



ZEF news

Editorial

Climate change represents a global challenge for mankind. It affects those people in particular who are neither responsible for climate change nor benefit from the achievements which contribute towards global climate change. Poor people in developing countries are forced to react to environmental problems such as droughts and floods, shortages of water and changes in the rainy season, which they are hardly able to gauge and which, in many cases, they have to face without any support. Transdisciplinary research on climate change and on poverty reduction call for a combination of cutting-edge research and local know how. A recent study by ZEF and CARE Deutschland-Luxemburg on "Combating poverty in times of climate change" takes advantage of a combination of experience in interdisciplinary research in the development context and poverty-oriented, practical development cooperation to provide relevant, scientifically founded solutions. The range of strategies – from short-term responses to long-term adjustments to the consequences of climate change – clearly shows that both local and external knowledge as well as strategies developed on the basis of such knowledge are essential for a life under continually changing conditions. Flexibility in utilizing different forms of knowledge increases the capacity to find local solutions to the global effects of climate change and to remain capable of acting even in situations of extreme uncertainty.

Solvay Gerke

Solvay Gerke
The author is Director of ZEF's
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Coping locally with global climate change. A ZEF/CARE study

The discussion on climate change is increasingly highlighting the link between poverty and the consequences of climate change. Today, it is generally acknowledged that poor people are exposed to a considerable degree to the consequences of climate change and can do very little in response. This means that their livelihoods and their ability to satisfy their needs are in acute danger. But what concrete effects does this have, particularly with regard to poverty reduction? These questions formed the basis for a study which ZEF has conducted in association with CARE Germany-Luxemburg entitled "Waiting for the water to come?"

Climate change is making poverty reduction more difficult in two respects: On the one hand, increasingly uncertain conditions are making it more difficult to help people to free themselves from poverty.



Climate change is making poverty reduction more difficult.

Even the projections on climate change are vague in many respects. For example, it is uncertain just how effective measures which are intended to enable people to adapt to climate change, or to support them in their efforts, will actually be.

On the other hand, there is reason to fear that climate change will plunge even more people into poverty. According to the Stern Review, 144 to 220 million people in Asia and Africa may be pushed,



Projections on climate change are sometimes vague.

or pushed back, into poverty by 2100.¹ This means that the limited capacities available for poverty reduction will be faced with an increasing number of people in need of help.

Climate change exacerbates poverty, poverty influences adaptation

The ZEF/CARE study provides an overview of the anticipated consequences of climate change and their effects, particularly with regard to poorer people. It shows how the reasons for the vulnerability of the poor (their dependence on nature, their low economic resources *inter alia*) also limit their ability to react. People who are poor are hardly able to escape the consequences of climate change. At the same time, however, adjustments are already taking place. Poor people are reacting to changes in the weather, floods, etc. They are making use of their local knowledge and adopting—more or less successfully—new strategies to safeguard their livelihoods. This is precisely where they must be given support. Measures must be taken not only to cushion the short-term effects of climate change, but also to adapt to the new conditions. The study therefore shows how poverty reduction can support these measures and what the aims and criteria should be.

¹ Stern (2006): Stern Review: The Economics of Climate Change. www.hm-treasury.gov.uk/stern_review_report.htm

It is crucial in this context that poverty reduction measures are *effective*. This sounds trivial but is by no means simple in everyday practice. For example, the measures must be compatible with the specific living conditions and cultural ideas of the people concerned—otherwise they will not be effective. In addition, they must be both *flexible* and *sustainable*. The former is important because it is often uncertain what kind of changes in the climate will actually occur locally, and measures must be able to take hold even in the event of unexpected developments. Measures become sustainable among other things when they are firmly anchored in the everyday lives of the people and continue to be effective even when support from outside ends. Finally, measures must be both *efficient* and *fair*. There is no point in introducing adjustments where the costs are higher than the benefits, or if a different approach would be cheaper. However, for reasons of fairness, it is important that those people receive support whose life strategies are most at risk—even though this may be more difficult and more expensive.

There are various examples showing how people can adapt to climate change in concrete terms. These demonstrate that there is no one-size-fits-all solution – in some contexts a diversification of sources of income may help, in others specialization on one particular economic activity. There are also examples of maladjustments



Limited capacities for poverty reduction are faced by more people in need of help.

where traditional strategies actually serve to aggravate the situation. In order to illustrate all this in detail, ZEF conducted its own case study in Indonesia. The example



Children in Toineke, Indonesia.

of the village of Toineke in West Timor (Indonesia) clearly shows how the survival strategies of the inhabitants are affected by global climate change and how the people react. Since the beginning of the 1990s, the people of Toineke have been observing a massive change in the

local climate with floods and droughts. These increasing irregularities in the weather are putting agriculture at risk and with it the livelihoods of the local population. The case study shows: Knowledge is the most important factor for ensuring that people are capable of taking action and able to adapt effectively. On the one hand, this is local knowledge based on traditional strategies for coping in times of shortage. On the other hand, it is essential to have local innovations such as putting houses on stilts as well as external knowledge, for example concerning newly developed seeds, in order to introduce longer-term adjustments. In other words, just how well people can react to the consequences of climate change depends largely on their standard of living. Climate change widens the poverty gap and leads to new inequalities, within village communities as well as between villages, regions and countries.

The authors take stock of the consequences of climate change and the experiences of the case study and put forward eight recommendations for action for organizations such as CARE.

Recommendations for successful poverty reduction

1. Poverty reduction should aim primarily at adapting to (and not just tackling) climate-induced changes and should be based on existing local strategies.
2. It should systematically involve local knowhow on climate-related linkages and options for adjusting and should encourage the development of this knowhow.
3. Existing practices should be assessed just as critically as new strategies on the basis of five criteria (effectiveness, flexibility, fairness, efficiency and sustainability).
4. Poverty reduction should encourage awareness and independent local adjustment strategies, particularly with regard to those effects of climate change which have received little attention to date.
5. The concrete effects of climate change are highly uncertain. This should not be ignored by introducing adjustment measures based on the assumption that current projections are "certain".
6. The urgent need to adapt to climate change should not lead to the introduction of adjustments over the heads of the local populations (for example in the form of forced resettlement).
7. Poverty reduction should encourage the general resistance and ability to act of the poorest in the sense of a realistic pooling and coordination of strengths.
8. The full range of the consequences of climate change and adjustment measures should be analyzed broadly and critically. In some cases, recommendations such as the diversification of sources of income have proved to be unproductive or counter-productive in the context of poverty reduction.

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“We can assist smallholder farmers with escaping the poverty trap”. A ZEF PhD student reports from her field research in Zimbabwe

My name is Patricia Masikati and I am from Zimbabwe. I obtained my Master of Philosophy degree in Agriculture from the University of Zimbabwe. After my Master studies, I worked as a Scientific Officer in natural resource management and also as a consultant for the International Crops Research Institute in the Semi-Arid Tropics (ICRISAT). In 2007, I started my doctoral studies at ZEF to enhance my scientific qualifications and also to support and contribute to agricultural development in my country. My PhD work focus is on developing technological interventions which can be applied by smallholder farmers in semi-arid areas to improve crop and livestock water productivity and enhance rural livelihoods. In this context I did my research work in Nkayi district, which is located in the north-western part of Zimbabwe. The district has a high population and livestock density. Rainfall is erratic and poor. I was part of a research team which consisted of three scientists from ICRISAT and six MSc students from the University of Science and Technology in Zimbabwe.



Patricia Masikati (second, right) during her field research.

Key factor water productivity

When we first went to meet with farmers to do baseline surveys on their crop, livestock and water management, it was October, one of the hottest and driest months in north-western Zimbabwe. Fields were bare and we could see clusters of homesteads from a distance. The 2007/2008 season had had below average rainfall and there was a drought in most parts of the country. During that time farmers expected nothing else but food aid and there we were with questionnaires. It was a very difficult

experience both professionally and emotionally. Although farmers were quite receptive, each time a truck passed by they would all be distracted. It was also difficult as farmers had to totally depend on food handouts. During periods of shortages farmers are vulnerable as people with access to staple food increase prices in a punitive way, impoverishing farmers who have run out of options. For example, a full ox would be sold for 150 kg of maize, which at the time was equivalent to 42 US\$. Farmers sold livestock more out of distress and the need to solve food-related problems than as a conscious choice to commercialize livestock production.

When we conducted surveys among the farmers, we also introduced the IWMI-ICRISAT (IWMI is the International Water Management Institute) collaborative crop-livestock water productivity project. The project aims to optimize productive use of water to increase incomes and improve the environment within crop-livestock systems in the semi-arid areas of Southern Africa and the Blue Nile basin. In these areas, water scarcity is a principle constraint, and available water is used ineffectively, partly because livestock is poorly managed and continues to be ignored in water policy decisions and development programs. The project also focuses on biophysical optimization and resource governance, and applies a water productivity framework, which is suitable for crop-livestock systems, to diagnosis entry points for intervention. The project is being implemented through the step-wise integration of various entry points to improve crop-livestock water productivity. On-going research and baseline surveys have already helped researchers to identify constraints and possible interventions which can be used to improve crop-livestock water productivity.

Research outcome

From the surveys we found out that there are a number of constraints which affect crop and livestock production. Constraints reported by farmers were, among others, high incidences of livestock diseases, dry season feed and water shortages, and low soil fertility. The constraints are mainly caused by shortages of financial resources, low access to markets and unfavorable policies and institutions such as a lack of extension services for smallholder farmers.

My field research focused on evaluating technological interventions which could improve dry season feed and soil fertility and also assessing potential benefits using simulation modeling. To achieve this, I grew forage legumes on-farm as well as on-station to test their agronomic performance and viability in terms of labor demand and their feed value. I found out that forages can grow very well in these areas and, as the crop was grown for the first time in the area, the farmers were pleased to find that their livestock found the legumes palatable.

There is still on-going work on crop-livestock simulations to evaluate the effects of improved soil fertility and feed on crop and livestock production. Preliminary simulation results show that legumes in rotation with maize could be one promising intervention which can be used to address both soil fertility and feed issues.

There is potential for assisting many smallholder farmers to escape the poverty trap. We all hope that we will manage to move from subsistence farming to food security and commercialization.

Patricia Masikati

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Combining data and disciplines: Modeling crops and water use in Khorezm, Uzbekistan

This PhD study in the field of Economics was carried out in the ZEF/UNESCO project in Uzbekistan. It identifies key obstacles and potential solutions to promoting sustainable development in the region of Khorezm, Uzbekistan. The work extends clearly beyond the disciplinary approaches taken so far. The study includes different crop allocation and water use options in a context where linkages between the environment and socio-economic impacts are considered simultaneously, while analyzing economic and ecological benefits from different agricultural activities. To this end, a static, stochastic model was developed for Khorezm which can explore potential risk-reducing strategies for farmers, while at the same time considering the ecological consequences of potential policies.

Constraints for agriculture in Khorezm

Irrigated agriculture for cotton and wheat production forms the backbone of the rural economy in Khorezm. At the same time, it has led to ecological deterioration and inefficient resource use, presenting a significant threat to the livelihoods of those most dependent on this sector. First of all, inefficient water use has resulted in rising ground water tables and widespread water and soil salinization. Furthermore, the high water demand for crop production in the region makes farmers vulnerable to the predicted decrease in water supply. Farmers in Uzbekistan are especially vulnerable to uncertain water supplies. This is due to current national policies which restrict the farmers' scope to make their own decisions on what type of crops to grow, when and where. Similarly, they also face increasing risks in terms of yields and price fluctuations due to natural conditions (such as the regional impact of climate change) as well as fluctuations in the market.

Working with the model

The model developed in this PhD study aimed at optimizing the water and land allocation of 300 fields, belonging to 99 farmers in one Water User Association (WUA), namely Shamahulum, located in the district of Khiva in Khorezm. First of all, an analysis was carried out on the basis of data collected in Shamahulum. Then, a



Ihtiyor Bobojonov in his home country Uzbekistan.

stochastic programming model was developed to combine the so-called "Expected Value-Variance" approach with chance-constrained programming. The availability of data based on the Geographical Information System (GIS) allowed the integration of spatial aspects into the model. Following calibration, various simulations were conducted to assess the impact of different policy scenarios

The model findings suggest that cultivating less water-demanding crops in the area as well as using alternative irrigation methods would help to secure farmers' incomes. However, farmers remain unable to fully utilize these risk-coping strategies because more than 70% of the area falls under agricultural state order, stipulating the cultivation of low-income crops such as cotton and winter wheat.

The key findings from the study indicate the possibility of improving water use efficiency and thus the environmental situation in the region through the introduction of water pricing. Results also showed that economic and ecological development could be achieved simultaneously if farmers had the opportunity to make more, and more flexible, decisions at the farm level.

Ihtiyor Bobojonov

The author did his PhD research at ZEF. He received the ZEF Friends' Award for the best doctoral thesis 2007–2009. He is now working with the International Center for Agricultural Research in the Dry Areas (ICARDA) in Syria.
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Facts & news

Nobel prize laureate visited ZEF in January 2010 to discuss research ideas

ZEF used the opportunity to congratulate Elinor Ostrom on winning the 2009 Nobel Prize in Economics. Elinor Ostrom is Professor of Political Science and currently Senior Research Director of the Workshop in Political Theory and Policy Analysis at Indiana University, Bloomington, USA. Ostrom's work is of great relevance for ZEF's research, especially in the fields of institutional analysis and development.



Nobel Laureate Elinor Ostrom with ZEF Director Joachim von Braun (r.) and ZEF Senior Researcher Franz Gatzweiler (l.), a former student of Professor Ostrom.

Habilitation at ZEF

Conrad Schetter, Senior Researcher at ZEF's Department of Political and Cultural Change, held a public lecture on "The Taliban – Lifestyle between tribal culture, islamism and globalization" in December 2009, accomplishing his *Habilitation* procedure. He received the title of "Privatdozent (PD)" (Associate Professor) and *venia legendi* in Development Research.

ZEF among Top 5% of international Think Tanks

The "Global Go-To Think Tanks" ranking is an annual list of Think Tanks in 169 countries covering different areas of expertise such as Health, Environment, Security and International Affairs.

The 2009 "Global Go-To Think Tanks" ranking put ZEF at 6th place among the Top 10 Science and Technology Think Tanks worldwide. Positions 1 to 5 are taken by US Think Tanks such as RAND Corporation and the Brookings Institution.

The ranking is an initiative of the "Think Tank of Think Tanks", the Think Tanks and Civil Societies Program of the International Relations Program at the University of Pennsylvania, USA. For more than four years now, the Program has been collecting and selecting data and information from more than 6,000 Think Tanks around the world. The nomination and ranking is carried out by more than 500 international experts.

ZEF's doctoral students in the spotlight

ZEF recently launched an information movie on its doctoral program. The movie "Capacity Development for the Developing World" gives an overview of ZEF's Bonn Interdisciplinary Graduate School (BiGS-DR), of its students and alumni, its concept and its management. There is a short and a long English version of the movie downloadable from ZEF's homepage under www.zef.de. To order a German language version, please contact ZEF's press and public relations unit under presse.zef@uni-bonn.de.

Yayu on its way to UNESCO biosphere reserve

The International Advisory Committee for Biosphere Reserves of UNESCO decided at its meeting in Paris in January 2010 to recommend two Ethiopian proposals for UNESCO biosphere reserves for final approval. One of the Ethiopian proposals has been prepared by a local NGO, ECoFF (Environment and Coffee Forest Forum), which was initiated and supported by ZEF's project on the conservation and use of wild *Coffea arabica* in the montane rainforests of Ethiopia (CoCE). The proposed area for a biosphere reserve, Yayu in Southwest Ethiopia, consists of a former research area of the CoCE project. The final decision will be made by UNESCO in May 2010. Currently, the World Network of Biosphere Reserves is composed of 553 sites in 107 countries.



"World Water Day 2010: All about Water – Quality"

The next Water Lecture will be held at ZEF on Wednesday, March 17 2010, 5.30–7.00 pm, on the occasion of World Water Day 2010. An experts' panel will discuss issues of water quality, the theme of this year's international World Water Day. For information and registration please contact presse.zef@uni-bonn.de

ZEF at the Deutsche Welle Global Media Forum

ZEF will organize a workshop on "Covering Climate Change in West Africa" in the context of the Deutsche Welle Global Media Forum, taking place in Bonn from June 21–23, 2010. This year's title is "The heat is on – Climate Change and the Media".

Homepage: <http://dw-gmf.de>

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On the tracks of science: Knowledge transfer in West Africa

What traces does a large-scale, long-term research project leave behind in the region where it conducted its research? For example, the GLOWA Volta Project led by ZEF, which deals with the regional effects of global climate change.

Human capacity building

Among the answers is, first and foremost, a large number of extremely well-trained African scientists. More than 80 scientists were trained within the framework of the GLOWA Volta Project, more than 40 of them in ZEF's doctoral program. Two thirds of these scientists came from West Africa and most of them have returned to their home region to contribute their enhanced disciplinary knowledge and interdisciplinary skills to solving problems locally.

Data management

Apart from developing academic human capital in West Africa, the GLOWA Volta Project has also attached considerable importance to collating, storing and processing data; and doing so in such a way that it can be used, maintained and developed on the spot in future.



A workshop for stakeholders in Burkina Faso.

land use, soil, vegetation and changes in vegetation, as well on populations, households and their consumer behavior. Depending on the user's authorization, the data can be downloaded from the results of a search for local use as data files. The portal contains approximately 60 interactive maps, which can be combined in a single map view according to the user's specialist interests.

Support for decision-making

A further central aim of the GLOWA Volta Project was to make the project's scientific products and results available to local stakeholders and political decision-makers as a support system for decision-making processes – for example, on sustainable water resource management in the Volta Basin.

Since the models, tools and data designed by the project will also be used and applied by the actual stakeholders following the completion of the project, the geoportal was developed from the very start in close coordination with the stakeholders. Surveys among representatives of state and non-state organizations in the water sector in Burkina Faso and Ghana indicated that these organizations need, first and foremost, a web-based system to publicize their own databases, to search external databases and assess their benefits according to certain criteria, and to exchange data. Several training courses were held for relevant stakeholders.



Village scene in Ghana, research region of the GLOWA Volta Project.

Accordingly, the scientists in the GLOWA Volta Project have worked in close cooperation with the Institute of Computer Science III at Bonn University to develop a so-called geoportal, the first prototype of which went online in 2008. The central components of the GLOWA Volta Geoportal are the web-interfaces for accessing a meta database with simple or complex search questions. The database contains over 400 collected and collated sets of hydrological and meteorological data, data on

What does the geoportal offer?

- Completely web-based access to the information system for cataloging, integration and administration purposes and for obtaining heterogeneous data and data products.
- A role-based user concept for various administrative tasks as well as to limit access to sensitive data.

- Use of free software to avoid license costs.
- Use of internationally valid standards to enable communication with other providers of cataloging and mapping services in the future.

Collecting information

The project was tested as to its user-friendliness and performance up to the end of the GLOWA Volta Project in May 2009. Members of the Institute of Computer Science III are now introducing functional improvements based on an evaluation of this test phase.

In parallel to this, preparations are being made for the introduction of the portal in the project region. The most important cooperation partner is the Volta Basin Authority (VBA) with its headquarters in Ouagadougou in Burkina Faso. The VBA is an intra-regional authority of the six riparian states of the Volta catchment area. Its mandate is to ensure cross-border, integrated water resource management in the Volta Basin by providing political counseling, mobilizing funding and providing technical resources. One of the projects led by the VBA is an observatory for water resources and related ecosystems (environment) based on measurement networks.

In this context, the geoportal is to be used for storing, administrating and exchanging mainly georeferenced

(coordinate-based) monitoring data and data products such as maps.

Keeping track

Not all suppliers of data within the framework of the observatory have already been identified. For the most part these will be national services, authorities and scientific institutes in the field of the environment. As far as ZEF is concerned, this means that stakeholders in existing networks are being trained in "data sharing" via the geoportal in courses and workshops since it is to be assumed that some of these clients will also be among the stakeholders in the observatory.

The next step on the way to technical implementation following the relaunch of the extended geoportal at the beginning of 2010 will be the continuation of the exchange with technical advisers from the VBA with a view to making final adjustments to software before the system is handed over to the VBA in early summer 2010.

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High-tech meets local knowledge: How remote sensing can help to improve agricultural land and water management in Uzbekistan

Why does a project on improving natural resource management in Uzbekistan need remote sensing technology? "Continuous land use mapping is essential for improving irrigation water distribution, identifying deficiencies in irrigation water supply, and estimating yields", says Christopher Conrad, a researcher from the University of Würzburg and affiliated to DLR (German Aerospace Agency) working in the ZEF-UNESCO

research project in Khorezm, Uzbekistan. "We want to demonstrate how remote sensing and Geographical Information Systems, GIS, can contribute to monitoring and improving land use in irrigation systems".

Khorezm is a region dominated by irrigated cotton cultivation and production. Especially for such a region, remote sensing can be a useful tool for local decision makers to develop strategies and policies for profitable and sustainable land and water management. However, implementing remote sensing technology requires expert knowledge on digital data acquisition and analysis software such as GIS. The processing of data requires technical training and a good internet connection.

The remote sensing experts in the ZEF/UNESCO project have used remote sensing technology to provide region-wide information on land use, thus gaining knowledge on actual land use and its temporal dynamics. For this purpose, they analyzed satellite data for Khorezm recorded between 2004 and 2007 in a twin exercise: First, field boundaries were extracted to simulate cadastre information and separated from non-agricultural areas, such as cities, lakes, canals, and the desert. The results were stored in a GIS data base. Field samples of the major land use classes were collected comprising cotton, rice, crop rotations with winter wheat, and a further class



Remote sensing technology provides information on actual land use.



Cropping patterns can be improved by reducing monocultures.

summarizing land use apart from the aforementioned. The information was then extrapolated using knowledge-based classification methods provided by the powerful GIS-tools. Criteria for land use classification were derived from the cropping calendar, which was established with the aid of local farmers.

What can be recorded with remote sensing technology?

"Taking into account an accuracy of the land use maps of between 81% and 86%, the maps showed the following characteristics and developments for the region of Khorezm", Christopher Conrad relates: "An intensive use of land, an increase in crop rotations with winter wheat during 2004–2007, a decrease in cotton cultivation, and a low percentage of fallow land (below 3%) in all observed years. Furthermore, rice cultivation is concentrated in areas close to the Amu Darya River, but also occurs scattered throughout the region. Although cotton or rice monocultures still prevail in nearly 20% of the study area, an increasing trend towards crop rotation is noticeable", Conrad concludes.

What can remote sensing technology do? It can help with

- optimizing crop rotations on fields of (neighboring) farmers in terms of water distribution and soil conservation,
- supporting the Uzbek government's ongoing land reforms, since changes in cropping patterns can be detected and reported rapidly and easily,
- carrying out water saving interventions, especially in reaction to water scarcities, because timely information on cropping patterns enables the updating of water demand calculations and proposals for in-season corrections, and
- modeling area-wide and field-specific crop yields and water use (water productivity).

Thus, present cropping patterns can be improved by reducing monocultures, which contribute to soil degradation. If the latest satellite systems are able to provide more accurate information, the ZEF/UNESCO project will investigate the options of using crops different from those used and studied so far as well as crops on small household plots.

Sharing and exchanging local knowledge

"Remote sensing technology can complement conventional data collection and analysis for strategic land and water management", Christopher Conrad concludes. "The latter is obtained, for instance, by exchanging findings during discussions among farmers on the optimization of land use. For example, if farmers make a decision about the common use of water on neighboring fields, land use maps of previous seasons can disclose problems in cropping patterns or bottlenecks for water distribution. Farmer groups can elaborate options, where to plant which crops with comparable water demands. Canal sections and pumps may be operated jointly, preventing a repeated overflow of freshwater to the drainage systems and saving water, especially in cases of water scarcity".



Remote sensing maps show an intensive land use in Khorezm.

Managers of Water User Associations (WUA) might use crop rotation maps as additional information for improving the productivity of their land. Comparing the land use maps of different WUAs can help to understand whether changes in crop rotations are beneficial to increase and sustain farmers' incomes. Due to the complexity of remote sensing and GIS applications, it would be advantageous to have special training for land and water managers and to integrate remote sensing technology in the curriculum of the local universities.

Research team:

Christopher Conrad and his team are based at the University of Wuerzburg. They cooperate with the German Aerospace Center (DLR) and are part of the ZEF/UNESCO project in Uzbekistan. Contact: christopher.conrad@mail.uni-wuerzburg.de





Viewpoint

"Development research can make a difference to the lives of poor people"

Interview with Joachim von Braun, former and new Director of ZEF's Department of Economic and Technological Change

Joachim von Braun was Director of ZEF's Department of Economic and Technological Change from 1997 to 2002. From 2002 to 2009, he was Director General of the International Food Policy Research Institute (IFPRI), based in Washington DC, USA.

Professor von Braun, you were one of the "founding Directors" of ZEF in 1997 and therefore at the forefront of setting up the institute. How does it feel to come back after spending eight years as Director General at IFPRI in Washington DC, USA?

It does not feel like "coming back", but more like "moving to", as the world's development challenges have changed over the years and ZEF has evolved – and my thinking has evolved, too. Founding ZEF with my colleagues 13 years ago was a very exciting opportunity. Germany urgently needed a development research institute, and ZEF is now well established. The international experience which I gained at IFPRI, which was a well established international institute when I became its Director General and which more than doubled its funding and staff to about 300 under my leadership, comes in handy for the tasks we are facing at ZEF. However, ZEF with its doctoral studies program and multi-disciplinary research is also very different from IFPRI.

What were your main research areas and research priorities at IFPRI?

My main priorities were the establishment of strong research programs on development strategy, governance, poverty reduction, food security, nutrition and health, markets and trade, and technology and climate change. Doing this in a decentralized way and in cooperation with partners, and by establishing offices in developing countries, for instance in New Delhi, Addis Ababa, Beijing and many other locations, was a new approach to research implementation that strengthened IFPRI as a global research institution. IFPRI is now not only the leading think tank on food policy, but also ranks among the top one percent of institutes of development economics research. My personal research agenda is exemplified by two recent books: one on "globalization and the poor", and one on "the poorest and hungry". In the past three years, solutions to the world food crisis dominated my research and policy advice.

Do you think there is a difference between the way development-related research is being perceived and treated by donors, academics and public opinion in Germany and in the international research community elsewhere?

Germany makes a good contribution to international development research funding, but German academia is under-represented in development research. Germany lacks an international voice and strong international engagement rooted in a sufficiently robust think-tank culture; this problem needs to be addressed by policy and business, as it is relevant for the quality of Germany's development cooperation and also for our country's engagement in international trade and investment. ZEF can play a role in strengthening that voice. As regards public opinion, let me refer to the many calls I got from the German media in the past years while in Washington. This suggests that the German public is strongly interested in development issues, and that is encouraging.

What were your most remarkable professional experiences in the international context and in the US that you would like to see transferred to Germany and/or ZEF?

Development research can make a huge difference to the lives of poor people. Policy-makers and development investors are eager to receive evidence-based information. In the world food crisis of 2007/08, for instance, knowledge that existed at research centres like IFPRI and ZEF was swiftly transformed into policy and action by the United Nations and national governments, such as India or Ethiopia, and many heads of state suddenly started to call on us directly. The lesson that I learned from this experience is that we not only need excellent research projects, but also a strong research basis to respond effectively to increasingly risky and unpredictable global developments.

Which research fields and priorities would you like to see addressed at ZEF in the coming years?

ZEF has a sound research agenda and strategy. My focus on poverty reduction will remain strong. We increasingly need to focus on risks, that is, environmental, economic and political risks. Moreover, development policy needs

to embrace international science policy more actively, not just aid, trade, and investment policy. In the coming decades, the prices of land, water and other natural resources will increase further, creating opportunities and conflicts in developing nations. This calls for a strong emphasis in our research on institutional innovation.

What are the challenges you expect to face considering the changes ZEF and its setting have undergone since you left in 2002?

It is too early to be specific. First of all, it is important to listen to colleagues and partners and explore funding opportunities for the ideas mentioned above. My colleagues and I will certainly continue to work on

the scale and quality of the doctoral program at ZEF, linking it even more to the international research and think-tank environment, while emphasizing the sound research and effective training of our students, who come from all corners of the world. ZEF is not only those students who are currently at ZEF, but also those who were here before, the alumni. During my worldwide travels for IFPRI, I was delighted to often meet former alumni from the ZEF doctoral program who now work in responsible positions and thus demonstrate the soft power of ZEF and Bonn University. That is a big difference from the situation when ZEF started in 1997, and it is a strong asset to build on.

The interview was conducted by Alma van der Veen, ZEF.

Water related activities running again in GWSP Office

A new three-year phase of the International Project Office (IPO) of the Global Water System Project (GWSP) started in March 2009 with the appointment of three new members of staff to the IPO hosted at ZEF. We greatly appreciate the renewed support of the German Ministry of Education and Research (BMBF). Future challenges and plans for the project will build on the substantial progress made since its inception five years ago within the framework provided by the four programs of the Earth System Science Partnership (ESSP), which itself has been steadily evolving. Various articles reporting details of recent developments in the GWSP illustrate the inter-disciplinary nature of the GWSP and the extent and value of collaboration with institutions and ESSP partner projects around the world. The GWSP is a global project and, led by its international Scientific Steering Committee, it will continue to build on past strengths and chart new courses in response to accelerating global environmental change.

The central tenet of the Global Water System Project is that human-induced changes to the water system are now global in extent, yet we lack an adequate understanding of how the system works and responds to disturbances, and how society can best adapt to rapidly evolving new situations.

The hydrological cycle

The hydrological cycle is increasingly being dominated by global environmental change and its components: climate change, land degradation, the consequences of unsustainable resource use, population pressure and the inherent needs and impacts. These challenges are therefore the focus of scientific concern and international debate.

The observed and expected increase in water demand means more water withdrawal for human purposes from natural water bodies. This further emphasizes the competition between socioeconomic uses and ecosystem

needs. Water is likely to become *the* security issue of the 21st century. This said, the emphasis is not on military security, but rather on securing humanity's development options and future sustainably. Irrespective of its various compartments – catchments, basins, aquifers – through atmospheric and ocean links, there is ultimately only one global hydrocycle in the world. Hence the governance of the fragmented terrestrial component should not be decoupled from the global context.

In view of the central role that water plays in ecological integrity, biogeochemical cycling, climate dynamics, and human development and well-being, a new science perspective is today considering fresh water resources as a multi-faceted system and, more specifically, as a global system. A founding principle of the Global Water System Project, and one that distinguishes it from other water science efforts, is the notion that physical, biological, chemical, and social factors all shape the character of the water cycle and hence the world's global freshwater resource base.

The IPO in Bonn is run by Janos J. Bogardi (Executive Officer), Konrad Vielhauer (Science Officer) and Gisela Ritter-Pilger (Administrative and Finance Officer).



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Tracing capacity development in Africa: Spotlight on African ZEF alumni

For ten years, ZEF's Bonn Interdisciplinary Graduate School for Development Research (BiGS-DR) has been training young academics from all over the world in interdisciplinary development research. Roughly one third of the over 200 BiGS-DR doctoral graduates so far have come from Africa. They thus form the largest single alumni group. ZEF has conducted a survey among its African alumni, asking them about their specific experiences prior to, during and after graduation. The main aim was to identify the key factors contributing to successful capacity development processes in African countries with reference to temporary academic migration. The survey was conducted online from July to September 2009 among around 60 ZEF alumni from Africa.



African alumni form the largest single ZEF alumni group.

The results of the survey clearly indicate that BiGS-DR's "home-tie" approach to training provides a solid base for supporting capacity development processes in Africa. This also explains the high returnee rate of more than 80% of the African alumni

to their home regions. ZEF's Graduate School is based on two major components which make a significant difference compared with doctoral studies performed on a purely individual basis: (1) a program design involving joint training with fellow students from other countries and disciplines and (2) a project design which integrates many PhD students in ZEF's large interdisciplinary projects all over the world. This enables students to link up with research and policy institutions in their home countries and regions.

According to the survey's results, the specific setting at ZEF enables the students to establish or maintain networks with former and present colleagues at ZEF and in their home regions. Moreover, it facilitates career-oriented cooperation and networking following graduation as well as contacts with old and new employers, colleagues and research institutions in their respective home countries or abroad. Furthermore, the design of ZEF's doctoral program also helped the graduates to strengthen their intercultural and interdisciplinary skills and – last but not least – provided a base for mutual collegial support to overcome difficulties related to work or private-life during their PhD studies.

It is a common practice among many African employers to send staff and students to Bonn for PhD training, with a contractual commitment to return to their host institution. This offers the graduates attractive career

perspectives in their home countries, and thus forms a pull factor, together with other "home-tie" components such as family and private contacts.

The survey's results finally show that most of the African alumni contribute their knowledge, expertise and experience to influencing or shaping political and societal processes in their home countries – even though this occurs rather on an institutional than an individual level. One possible factor explaining this high involvement in development-relevant consultancy and decision-making processes among the alumni may be the fact that PhD candidates from Africa are often selected by ZEF from institutions which do not only have a high scientific reputation, but are also well-connected and good at communicating their research results both to the public and policy-makers. Many of these institutions, therefore, already have a policy impact at a national level and the ZEF alumni are well-prepared.

The complete study has been published as ZEF Working Paper No. 51 and is available at www.zef.de.

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