In focus: Governance of natural resources

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Editorial: Sustainable Development Goals without science?

The debate on sustainable development goals (SDGs) is progressing in the United Nations context. The top goals are “end extreme poverty” and “end hunger” – which is rightly so. In the list of 17 goals currently in circulation, only the last one mentions science. Besides that science has to be considered an instrument, not a goal, it is surprising how little a role science is to play in the emerging SDG agenda. In view of the fundamental challenges for human development, sustainable use of natural resources, and protection of nature as well as the ambitious SDGs one wonders about sustainable development without science. Solutions to sustainable development problems are not ready for use on the shelf. The SDGs cannot be achieved without massive innovation – technological and societal – and that depends largely on scientific research and innovation. Emerging economies and low income countries can expect that the science capacities in the richer world are shared a lot more with them while they scale up their own science spending and proceed with science policy reforms.

Sustainable consumption and the fate of tropical forests: Can trees make us happier?

There is both good and bad news on tropical forests. Some countries, most notably Brazil, have reduced deforestation to historically low levels. But, overall forest loss is still on the rise in the tropical world. Increasing global demand for agricultural land is expected to reinforce pressures on the remaining primary forests, particularly in the southern hemisphere. Two strategies to address these pressures tend to dominate in the forest conservation debate, namely, (1) productivity-enhancing technological innovation in agriculture and (2) improved forest governance. Clearly, technological intensification comes with the potential to reduce the amount of land needed for food production. At tropical forest margins, however, technological change has often boosted demand for land, causing additional forest loss. Effective forest governance thus tends to be a necessary condition for the conservation benefits of technological innovation to materialize on the ground.

It is probably not such a big surprise, after all, that an emerging economy like Brazil has successfully pioneered innovative forest governance schemes. Apart from the political will, effective forest law enforcement hinges on sophisticated land cover monitoring systems and well-equipped environmental protection agencies. Even under the optimistic scenario of efficiently functioning forest conservation mechanisms in a new global climate policy deal, millions of hectares of primary forests will be lost before similarly effective environmental governance mechanisms are in place throughout the tropical world. But, economic tradeoffs vis-à-vis increasing world prices for food, feed, fuel, and fiber are likely to push natural ecosystems up for short-sighted bargains for many years to come. Are tropical forests doomed?

Conservation policy research is only beginning to pay attention to a set of relatively recent institutional innovations along major commodity value chains that may pave the way towards complementary consumption or demand-based approaches to tropical forest conservation 1.

The Brazilian Soy Moratorium is just one of these innovations and was instituted in 2006 by soybean producer organizations following a Greenpeace report linking fast-food products to illegal deforestation for soy-based feed production in Brazil. Its success in curbing Amazon forest loss remains to be proven, but image considerations have induced a powerful industry to adopt credible and costly conservation measures, including monitoring and sanctioning mechanisms. Knowledge about value chain linkages and consumer awareness were key drivers of change in this process.

Tracing back global consumption patterns of key agricultural commodities to land use change and ecosystem services loss in the developing world is a major research challenge that is being addressed by increasingly multidisciplinary research teams in Europe and beyond. But, improving product traceability is not enough in order for demand-based conservation initiatives to thrive. Consumers actually need to use this information and make choices that signal their sustainability preferences to producers and retailers.

Sustainable consumption – how?

So called “sustainable consumption” has been a vision of researchers and conservationists for more than a decade, but advocates of “national veggie days” and similar regulatory policy approaches have found it difficult to gain majority support. Psychologists, behavioral economists, and members of the “happiness research” community are increasingly advocating alternative strategies to promote sustainable consumption behavior. One approach called “nudging” can help to alter undesirable consumption behavior that results from limitations to human cognitive capacity and contribute to closing gaps between actual behavior and accepted social norms. Simply rearranging the placement of food items in supermarkets or providing small incentives may then sometimes be enough to “nudge” consumers towards more sustainable choices and thereby actually make them “happier”. Some research also suggests that environmentally damaging social norms and values can be influenced and eventually changed through “social norm management”, i.e. advertising campaigns or appeals from respected individuals 2. Clearly, social norms are complex systems and naive manipulation attempts are likely to backfire in unexpected ways. But, with the promise of a greener planet with happier people it is arguably worth investing in more research on “sustainable consumption” as a complementary conservation strategy.

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References


Some could have it all: Comparing cotton cultivation in Kazakhstan and Uzbekistan

In May 2014, ZEF senior researcher Anastasiya Shhtaltovna presented the results of a comparative study on cotton farming and production in Kazakhstan and Uzbekistan at the “Open Society Foundation” in Washington D.C. during a two-day event on ‘The social cost of the Uzbek cotton industry’. The study was co-authored by ZEF-director Anna-Katharina Hornidge and sponsored by the Open Society Foundation.

Cotton cultivation could be a lucrative business in Uzbekistan.

In fact the countries have a similar history, but after the break-up of the Soviet Union they chose different paths. The main difference between Kazakhstan and Uzbekistan regarding cotton production is its relative importance to each country. In Uzbekistan, cotton is cultivated on up to half of the country’s total cropland area and cotton is of immediate strategic importance to the national budget. The country is still one of the world’s major cotton exporters, accounting for 11 percent of the world’s cotton exports. Kazakhstan benefits from more important sources of rent such as oil and gas. Therefore, only an average of 140,000 ha in five districts of Southern Kazakhstan is allocated annually to the cultivation of cotton. As a consequence, two entirely different policy and farming approaches have been adopted in the two case study countries.

Role of the state and scope of action for farmers involved in cotton cultivation

The government of Kazakhstan creates advantageous conditions for cotton farmers by offering a range of different subsidies as well as freedom of choice on what to grow to maximize profit. In contrast to this, Uzbek farmers work under a state procurement system that exerts strict state control over the agricultural production system, with only limited opportunities for farmers to make profits. So farmers spend lots of time dealing with state inspections instead of actually farming. They even have to fight for permission from the state for various kinds of transactions such as obtaining permission to grow crops other than cotton. Ways to obtain cash money and inputs for growing cotton are also different in the two countries: Kazakh farmers have access to funds allocated from a range of banks as well as to their own savings. There are also numerous private input providers, from whom Kazakh farmers can purchase any input they deem necessary. Uzbek farmers have to negotiate with the bank in order to gain permission to decide how to use the money they ostensibly have (i.e. how to invest and operate their farm business). Moreover, in Uzbekistan almost all agricultural service providers are under government control, and thus have a monopoly status. Facing these difficulties is a great challenge and rarely overcome by creative initiatives on the part of farmers.

Main research findings and recommendations

A joint workshop for Uzbek and Kazakh cotton-growing farmers was organized to exchange their experiences. One of the results was a cost-benefit analysis of cotton growing. It shows that although the average yield in Uzbekistan is higher than in Kazakhstan, the cotton production in Uzbekistan is unprofitable for the average farmer as it leads to a loss of roughly 585 USD/ha. In Kazakhstan, cotton is a profitable venture, with average earnings of around 1,500 USD/ha (including state subsidies for cotton growing) per farmer. The Uzbek farmers developed three scenarios for improving their cotton production system: (1) under a capitalist market system (2) under an improved state procurement system and (3) under a cooperative farming system. Based on these scenarios, the following recommendations were made: state intervention in farmers’ business must be reduced to a minimum; prices for cotton must be increased and transparency strengthened; access to cash and profit has to be guaranteed; the tax system for Uzbek farmers has to be simplified; there is a need for alternative agricultural service providers; agricultural producers have to be developed to become entrepreneurs; land rights have to be assured; favorable conditions should be created in which different models of cotton growing can co-exist, similar to the experience in neighboring Kazakhstan.

Organic farming in Bhutan: a way of life but also hard work for happiness

Practicing organic farming is a main component of the “Gross National Happiness” strategy in Bhutan. Sonam Tashi, an agricultural scientist and doctoral student at ZEF, carries out a feasibility study of his home country’s plans to have a 100%-based agriculture by 2020. He compares the performance of organic and conventional farming.

“Organic farming is increasingly being promoted worldwide as a better alternative to conventional farming in terms of producing healthy food and alleviating poverty. It is also considered more sustainable because it causes relatively less environmental damage”, tells Sonam Tashi. For his feasibility study, he looks into factors such as yield, soil nutrient status, cost-benefits and socio-economics and analyzes support provisions, including policies to achieve the country’s ambitious goal of being fully organic by 2020. “By looking into the constraints prevalent in Bhutan and into the increasing influence of conventional farming, I analyze how and to what technological, management and social extent organic farming can meet the expectations”, he explains.

Organic farming: challenges and constraints

“Organic farming, though theoretically based on the principles of low-cost and low-input such as fertilizers, also has its price”, says Mr. Tashi. “First of all, organic farming is mainly a small-scale business, which means farmers generally have less yield and produce to sell. Furthermore, this type of farming is labor-intensive, especially if you keep in mind that Bhutan consists of up to 70% of forests – spread over hills and mountains. The government has stipulated that this level of forest cover has to be maintained. Fifty-one percent of our land is so-called protected area. So, you have many regulations to stick to as a farmer, which limits your options. Most farming areas are surrounded by forests, full of wildlife, which poses further challenges. Finally, to be competitive on the international markets for organic products, you have to certify and label them, which is a complicated and above all expensive process to follow”. Solutions: preliminary insights

Although Mr. Tashi has not come up with final conclusions yet, he definitely sees a need for more support for Bhutan’s farmers. “Bhutan may be statistically one of the happiest countries in the world, but it does not belong to the monetarily richest ones”, he says. “Our main sources of income consist of exports of hydropower, tourism, construction and agriculture. Bhutan has no seaside and therefore no ports, so exports costs via air are too high. In addition to financial support, farmers need to be trained to succeed in organic farming methods. We actually do receive support, e.g. from the Vandana Shiva Foundation in India, which has extended its training programs for organic farmers in India to Bhutan. We also receive help from Japan in developing and improving agricultural technologies. But still, as an academic I think more needs to be done to make the whole endeavor a success story”, Mr. Tashi concludes.

His Majesty the King of Bhutan awarded Sonam Tashi with the National Order of Merit for academic excellence in 2012. He is one of the few academic experts working on organic farming in his country.
From maximizing to optimizing resources use: lowering fertilizer input in China

In many of the world's agricultural regions, high yield levels are achieved through an enormous input of chemicals. Nitrogen (N) fertilizer application in China is a typical example: more than 30 percent of the global N fertilizers are applied in China on only 7 percent of the world's arable land. China's farmers tend to apply on average 30 to 60 percent more than the knowledge-based optimum rate of mineral nitrogen fertilizers.

Fertilizers are cheap and easy to obtain in China. However, because of over-application, only 18 to 35 percent of the Nitrogen is absorbed by the crops. Large amounts of the non-used fertilizers end up in aquatic ecosystems, driven by surface and subsurface water dynamics. As negative consequences, these ecosystems are impacted by eutrophication and pollution, leading to their malfunctioning and health problems among human beings. Therefore, we urgently need alternative strategies to raise agricultural productivity, lower the pressure on ecosystems, reduce negative health impacts and in turn enhance the sustainability of agricultural production. These strategies are to be based on optimizing the input-output processes and considering the environmental impacts instead of only focusing on maximizing agricultural yield.

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How models can support sustainable management of groundwater resources in Gaza

The Gaza Strip has been in dramatic turmoil over the past months. Apart from its involvement in the armed conflict, there are a bunch of long-term issues affecting the region. Water scarcity is one of them: Gaza faces serious challenges with regard to the sustainability of its water resources. In addition to the lack of water quantity, mainly a consequence of its semi-arid climate, overall water quality is poor. The Gaza aquifer is polluted with high levels of nitrates and chlorides and the Wadi (valley) Gaza with the sewage from towns and camps. This poses a threat to the sustainability of the entire water system in the Gaza Strip.

Therewith, Gaza is a typical example of a coastal region under pressure of climate and land use changes. Additional challenges result from a high population density; a dependency on surface and subsurface runoff mainly generated outside the Gaza Strip; and a high demand for water for agriculture and industry. Thus, proper development planning is urgently needed to solve these problems and ensure a sustainable water environment in the future. In order to do so, it is essential to improve the information base and provide appropriate management indicators.

This doctoral research conducted at ZEF aims to contribute to this effort by evaluating the quantitative impacts of human activities on water resources.

Objectives

The main goal of this research is to provide decision-makers with tools for the sustainable development planning of water resources in Gaza. The research simulates in an integrated way the water resources system, including surface and groundwater.

Methodology

The research approach consists of three major steps: (1) coupling of models for surface water (SWAT), groundwater (MODFLOW) and matter dynamics (MT3DMS package) to quantify surface-groundwater and quantity-quality interactions; (2) developing a new concept for a sustainability index and a spatial sustainability index for the water environment of the Gaza Strip; and (3) carrying out a multidimensional analysis of the urbanization and water environment of the Gaza Strip under consideration of available development planning alternatives (urbanization in terms of wastewater, land use, seawater intrusion, storm water harvesting, sewage system performance).

Preliminary findings

Expanding urban areas affect the water system in a twofold way: they lower the groundwater recharge and enhance the runoff of surface water. This impact of urban area expansion was quantified using SWAT simulations. We developed an urban-surface runoff index (USI) and an urban-percolation index (UPI) to conduct a micro-level evaluation of different expected urban change scenarios in the sub-basins. These indices reflect the percentage of change in surface runoff (USI) or in percolation (UPI) caused by a presumed 1% increase in urban area at the sub-basin level. The global urban-surface runoff index (GUSI) and the global urban-percolation index (GUPI) were derived to measure the influence of urban expansion on the macro level, the Gaza coastal aquifer.

From ideas to implementation

Based on our simulation models and measurements, we assessed the potential future impact of urban expansion on the groundwater table level in the region. We detected and quantified a significant decline in groundwater levels. We also identified areas sensitive to further lowering of recharge and/or rising groundwater withdrawals. As a means to combat these trends, we highly recommend increasing the recharge and reuse of treated wastewater and decreasing groundwater depletion caused by storm water harvesting and/or desalination. This information can help decision-makers to frame planning and coordination activities aimed at water resources sustainability.

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"I can build on a very strong team"

You have been appointed Director at ZEF for the next three years. What are your ideas on the concept of development?

Development is always considered as a form of ‘positive’ change. However, defining development depends on who is assessing what is positive. Currently, we have a strong focus on (economic) growth. But there are also divergent definitions, for example focusing on human well-being or happiness, as employed in Bhutan. Definitions of ‘development’ by state organizations probably differ from those made by subsistence farmers, international donors and development organizations or people who are supposed ‘to be developed’. The variety of definitions also means that actions are guided by a multitude of views on development. Here, development acts as a so-called boundary concept. It is obvious that development can never be a linear process, but rather interlinks many different processes. It is therefore an open concept and platform that can bring very different actors together.

You wrote your doctoral thesis in 2007 on the Knowledge Society, comparing Singapore and Germany, and your habilitation this year was about ‘discourses of knowledge’. Why this fascination with knowledge?

‘Knowledge’ as an open concept – similar to ‘development’ – can comprise stocks of high-level technological expertise but also farmer-driven ideas on development expressing how they perceive their future and how their actions are guided by this perception. This is where it becomes very relevant to development research.

Your geographical research focus has shifted in the course of the last academic years from South East Asia to Central Asia. Was this shift coincidental or a deliberate choice?

Originally I studied Southeast Asian Studies, and hold a master’s degree in Indonesian language. I am convinced that qualitative and quantitative ethnographic research requires local language skills and cultural expertise. Yet, at the same time, we need strong conceptual and methodological groundings for conducting social science research. Moving from Southeast Asia to parts of Central Asia implied that I could gain experience in project coordination and management. First, I coordinated the social science side of a BMBF-funded and ZEF-led project in Asia implied that I could gain experience in project coordination and management. Yet, at the same time, we need strong conceptual and methodological groundings for conducting social science research. Moving from Southeast Asia to parts of Central Asia implied that I could gain experience in project coordination and management. First, I coordinated the social science side of a BMBF-funded and ZEF-led project in Uzbekistan, then I led two smaller projects in Tajikistan and became involved in and coordinated the Crossroads Asia competence network. In each of these projects I collected new experiences at additional research sites, in local settings and with regard to scientific project management.

What are your plans, what will be your focal points, your goals for the coming three years?

I can build on a very strong team at ZEF’s Department ofPolitical and Cultural Change. We have our core themes and have been working on several world regions, thus acquiring substantial expertise over the past years. Yet, what I would like us to do in the coming three years is to enhance the interaction between the research fields and themes we conduct. We can do this by putting our current implicit focus on different change processes into a joint frame. We work on environmental change processes such as climate change in Western Africa and Southeast Asia, as well as socio-economic processes in Central Asia and the Caucasus. It all comes down to processes of change: we see that people mobilize different types of knowledge, develop their own ideas and innovations in creative manners in order to cope, adapt and live with these challenges and the changes they experience. So we will continue working on the local level, as well as conducting ethnographic research. But we will also include quantitative social science research and qualitative contributions using, for example, multi-agent based models in our interdisciplinary projects with the economic and natural sciences at ZEF.

What is the specific contribution of the social sciences to ZEF’s research agenda?

Within the interdisciplinary teams at ZEF, I see it as one of the tasks of the social sciences to encourage and ensure continuous processes of reflection on research ethics, on the way we build and foster research cooperation, how we plan and implement research. Yet, within our own social science research, it is our task to use the locally collected, empirical research material in order to abstract from it and develop non-western, empirically-based mid-range concepts along Robert Merton’s middle-range theories. Together with our local partners, we want to contribute to conceptual as well as methodological debates and to reducing the continuing western/northern bias of the social sciences as practiced in the epistemic centers of the world. This is what we can offer. We have the empirical material and the analytic capacities. So let’s take this further.

The interview was conducted by Alma van der Veen

Watch the full interview on our youtube channel: http://www.youtube.com/watch?v=sF8PzXRZ7TA

Viewpoint

Interview with Anna-Katharina Hornidge, new Director and Professor of ZEF’s Department of Political and Cultural Change as of August 1, 2014

Paul Walker spoke at ZEF
Paul F. Walker, Director, Environmental Security and Sustainability, Green Cross International and Laureate of the Right Livelihood Award 2013, gave a lecture on the abolition of chemical weapons at ZEF, April 9, 2014. You can watch the lecture here: http://youtu.be/noWttnCV1W4

"Independent media in a time of war"
Amy Goodman gave a talk on “Independent media in a time of war” on June 30. About 200 guests attended. The event was organized by the Right Livelihood Campus Bonn at ZEF. http://youtu.be/phe_iGOSFhM

Right Livelihood Campus Bonn becomes RLC Global Secretariat
In May 2014, RLC’s headquarters for global research and education, the Global Secretariat, moved officially from Penang, Malaysia, to Bonn. The opening ceremony of the RLC Global Secretariat was held in the Old City Hall of Bonn on Monday, May 26, 2014.

Joachim von Braun is “Bonn International Ambassador”
Joachim von Braun was appointed by Bonn’s Lord Mayor Jürgen Nümpch to serve as a “Bonn International Ambassador”. The role of Bonn International Ambassadors is to strengthen international relations for the City of Bonn.

Pakistanis visit ZEF
About 40 Pakistani students aged between 17 and 22 visited ZEF in July this year. The students were the ‘exam toppers’ for the whole of Pakistan in various topics and at various levels (school and university undergraduate).
Private companies can contribute to reducing poverty in Ethiopia.

The Ghanaian-German Center for Development Studies is funded by the German Academic Exchange Service (DAAD) as one of its five “Centers of Excellence” in Africa.
Doctoral field research in Ethiopia: how aspirations can boost ways out of poverty

In your research, you correlate individual aspirations and poverty. Can you tell us more about this concept?

The concept of aspirations was originally developed and is being widely used in psychology, sociology and related fields. Economic sciences used to be mainly based on quantitative methods and on the assumption that people behave rationally. This, of course, affects their decision-making accordingly. But there are phenomena that cannot be explained by rational behavior alone. In Ethiopia, where about 80% of the population lives from agriculture, the use of agricultural technologies is still low. This is the case despite long years of efforts by the government and other actors, including foreign aid and investment programs, to promote the use of improved agricultural technologies and practices. To understand and explain this situation, we have to look at the individual level – meaning at the aspirations and expectations of farmers. This approach is quite new for classical economics.

So how did you apply this approach during your field research?

To find out why the adoption of agricultural technologies in Ethiopia is so low, I conducted surveys among farmers at three study sites. One of Ethiopia’s main crops is widely grown at each site: maize, wheat or teff. Around 390 households (approximately 700 individuals) participated in the surveys. The households I interviewed had already previously participated in a baseline survey with follow-up surveys by a local organization. Thus, I could build on these data to collect enough information to set up a so-called aspiration index, consisting of information about wealth, income, social status and education. During the surveys I asked the farmers about their aspirations and expectations and other behavioral indicators on top of agricultural and basic socio-economic indicators.

You focused especially on education as an indicator for aspirations. Don’t all parents want their children to go to university?

Not necessarily. Aspirations are rather context-driven. So your social network and environment (so-called reference groups) also determine what you expect to achieve in your life and that of your children. We speak of aspiration window, gap and failure. The window is about your cognitive life and that of your children. We speak of aspiration winners and losers. The window is about your cognitive life and that of your children. We speak of aspiration winners and losers. The window is about your cognitive life and that of your children. We speak of aspiration winners and losers. The window is about your cognitive life and that of your children. We speak of aspiration winners and losers. The window is about your cognitive life and that of your children. We speak of aspiration winners and losers. The window is about your cognitive life and that of your children. We speak of aspiration winners and losers. The window is about your cognitive life and that of your children. We speak of aspiration winners and losers.

What can you reveal about your outcome so far?

I am yet to analyze the data I have collected. But my literature review shows that higher aspirations and expectations lead to a higher effort to improve one’s outcomes and, of course, the other way around. I am testing this theory in terms of investment in agricultural technologies and innovations by farmers. Ethiopia is not an easy case – literature suggests that its people tend to be a bit fatalistic. Experience in the country has shown that agricultural development is not only a matter of resources and technology. We have to understand what factors influence a farmer’s decision-making so things can be changed and improved. This is what I can contribute as a researcher – advising policy makers and other stakeholders in my country. In the context of my research, I think the government has started following this innovative approach. For example, on multiple occasions it has awarded medals to “successful” farmers in a televised ceremony – the effect of which may boost the aspirations of other farmers.

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