-relevant topics such as land management, land markets and patterns of investment, agricultural development, poverty, inequality, poverty health traps, foreign direct investment or the governance of Ghana's oil resources. This research not only directly contributes new insights and knowledge that feed into the development process, but also equips the students with expertise enabling them to take up responsible positions in universities, government, NGOs, and international organizations after obtaining their PhD.

Doctoral Program for Environmental Planning at Addis Ababa University, Ethiopia

ZEF cooperates with the University of Addis Ababa for running this first PhD Program on Environmental Planning in Ethiopia. The interdisciplinary and applied program aims to improve the academic capacities in Ethiopia in the field of environmental planning with a focus on biodiversity. The aim is to help with promoting more sustainable utilization and conservation of natural resources in the country.

Contact: Till Stellmacher (project coordinator)

Email: t.stellmacher@uni-bonn.de

Funders: German Academic Exchange Service (DAAD), Ministry of Education of the Federal Democratic Republic of Ethiopia

Website: www.zef.de/1629.html

Main Cooperation Partners: Department of Landscape Planning and Design, Addis Ababa University, Institute for Environmental Planning, University of Hanover, Ethiopian Coffee Forest Forum, Addis Ababa

4.3 Capacity development in Asia

German-Pakistani Research Collaboration and Academic Capacity Building Program

In the second year of the partnership between ZEF's Department of Political and Cultural Change and the Faculty of Arts and Social Sciences of the Government College University (GCU) Lahore, a new batch of seven MPhil-level students was trained in qualitative social science research methods and assisted with the preparation of their field research for their MPhil theses. The topical focus in this round of training and research capacity-building revolved around marginality and social change in the urban setting of Lahore.

The students qualified through three distant learning assignments over three months among 17 total applicants from four social science departments: History, Political Science, Economics, and Psychology. Based on the students' pre-elaborated research proposals a two-week spring school titled 'Introduction to qualitative social science research methods' was conducted jointly by GCU and ZEFa staff (Joe Hill, Helena Cermeño, Katja Mielke). The best two students from the previous 2011/12-batch took part in ZEFa's Disciplinary Doctoral Course work over 10 weeks. In addition, the exchange of faculty, and guest stays of Pakistani colleagues at ZEF were enabled by the programme.

Contact: Katja Mielke (project coordinator)

Email: kmielke@uni-bonn.de

Funder: German Academic Exchange Service (DAAD)

Website: www.zef.de/1837.html

Irrigation Water Use in the Punjab Province of Pakistan by Raising Flexibility and Integrating Surface and Groundwater Resources

This project aims at working out options for a more flexible and demand-oriented irrigation scheduling integrating surface and groundwater resources in Punjab. Cooperation with local farmers and water management associations as well as capacity development are crucial to the project.

Major activities 2012-2013:

- Training workshop for students of the University of Agriculture Faisalabad (UAF) in March 2012 on advanced Remote Sensing tools, Geographical Information Systems (GIS),
- Summer 2012: students of UAF collected and analyzed field data on soil, crops and irrigation characteristics in three study areas in Punjab. Results were presented and discussed in a workshop held in Bonn (Sep. 2012) with representatives from UAF, IWMI and the irrigation administration.
- December 2013: workshop in Faisalabad with project partners from ZEF, UAF, AAU, IWMI and Punjab Irrigation with stakeholders operating (water managers) and utilizing the irrigation systems in Punjab (farmers).

Contact: Bernhard Tischbein

Email: tischbein@uni-bonn.de

Funder: German Academic Exchange Service (DAAD)

Website: www.zef.de/2162.html

4.4 Right Livelihood Campus

The Right Livelihood Campus at ZEF

The Right Livelihood College (RLC) is a global science and capacity building network of universities and the "Alternative Nobel Prize", the Right Livelihood Award. RLC has currently 5 campuses worldwide, at universities in Sweden, Malaysia, Ethiopia, Nigeria and Bonn, Germany. Since 2011, the RLC Campus Bonn is hosted by ZEF and supported by the German Academic Exchange Service (DAAD). It aims to promote applied interdisciplinary research and education in the fields of poverty alleviation, environmental sustainability and social justice by promoting exchange and synergies between laureates of the "Alternative Nobel Prize", PhD students, senior experts and an interested public.

RLC Campus Bonn provides 3-years PhD scholarships for research projects in Asia and Africa, and organizes international scientific workshops and public talks in Bonn. In 2012, RLC PhD student Ms. Divya Rajeswari Swaminathan started her PhD research on "Indigenous People and Agricultural Transformation in Protected Areas - A Comparative Case Study in Karnataka and Tamil Nadu, India". In 2013, Mr. Willis Okumu from Kenya has been awarded a RLC PhD Scholarship for his work on "Inter-community vs. Inter-clan Violence in Samburu North and Kuria East districts in Kenya".

Contact: Till Stellmacher (project coordinator)

Email: stellmacher@rlc-bonn.de

Funder: German Academic Exchange Service (DAAD)

Website: www.rlc-bonn.de

5

Selected outreach

Lectures

Public Lectures

“Feeding 10 Billion with Less” Joachim von Braun talked at the 7th **Jülich Lecture** together with M.S. Swaminathan, who holds the UNESCO Chair in Ecotechnology and is a World Food Prize Winner. Joachim von Braun talked about “Feeding and Fuelling the Future”. Find more information here: www.zef.de/1548.html?pk=4180 June 2012

Water Lectures

On the occasion of “**World Water Day**” 2013 ZEF co-organized with its partners a panel discussion on “Water cooperation: Challenges and opportunities”. Find more information here: www.zef.de/1548.html?pk=4106&ref=199&view=archive&start=10. March 2013

“**Grabbing water?** Large-scale investments in agriculture and perspectives for regulation”. This Water Lecture addressed the question if large-scale investments in agriculture provoke „water grabbing“ and discussed perspectives for regulation and sustainable agriculture. November 2012

“**Coping with hydrological extreme events:** From Rio 20+ to regional water management”. Panel Discussion with Jr.-Prof. Asia Khamzina and Dr. Reda Keleme-work Tafere. A keynote was held by Prof. Mariele Evers, University of Bonn. October 2012

Awards and events

ZEF was listed again among the world wide leading think tanks: In the 2012 Pennsylvania ranking ZEF is among the 10 best “Science and Technology Think Tanks” and the 20 best “University Affiliated Think Tanks” (see www.gotothinktank.com)

What development goals next? Which role will research play in the **Sustainable Development Goals?** Panel discussion at ZEF, September 19, 2013.

Book Launch “**Pakistan – Land der Extreme**”, co-authored by Katja Mielke and Conrad Schetter, published in Beck Verlag: The book launch was co-organized with the Bonn International Center for Conversion (BICC). September 18, 2013

ZEF organized a **UNFCCC side event** on “Drivers of deforestation: leverage points and REDD+ efficiency” in cooperation with The World Agroforestry Center (ICRAF) and ASB Partnership for the Tropical Forest Margins (ASB). See www.zef.de/index.php?id=2106. June 2013

The major GWSP conference on “**Water in the Anthropocene: Challenges for science and governance**” brought together 300 scientists from around the world, among them many ZEF researchers. Find the keynotes and interviews at conference2013.gwsp.org/228.html. May 2013

Right Livelihood College workshop on “Mobilization for Change: Re-defining local decision-making and participation”. ‘Alternative Nobel Prize’ laureates

Sima Samar (Afghanistan), Ruth Manorama (India) and Monika Hauser (Germany) joined junior and senior scientists from all over the world to discuss locally-adapted innovative solutions to mobilize disadvantaged and discriminated people in the Global South and women’s rights in Afghanistan. May 2013

ZEF won the **National Energy Globe Award** Uzbekistan 2013 with its project “Economic and Ecological Restructuring of Land- and Water Use in the Region Khorezm, Uzbekistan”. April 2013

An international workshop on “**Food price volatility and food security**” was co-organized by ZEF and IFPRI. Leading international experts and junior researchers shared and discussed their findings on the much debated volatility and speculation issues in food markets. See: www.zef.de/1548.html?pk=4063. February 2013

Joachim von Braun was appointed for life to the **Vatican’s Academy of Science** by His Holiness, Pope Benedict XVI. The Vatican’s Academy of Science has about 80 members and covers basic science issues, and also science related to human development themes, such as health, climate change, food issues. October 2012

Right Livelihood College Academy on “The Economies of the Commons: Reshaping Economic Education”. Eleven PhD students from Asia, Africa and Latin America were granted scholarships by DAAD to participate in the workshop and engage with the laureates of the ‘Alternative Nobel Prize’. September 2012

All events at ZEF

For all events see www.zef.de

Press

Press coverage at www.zef.de/index.php?id=1422

Publications

For an overview of all publications published by ZEF researchers see www.zef.de/publications.html



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Budget 2012/2013. ZEF's funding partners

Indirect Support*)	in Euro	in %
German Academic Exchange Service (DAAD) / German Federal Ministry of Economic Cooperation and Development (BMZ)	404,911	54.4
China Scholarship Council	62,600	8.4
Own funds of students	62,300	8.4
German Academic Exchange Service (DAAD) Regional Program / German Foreign Office (AA)	37,535	5.0
Katholischer Akademischer Ausländer-Dienst (KAAD)	30,600	4.1
Evangelisches Studienwerk e.V. Villigst	24,600	3.3
IFEU/GIZ, DAAD	21,600	2.9
Ministry of Higher Education, Malaysia	17,351	2.3
Ministry of Education, Indonesia	16,800	2.3
Government of Iran	12,300	1.6
Stiftung der Deutschen Wirtschaft (SDW)	12,300	1.6
Hanns-Seidel-Stiftung	12,000	1.6
Landesgraduiertenförderung Hamburg	11,400	1.5
Ministry of Agriculture and Rural Development of Vietnam	9,620	1.3
Jack Kent Cooke Foundation	4,575	0.6
Higher Education Commission Pakistan (HEC)	3,600	0.5
Evangelischer Entwicklungsdienst (EED)	1,600	0.2
Total	745,692	100

*) Scholarships directly funded by the donors.

External Funds**)	Projects	in Euro	in %
German Federal Ministry of Education and Research (BMBF) via		9,982,441	67.6
<ul style="list-style-type: none"> German Aerospace Center (DLR), or 	Advancing Health Research Networks in Sub-Saharan Africa Crossroads Asia European Land-Use Institute Forest Landscapes Institutions & Development International Advanced Study Courses (IPSWaT) International Project Office (IPO) Global Water Systems Project (GWSP) WASCAL project, West Africa		
<ul style="list-style-type: none"> Forschungszentrum Jülich (FZJ) 	GlobE: BiomassWeb Olifant, South Africa Wisdom, Vietnam		
<ul style="list-style-type: none"> Karlsruher Institut für Technologie (KIT) 	Client China Delight		
German Federal Ministry of Economic Cooperation and Development (BMZ)		1,461,001	9.9
directly	Economics of Land and Soil Degradation Excessive Price Volatility		
BMZ via			
<ul style="list-style-type: none"> German Academic Exchange Service (DAAD) 	PhD Course at the University of Addis Ababa, Ethiopia		
<ul style="list-style-type: none"> International Center for Agricultural Research in the Dry Areas (ICARDA) 	Wheat for Asia		
Bill and Melinda Gates Foundation	AG-WATSAN-Nexus Marginality TIGA	1,097,639	7.4
German Academic Exchange Service (DAAD) / German Foreign Office (AA)	Capacity-Development DAAD/ZEF Centre of Excellence, Ghana Improving irrigation Water use in the Punjab Province of Pakistan RLC Campus	451,454	3.1
Robert Bosch Foundation (RBS)	Junior Professorship – Prof. Börner Junior Professorship – Prof. Khamzina	423,727	2.9
European Commission (EU)	FoodSecure Urban	285,531	1.9
German Research Foundation (DFG)	Health Impact of Water Access in urban Tibet Water Resources Institutions & Human Health, India Workshops	161,159	1.1

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

International Food Policy Research Institute (IFPRI)	Enhancing Women's Assets to Manage Risk & Climate Change	145,430	1.0
German Academic Exchange Service (DAAD)	International Doctoral Studies Intercultural Weekend Seminar	125,719	0.9
Fiat Panis Foundation	Dr. Hermann Eiselen Doctoral Program	114,602	0.8
German Federal Ministry of Food, Agriculture and Consumer Protection (BMELV)	Regiopower – Part 1	73,952	0.5
Fritz Thyssen Foundation	Competitive Knowledge Workshops	73,944	0.5
Participant Fees	Participant fees for GWSP Conference	69,952	0.5
German Technical Cooperation (GIZ)	International Agricultural Research Security System for GIZ & KFW, Afghanistan	56,230	0.4
Volkswagen Foundation (VW)	Conversion von Scientific Relations, Tadchikistan Junior Fellowship: Research Funds Laube	49,277	0.3
Bayer CropScience	International Price Effects on Land Use & Production	48,698	0.3
Union Investment	Price Development for Food Products	37,256	0.3
Third-Party Project Funds available after project end	Third-Party Project Funds available after project end	26,898	0.2
Dreyer Foundation	Doctoral Scholarship	14,545	0.1
IGBP	Contribution to GWSP	10,290	0.1
Stiftung Internationale Begegnung	Contribution to GWSP	10,000	0.1
IASS	Issue Paper on "Economics of Land Degradation"	8,000	0.1
Diversitas	Contribution to GWSP	7,830	0.1
UNU-IHDP	Contribution to GWSP	7,286	0.1
Total		14,742,881	100

Core Funds***)	in Euro	in %
Personnel Costs	1,174,346	73.3
Administrative Costs	283,530	17.7
BMBF & DFG Overhead Shares****)	144,369	9.0
Total	1,602,245	100

Indirect Support & External Funds & Core Funds	17,090,818	Euro
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*)Scholarships directly funded by the donors.

**)Third-Party Projects of ZEF. Funds budgeted i.a.w. annual financing plans.

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

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

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ZEF's International Advisory Board

Prof. Dr. Hans van Ginkel (Chairman of the Board). Former Under-Secretary General of the UN and Rector of the United Nations University in Tokyo, Japan.

Prof. Dr. Bina Agarwal. Director, Institute of Economic Growth, University of Delhi, India.

Dr. Ernest Aryeetey. Vice Chancellor, University of Ghana, Legon.

Mr. Hans-Jürgen Beerfeltz. State Secretary, Federal Ministry for Economic Cooperation and Development (BMZ), Germany.

Dr. Maritta von Bieberstein Koch-Weser. Founder and President of Earth 3000, former Director General of IUCN - The World Conservation Union; Chief Executive Officer of The Global Exchange for Social Investment (GEXSI - Global Headquarters), United Kingdom.

Mr. Gisbert Dreyer. G. Dreyer Planungsgesellschaft m.b.h.; founder of the Dreyer Foundation, Germany.

Prof. Dr. Jürgen Fohrmann. Rector of the University of Bonn, Germany.

Prof. Dr. Mohamed H.A. Hassan. Former Executive Director, UNICONS, Sudan.

Mr. Wilfried Kraus. Federal Ministry of Education and Research (BMBF), Head of Cultural, Earth System and Environmental Research, Germany.

Prof. Dr. Günther Schlee. Director at the Max Planck Institute of Social Anthropology in Halle, Germany.

Dr. Angelica Schwall-Düren. Minister of Federal Affairs, Europe and the Media of the State of Northrhine-Westphalia in Düsseldorf, Germany.

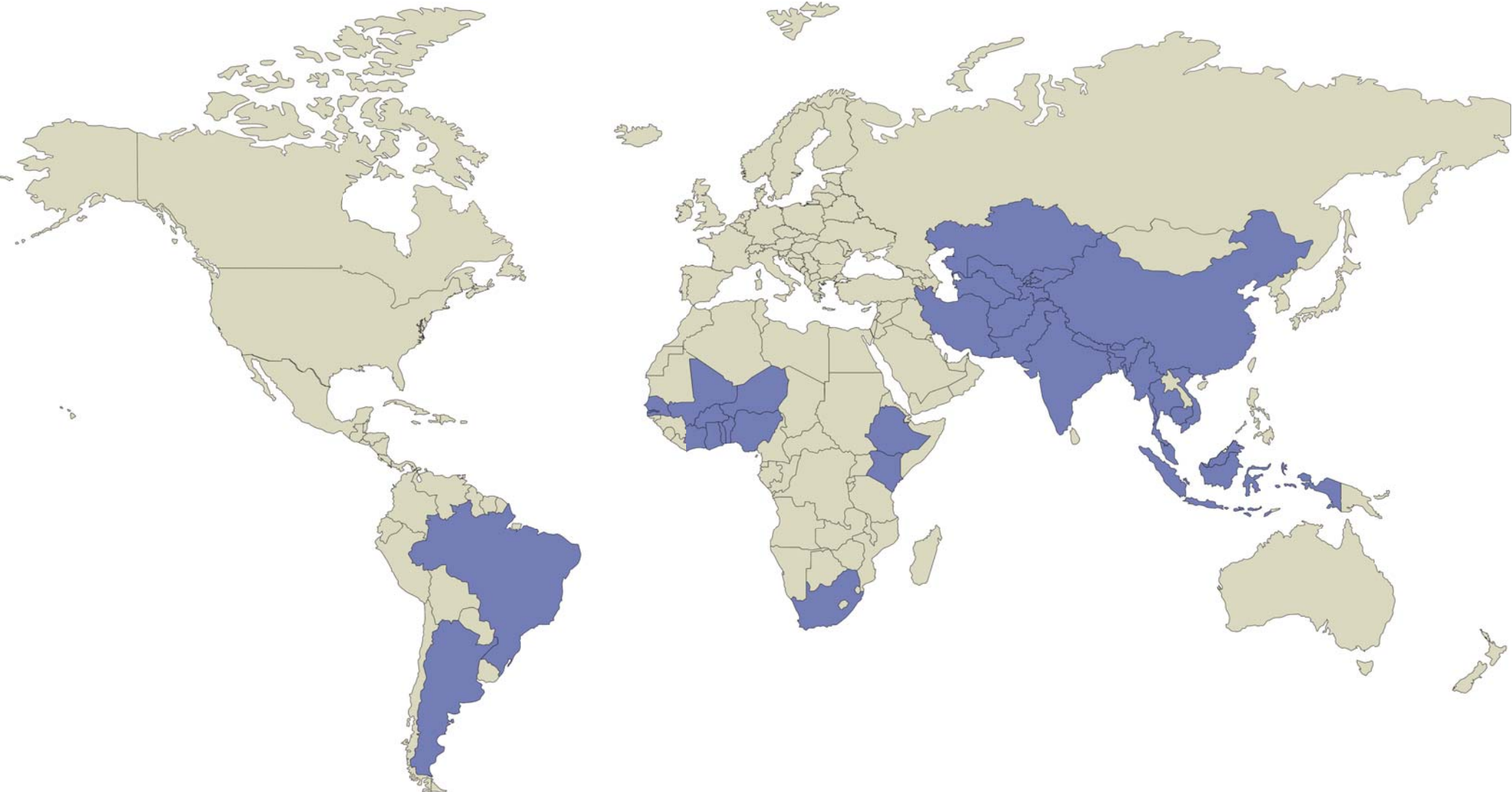
Prof. Dr. Lisa Sennerby Forsse. Rector of the Swedish University of Agricultural Sciences, SLU, Uppsala, Sweden.

Prof. Em. Frances Stewart. Centre for Research on Inequality, Human Security and Ethnicity (CRISE) University of Oxford, United Kingdom.

Prof. Dr. Holm Tiessen. Director, Inter-American Institute for Global Change Research (IAI), São Paulo, Brazil.

Prof. Dr. Carolina Vera. Director of the Center for Atmospheric and Ocean Research (CIMA), Buenos Aires, Argentina.

A global view on ZEF's major research initiatives



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