



ZEF news

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Editorial

Knowledge is being generated on an ever-increasing scale. It is estimated that the volume of knowledge at our disposal is currently doubling every five years. However, the creation of new knowledge is always juxtaposed by the creation of new unknowns. Research results continue to raise new questions and problems and anyone who wants to conduct relevant research, therefore needs to know about the unknowns. According to conventional wisdom, knowledge can be imported quickly and at minimal transaction costs by use of the latest information technology. Governments in countries with few natural resources are thus tempted to try to leap into the post-industrial age. They might even succeed, were it not for the "knowledge trap". The "knowledge trap" implies that data, information and knowledge are often adapted without any understanding of the corresponding unknowns. This is particularly relevant when the people acquiring such knowledge simply copy solutions. Failing to import an understanding of the unknowns consequently leads to bad investments and stagnation. Desired results are not achieved and a "knowledge economy" will certainly not be created. After all, a complex environment with government institutions, scientific institutions, and civil society organizations is necessary to structure local knowledge development successfully. Any kind of knowledge economy must be aware of such unknowns if it is to expand further through research and development. International discussion on the digital divide does not take this factor into account. Consequently, many of the strategies currently preached are misplaced.

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Remarkable Results of the *Coffea arabica* Project in the Ethiopian Montane Rainforests

Arabica coffee (*Coffea arabica*, Rubiaceae) has its center of origin in the highlands of southwest and southeast Ethiopia where wild coffee populations grow naturally in the undergrowth of the Afromontane rainforests at altitudes of between 1,000 and 2,000 m. The wild populations are highly endangered by land-use pressure on the montane rainforests. Poverty and conflicting property rights make farmers convert forests into agricultural or pastoral land, thereby threatening the entire biodiversity of the rainforests. As wild coffee is collected by local people, the biodiversity of the forest habitat is also threatened by management interventions to increase the productivity of the wild coffee stands. Intensive management of wild coffee leads to the conversion of coffee forests into semi-forest coffee systems.

Ethiopia is currently the seventh largest coffee producer worldwide. Coffee is by far Ethiopia's most important export crop (one-third is exported to Germany) and, at 40%, contributes decisively to the country's foreign currency income. Furthermore, 15 million jobs are associated with coffee production.

Under the framework of the research program "Biosphere Research - Integrative and Application-oriented Model Projects - BioTeam", initiated and funded by the German Federal Ministry of Education and Research (BMBF), *Coffea arabica* is very well suited as



Coffee is Ethiopia's most important crop.



Coffee field gene bank near Choche in southwest Ethiopia.

a model species in biodiversity research as it is one of the few economically important crops whose origin is restricted to one country and whose wild populations are still to be found in natural rainforest habitats. In Ethiopia, the wild coffee is collected by local people for their own consumption and as a cash crop. Furthermore, numerous landraces in Ethiopia originate from the wild coffee and are cultivated as garden coffee.

This gene pool of *Coffea arabica* is highly endangered by increasing settlement and land-use pressure on the montane rainforests. The importance of rainforest protection can be viewed against the background of human-induced destruction or conversion in about 60% of the Ethiopian forests over the last 30 years. Currently, only about 2,000 km² of forests are undisturbed, whereas the remainder is extremely fragmented. This leads to an irreversible reduction of the gene pool of *Coffea arabica* resulting in huge benefits foregone in coffee breeding and production. Therefore, the possibilities of *in-situ* conservation with the establishment of conservation areas – in addition to *ex-situ* conservation in field gene banks – must be exploited. *In-situ* conservation at the species' natural sites is important because natural selection and adaptation mechanisms (apropos changing site and environmental conditions) are maintained.

The importance of the Ethiopian montane rainforests has been internationally acknowledged as they have been part of the "Eastern Afrotropical Biodiversity Hotspot" since January 2005.

Main results

From August 2002 to June 2006 (subsequently referred to as CoCE I), the diversity and the economic value of the Ethiopian coffee gene pool and its forest habitat have been assessed. Based on the findings, models have been developed for the conservation and use of the genetic resources of wild *Coffea arabica* populations in Ethiopia. The *in-situ* conservation of wild coffee offers a promising approach as the conservation of coffee genetic diversity is connected with the conservation of forest species diversity, i.e. the conservation of the coffee gene pool becomes rainforest conservation and vice versa.

The investigation of wild coffee populations in their comprehensive biodiversity context called for a multidisciplinary approach, which considers natural

sciences, economics, and social sciences. The respective field studies were carried out mainly in Bonga, Boginda, Berhane-Kontir, Maji, and Yaju forests located to the west and in Harenna forest in the Bale Mountains east of the Great Rift Valley.

The main results of CoCE I (as of January 2006) are:

In the vegetation surveys more than 700 plant species were found, comprising 10% of the Ethiopian flora. The vegetation analyses reveal that the montane forests of the five study regions are significantly different flora-wise. The floristic compositions of forest areas with wild coffee occurrence, however, are cross-regionally very similar, thus, allowing the definition of "coffee forests". The occurrence of wild coffee very much depends on altitude (1,300 to 1,600 m) and management intensity by local coffee growers. Management intensity, i.e. the extent to which competing vegetation is removed from the undergrowth, determines species composition and structure of the coffee forests.

Molecular genetic analyses based on Inter-Simple Sequence Repeat (ISSR) markers confirm the high genetic diversity of wild *Coffea arabica* and show that wild coffee clearly differs genetically from landraces and cultivars.

From a strictly utilitarian point of view, genetic diversity is not, a priori, a value. In combination with the variability of the ecological and physiological properties of the coffee plants, however, genetic diversity gains in importance. Therefore, the drought tolerance of wild coffee populations along a rainfall gradient has been analyzed. Ecophysiological studies reveal that drought tolerance is site-specific and the water-use efficiency of wild coffee plants increases with decreasing mean annual rainfall of the study sites. In addition, drought-stressed coffee plants recover faster at the end of dry spells when they originate from dry environments such as Harenna or Bonga.

An economic valuation of the coffee forests has been carried out from the farmers' and society's perspectives. Income analysis reveals that from the farmers' perspective the conversion of the forest into arable land (for timber and maize production) is more profitable in the short term than sustainable forest management. The income from the latter would only amount to 65 to 75% of the former. Private and social economic analyses differ with regard to the type and amount of assets taken into account. Examining the value of coffee forests from a societal perspective involves taking all forest assets into account. These include, inter alia, sustainable timber production, collection of wild coffee and its sale for a premium price, and the ecosystem services the forest cover provides. Under those conditions sustainable forest management achieves higher net benefits compared to exclusionary conservation or conversion into arable land which only achieve 50 and 70 to 85%, respectively, of the benefits from sustainable forest management.

Conflicting interests

Management concepts that target the conservation and use of natural resources might create conflicts. In

Ethiopia, all forests are nationalized. Most coffee forest areas are located in so-called National Forest Priority Areas (NFPA), where local forest users have limited access and use rights, which conflict with traditional property rights. Combined with a lack of incentives and no monitoring and enforcement activities, this has led to a de facto open-access situation. Institutional research found that the traditional use rights in the forests are still practiced, i.e. the forests are subdivided into clearly defined plots, each of which is the property of an individual family. This fact is very often unknown or ignored by new settlers and predetermines conflicts between traditional forest users and new settlers. Although there are as many functioning traditional and informal community-based institutions (e.g. norms, regulations, networks) as formal institutions (e.g. authorities, NGOs, official use rules for NFPA) that are operational at the local level, there is hardly any cross-institutional link which is necessary for the pursuit of conservation and natural resource management concepts.

As indicated, CoCE I produced important information and helped to advance our knowledge about wild *Coffea arabica* and its natural habitats, the montane rainforests of Ethiopia. In particular, it could be proved that:

- ▶ There is a high degree of species' diversity in the montane rainforests, both at local and cross-regional levels.
- ▶ There is also a high degree of genetic diversity in wild *Coffea arabica* populations differing from region to region (the differences in its disease and drought tolerance exemplify the genetic diversity).
- ▶ Wild coffee and coffee forests have considerable potential economic value at global and local scales, respectively.
- ▶ A multitude of local, regional, and national stakeholders with conflicting interests, mandate disparities, changing responsibilities as well as diverging property rights are involved in the use and management of forest resources.

In general, research results support the assumption that wild coffee has contributed to sustaining at least a modicum of forest resources as they have been used traditionally throughout history - although there have been demands for arable land at all times. Nevertheless, high settlement and agricultural land-use pressure still exist and continually reduce the remaining forest fragments together with the wild coffee populations. Even though the potential economic value of the coffee genetic resource and the forest could be demonstrated, a financial analysis from the farmers' perspective verified that the conversion of forest into agricultural land is an

economically sound decision. Influencing the behavior of farmers is difficult due to insufficient financial resources for conservation incentives and income alternatives or insecurity of land tenure – just some of the factors which maintain pressure on forest resources.

Outlook

CoCE I concludes that basically four problem areas have to be addressed to realize the conservation and use of wild coffee populations in the montane rainforests of Ethiopia:

- ▶ As natural forest areas are shrinking and coffee production is increasingly based on modern coffee cultivars instead of landraces and wild coffee, practical measures have to be developed to preserve the wild coffee gene pool *in situ* but detached from strict forest conservation.
- ▶ The potential economic value of the wild coffee genetic resource has to be transformed into real economic benefits for the rural population through adequate incentive and financing mechanisms.
- ▶ Implementation strategies have to be developed which include communication and public awareness building, education as well as institutional capacity building for the conservation and sustainable use of forest resources.



The gene pool of wild coffee is endangered by increasing settlement.

- ▶ In the course of CoCE I, new research issues have evolved which require further attention. These include genetic diversity, coffee diseases, coffee quality as well as the relationship between the rules and regulations of forest management and the condition of the forests.

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Between Security and Cooperation Cross-border interactions at the Amu Darya River

The ZEF research project "Local Governance in the Amu Darya Borderland Region", funded by the Volkswagen Foundation, tries to show how borderland governance is designed in reaction to cross-border interactions and how the directly affected borderland population discerns border policy and their neighbors beyond the border. The cross-border component of this study combines political and economic aspects with socio-spatial identifications. This article presents some initial observations of the Tajik borderland.

Borders have several functions. As symbols of sovereignty they mark territorial rule. Along borders, states are eager to show power and control capacity over their territory by fencing it in, erecting checkpoints and deploying border guards. Via borders, goods, people, ideas,

order to access markets and products. On the other hand, recent figures of the United Nations Office against Drugs and Crime (UNODC) rate the share of drugs trafficked from Afghanistan through the country's northern border at an estimated 20 percent.

The Amu Darya encompasses almost all of the greater than 1,300 km borderline between Afghanistan and Tajikistan. Especially in the mountainous areas of Badakhshan, the border is almost impossible to control. Though not contested, the borderlands have been a sensitive area for at least the last quarter of a century. Wars on both sides of the border have triggered refugee flows across the river. Since the early 1990s, rising Afghan drug production has used the border as a conduit. From Shurabad and Hamadouni in east Khatlon, incidents of Afghans crossing the border to kidnap indebted Tajik dealers have been reported. It is no wonder then that security aspects dominate border management efforts supported by UN organizations, the EU, the USA, and Russia. At one of a series of conferences on the issue in May 2006, Tajik President Emomali Rakhmonov referred to the rising poppy production in Afghanistan when stating: "Unfortunately one can't choose his neighbors".

Fewer conferences are held on cooperation. However, in recent years three bridges have been built in Badakhshan with fenced-in border markets. Another bridge is under construction at the border post of Nizhnij Pyanj in Khatlon area. At this site, a huge wholesale market is planned to attract traders from Afghanistan, Pakistan, and Iran. So far, trade across border points is petty but rising.

The potentially largest trading commodity from Tajikistan to Afghanistan and other countries is hydro-power. Northern Afghan cities like Kunduz are already supplied with power from Tajikistan while the Tajik province endures power cuts. Plans to secure power supply and to expand export are connected to various hydro-power station projects. But disputes with Russian investors protract the most ambitious one (Rogun), while others remain wishful thinking for the time being. Among the latter is the Daschtijum power-station, planned to link both states over the Pyanj.

Improving infrastructure is one issue, alleviating border procedures is another. Some of the Afghans' most needed products like wheat-flour and oil are blacklisted for export by the Tajik side. Obtaining a visa is an expensive and tedious procedure. Tajik customs' services, recently top-listed in a corruption study of the president's think-tank, form another obstacle for cross-border trade. There are well-organized vested interests in keeping border crossings shadowy.

But would the Tajik borderland population be ready for



Bridge connecting Afghanistan and Tajikistan.

and information flow in. Only in fully integrated regions is entry free. Anywhere else customs' duty, licences, visas and fees will be demanded. Hence borders generate specific incomes. In this context, there is tension between security and cooperation. Whereas a security-sensitive strategy is directed towards a reduced vulnerability to negative externalities by controlling the border, cooperation-oriented border management aims at supporting positive influences by facilitating movement.

So far, the growing number of empirical border studies has neglected another dimension. Being dynamic social constructs, borders also form historically grown borderlines for identification. Moreover, scant research has been conducted on borderland issues in post-conflict areas, although it is extremely important to find a balance here between security and cooperation. This holds true for the Amu Darya borderland area of Afghanistan, Tajikistan, and Uzbekistan. As all three countries are land-locked, they are forced to pursue good neighborly relations in

more interaction with Afghanistan? Due to negative images of their Afghan neighbors, only a few people really seem to welcome the opening of planned bridges and markets. Moreover, purchasing power in Tajikistan is low and some fear that wholesale trade might suffocate small traders. Most community representatives do not think about common cross-border projects but rather wait for orders and help from above. An escalation in drug trafficking is feared. But for some it will still offer an alternative to labor migration to Russia.

The picture is different in Badakhshan (Tajikistan). There are good reasons why this region is moving forward in terms of cross-border interaction. Due to the rugged topography people are dependent on trade or cooperation. The perception is more widespread here that people sharing the same language, culture and beliefs live on both sides of the river. Tighter historical connections – some regions reached across the river before Tsarist

Russia stopped expansion there – were cited as the main reason. Later, interaction was more active across the river (more family ties here than anywhere else survived the closure of the border during the era of the Soviet Union). Not least, most of the people on both sides of the border are part of the Ismaili community, supported in particular by the Aga Khan Foundation.

In general, expectations on border management stress the security component. Yet, there is some potential in the economic sphere. If measures to facilitate cross-border trade benefit a broader segment of the population, these could help to overcome prejudices and affect other aspects of cooperation like cross-border community building, irrigation planning, and combating floods.

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A General Equilibrium Approach to Water and Land-use Reforms in Uzbekistan

This study was set against the background of the droughts in 2000 and 2001 during which agricultural producers suffered severe losses due to water scarcity. The agriculture sector employs around 40% of the working population, and the droughts therefore had a significant impact on the welfare of the rural population. A leading question for the research was consequently, why, after more than a decade of independence from the former Soviet Union and despite continuous imports of capital goods ever since, the overall structure of the Uzbek economy was not subject to significant shifts away from agriculture towards an economy with a higher share of private, non-agricultural sectors. This observation is even more startling as it was the explicit objective of the Uzbek Government to re-allocate resources from agriculture into industrial and service sectors. Therefore, the aim of this study was to analyze the impacts of the current legal-administrative setting related to the agriculture sector of Uzbekistan on the economy as a whole. Especially, the policies related to cotton production and processing were addressed in detail. The complex linkages between production and processing sectors, the government, and external trade demanded a general equilibrium approach, in which these elements were represented. A necessary step before implementing a macro-economic model of the proposed type was to establish a consistent database. Because a comprehensive set of macro-economic data was not available from a single Uzbek authority, the dataset had to be compiled based on various sources, such as international organizations and diverse branches of regional and national Uzbek ministries.

The thus derived, yet inconsistent items of information were used as starting points for the estimation of a balanced dataset, which in turn was used for simulations.

Especially with regard to data compilation, a significant step forward could be achieved by establishing a consistent system of national accounts and a refined maximum entropy algorithm to balance the datasets on a comparatively high level of disaggregation. Thus, it was possible to represent the national economy of Uzbekistan via 20 productive sectors, of which seven concerned agricultural production and ten referred to industrial sectors, of which cotton processing and the domestic textile industry were of major interest. A further task within the compilation of the data was the assessment of the patterns of water usage for irrigation. Besides purely quantitative aspects such as water demand of cropping activities, in addition the computation of a shadow-price for water was addressed. It turned out that the price estimate of irrigation water in Khorezm lies within



Analyzing water availability was necessary to develop the model.

US\$0.06 and 0.08 in the range of the water charges for farmers in Cyprus and Tunisia. Another water-related finding came from the analysis of water supply and demand for Khorezm. The total value of crop production for each district in Khorezm was compared with the probability of obtaining at least a certain minimum quantity of water. The probability of obtaining enough water was within 61 to 67%, the lowest being in the off-stream located districts. Not surprisingly, it turned out that the probability to obtain enough water in these districts coincided with crop losses from 1999 to 2001.

The analysis of water availability was one of many intermediate steps in the development of the general equilibrium model. Another surprising insight during the establishment of the database was the fact that within the agriculture sector animal production, not cotton cultivation, was the largest sub-sector. In 2001 it contributed 48.4% to the total agricultural output value of Uzbekistan, whereas cotton production contributed only 15.7%. These and other intermediate results were used to build the general equilibrium model, which was finally used to evaluate changes in policies related to the agriculture sector, especially for the cotton market. One of the more surprising results came from an experiment in



Cotton cultivation is the second largest agricultural sub-sector.

which the cotton market was liberalized by assuming that production targets were abolished and taxation as well as subsidization of producers and processors of raw cotton decreased by 50%. Instead of decreasing total governmental revenues, the policy change caused an increase by 3.3%. There are basically two reasons behind this outcome. First, the government loses tax revenues from the cotton sector, but on the other hand has less expenditure on input subsidies, so that the negative effect on the revenues is netted out to some extent (decline of indirect taxes less subsidies: 3.8%). Second, the allocation effects caused by the deregulation generate higher capital incomes for the cotton-related producers and consequently higher payments of direct taxes (income and profit taxes). The direct tax revenues increase by 12.9%. The incomes from wages, however, decrease by 3.5%, which cause a net income loss for the households whose capital incomes are low compared to the labor income – i.e. the urban and rural poor.

The outcome of this experiment sheds new light on the discussion about the effects of the cotton market regulations in Uzbekistan. If only policies like production targets, fixed prices, and export taxes are considered then the Uzbek cotton system is a generator of income for the government, which in turn might be used for public investment in non-agricultural sectors. But if the input subsidies for producers and the effects on the general equilibrium of the national economy are considered as well, it appears that one aim of the regulations is supporting the households whose incomes depend mainly on their labor force. Thus, it can be assumed that the cotton market regulations have indeed a strong social objective as opposed to purely generating governmental revenues.

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Traceability and Its Impact on Developing Country Food Exports

New research has started at ZEF on traceability and the implications of the new European Union Regulation No.178/2002 for developing country food exports. This regulation came into force in January 2005 and states that to ensure the safety of food and to protect human health, it is crucial to trace and follow a food, feed, or substance intended to be incorporated into a food or feed, through all stages of production, processing and distribution because each element may have potential impact on food safety. However, the effects this regulation will have on developing countries remain unclear.

Sector-specific guidelines have been developed for tracking and tracing individual products; for example in the fish sector, for meat, with respect to fruits and vegetables, nuts and spices, and wine. These are all very important sectors in the export businesses of numerous developing countries, accounting for more than 50% of

their total agricultural food exports. Small- and medium-scale farmers who often produce more than half of the exports in their respective countries are expected to be affected negatively by the new regulation.

The costs associated with traceability relate to (i) the lack of administrative and technical capacities to comply with the requirements; (ii) the high costs in upgrading facilities; and (iii) the public costs to be covered by the state, e.g. for regulation and monitoring authorities.

Indeed, several countries (e.g. Thailand, Vietnam, Chile) have voiced concerns that the new EU regulation along with the numerous initiatives of private sector companies may create non-tariff barriers to their exports, undermining their comparative advantages.

On the other hand, it has to be recognized that a traceability system may also result in benefits for producers, because it urges them to (i) improve supply

side management (production/distribution/marketing optimization); (ii) facilitate trace-back for food safety and quality leading to reduced recall expenses and higher reputation; and (iii) differentiate foods with undetectable quality attributes (e.g. genetically modified [GM] and non-GM foods).

All these elements translate into larger net revenues for the firm. Thus, some developing countries that export food products have eagerly embarked on implementing traceability systems, expecting that the benefits will outweigh the costs. As a result of a foot-and-mouth disease outbreak in 2000 for example, Brazil, Argentina, and Uruguay were heavily affected by closed export markets and thus foregone export gains. All three countries invested in the introduction of a traceability system in the livestock sector with positive outcomes. In Guatemala, a traceability system had already been introduced in the export-oriented production of raspberries in the 1990s, which successfully stopped an outbreak of the parasite *Cyclospora*, thus preventing a disruption of exports.

A general conclusion regarding the balance between costs and benefits of traceability systems for developing



Small-scale farmers are negatively affected by the new regulation.

countries cannot be drawn. Benefits for individual countries will depend on the kind of products they export, their institutional structure, their technical capacity, and their financial ability.

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Facts & news

An international workshop on the Coffee Biodiversity Project was held from March 27 to 28 in Ethiopia and was preceded by a field tour to the coffee forest area in the south of the country. The workshop was opened by the President of Ethiopia and provided an impressive overview of the accomplishments to date. Negotiations are underway to try to assemble the information in a special issue of a relevant journal. ZEF participants were Manfred Denich, Franz Gatzweiler, Ulrike Grote, Paul Vlek, and several of our PhD students.

On May 5 2006, the official inauguration ceremony for the honorable professorship awarded by the University of Urgench, Uzbekistan, to Prof. Dr. Paul Vlek in June 2005, took place at the University in the presence of the members of the University's Science Council.

On July 7 2006 ZEF had a stand during the University of Bonn's "Science Night". As this year's overall topic was Water, ZEF presented its GLOWA Volta project. The stand was shared with the Global Water System Project (GWSP).



The GLOWA ("Global Change in the Hydrological Cycle") Volta project proposal for the third research phase in the Volta Basin in Ghana and Burkina Faso has been officially accepted by the German Federal Ministry of Education and Research (BMBF). Research Phase III is due to continue until 2009.

At a glance

ZEF will continue its "Public Lectures" series in winter term. High ranking international experts from science, development policy institutions and practice will contribute to the following core themes: Land use, water management, diversity, renewable energy, and health. For up-to-date information please have a regular look at www.zef.de. If you want to register for ZEF's mailing list please send an e-mail to presse.zef@uni-bonn.de.

The "Water Lectures" series, which was initiated in the end of 2005 in cooperation with the Global Water System Project (GWSP) and the United Nations University (UNU-EHS) in Bonn, will also continue on an irregular basis. Please have a look at www.gwsp.org or www.zef.de for up-to-date information. You can register for e-mail invitations to this series at presse.zef@uni-bonn.de.

Also, ZEF's "Silk Road Lectures", focussing on the political, historical and social background in the region of the former silk road, will be continued. Contact and registration: c.schetter@uni-bonn.de

Publications

- ▶ Afifi, T. (2006): Assessing the Dynamic Effects of the Egyptian Regional Trading Blocs. Proceedings of the Scottish Economic Society Annual Conference, Perth, Scotland, April 24-26 2006.
- ▶ Afifi, T. (2006): The Impact of Institutional Quality on the Trade between Arabs. Proceedings of the 5th International Conference of the Middle East Economic Association (MEEA), Sousse, Tunisia, March 10-12 2006.
- ▶ Berger, T., P. Schreinemachers and J. Woelcke (2006): Multi-Agent Simulation for the Targeting of Development Policies in less-favored Areas, in: *Agricultural Systems* (88) 28-43.
- ▶ Braimoh, A.K. and E.T. Craswell (2006): Assessing Global Water Systems Research, in: *Eos Transactions American Geophysical Union* 87(16):159.
- ▶ Braimoh, A.K. and P.L.G. Vlek (2006): Soil Quality and Other Factors Influencing Maize Yield in Northern Ghana, in: *Soil use and management* 22(2):165-171.
- ▶ Evers, H.-D., S. Gerke and T. Menckhoff (2006): Wissen und Entwicklung - Strategien für den Aufbau einer Wissensgesellschaft. ZEF Policy Brief No. 6, Center for Development Research, Bonn.
- ▶ Friedland, C. (2005): Die digitale Kluft überwinden: Informations- und Kommunikations-technologien in Afrika, in: *Afrika Dossier*, Bundeszentrale für politische Bildung, <http://www.bpb.de/themen/HRTBRR>
- ▶ Ihne, H. and J. Wilhelm (2006): Einführung in die Entwicklungspolitik, Einführungen. Politik, LIT Verlag.
- ▶ Kaizzi, C.K., H. Ssali and P.L.G. Vlek (2006): Differential Use and Benefits of Velvet Bean (*Mucuna pruriens* var. *utilis*) and N Fertilizers in Maize Production in Contrasting Agro-Ecological Zones of Eastern Uganda, in: *Agricultural Systems* 88, 44-60.
- ▶ Khamzina, A., J.P.A. Lamers, C. Martius, M. Worbes, P.L.G. Vlek (2006): Potential of Nine Multipurpose Tree Species to Reduce Saline Ground Water Table (Biodrainage) in the Lower Amu Darya River Region of Uzbekistan. *Agroforestry Systems*, online at: DOI 10.1007/s10457-006-9006-9.
- ▶ Lerman, Z. and P. Schreinemachers (2005): Individual Farming as a Labour Sink: Evidence from Poland and Russia, in: *Comparative Economic Studies* (47) 675-695.
- ▶ Mussng, F., M. Becker, T.T. Son, R.J. Buresh and P.L.G. Vlek (2006): Yield Gaps and Nutrient Balances in Intensive, Rice-based Cropping Systems on Degraded Soils in the Red River.
- ▶ Oguntunde, P.G. (2005): Whole-Plant Water Use and Canopy Conductance of Cassava Under Limited Available Soil Water and Varying Evaporative Demand, in: *Plant and Soil* 278(1-2), 371-383
- ▶ Römbke, J., H. Höfer, M.V.B. Garcia and C. Martius (2006): Feeding Rates of Soil Organisms at Four Different Forest Sites in Central Amazonia, in: *Journal of Tropical Ecology*, 22(3), 313-320. doi:10.1017/S0266467406003166.
- ▶ Schawe, M. (2005): Hypsometrischer Klima- und Bodenwandel in Bergregenwaldökosystemen Boliviens. Göttingen, pp.127.
- ▶ Schetter, C. (2006): Die mediale Ethnisierung eines Konflikts: Afghanistan nach dem 11. September, in: Butterwegge, C., G. Hentges (eds.): *Massenmedien, Migration und Integration*, VS Verlag für Sozialwissenschaften, 171-182.
- ▶ Schetter, Conrad (2005): Ethnoscapes, National Territorialisation, and the Afghan War, in: *Geopolitics* 10 (1): 50-75.
- ▶ Schetter, C. (2006): Afghanistan zwischen Wiederaufbau und Destabilisierung, in: Helmut Hubel et al.: *Jahrbuch Internationale Politik 2003-2004*, München, R. Oldenbourg Verlag: 77-86.
- ▶ Schetter, C. (2006): Die Neuordnung Afghanistans, in: Bernhard Chiari (ed.): *Wegweiser zur Geschichte: Afghanistan*. Paderborn: Schöningh: 82-91.
- ▶ Simtowe, F., J. Mduma and M. Zeller (2006): Can Risk-Aversion Towards Fertilizer Explain Part of the Non-Adoption Puzzle for Hybrid Maize? Empirical Evidence from Malawi, in: *Journal for Applied Sciences* 1(6), ISSN 1812-5654, Asian Network for Scientific Information.
- ▶ Terlinden, U. (2006): FAST Update Somalia. Semi-Annual Risk Assessment. July 2005 to January 2006. Bern, February 14 2006. http://www.swisspeace.org/uploads/FAST/updates/Somalia_FAST%20Update%202_2005.pdf.
- ▶ Wall, C. (2005): Inventing a Soviet Countryside: State Power and the Transformation of Rural Russia, 1917-1929 - a critical review of James Heinzen. *Ab Imperio* 6 (3) 623-629.
- ▶ Wall, C. and J. Overton (2006): Unethical Ethics? The challenges of conducting development research in Uzbekistan. *Development in Practice* 16 (1) 62-67.

ZEF Discussion Papers on Development Policy:

No. 104: Roukayatou Zimmermann and Faruk Ahmed: Rice Biotechnology and Its Potential to Combat Vitamin A Deficiency: A Case Study of Golden Rice in Bangladesh, Bonn, March 2006.

No. 105: Adama Konseiga: Household Migration Decisions as Survival Strategy: The Case of Burkina Faso, Bonn, April 2006.

No. 106: Ulrike Grote, Stefanie Engel and Benjamin Schraven: Migration Due to the Tsunami in Sri Lanka - Analyzing Vulnerability and Migration at the Household Level, Bonn, April 2006.

No. 107: Stefan Blum: East Africa: Cycles of Violence, and the Paradox of Peace, Bonn, April 2006.

No. 108: Ahmed Farouk Ghoneim and Ulrike Grote: Impact of Labor Standards on Egyptian Exports with Special Emphasis on Child Labor, Bonn, April 2006.

No. 109: Oded Stark: Work Effort, Moderation in Expulsion, and Illegal Migration, Bonn, May 2006.

No. 110: Oded Stark and C. Simon Fan: International Migration and "Educated Unemployment", Bonn, June 2006.

ZEFConsult: Bridging Development Research and Politics

ZEFConsult is a unit within ZEF that has been launched to strengthen and improve the consultancy and advisory capacity of the Center for Development Research. ZEFConsult aims to provide advice to parliaments, governments and their institutions of development policy, as well as to non-governmental organizations in the field of development cooperation.

Since its inception in mid 2005, ZEFConsult has been concentrating on sharpening its conceptual profile, establishing an infrastructure, and consolidating a network. At the same time it has identified and run consultancy projects with partners such as the German Bundestag, the World Bank, the African Development Bank, InWEnt, and DAAD. Fields of consultancy so far have been services for the poor, information and communication technology, media interaction, renewable energies, and tertiary education.

Globalization makes the world more complex to understand. Academic research contributes to this increase in complexity, as it provides more and more analytical data, information, and knowledge about the world. For policy-makers this complexity poses an enormous challenge. In fact, they need a continuous input of scholarly advice in order to grasp the very scope and consequences of this complexity and deal with it properly.

As this is not a feasible perspective, the question of

how to convey knowledge to policy-makers in a useful way is of growing interest to researchers, policy-makers, and donors alike. Thus, institutions like ZEFConsult try to build a bridge between research and politics based on the following questions: How can interaction between researchers and policy-makers be improved, and how can policy-makers best make use of research and move towards evidence-based policy-making?

ZEFConsult has a demand- and supply-driven approach, which has a reciprocal effect: On the one hand, ZEFConsult focuses on the political dimensions of research conducted at ZEF. The purpose is to translate and to utilize research findings made by ZEF for the support of decision-making processes in development cooperation and politics. On the other hand ZEFConsult aims to enrich the portfolio of ZEF by introducing new subjects from the agenda of development cooperation policy and to generate evidence-based expertise in development following the needs of development practice.

One of ZEFConsult's assets is that it can build on the broad- and long-term experience of ZEF in multi- and monodisciplinary research, capacity building as well as in policy dialog.

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Services for the poor are one of ZEFConsult's fields of expertise.



Viewpoint

Desertification: Half-time for the YDD

Interview with Dr. Miriam Akhtar-Schuster, chairwoman of the German Desert*Net, an association of German researchers and research institutes conducting research on desertification.

Dr. Akhtar-Schuster, what has been the main reason for the United Nations (UN) to declare 2006 as the international year for combating desertification (IYDD)?

Over 250 million people in more than 110 countries are directly affected by desertification, and the lives of over a billion people are threatened by it. Furthermore, there is an increasing danger of desertification in all arid lands bordering desert lands. This has a negative impact not only on soil fertility, water availability, vegetation, and biodiversity, but also on the livelihoods of people living in these affected areas, and leads to migration into cities. Nevertheless, the global problem of advancing desertification is paid minimal attention only by the general audience. To change this, the UN declared 2006 as the international year for combating desertification.

Half a year has elapsed – how would you evaluate the impact of activities to date?

Above all, there is an increasing integration of scientific and non-scientific activities. There have been academic conferences, with representatives from ministries, institutions of development cooperation, as well as from the UN conventions participating. One such example was the Conference for Soil and Desertification, which was run by Germany's Desert*Net in cooperation with the Research Group for Soil Geography.

In addition, there is an effort to reach out to a more general audience by communicating the results of scientific work, for example through public exhibitions. These activities take place in close cooperation with the United Nations Convention for Combating Desertification (UNCCD) in Bonn.

What role does research play in these activities?

Science has recognized that it must abandon its isolated position and try to build a bridge for implementing solutions to sustainable forms of land use. With growing success, science has proven itself to political colleagues as an indispensable partner for sustainable development. Especially the German scientific network for desertification (Desert*Net Germany) has successfully advanced this role.

Furthermore, under the leadership of the Desert*Net in Germany, a European scientific network for combating desertification was founded in 2005 (see *ZEF News No. 18*). It is considered an important scientific structure for combining information and data about "best practices" for combating desertification in the future.

How would you evaluate the cooperation between science, politics, and development cooperation in combating desertification?

Since the publication of the "Millennium Ecosystem Assessment" (MEA) report, which was commissioned by

the UN and written under the collaboration of 1,360 scientists from around the world, science is seen as an increasingly important partner in the framework of development. In the MEA report, scientists were not able to confirm the previous common assessment that 70% of arid lands worldwide are directly affected by decreasing productivity of agricultural lands and pastures. Their calculations indicate a mere 10 to 20%. This means that it is imperative that policy-makers, development organizations, and scientists work in close cooperation with each other. Only then, can problems be properly recognized and solutions drafted and implemented.

Therefore, it is first necessary to create a structure for continuous communication between policy and research. The results of research that reveal the causes and consequences of desertification must be incorporated for policies on sustainable development. In addition, information about scientifically founded and practical measures for combating, rehabilitating, and preventing deforestation needs to be included. One challenge lies in the fact that policy expects quick, simple, and cheap solutions. As science usually comes to conclusions only after complicated and time-consuming research, this is often impossible. Desert*Net in Germany seeks to break down these barriers because the problem of desertification is more urgent than ever.

What are the largest challenges for science?

Research projects on land degradation and sustainable development have to be designed in line with an interdisciplinary and integrated approach. In addition, the land users and decision-makers in the affected area have to be integrated in the research project. A successful example of such integrated and interdisciplinary research is the ZEF-led project on economic and ecological reorganization in Uzbekistan.

The chances of success for the implementing sustainable management systems grow correspondingly. Science profits from the traditional knowledge of the people in the affected areas, and the local people get in contact with scientific work and necessities. The sponsors of research must also recognize that projects on combating desertification are only successful when an interdisciplinary approach is used and participation by the local people is guaranteed. This implies new logistical and support structures.

Do you see reason to be optimistic?

Yes, through a raised awareness among all interest groups (scientists, policy-makers, technical cooperation, and local users of the land) we can be optimistic that the problem of land degradation can be solved, but only through collective work performed in synergy.

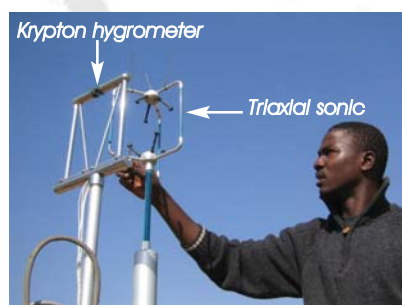
The interview was conducted by Alma van der Veen.

The Impact of Land-use Intensity on Surface Fluxes: A Case Study in Burkina Faso

Micrometeorological studies are rare in the savannah zone of West Africa. The only available documentation comes from the large-scale SEBEX and HAPEX experiments – Sahel projects in the early 1990s. Recent research on improving the representation of the land-surface-atmosphere interactions within general circulation models has resulted in over 40 different soil-vegetation-atmosphere transfer schemes (SVATs). Most of these SVAT models failed when simulating the dynamics of surface fluxes in the savannah. The feedback mechanisms in the boundary layer in the temperate zones, for which the original models were developed, are completely different from those in the savannah.

An important role of ZEF is to enable young scientists from developing countries to conduct research which improves our understanding of the physical environment. The ZEF-led GLOWA Volta Project (www.glowa-volta.de) has offered many PhD candidates – especially from Africa – the possibility to perform well-equipped long-term research. The general motivation behind this thesis research was to organize the first long-term eddy covariance campaign ever reported upon for this part of the world. The fieldwork aimed to improve our knowledge of the effects of land-use intensity on surface fluxes, especially on actual evaporation.

Feedback between the land surface and the atmosphere takes place through the exchange of energy fluxes. Incoming solar radiation is partially reflected back into the atmosphere. The solar energy that is retained by the surface is partitioned over several processes. First, the surface warms up, which results in increased long-wave thermal radiation, which in turn is absorbed by atmospheric molecules such as water vapor and carbon dioxide. Part of the energy also warms up deeper soil layers, which release this heat again during the night. Most important, and most difficult to measure, are the turbulent fluxes that carry the energy available at the surface



Eddy covariance sensors: The anemometer measures 3D wind speed and air temperature, whereas the hygrometer measures air humidity.

directly into the lower atmosphere. These turbulent fluxes consist of sensible and latent heat fluxes. Sensible heat flux is simply air that is, through contact, warmed up by the land surface and carried into the colder atmosphere. Latent heat flux is the energy used to evaporate water from surfaces and plants. This water vapor is carried into the atmosphere, where it releases its latent energy when it condensates to form clouds.



The study showed the effects of land-use intensity on surface fluxes.

Probably the best way to measure the turbulent latent and sensible heat fluxes is through eddy covariance measurements. This method functions as follows: Air movements are measured very rapidly in all three dimensions, together with air temperature and humidity. During the day, upward moving eddies will be slightly warmer and more moist than downward moving eddies. The time-averaged differences give directly the sensible and latent heat fluxes. Theoretically speaking this is simple. The measurement instrument however is rather complicated, as 3D wind speed, humidity, and temperature need to be measured ten times per second. The complexity of the instrument means that it is rarely used in Africa and if at all, for special campaigns only. The present study is unique in that it has been measuring the fluxes continuously for 20 months, including two rainy seasons and the dry season in between. Interestingly, one rainy season was relatively wet (1,230 mm) and the second was relatively dry (825 mm).

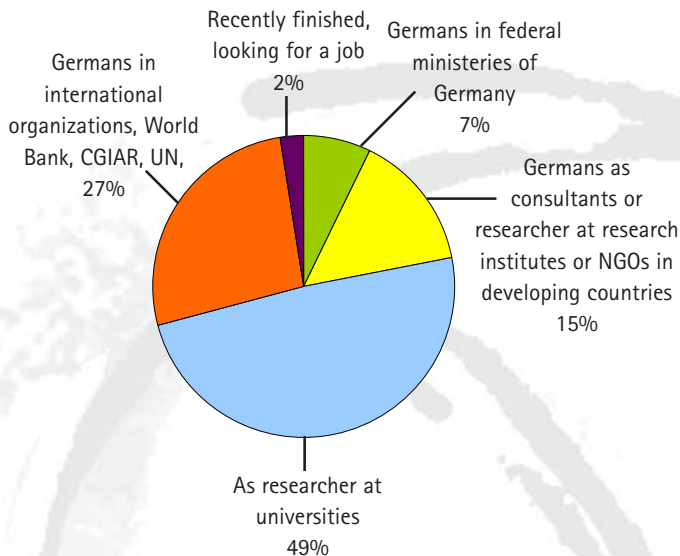
The extensive dataset was used to adjust a SVAT so that it better reflects the surface-atmosphere interactions over the savannah. For dry periods, the diurnal and day-to-day dynamics were driven by the dryness of the air, with the vegetation shutting down when it was too dry. During wet periods, the available solar radiation is the main determinant. Probably the most important finding was that the roughness of the surface determines the energy fluxes to a larger extent than previous models suggested. All these findings could only be made through the long measurement period. The improved SVAT is very relevant input for the eco-hydrological models that are being developed within the GLOWA Volta Project for West Africa.

Fafré Bagayoko

The author recently finished his doctoral thesis at ZEF. The GLOWA Volta Project is part of the BMBF-funded program "Global Change in the Hydrological Cycle" (GLOWA). The research was also supported by the EU-funded VinVal project. Contact: fbagayoko@yahoo.fr

Results of a Career Survey among ZEF Alumni

ZEF's International Doctoral Studies Program (IDSP) has become internationally renowned since its inception in 1999 because of its uniqueness in Germany, its size (150 PhD students), and interdisciplinarity. The overall goals of the IDSP are to train future decision-makers from developing countries, and German and European scientists for their international careers. It offers doctoral degrees in social and natural sciences, economics, and agriculture at the University of Bonn or other universities.



Careers of ZEF alumni from developing countries and Germany, end of May 2006.

A survey on the careers of the former participants of the IDSP showed that 60% of the graduates from developing and transition countries returned to their home countries to take up positions in the fields of research, teaching, administration, and politics. Others found jobs (15%) in international organizations like the World Bank, the Consultative Group on International Agricultural Research (CGIAR), and the United Nations. Some of the former doctoral students found post-doctoral positions in Germany immediately after their PhD graduation. The monitoring of the careers of former German participants also confirms the success of the concept of the IDSP: Immediately after completing their theses, most took up positions in national or international organizations in a development-related context, in German ministries or in developing countries.

The current main sponsors of the IDSP are the German Federal Ministry for Economic Cooperation and Development (BMZ) via the German Academic Exchange Service (DAAD) and the German Technical Cooperation (GTZ), the Ministry of Innovation, Science, Research and Technology of the State of North Rhine-Westphalia (MIWFT), the Robert Bosch Foundation, the German Federal Ministry of Education and Research (BMBF), the German Research Foundation (DFG), and the Volkswagen Foundation, and many other donors for scholarships.

Application:

A successful application to the IDSP requires an excellent master's or diploma degree in Economics, Political Science, Agricultural and Resource Economics, Engineering, Geography, Mathematics, Natural Science or Agriculture, and excellent proficiency in English. The applicant should be younger than 32. Initially data should be entered in an online registration form at www.zef.de/290.0.html. Then a hard copy of the application, written in English, should be sent to us, accompanied by a letter of application, application forms from ZEF, an abstract of the master's or diploma thesis, the plan of the proposed research, two letters of recommendation, a curriculum vitae, and certified copies of all relevant certificates. The deadlines for applications to the doctoral program and scholarships are: August 31, yearly, for non-EU citizens and DAAD scholarships (available only for applicants from developing countries), and May 31, yearly, for EU citizens and scholarships of the Robert Bosch Foundation. Information is available from Günther Manske (e-mail: docp.zef@uni-bonn.de) and from the ZEF homepage (www.zef.de).

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