



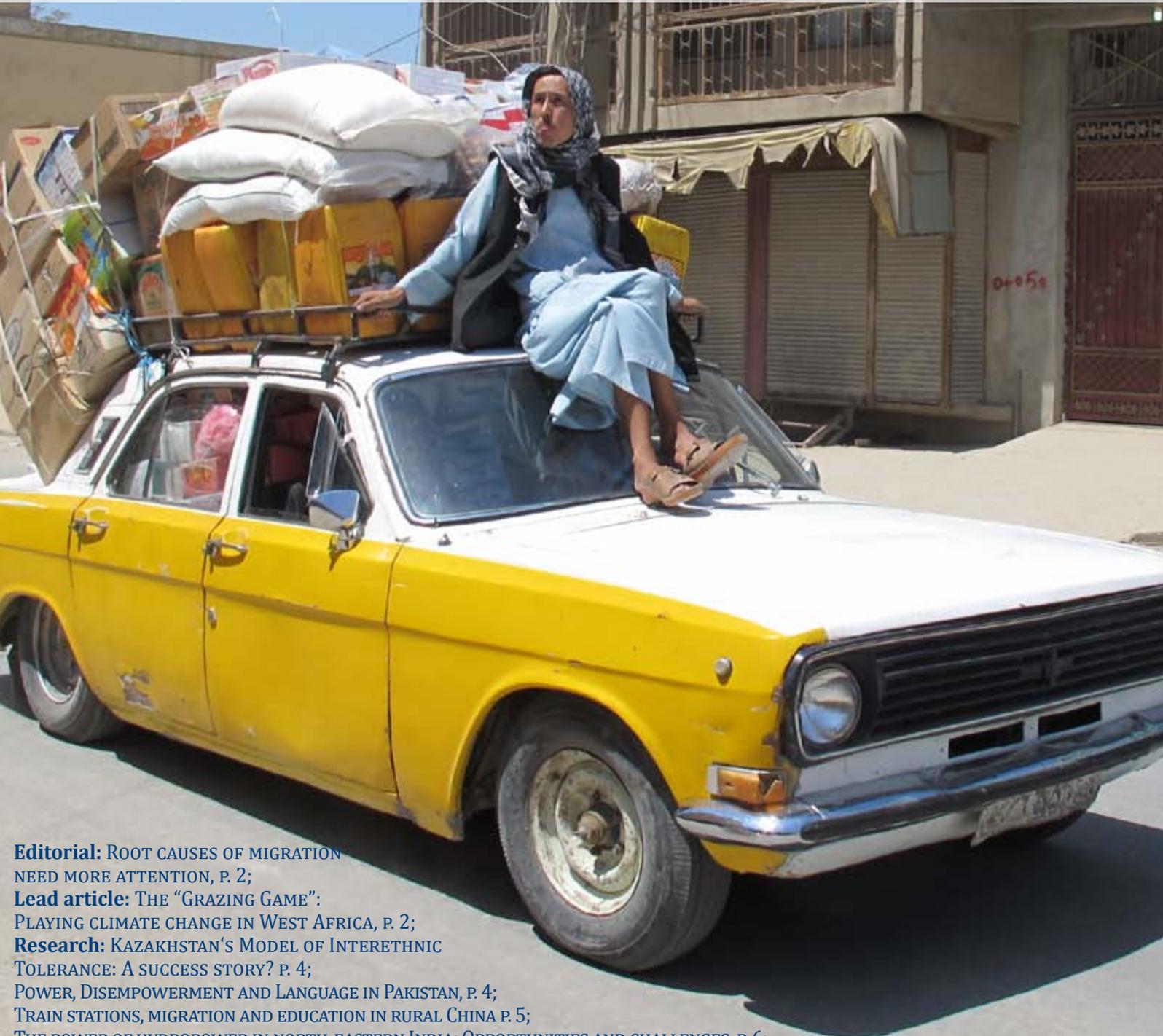
Zentrum für Entwicklungsforschung
Center for Development Research
University of Bonn

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OCTOBER 2015

ZEFNEWS 32

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EDITORIAL: ROOT CAUSES OF MIGRATION NEED MORE ATTENTION

Everyday we are confronted by a continuous series of pictures, videos, reports, and news revealing the plight of desperate people risking and sacrificing their lives to attain secure and better living conditions in countries in Europe, Asia and the Americas. According to statistics on forced migration in the UNHCR report "Global Trends", almost 60 million people were forcibly displaced globally at the end of 2014. Among the displaced are internally displaced persons (38.2 million), refugees (19.5 million), as well as asylum seekers (1.8 million). The search for better living conditions forces thousands of people to travel either on broken-down boats across the Mediterranean Sea, as a human cargo in overcrowded and stifling trucks, or as stowaways on train routes such as the notorious "La Bestia" from Central to North America. The countries of the global North are complicit in creating the present refugee crisis with their refusal to implement legal immigration options and, thus, secure escape routes. The

topography of forced displacement shows once more that the root causes of forced migration need more attention than in the past. The reasons why people are forced to migrate are multiple and related to a complex system of economic, environmental, social, and political interconnected processes and causalities. Since its inception in 1997, ZEF has been conducting interdisciplinary research in countries of the global South to find science-based solutions for precisely such development-related issues. It will have to intensify its efforts given the current crisis.



Eva Youkhana has been Director of ZEF's Department of Political and Cultural Change as of September 1, 2015

LEAD ARTICLE

THE "GRAZING GAME": PLAYING CLIMATE CHANGE IN WEST AFRICA



The most extreme effects of climate change are projected in West Africa and are expected to occur in desert and grassland areas. It is crucial for local populations in this region to better understand what such projections mean for them so that they can develop sound adaptation policies and interventions. For this purpose, we developed an online game, called the 'grazing game'. With this computer-based game we conducted trials with local farmers at multiple study sites in West Africa. The grazing game is a learning tool to better understand the behavior of farmers in response to climate variability under semi-arid conditions and to facilitate social learning. The grazing game was also designed to reveal the human-induced processes that lead to over-grazing and desertification. So the game shows the players' interactions with environmental condi-

tions and their resulting decisions.

Here, we are reporting on the game trials we conducted in Benin and Ghana. In Ghana, we conducted a total of 23 game trials around the Veve catchment of the Upper East Region of Ghana involving 243 individual farmers. In Benin, we explored gender-specific responses and coping strategies with respect to climate variability in the agrarian context. In Benin, we used a combination of a household survey and an experimental gaming exercise involving 260 households. 76 percent of the respondents were male and 24 percent female.

Ghana: Playing climate change

The game trials we ran in northern Ghana replicated rainfall fluctuations and assessed the respective responses of

local farmers. The farmers responded very positively and by playing the game were able to identify coping strategies such as selling cows, seeking government assistance, and engaging in alternative livelihood means. It turned out that the farmers participating in the game tended to avoid uncertain situations and sought to simplify their decisions. On the other hand, the game provided insights into the farmers' rich ecological knowledge of environmental indicators. Based on the results of the game trial, we found that the game can facilitate instrumental and communicative learning processes among the players and facilitators. Further, the game can serve as a platform where players share their views, knowledge and perceptions of climate-related issues.

Benin: Gender matters

This study explores gender-specific responses to climate variability and related coping strategies in the agrarian context of Benin in West Africa. To date, there is only a limited understanding of gender-differentiated impacts of climate change in West Africa. Yet, there is an urgent need to integrate gender analyses into adaptation responses to climate change. Only a few studies have explored the linkages between gender and agro-ecological sustainability, decision making, and the shaping of multi-functional landscapes. In this research conducted in the context of a semi-arid ecosystem in northern Benin, we explored the following questions: How do male and female farmers perceive and react to climate variability and extreme weather conditions? Do male and female perspectives differ in terms of land-use preferences and coping strategies for climate variability? What determines related decisions under conditions of climate uncertainty? These research questions are linked to the overall understanding of resilience among subsistence agricultural systems in semi-arid ecosystems. Improved knowledge of gender-differentiated exposure and response to shocks, particularly climate change-related shocks, is key to helping communities become more resilient in the face of the risks and uncertainty associated with global climate change.

Women are more active and innovative

Rural subsistence farmers in northern Benin are suffering from highly erratic rainfall patterns. Some of the 260 households interviewed about gender-related responses to climate variability also participated in an experimental gaming exercise. The results indicate that although men and women are equally aware of climate variability and share similar coping strategies, their specific land-use related strategies, preferences, and motivations differ. In this game, both male and female farmers played the role of land manager under erratic rainfall conditions. Both methods captured some aspects of the realities they are facing and common problems in the study area. Although perceptions and adaptation measures related to climate change are quite similar between men and women, the means, capabilities and motivations vary by gender. Thus, their approaches to the risks and uncertainties were also different. While men remain the primary decision makers



in Benin households, women were found to respond in more active, dynamic and innovative ways (in terms of diversifying income sources) when dealing with rainfall variability. Men continued to engage in seasonal migration or permanent relocation as a coping strategy, which is a common response to economic hardship. Although migration or relocation may increase household resilience for both those who stay and those who migrate, women are most likely to stay and continue to cultivate crops for household subsistence and thus bear the impacts of climate change.

Games can make a difference

Thus, the differences between male and female decisions lead to varying extents and ways of exposure to risk and vulnerability to climate change-related shocks and coping mechanisms in the long run. Our study provides initial steps towards enhancing capacities for adaptation and resilience among rural subsistence farmers. We do so by addressing gender-specific responses to the effects of climate change through anticipatory learning.

About the author

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KAZAKHSTAN'S MODEL OF INTERETHNIC TOLERANCE: A SUCCESS STORY?

Ethno-cultural and language diversity are a distinctive feature of modern Kazakhstan with its more than 100 different ethnic groups such as Kazakhs, Russians, Uzbeks, Germans, etc. Unlike its Central Asian counterparts, Kazakhstan has strived for institutionalized multiculturalism.

The Assembly of the People of Kazakhstan: a model for interethnic co-existence?

The Assembly of the People of Kazakhstan plays an important role in implementing modern ethno-cultural policies of interethnic co-existence and tolerance. It aims to represent all ethno-cultural groupings through their self-organization under the umbrella of the Assembly and its network and thus to protect the rights of minority groups. The "Houses of Friendship", established with the purpose of providing state support for ethno-cultural organizations, also play a role as a platform for ethno-cultural diversity.

Kazakhstan's ethno-cultural and language policy

Officially, Kazakhstan has pursued a trilingual strategy since 2007. Its objectives are that everyone should speak fluent Kazakh (the national language), Russian (for everyday transactions and inter-ethnic communication) and English (for international communication). This ethno-cultural policy certainly helps pacify the country – especially if we compare it with neighboring and post-Soviet countries like Kyrgyzstan



and Ukraine. Nevertheless, there are nationalist sentiments in Kazakhstan. People express views such as 'Kazakhstan for the Kazakhs', or oppose Kazakh returnees (*oralmani* - see picture with protesting *oralmani* in 2011) by making them second-class citizens in the virtual space or local media. However, the Assembly of the People of Kazakhstan, its networks and Kazakh citizens continue to advocate publicly for tolerance and the free development of all ethnic groups living in Kazakhstan.

Conclusion

Kazakhstan's model for interethnic and inter-confessional tolerance has prevented violent conflicts and facilitated the peaceful co-existence of various ethno-cultural groupings in Kazakhstan for the past 20 years. Future challenges such as the inflow of labor migrants and the accommodation of Kazakh returnees do exist. Yet, the model of so-called consociationalism – only partly applied in Kazakhstan – offers perspectives for future development and challenges in the whole region. This could take the form of elements of federalism for regions as well as extended power-sharing and minority vetoes for countries experiencing ethnicized conflicts such as Tajikistan or Ukraine.

About the author



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POWER, DISEMPOWERMENT AND LANGUAGE IN PAKISTAN

Generally we presume that the prime purpose of language is communication. One understands and is understood by others by using a shared and highly intricate symbolic system, called language. But what if language is used to debar others from understanding what is being said and is thus used as a tool for systematic and structural disempowerment? I investigated these questions during my one-year qualitative field research in the judicial and education sector of Punjab province in Pakistan. When one looks at the linguistic landscape of Pakistan, it emerges that every province has its own regional language whereas Urdu is designated as the national language. However, English is the official language of the national state. This means that the lingua franca of a province is the regional language; the language of the majority of state schools and the media is Urdu, while the language of

official transactions, constitution, law and higher education is English. Here lies the fault line because if, for example, a common villager, knowing only a regional language, goes to the court to seek justice, he/she is incapable of understanding the court proceedings, as he/she cannot decipher the English-Urdu mixed code that is used in the court rooms. Based on the interviews I conducted with various lawyers, judges and clients, and my observation of proceedings at various courts, I came to the conclusion that (not) being capable of English has an impact on the people involved. The differential treatment is contributing, among other factors, to the disenfranchisement of the masses from the judicial system, and people feel disempowered.

The underlying discourse of such disempowerment calls for attention from academia. I therefore conducted

research in two bigger public universities in Punjab. Here, I found that the discourse of differential attitudes towards languages was created and perpetuated by the country's education system. For example, the highly expensive private schools use English as the language of instruction; whereas, the wide-spread state-run schools use Urdu. However, at the higher education level, both public and private universities use English as the language of instruction and examination. This means that students with a rural background, who completed their school education in Urdu, face an insurmountable challenge of competing with those highly-trained students who have always been taught in English. This competition also stretches to further practical purposes, such as obtaining admissions, better jobs, good career opportunities, etc. It can be con-

cluded that, on the societal level, this differential system excludes those who do not know a particular language, i.e., English, and disempowers them structurally from getting their due share of state-provided services, such as justice and education.

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TRAIN STATIONS, MIGRATION AND EDUCATION IN RURAL CHINA

What is the effect of migration on the education of individuals staying behind in the source region? This is a question that has induced a significant strand of the literature in economics with inconsistent findings. Furthermore, it is a particularly interesting and important question in a country like China where internal (rural-urban) migration has been restricted through the hukou system under which citizens are only able to claim public services in the area they are registered in and where a change of residence has been extremely difficult until mid-2014.

While there are theoretical arguments for positive as well as negative effects of migration on education, determining which one outweighs the other is an empirical question. Answering it with the help of data is complicated, however, as causality may run in both directions and empirical evidence comes mainly in the form of simple correlations that do not imply causality. To be specific, say that evidence of a positive association between migration and educational attainment was found: This could indeed mean that migration positively influences the investment in human capital in the source region, but it could also mean that being more highly educated increases the possibility of migrating or that another factor leads both variables to behave that way without a causal relationship existing between the two.

A methodological approach that is often applied to provide empirical evidence for this type of question is the use

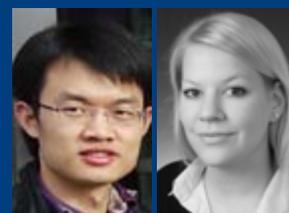
of instrumental variables that proxy, in this case, migration but are not directly causally correlated with the outcome, in this case, the education of stayers. We chose a novel instrument: the existence of a local train station in a rural village, and investigated changes within villages over time rather than average effects across villages. Interestingly, the positive effect of the availability of train services on migration through a reduction in the costs of migration appears to be outweighed by the discouraging effect brought about by train stations facilitating economic integration and industrialization, and thereby making migration superfluous. To be specific, the data show that the presence of a train station is negatively associated with migration outflows. With respect to the relationship at the heart of this research project, we find that the exposure to rural-urban migration (as measured by the village's ratio of migrants to the sum of migrants and stayers) in the village encourages education of those staying behind. Interestingly, this effect is stronger when migration of highly-educated individuals is concerned and when the effect on male stayers is investigated.

This suggests that the recent relaxation of barriers to rural-urban migration in mid-2014, a period our data do not cover, may have (unintended) positive effects on education in rural areas, in which, on average, less educational facilities and a lower investment in human capital are the norm compared to urban areas. Thereby, the relaxation of the hukou system could play an important role in minimizing the discrepancies between the urban and rural regions of China.



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THE POWER OF HYDROPOWER IN NORTH-EASTERN INDIA: OPPORTUNITIES AND CHALLENGES



This research explores the dynamics of local politics surrounding large hydro-power dam projects in the north-eastern border state of Arunachal Pradesh in Himalayan India. Large dams came back on the Indian development agenda as hydropower projects after a decade-long “break” following grassroots contestations over the huge multipurpose dam projects in the 1980-90s.

In a shift away from the 20th century discourse of nation-building and modernization, privatization now plays a key role when it comes to decisions about large dams. In fact, it is all about the profit-oriented extractive industry, which processes the ‘raw material’ water into ‘commodities’ such as electricity. This is then transported to the country’s centers of economic growth. At the same time, policy measures have addressed well-known negative impacts of large dams in the last decade. Arunachal, the epicenter of India’s hydro-power initiative (50,000 Megawatt), is inhabited by indigenous communities who claim ownership of vast tracts of land and water in the region.

This research looks into these new dynamics at the local level. Qualitative, ethnographic-based data was collected in two communities affected by two large hydropower projects in the Siang district in 2012-13.

Findings and discussion

Communities respond to dam projects in highly heterogeneous ways – even differing within a single community. Furthermore, they vary over time, ranging from contestation to negotiation to cooperation. In fact, contestation does not always mean that a project is rejected completely. It can also be an attempt to strengthen bargaining positions or to gain recognition as stakeholders.

The results of the research conducted so far indicate that

the response to or social acceptance of a project is mainly influenced by the local communities’ perception of what impacts the project will have, what mitigation measures are being undertaken and what perception other stakeholders (state and the company involved) have. How these impacts are perceived and assessed relates to a complex calculus of the communities’ livelihood practices and aspirations. Many community members see large-scale investment as an opportunity, whereas the perception of mitigation measures are largely based on the “Rehabilitation and Resettlement Policy” launched in 2008, which has been trying to address long-standing concerns regarding displacement and impoverishment. This policy is considered to be a promising but still incomplete effort. The perception that the state and the company involved have of the dam projects appears to have a strong influence on the community’s acceptance. If the local community mistrusts the intent of a company in terms of implementing promised mitigation measures, this will, of course, have a negative influence on the social acceptance of the project. In this setting, the local rural elites, positioned at the interface of the three stakeholders – state, company and community – act as amplifiers of the discontent, as well as negotiators for better outcomes for communities. In their competition for power and economic resources, the communities’ discontent becomes a resource to be used against other elites. At the same time, local elites are vulnerable to being co-opted as project advocates as they tend to be embedded in a wider network of political loyalties.

Conclusion

Though the landscape of local policies on hydropower development has changed, the process has stalled because not all project-affected communities have been recognized formally as such, thereby excluding them from the negotiation processes. In addition, policy measures do not go far enough to secure the long-term sustainability of mitigation measures. Thus, local concerns over distributive and procedural justice remain.

Funding

The research is funded by the German Federal Ministry of Economic Cooperation and Development (BMZ) via DAAD.

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WATER POLICIES IN SOUTH AFRICA EFFECTS, IMPACT AND TRANSACTION COSTS IN THE OLIFANTS BASIN

South Africa is among the 30 most water-stressed countries in the world. Many of its regions continue to face persistent water shortages as well as increasing competition between water users, a growing population and varying climatic changes. To tackle this challenge, South Africa has, among other measures, intensified efforts to implement its National Water Act. The Water Act stipulates, among other things, various Integrated Water Resource Management (IWRM) principles for better water management. The Olifants river basin ranks as the country's third most water-stressed basin and as one of the most polluted. This is due to an intensive demand for water from the main water-user sectors such as domestic, mining, agriculture, and industry. Despite the construction of new dams, concerns about water demand outstripping supply remain. South Africa's main water resources consist of major dams, farm dams, run-off river abstraction, and groundwater.

We looked at water use by sector (industrial power generation, urban, rural, mining, irrigation) in 2011 and the water balance for the Olifants catchment in the year 2010. We could see a small surplus in the water balance in 2010. However, if we include the reserve water requirements for each sub-basin, we end up with a deficit as the water requirements are higher than the available water resources. Projections indicate that the basin will have a negative water balance by the year 2035.

Integrated Water Resources Management for more sustainability

Water scarcity can be best handled by applying an integrated approach to freshwater management. South Africa is expected to meet the National Water Act goals of efficiency, equity, social development, and sustainability if it implements IWRM principles. However, measures to implement various further National Water Act policies such as water trade, compulsory licensing, effluent discharge permits, water tariffs and participatory water management through Water User Associations are facing numerous challenges like the lack of supporting institutional frameworks. Consequently, water allocation challenges such as poor water quality, poor services in water supply, water restrictions in dry periods, administrative delays, water distribution and storage difficulties still prevail. The current study therefore contributes to developing policies in the water sector and equipping decision makers with evidence-based research by examining the effects, impacts, and transaction costs of selected water policies in South Africa. We presume that water management policies affect the efficiency, quantity, and quality of irrigation water use and have significant effects on the welfare of irrigation water users. Additionally, we argue that significant transaction costs characterize the water policy implementation and compliance processes. We contacted several local experts and stakeholders for interviews. The experts pointed to a flawed policy implementation



process which lacked consistency and follow-up. They attributed this to weak institutional structures and a lack of capacity and resources. Forty percent of the irrigation water users interviewed were compliant with water tariff payments, another 40 percent were involved in Water User Associations while 20 percent complied with compulsory water licensing. There is hardly any water trade in the Olifants basin - only between family and friends. The effluent discharge permit system, which wants polluters (mainly industries and mines) to pay for their effluent emissions, is on trial in selected basins. Our analysis suggests that high transaction costs might hinder the implementation of policies as they are linked to non-operational water policies. Such evidence of existing transaction costs is important feedback to guide the design and improvement of water policy in South Africa.

Conclusions: The effects of pricing and licensing

Among the various factors assessed, we found that compulsory licensing had a positive and significant influence on water-use efficiency. Also, farmers involved in Water User Associations were likely to consume less water for irrigation. Water pricing, on the other hand, did not reduce irrigation water consumption because farmers were likely to pay higher prices for their water use. Results further indicated that farmers compliant with water pricing, compulsory licensing and membership in Water User Associations were less likely to use poor-quality water. This implies that these water policies actually foster the use of good-quality water and can thus act as indicators towards a water policy reform and better water management. Further, we find that water pricing has a negative impact on the welfare of small-scale farmers. This suggests the need for different pricing strategies for different farmer groups. Additionally, water consumption needs to be responsive to water price changes, so as to induce water conservation when the water price goes up.

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Viewpoint

INTERVIEW WITH ASIA KHAMZINA, ZEF ALUMNA

"MY YEARS AT ZEF HELPED ME TO DEVELOP A PASSION FOR RESEARCH ON LAND REMEDIATION THROUGH FORESTRY"



Ms. Khamzina, you started your career in Germany as a doctoral student at ZEF. You graduated from the University of Bonn's Faculty of Agriculture in 2006 with a thesis on the topic of afforestation in Central Asia. Since then, you have remained affiliated with ZEF in post-doc and even junior-professor positions and have continued to study this topic and the region until today. Where does this profound interest in trees and forests in Central Asia come from?

The reasons for the long affiliation are both personal and professional. I came to ZEF as a doctoral student and stayed until recently for the next 13 years. As a young scientist I was fascinated by the Center's multicultural, international atmosphere and the idea of research for development and was inspired by the Center's leadership. These positive formative years at ZEF helped me to develop a passion for work on the topic of land remedia-

tion through forestry. Next, the multi-disciplinary set-up at ZEF allowed me to initiate and engage in various aspects of this complex topic, including tree physiology and silvicultural management as well as carbon market adoption by farmers. Most recently I conducted and led research on landscape-level processes as well as modeling the assessment of potential impacts. The professional fulfillment I got from being able to work on these multifaceted issues, which are all related to the remediation of degraded land, has fueled my scientific enthusiasm over the years.

Your work has been embedded in ZEF's overall theme "Environmental and climate change". What are the main problems in Central Asia in this respect and how can science contribute to solving them?

The environmental and climate change challenges facing Central Asia are both severe and complex, which is typical for agriculturally-dependent regions. As such, the scientific contributions to helping them adapt necessarily need to reflect local priorities and to be based on integrated socio-ecological analyses.

You have also been involved in one of ZEF's largest long-term inter-disciplinary projects (2002-2012) dealing with the improvement of natural resources management in Uzbekistan. What do you consider the main benefits of this project for Uzbekistan and in what respect does the project have a long-term impact?

Collaborators in Uzbekistan called this project a "smithery of talents" acknowledging the great contribution that this program has made to local and international research



Facts & news

capacity building. The long-term engagement of the program provided the chance to assess the impacts of technologies developed at an early stage and to test their adoption under real-life conditions. This would not have been possible in a short-term activity.

The scope of your research questions and methods as well as your geographical focus have broadened in the course of your academic career. What were your most striking scientific insights or learning experiences during these years of research and academic work?

My long-term experience of various aspects of agroforestry research has given me a broader perspective and helped me to develop research tools and approaches which are useful in other geographical regions. But the most striking scientific insight was to realize that science is essentially a self-correcting activity based on a continuous process of examination and debate. Any number of research hypotheses can be developed that may be half-way consistent with an observation. So rather than aiming to find the "right answer" we are looking to eliminate as many incorrect ideas as possible.

What do you consider your greatest success in your scientific career so far?

Having been able to inspire bright, young PhD students by engaging them in my research projects and contributing to the success of their careers.

You have been a junior professor at Bonn University for the past six years with funds from the Robert Bosch Foundation. Tell us about your experiences.

During my term as a junior professor I have not met any other foreign faculty members - there are still not so many at the professorship level. However, I have established fruitful collaborations with other professors and their working groups at the University of Bonn.

The interview was conducted by Alma van der Veen



Imprint

Publisher: Center for Development Research (ZEF)
University of Bonn | Walter-Flex-Straße 3 | 53113 Bonn | Germany |
phone: +49 (0)228 / 73 6124 | fax: +49 (0)228 / 73 1889 |
e-mail: presse.zef@uni-bonn.de | www.zef.de
ISSN: 1438-0943

Editors: Irit Eguavoen, Julia Matz, Bernhard Tischbein and Alma van der Veen (resp.); Lynn Benstead (language editing)

Layout: Sebastian Eckert

Photos: ZEF and Christoph Wenzel (cover photo)

Printers: Druckerei Paffenholz

Number of copies: 1,100.

ZEF news is published in English twice a year and can be ordered free of charge at presse.zef@uni-bonn.de



Eva Youkhana is new interim director of ZEF's Department for Political and Cultural Change

Professor Eva Youkhana took over the Department's interim leadership from Professor Anna-Katharina Hornidge as of September 1, 2015. Eva Youkhana is a social anthropologist by training, with degrees from the Universities of Bonn (Bachelor), Cologne (Master), Frankfurt (PhD) and Bonn ("Habilitation"). Her geographic research focus is on South America, whereas her thematic research interests are migration and development.



Professor Paul Vlek retired as university professor



Professor Paul Vlek (67), one of the long-term and founding directors of ZEF, has retired as professor. He joined the university of Bonn and ZEF in 1998. He was also the initiator of the West African Science Service Center on Climate Change and Adapted Land Use (WASCAL), a BMBF-funded research and capacity building project.

Board Meeting at ZEF

The International Advisory Board met at ZEF from September 16 to 19, 2015. Prof. Dr. Mohamed H.A. Hassan, former President of the African Academy of Sciences, Kenya, gave a public lecture on "The Essential Role of Science Academies in Society" on Wednesday, September 16.



RLC workshop on human rights and the empowerment of the marginalized

From September 26 until October 1, 18 young researchers from ten different countries worked together with representatives of two Right Livelihood-awarded human rights organizations at the Right Livelihood College Campus in Bonn. The workshop focused on research and education in the field of human rights in Asia and Africa as well as on practical concepts and approaches to empower marginalized social groups.

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What is your PhD research about?

My PhD research looks into the experiences of male and female migrant workers in and outside their working places in Malaysia. I look specifically at documented and undocumented, low-skilled laborers from Indonesia, Myanmar, Vietnam, The Philippines, Nepal and Bangladesh, who work in the manufacturing and construction sectors.

Part of the literature deals with the labor migration regulations specifying the rigid control of migrants' employment and movement in the receiving countries. Other studies focus on the migrants' perspectives, e.g. on the formation of migrant-networks along national lines. The innovative aspect of my research is to include both aspects. I want to capture a comprehensive picture of the lived and every-day realities of migrants. The main findings reveal that migrants are neither victims nor fighters, but ordinary people looking for ways to improve their living conditions in terms of securing their incomes, developing skills, providing assistance to others when necessary, and interacting culturally and socially.

Why did you choose Penang as your research site?

Despite facing social, political and natural threats and disasters, Penang state retains its potential as an island of high economic and cultural diversity. It has a high level of urbanization (90.8 percent) and the second highest population density in Malaysia. It is a major production center in the global electronics industry with mainly international manufacturers of semi-conductors and computer hardware. Penang currently accounts for 25 percent of Malaysia's total electronics exports. In addition, the establishment of the Industrial Free Zone and the construction of buildings in Penang have attracted many workers in these sectors.

So what kind of numbers are we talking about when we talk about migrants in Malaysia?

In November 2014, Human Resources Minister Richard Riot Jaem reported that of the "6.7 million foreign workers in the country, 4.6 million had entered the country illegally". Furthermore, the government is planning to bring in another 1.5 million workers from Bangladesh as announced by Home Minister Ahmad Zahid Hamidi on June 25, 2015. (Source: Malaysiakini, July 8, 2015).

What kind of migration and migration policies does Malaysia have?

The policies of Penang's government stipulate that employing local citizens takes priority over employing foreign

workers. Therefore, employers have to find local candidates first and only if they fail are they allowed to recruit foreign workers. Employers are permitted to recruit workers from mainly 15 countries through direct employment by a company (the employer deals directly with the authorized bodies in the migrant's country of origin); or through indirect employment by a company or a recruitment agency (the employers pay for their services); or via the new outsourcing system which was introduced in 2005. Here, the agents are paid directly for recruiting and managing the workers for the duration of their employment.

What are the working conditions for migrant factory and construction workers like in Penang?

Most employers provide housing for their foreign employees. However, there is a significant difference between construction workers with a regular and those with an irregular status. Regular and registered factory workers are provided with transportation and accommodation arrangements, a monthly pay slip, health-care services, can negotiate their daily wages, and so on. In contrast, construction workers build temporary huts next to the construction area they work in and then move on to various project locations.

How do government policies affect migration and working conditions?

The policy, laws and regulations applying to foreign workers have become increasingly stringent since 1970. Nevertheless, Penang's main economic interest remains to dispose of cheap labor in order to be competitive in the global market. On the other hand, the government tries to respond to a certain threat arising from the overwhelming numbers of foreign workers coming into the country. For instance, the laws on low-skilled foreign laborers are inflexible as to deter them from social integration. They are barred from working outside the sector they were originally employed in, have fixed employment periods, intermarriage between foreign workers and local citizens as well as pregnancies of female foreign workers are prohibited, and so on.

What are the differences between refugees and work migrants in Malaysia? Is it possible for illegal migrants to get a work permit?

In general, there is no legal protection for refugees in Malaysia, although it hosts most of the refugees from Myanmar. Refugees are often treated in the same way as "undocumented migrants" and are susceptible to arrest, detention and deportation. The government tries to curb illegal migration in different ways: the Biometric Identity Cards introduced in 2008 are a means to combat the expansion of the "fake document" industry. Furthermore, undocumented workers were able to legalize their status under the Illegal Immigrant Comprehensive Settlement Program introduced in 2011. Around 130,000 undocumented workers were legalized under this program in November 2011.

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GERMAN-BOLIVIAN PARTNERSHIP FOR BIODIVERSITY AND ENVIRONMENT

"Integrating biodiversity measures in environmental impact assessments" is a long-term German-Bolivian partnership between ZEF and the Environmental Engineering Department of the Universidad Católica Boliviana, Bolivia. The research cooperation aims to strengthen the exchange on biodiversity conservation research between these two institutes. In addition, it strives to enhance the science-policy interface on biodiversity and ecosystem services by involving additional regional partners, including universities, policy makers, and governmental as well as non-governmental organizations.



Background

Bolivia is a country of extremes that harbors an outstanding variety of ecosystems ranging from the Andean highlands to lowland rainforests, from swamp savannas to semi-arid deciduous forests and even deserts. Bolivia belongs to the top ten countries with the highest species richness worldwide. Yet, its biodiversity is currently facing multiple threats. Despite its abundant natural resources Bolivia remains the poorest country in South America. The government is therefore putting strong political emphasis on economic growth, which has led to even more pressure on ecosystems, e.g. by increasing deforestation.

Environmental Impact Assessments

Like many other countries, Bolivia has reacted to increasing environmental pressure by introducing Environmental Impact Assessments. Such assessments are a method to estimate the environmental consequences of development activities such as infrastructure development projects prior to their implementation. Environmental Impact

Assessments then propose alternatives, countermeasures or adjustments to minimize negative impacts. Thus, these assessments can be powerful policy instruments to ensure a certain environmental compatibility of plans and projects. However, in Bolivia the assessments rarely take into account the loss of biodiversity and ecosystem services caused by such projects. There are few indices for assessing biodiversity in place in Bolivia and these are mainly focused on aquatic environments. Thus, the protection of Bolivia's great diversity of ecosystems and its rich biodiversity requires the development of biodiversity indices that are adapted to local conditions and ecosystems. This is where the cooperation with ZEF comes in: The exchange with German partners aims at the joint development of norms, indicators, and methods which are adapted to locally relevant parameters and conditions.

Project approach

The partnership has the following main objectives:

- Develop a concept for integrating biodiversity aspects into Bolivian Environmental Impact Assessments based on the consolidation and adaptation of existing tools and guidelines to conditions in Bolivia.
- Design and jointly develop a module for the university education of environmental engineers at the Universidad Católica Boliviana.
- Work on the practice-science-policy interface of biodiversity and ecosystem services by initiating discussion on Environmental Impact Assessments with the relevant Bolivian political institutions and biodiversity conservation practitioners.



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"FARMERS INNOVATE OUT OF CURIOSITY, COINCIDENCE OR NECESSITY"**In which region did you do your research, how long did you stay there, and why did you choose this region?**

My PhD research was on the identification, determinants, and welfare impacts of farmers' innovations in rural Ghana. From August 2012 to May 2013, I conducted my field research in the Upper East region of Ghana, which is one of the selected areas for implementing the core research program of WASCAL (West African Science Service Center of Climate Change and Adapted Land Use). Moreover, Upper East is a rural region with a high population density, low food security, limited infrastructural services, and increasing challenges such as climate change and soil infertility. This is the kind of challenging environment where one expects to find many local innovations. My research started with identifying promising innovations by farmers. I therefore assisted my tutor, Tobias Wünscher, in implementing an innovation contest throughout the region between August and November 2012. In the contest, farmers competed by presenting their independently developed innovations. The top three innovators were awarded prizes during the National Farmers Day celebration. I also collected survey data from 409 farm households in three districts in the region (Kassena Nankana East, Kassena Nankana West, and Bongo), which I used to analyze the drivers and impacts of farmers' innovations.

**Why were you interested in farmers' innovations, and what exactly were you looking at?**

Research institutions have developed numerous technologies that are disseminated to farmers for adoption. However, many of these technologies are not adopted by smallholders because, among other things, there are difficulties with accessing them, there are high costs, and the technologies often do not fit local conditions. However, some farmers are very creative and have developed their own locally-adapted innovations to address the challenges they face. Nevertheless, the scientific literature on agricultural innovations focuses primarily on the innovations developed by researchers, while those developed by farmers are often neglected or under-valued. So my research, in contrast to existing studies, looks at innovations developed by farmers themselves. I also examined whether such innovations can play a role in improving the livelihoods of

rural farm households, and how to strengthen farmers' capacities for generating more of such innovations.

How are farmers' innovations related to climate change?

Most of the identified farmer innovations are yield-related. Furthermore, these innovations are locally adapted and can help to cushion the effects of climate change. Some farmers' innovations also emerge directly in response to environmental shocks. One of the main findings of my study is that farmers who develop innovations are more resilient to climate shocks than those who do not.

What makes farmers innovative and in what way do farmers' innovations contribute (or not) to households' welfare?

Farmers innovate either out of curiosity, by coincidence or driven by the need to increase production and solve problems. I also found that the Farmer Field Fora (FFF) program, which is being implemented by Ghana's Ministry of Food and Agriculture, helps to build the capacity of farmers to innovate. The FFF is a platform for innovations and mutual learning among agricultural stakeholders, particularly farmers, agricultural extension services agents, and researchers. I analyzed the effects that farmers' innovations have on a number of household welfare indicators. I discovered that farmers' innovations play an essential role in farmers' households and innovations can significantly improve the income and consumption expenditure of the innovators. In addition, innovations contribute to increasing food security in the innovative households because these spend more on food consumption, and therewith reduce the length of the hungry season.

What were your most exciting findings?

One of the most interesting findings of my research is that farmers do not only adopt but also generate innovations. Farmers' innovations may emerge by coincidence, but can also be induced through capacity building programs such as those provided by the FFF. Also, farmers' innovations can complement the innovations developed by public and private research institutions in addressing the challenges farmers face and in reducing rural poverty. Finally, the opportunity to win prizes through a contest can serve as an incentive for farmers to reveal their innovations instead of keeping them a secret.

The interview was conducted by Jelana Vajen, ZEF.

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