Rural21

The International Journal for Rural Development

No. 4/2012
Volume 46
ISSN 1866-8011
D 20506 F

Responsible investments in the food chain

Photo: F. Barakat/UNIDO

www.rural21.com

Editorial

Dear Reader,

Since the 2007/2008 world food price crisis at the latest, the international community has tirelessly reiterated the key role played by the agricultural sector and rural areas in efforts to combat hunger and poverty. The many years of neglect of the sector in international cooperation – and in many of the policies adopted by the affected countries themselves – is now to be remedied as quickly as possible. Large sums have been pledged and, in the best case, have been deployed. But will those for whom they are intended, namely the smallholders and rural poor, profit from all this investment? What shape must investments take in order that they really reach the target group? And which – desired and undesired – side effects are to be expected? The authors contributing to the Focus section of this issue of Rural 21 have explored all these questions and more.

The increasing integration of developing countries in global markets has caused modern food value chains to spread rapidly. Some praise this development as an engine for rural income, mobility and poverty reduction, while others see it as a process that merely amplifies existing inequalities. How do these value chains operate precisely? How can smallholders be integrated within them, and what conditions must be in place if small farmers are to profit from them? Frank Hartwich gives an overview (pages 12–15).

Miet Maertens wanted to know how the participation of rural households in these supply chains affects household welfare. Her study of the vegetable export market in Senegal shows that, beside the direct income and employment effects, there are also important indirect effects. For instance, the employment of women in the processing sector has not only improved their social situation: the strengthening of female bargaining power in the household has also caused the school enrolment rate of primary school-aged children to rise significantly (pages 20–22). Yet value chains need not necessarily be export-oriented for them to contribute to poverty reduction in rural areas: the expansion of domestic supermarkets in Kenya has led to a boost in productivity among the smallholders who have supply contracts with the supermarkets. Furthermore, poverty rates among supermarket suppliers have dropped by one fifth, as Matin Qaim and Elizaphan Rao have found (page 23).

A result of "supermarketisation" and the rising global demand for processed and convenience food is that large-scale agro-processors are gaining ever greater importance. This is also apparent in sub-Saharan Africa, where investment in the sector, both by foreign investors and by local companies, has progressively increased since the mid-1990s. However, the complicated nature of procurement and land ownership structures in the region, the dominance of informal value chains and weak government structures make it difficult to achieve a win-win situation for all partners, notes Michael Brüntrup (pages 24–27).

The question of how to enhance the interaction between farmers and receiving hands has exercised development agencies for many years. Thomas Breuer and Yotsawin Kukeawkasem present the partnership farming approach of GIZ (pages 28–30). The willingness of business partners to contribute to a broader agricultural education for farmers is a key element of that approach. On the other hand, the private sector neither can nor should be the sole player when seeking to impart to farmers the knowledge and abilities they need to become embedded in value chains, stresses Kristin Davis: an individual mix of public and private providers, of basic and specific training is key to achieving sustainability and making investment successful (pages 32–33).

In no realm of investment are calls for responsibility so prominent as when it comes to the land resource, particularly in view of the accelerating "rush for farmland". However, when judging which is the "right" type of investment to attain food security and sustainability, several key factors tend to be ignored, points out Benjamin Luig: these include the link between farm size and efficiency of land use, and the non-monetary components of investment (pages 16–18). Roman Herre presses the point that farmers themselves are the most important investors in efforts to combat hunger and realise their right to food (page 34). In his view, therefore, the question of how to make large-scale land acquisitions sustainable is in itself misguided.

Have an interesting read,

Silvia Richter

Partner institutions of Rural 21:

BMZ Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung

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Photo: European Commission

Photo: F. Hartwich

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Photo: S. Rajeesh

Protecting our most precious resource

It is estimated that 24 billion tons of fertile arable land world-wide is lost through erosion each year. At the same time, urbanisation is causing the extent of arable land across the world, which accounts for a mere twelve percent of the Earth's surface, to further decrease. But without fertile soil, neither world hunger nor climate change can be successfully combated. This is precisely the context that the First Global Soil Week sought to draw attention to. It was organised by the Institute for Advanced Sustainability Studies and held in Berlin/Germany in co-operation with several German institutions and UN organisations from the 18th to the 22nd November 2012.

Multifunctional, non-renewable, globally in danger

The event brought together around 400 representatives of science, politics and civil society to discuss the threat to the precious resource of soil and adopt an agenda for action towards sustainable land use. The topics discussed ranged from soil contamination, soil degradation and urbanisation challenges through payments for ecosystem services and markets for soil organic carbon to natural resource governance and global soil policy.

Statistically, 0.22 hectares of land is available to every human being nowadays; in 1950, it was 0.5 hectares. Rainer Horn, President-Elect of the International Union of Soil Sciences (IUSS), pointed to the multitude of crucial functions that soils performed. Not only did they provide the basis of the production of food and other biomass, but they were also crucial to environmental interactions such as the storage, filtering and transformation of substances from water and the atmosphere (e.g. in the carbon cycle). Soils constituted a biological habitat and a gene pool as well as a source of raw material, and they were used in the construction of buildings and roads, not to mention their role as cultural heritage. It was all the more worrying that soil represented a resource that was virtually non-renewable, for it took 500 years for a 2.5 cm. layer of topsoil to form on arable land.

In the conference outcome paper, the participants drew attention to the fact that processes such as erosion, loss of soil organic matter or land and soil loss from urban expansion were affecting both the North and the South. Although soils were locally owned and managed, a global approach to soil protection was needed. Sustainable land management practices were of the utmost importance in achieving a land and soil degradation-neutral world. In his video message, Olivier de Schutter, UN Special Rapporteur on the Right to Food, stressed the role of small-scale farmers in this context. However, crucial obstacles were facing the promotion of smallholders: insufficient support on the part of public policies, one-sided promotion of export-oriented agriculture, a lack of security of tenure, not enough funding for agricultural research and general prejudices against small-scale farming. Many governments were viewing the future solely in terms of large-scale industrial farming while ignoring the advantages offered by smallholder production for food security and the conservation of precious resources.

Of investments and responsibility

In Africa, 90 per cent of the food consumed in the continent was being produced by 33 million smallholders, reported Madiodio Niasse, Director of the International Land Coalition Secretariat. The sector was characterised not only by severe land degradation, poverty and hunger, and a huge generation gap, but also by an enormous investment gap. Only seven per cent of Africa's arable land was under irrigation (20 per cent globally), while on average, African governments were spending 20 US dollars per rural inhabitant and per year. No wonder that investors

Photo: P. Chiussi / IASS

were, as a rule, welcomed with open arms. However, estimates of global large-scale land deals varied considerably. While the International Food Policy Research Institute (IFPRI, 2009) was reckoning with a total of 25 million hectares world-wide, the online database Land Matrix stated an area of 50 to 80 million hectares for the past five years.

However, what was certain was that Africa accounted for 60 to 70 per cent of the land deals, with the investors having their eye on the fertile soils. Niasse noted that a number of common patterns were now becoming apparent among these deals. The countries whose land was being bought up were above all those under poor governance, with deals being secretly negotiated, only a small proportion of land developed, and deals often having adverse impacts on the people and the environment. "The deals pose a risk to food security in the targeted countries," Niasse maintained. A major share of the land was being used for growing non-food crops, and if food was grown, then this happened above all with a view to exporting to the investor countries. Excessive water withdrawal presented a problem, too. So what could these countries do? First and foremost, Niasse recommended, they could formulate national food security strategies and step up their own investments. If foreign investments were needed, those could be given priority that would not result in any land conversion and were based on exchange agreements.

Pro-poor natural resource governance – easier said than done

Rights-based approaches are coming more and more to the fore in the debate on natural resource governance and the pro-poor effects sought in this context. However, practical implementation presents a number of obstacles. This starts with the redistribution of land also always resulting in changes within a country's social relationships, according to Saturnino Borras of the International Institute of Social Studies (ISS) in The Hague, Netherlands. Borras maintained that a great gulf frequently existed between the desired policy and unexpected outcomes. One example here was the land reforms in the Philippines in the 1980s. Although they had fulfilled their objective of being pro-poor, they had resulted in only men and Christians being considered in the allocation of land, while women and Moslems were left out. Before the land reforms, women had formed a third of the rural labour force, while afterwards, they played hardly any role at all. Studies on land reforms in Latin America and the Caribbean had revealed that almost all measures had been anti-women.

In addition to the issue of recognising rights, examples from India and Brazil were used to discuss implementation problems: different interpretation of land reform, insufficient co-ordination or conflicts of jurisdiction between authorities involved, contradictory laws, unequal power relations between individual groups, and the question of how to handle community rights. The existence of legal frameworks will be of no use if they are not enforced, as land tenure policy in Mozambique und Cambodia has shown. Moreover, translating rights into practice in society is a tedious process.

A difficult situation could arise for the social movements involved that are campaigning for the rights of marginalised sections of the population. If they ultimately fail to help their groups claim their right to land, they will lose their credibility. And last but not least, it is not easy to get local elites to push for changes in property relations. People don't usually like to resign privileges. *(sri)*

Putting people first

The 7th European Development Days, held in Brussels/Belgium, pursued three objectives: discuss how best to empower farmers and scale up agricultural production in development countries in order to reach food security, evaluate new approaches to public-private collaboration, and show ways so that all people can participate in and benefit from wealth and job creation.

Resilience needs human safety nets

The issue of resilience formed a thread followed by a large number of the events. The participants of the Panel "A more effective partnership for a more effective world" agreed that humanitarian and development teams had to work more closely together. The aim had to be to ensure that development gains were not lost to damage from natural disasters and that relief efforts had long-term strategies for development built into them. In this context, Kristalina Georgieva, European Commissioner for International Cooperation, Humanitarian And Crisis Response, criticised that today, just two per cent of development assistance was allocated to disaster preparedness and response, and out of this, only 3.6 per cent benefited preparedness, and the rest response/rehabilitation. Why should this be the case? "Preparedness is not an attractive field of action," Georgieva commented.

Caroline Anstey, Managing Director of the World Bank Group, noted a further imbalance: Every third US dollar spent in the context of development co-operation went lost because it was invested in areas that had already been established but were then destroyed, for example through natural disasters. "We have been holding a large number of international meetings addressing global financial safety nets since 2008. But what we need is human safety nets," Anstey maintained, and she reminded participants that across the world, 56 per cent of countries had weak social protection systems. Anstey stressed the importance of reliable data in this context, for "otherwise, we don't know where the money is supposed to go". For example, just under half of the countries in sub-Saharan Africa had not conducted any household surveys for ten years.

European Development Days 2012

Organised by the European Commission for the seventh time, this year's European Development Days were held under the motto "Sustainable and inclusive growth for human development". The more than 50 events centred on three topics:

- Sustainable agriculture, food security and resilience
- The private sector and development
- Empowering people for inclusive growth

Six high-level panels were held for each thematic block. You can read about some of the key contents of the meeting on these pages; we are presenting the "Small farmers – big business?" panel on pages 8–9. On pages 10–11, brief examples of projects dedicated to supporting smallholders provide a supplement.

You can find a wealth of material on the website www.eudevdays.com: background information on and summaries of the individual events, quotes from the presentations as well as video recordings and photos.

Photo: European Union

Above: Indu Capoor, Director of the Indian Centre for Health Education, Training and Nutrition Awareness.

Below: Closing ceremony of the European Development Days: Andris Piebalgs, European Commissioner for Development.

Photo: European Union

Many actors, one goal: zero hunger

It is a known fact that how a child is nourished from its conception to its second birthday sets the course for its physical and mental development potential. But one in four children is stunted in its development because of under-nutrition, while one-third of all child deaths around the world are related to malnutrition. Pervasive, long-term under-nutrition is destroying the potential of millions of children, thus slowly eroding the foundations of the global economy. Despite this insight, policy-makers are still hesitating to integrate nutrition into health, agriculture and food security initiatives. Why this should be the case and how this could be counteracted was discussed at the high-level panel titled "Resilience: the nutrition dimension".

"It is unbearable that so many children are dying from malnutrition. The time to act is yesterday, not tomorrow," Francesca Mosca of the Directorate-General for Development and Cooperation der European Commission said in her introductory note. This was whey the EU was involved in the SUN (Scaling-Up Nutrition) initiative launched in 2010. So far, more than 30 had committed themselves in the campaign to

significantly reduce child under-nutrition in their countries. The problem here was clearly not a lack or shortage of food, the panellists unanimously stressed. Also, proven, low-cost remedies and solutions to undernourishment were available. What was needed was more leadership and more political will to adopt nutrition policies and take effective action.

"If we can bring nutrition to the forefront, we know that it will have a huge return of investment," said Paulus Verschuren of the Ministry of Foreign Affairs of the Netherlands. All the pieces of solution were there. They simply had to be put together and adapted to the local needs. On the one hand, greater and better sustainable production in the field was important; on the other, food had to be available, affordable and accessible for consumers. Here, income and knowledge were equally important.

However, even the best programmes will be of no use if the social conditions are not taken into consideration. This was stressed by Indu Capoor, Director of the Indian Centre for Health Education, Training and Nutrition Awareness. If girls continued to get married at an early age, the problem of low wage births would not be remedied; if women continued to be illiterate, they would not be in a position to feed their children sufficiently. If no attention was given to who was participating in fortification programmes, only the men would benefit from them in patriarchal societies. In her opinion, the focus should therefore be on educating and training girls and mothers; in addition, a sustainable nutrition strategy ought to be developed which was based on local indigenous markets. To achieve this, nutrition had to attain the same status as agriculture, so that farmers would not only be interested in growing cash crops but realise that food crops could be worthwhile, too. Multisectoral action was required to address the highly complex topic of nutrition, Capoor stressed. But this meant that achieving success would be especially difficult, for most donors wished to work bilaterally and sought fast results.

No growth without social protection

In his final address, EU Development Commissioner Andris Piebalgs reminded the participants of Rio+20 and the post-2015 debate, in which sustainability assumes a central position. But according to the EU Commissioner, sustainability was just one half of the growth equation that the EU had established with its Agenda for Change; the other half of that equation was inclusiveness. In addition to poverty eradication, human dignity, decent work and responsible resource management, social protection had to be at the core of the post-2015 development framework as well. Nevertheless, the international community always ought to bear in mind what their work was really about: people-centred development. *(sri)*

Small farmers – big business?

A high-level panel on the role of the private sector in sustainable rural development

How can smallholders and producers be integrated into local, regional and global value-added chains? What are the opportunities and challenges that cooperation among smallholders and local producers with internationally organised trade chains poses? These questions were at the centre of the High-Level Panel "Small farmers – big business?" at the European Development Days 2012 in Brussels on the 17th October, which was organised by the Practitioners' Network for European Development Cooperation, the Europe-Africa-Caribbean-Pacific Liaison Committee COLEACP, SNV Netherlands Development Organisation, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and the United Nations Industrial Development Organization (UNIDO).

Kandeh K. Yumkella, Director-General of UNIDO, stressed the importance of sustainable and fair value-added chains for smallholders. Mohamed Ibn Chambas, Secretary-General of the African, Caribbean and Pacific (ACP) Group of States, noted that only a few years before, private companies had shown no interest in sustainable rural development. Nowadays, this was different. Nevertheless, he criticised the decline in investment in the agricultural sector, particularly in agricultural research and innovation. The private sector had to be involved as a development partner, for this was the only way in which the global goals of food security and poverty reduction could be achieved.

Apollo Owuor of Kenya Horticultural Exporters and Rashid Ally Mamu of Nyemo Investment Company, Tanzania, explained how they were supporting smallholders in fulfilling the rising quality standards in international as well as local markets. It was not only business here and now that counted in this context. Sustainably securing the value-added chain required the social responsibility of entrepreneurs, who had to take the living conditions of smallholder families and farm labourers into consideration in their business decisions.

Stephanie Barrientos, Director of the research programme "Capturing the Gains", also funded by the United Kingdom's Department for International Development (DFID), noted that a value-added chain was only as strong as its weakest link. "If the smallholders are not benefiting from it, the chain will break," she maintained. Thus it was important to avoid women becoming "cheap" labourers, as was the case in the flower trade. Hans-Jürgen Matern, Director of the Metro AG's Sustainability Department, explained his company's strategy. Smallholders were not regarded as mere suppliers but as consumers at the same time, and for a company like Metro AG, both sides were important. This was why the company was supporting smallholders in gaining access to markets. In addition, smallholders ought to have access to insurance and other financing options, Matern said.

Smallholders are always producing at a high risk. Insurance against inclement weather or natural disasters can prevent smallholders from dropping out of the value-added chain. Michael Anthony of Allianz SE explained that the use of satellite and radar technology was a promising development. A new system to be introduced in 2013 was going to enable insurance companies to identify the extent of damage immediately after the occurrence of a natural disaster. In this manner, farmers with a harvest insurance could be compensated for losses more quickly. Faster loss payment enabled faster reconstruction, which in turn lowered production losses, resulting in more secure income.

Kristian Schmidt, Director of the Human Development Department of the DG Development and Cooperation/EuropeAid, emphasised that the European Commission intended to support more transparency in trading land title rights, e.g. by providing information on markets and prices, so that smallholders were not disadvantaged here. At the same time, smallholders and producers ought to opt for selling their produce not only in the European market, but also, increasingly in local markets. Schmidt described the Commission's approaches in the area of rural development: 1) The European Commission had for a long time neglected agriculture as a development objective and so had many African countries. Now the focus on agriculture was back. 2) Private sector engagement was also being fostered now. Europe would try to facilitate stronger cooperation with Africa. 3) There was a need to involve farmers'

Photo: V. Duterne

The panellists (f.l.t.r.): Michael Anthony, Hans-Jürgen Matern, Moderator Conny Czymoch, Rashid Ally Mamu, Apollo Owuor.

organisations to guarantee an equal power relationship between the private sector and farmers.

Joe Cerell, Director of the Bill Gates Foundation in Europe, maintained that sustainable value-added chains are important to break the vicious circle of poverty and social marginalisation. Summing up the debate in her closing word, GIZ Management Board Chair Tanja Gönner stressed the aspects of trust, cooperation and knowledge transfer. Gönner pledged that the European development partners would "make their contribution to ensuring that the synergy effects of cooperation between government, the private sector and smallholders really come to bear. And they will see to it that smallholders can also benefit from new, innovative approaches, such as agricultural insurance."

Jörg Freiberg, GIZ, Eschborn, Germany

For more information on the event and the video live-stream, see **www.smallfarmersbigbusiness.org**

"Socio-economic benefits must reach poor producers and workers"

Mohamed Ibn Chambas, Secretary General of the African, Caribbean, and Pacific (ACP) Group of States, on preconditions for sustainable agricultural development and the role of the private sector.

Photo: V. Duterme

Mohamed Ibn Chambas

■ **Mr Chambas, the international community increasingly recognises the need for continued and targeted assistance towards agriculture and development in sub-Saharan Africa. Representing the 79 countries in the African-Caribbean-Pacific region, what is your position on this issue?**

At the Global Conference on Agriculture, Food Security and Climate Change in Hanoi last September, participants concluded that food security is and will remain a critical issue for the global community. By 2050, we will have an estimated world population of nine billion; to feed all these people, and to meet the growth in per capita consumption, we must increase global food production by a staggering 70 per cent. We are at a crossroads; as a global community, as a donor community, and as individual governments, and we have important decisions to make.

■ **G8 nations see investment in agriculture as a key route to economic growth, and African agriculture is operating in a progressively more global economy ...**

Discussions at the G8 recognised that development requires not only aid, but also the promotion of economic growth, and highlighted the pivotal role played by agricultural development. Together the G8 countries made a pledge to encourage investment in agriculture as a central route towards poverty alleviation. They also highlighted the role of the private sector – from multinationals to smallholder growers – as key drivers for development.

■ **How do you judge the potential of private sector investment?**

There is a huge potential if it's based on principles of sustainability, provide essential technical assistance, and ensure that socio-economic benefits reach poor producers and workers.

■ **The topic under discussion – engaging the private sector in sustainable agricultural development – addressed some of the key issues during the European Development Days. As Keynote Speaker, you opened the high-level panel "Small farmers – big business?" How do you consider such an initiative in the debate?**

The scenario we face today is challenging. The potential to further increase the cultivated acreage is relatively small. Furthermore, over the past century, the "green revolution", which was so dramatic in its potential, did not benefit everyone. We therefore have a new policy environment, with an increased emphasis on agriculture, and with development programmes designed around donors and governments working hand-in-hand with the private sector. In the case of small-scale growers, and small and medium-sized companies, they need support to capture the benefits and take advantage of innovations. They otherwise face growing disadvantages – with particular challenges facing women. In the spirit of this new policy environment, the panel "Small farmers – big business?" has brought a broad representation of players to address the critical theme of how best to involve the private sector while maintaining clear agricultural development and poverty alleviation objectives.

The high-level panel has been a very positive example of collaboration where individual institutes and organisations have worked together and put aside their individual perspectives and views, to address a common theme, remaining focused on the target: food security and poverty alleviation, with small-scale farming and sustainable production methods at the forefront.

Examples of smallholder farmers' promotion

UNIDO's pro-poor sustainable supplier development programme (SSDP)

Farms and small and medium enterprises (SMEs) in developing countries often face difficulties complying with market requirements and lack the technical and financial means to produce cost-effective goods of sufficient quantity and required high quality. As a result, when profitable new market opportunities arise, they are unable to be accepted as suppliers. These challenges are shared by companies like the Metro Group, who are committed to making their supply chains not only more efficient but also more inclusive and sustainable by including smallholder farms, especially as they expand their operations in developing countries.

Together with the retailer Metro Group, the United Nations Industrial Development Organization (UNIDO) has developed a capacity building programme to apply the Global Food Safety Initiative (GFSI) Global Markets Protocol, which enables suppliers to meet the internationally recognised requirements in terms of food safety and quality. The programme is sustainable through a successful business model, where all stakeholders, including the United Nations, governments, the private sector, donors, academia, etc. contribute either in-kind or financially.

UNIDO has implemented sustainable pilot projects in Egypt, Russia and India, where suppliers have achieved considerable improvement in their performance and compliance with food safety standards and Good Agricultural Practices (GAP). As a result, the quality and volume of marketable products has improved. At the same time, consumers have benefited from better and safer products and can expect more stable food prices. Metro have signed contracts with the majority of the upgraded suppliers. Due to its success, the sustainable supplier development programme (SSDP) has been expanded to cover the non-food sector as well as environmental, social and ethical issues. Currently, UNIDO is implementing a supplier SSDP with AEON, the biggest Japanese retailer, in Malaysia and is planning to expand the programme to other countries in the region. UNIDO is also negotiating with other top retailers, such as Walmart, Pick n'Pay, H&M, Marks and Spencer, etc., to deploy a similar programme in Africa and other regions of the world.

➤ **www.unido.org**

***Gerardo Patacconi**, Chief of Clusters and Business Linkages Unit; **Valentina Varbanova**, project management consultant; UNIDO*

Promoting competitiveness of African cashew farmers

Nearly 40 per cent of the global cashew crop is produced by about 1.5 million small farmers in Africa. The vast majority of these farmers live in rural areas and struggle to make as little as 90 to 330 euros of gross revenue per year through the production of cashews. Cashew farmers in Africa rarely organise themselves into associations. They are also insufficiently linked to international markets. Adding to the problem is the fact that only ten per cent of African raw cashew production undergoes further processing in Africa.

The main goal of the *African Cashew initiative* (ACi) is to increase the competitiveness of African cashew production and achieve a sustainable reduction in poverty in the five project countries: Benin, Burkina Faso, Côte d'Ivoire, Ghana and Mozambique. ACi is financed by the German Federal Ministry for Economic Cooperation and Development (BMZ), the Bill and Melinda Gates Foundation and private sector companies. It is implemented by a consortium of implanting partners led by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). Through a combination of strategies, ACi has reached 240,000 cashew farmers in three years' time, aiming to add at least 100 US dollars (USD) to their annual income. The project's intervention has led to the creation of 4,000 new jobs in cashew nut processing, with 70 per cent of them for women, and providing an average annual income of USD 900 per job.

Improving nut quality and production. Success in the global marketplace depends on the production of superior nuts. Therefore, ACi focuses on helping African cashew farmers meet international quality standards through training farmers on good agricultural practices to increase yields and quality. The initiative works with both public and private service providers and identifies "*lead farmers*" who can ultimately train other farmers.

Increasing the amount of local processing. Start-up processors are provided with a range of advice on how to grow their business, keep up with current market developments, access loans and financing, improve their use of technology and expand processing of cashew by-products.

Expand links to the global marketplace. With a 32-per-cent share of the global nut market cashews are highly prised in Europe and North America, with a growing demand in Eastern Europe, China and India. The African Cashew Alliance (ACA), primarily a cashew industry association functioning as a supranational platform for public and private partners, assists in the global marketing of African cashews.

Advocate policies that favour adding value and structuring the cashew sector. ACi works to inform policy-makers and government officials about the potential of the cashew value chain. This includes establishing platforms where knowledge sharing takes place and representation of interest groups is promoted to advocate the sustainable development of the cashew sector.

Farmers on cashew farm with intercropping.

Photo: M. Drexler

➤ **www.giz.de/themen/en/33437.htm**

***Peter Keller**, Director Development Operations ACi; **Bernard Agbo**, Production Manager ACi, GIZ*

European Development Days 2012

Cooperation is the key: an inclusive approach to rice in Lao PDR

Recognising the importance of improved rice production to both food security and development in Laos, the Enhanced Milled Rice Production in Lao PDR Project (EMRIP) has united rice millers and smallholders to increase rice supply, open new distribution channels and improve livelihoods for more than 100,000 people.

A joint initiative of SNV Netherlands Development Organisation and Helvetas, implemented in partnership with the Laos government with support from the European Union's Food Facility programme, EMRIP has facilitated the development of fair trade relations between over 20,000 smallholder households and more than 20 rice mills over two years. The project has also contributed to an improved government framework for rice production and trade, enabling rice exports to neighbouring countries, and the formation of a team at the department of agriculture to work on drafting a national rice strategy.

Millers in the middle. EMRIP focused on improving the capacity of millers to establish and strengthen fair trade links with smallholder farmers, and improve post-harvest handling and processing. Millers were helped to develop an inclusive business plan, including guidance on supporting farmers in producing high-quality rice. Millers received training and advice on forming and strengthening farmer groups, providing inputs to farmers, and business management skills. Millers also improved extension services by collaborating with government extension officers – expanding their traditional role by incorporating the provision of seeds, fertilisers and extension services based on production agreements with farmer groups. Investments in improving rice value chains and upgrading equipment were made possible through a co-investment fund. Millers only received funding if they were willing to form farmer groups and provide inputs and training to farmers. Consultation between millers and farmers helped ensure the uniform supply of quality seeds, affordable access to fertilisers and information about production techniques.

Taking it to scale. EMRIP has increased the supply of single variety paddy rice to the mills, leading to a 9-14 per cent gain in prices for milled rice and a 60 per cent increase in income for participating farmers. Meanwhile the rice mills participating in the project have taken a lead role in forming 14 miller groups in their respective provinces. The EMRIP approach is currently being expanded to four other Lao provinces.

➤ **www.snvworld.org**

***Ranjan Shrestha**, SNV Lao PDR*

The SNV/Helvetas EMRIP project has improved livelihoods for over 100,000 people in Lao PDR.

Photo: A. Dockery

COLEACP: supporting sustainable agriculture in ACP countries through training

COLEACP (Europe-Africa-Caribbean-Pacific Liaison Committee) started as a not-for-profit interprofessional association in 1973. It represents and defends the collective interests of African, Caribbean and Pacific (ACP) exporters/producers, consultants and EU importers of fruit and vegetables. Its main goal is to promote competitive trading between ACP countries and with the EU, and sustainable agriculture, notably by building capacity of food business operators, facilitating matchmaking among network members and advocating on behalf of the industry.

COLEACP has integrated training as an essential component in building capacity of technical staff in ACP horticultural companies, which are having to cope with ever more new conditions for access to the European market. Educational and support methods specifically adapted to this new environment had to be created from scratch. This is exactly what the PIP and EDES programmes are about. The European Commission (EC) has entrusted COLEACP with implementing PIP since 2001 and EDES since 2010. Both share the goal of reducing poverty in ACP countries. PIP works to maintain and increase their horticultural exports, whereas EDES supports their exports across all sectors by strengthening national food safety policies. PIP and EDES are complementary, with PIP directly supporting specific operators in the private sector and EDES primarily targeting the public authorities and services.

Training is based on a cascading approach via training of trainers and a revolving system fuelled by the local trainers. It has three components:

- long-term capacity building of ACP experts (Train the Trainers) and maximum involvement of local resources in the training activities;
- training courses for targeted audiences (e.g. managers, workers and small-scale growers), group training courses, in-house training courses and e-learning;
- ongoing development of new tools and new training courses (training methods or topics) adapted to needs expressed during the programme, which are then further developed and integrated into the initial training scheme.

Since 2001, COLEACP work has evolved from food safety to food security for ACP countries. By boosting and sharing resources, tools and methods, removing barriers between export and local levels and organising the mutual exchange of 'know-how', COLEACP supports small-scale producers in becoming able to feed tomorrow's world.

➤ **www.coleacp.org/pip**

***Emmanuel Bourcelet**, Head of Information and Communication, COLEACP PIP*

Engaging smallholders in value chains: who benefits under which circumstances?

Value chains can be an opportunity to link smallholder farmers in developing countries to lucrative markets for consumer goods worldwide. However, they are not a sure-fire success. This article provides an overview of the conditions under which smallholder engagement in value chains makes sense and what is necessary to make them a successful tool for development.

Agricultural value chains are organisational schemes that enable a primary product to get sold and transformed into consumable end-products, adding value at each step of a gradual process of transformation and marketing. It is not only recently that the value chain concept has been entering the development debate. Already in the 1990s, supply chain and logistics management scholars as well as the school of global value chains (GVC) found that value chains play an important role in development. From different angles, these scholars looked into how developing country suppliers link to markets in the more developed world.

Recently value chains have experienced renewed interest: Development agencies as well as private companies are using them as vehicles for smallholder engagement. This new agenda is driven by the following assumptions:

- Smallholder production can easily be absorbed by national and global value chains.
- Engaging smallholders brings income and employment benefits to smallholders.
- Smallholders have the capacities and resources required to produce in response to the requirements of value chain players, or at least they can acquire them with reasonable effort and time.
- Important value chain players, such as international buyers, would be keen on supporting the engagement of smallholders.

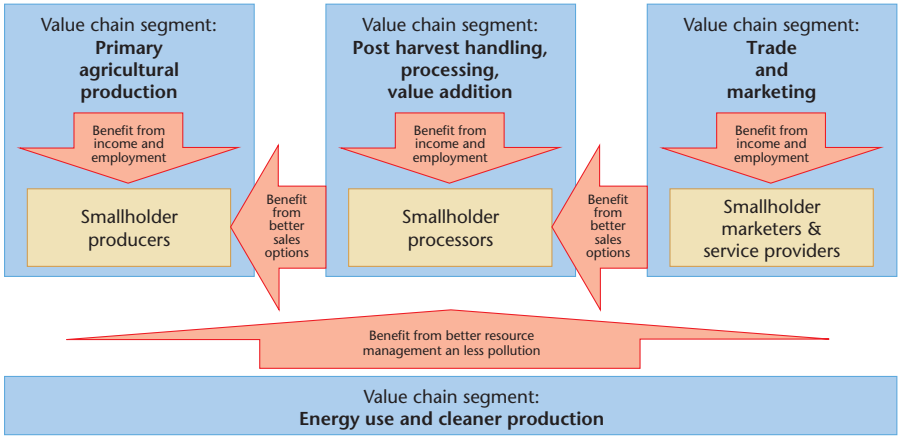
However, there is evidence that not all is gold that glitters in value chain development engaging smallholders. The spectrum reaches from projects that successfully help farmers improve productivity and incomes complying with international buyer requirements to initiatives where only few smallholders make the race, and without reasonable benefits.

This article tries to clarify a number of issues that result from smallholder engagement in value chains and to draw some conclusions on the usefulness of the approach and critical success factors.

How can smallholders engage?

Smallholder farmers often integrate in value chains as producers in the primary production segment supplying products to national and international buyers. One example is small-

How smallholders can benefit from value chain development



Frank Hartwich
Agribusiness Development Branch
United Nations Industrial Development Organization (UNIDO)
Vienna, Austria
f.hartwich@unido.org

Photo: F. Hartwich

Smallholders offering their potatoes in Eldoret, Kenya.

holder producers in Indonesia who sell cocoa beans to traders; the traders bring them to cocoa processing plants which process them into butter and paste to be sold to chocolate makers world-wide. Taking another example, smallholder engagement in Kenya's flower value chain sector is of a different type; smallholders disengage from independent production and become employees in flower plantation companies, gaining salaries that are well above the average of independent smallholders or labourers employed in other sectors. Smallholders can also pursue value addition, as for example in the case of rice milling in Vietnam, an activity that rice producers engage in as they see it is more profitable and complementary to the cultivation of rice. In general, three types of smallholder engagement in value chains can be distinguished:

1. Engagement in independent primary agricultural production with effect on smallholder incomes.
2. Engagement in dependent primary agricultural production with effect on incomes and employment.
3. Engagement in value addition of agricultural products with effect on incomes and employment.

There may be further engagement of smallholders in various services that support the functioning of the value chain, e.g. transport, advisory service, etc. The Figure on page 12 provides an overview of the various effects through which smallholders can benefit from value chain development.

Who drives smallholder engagement?

A common scenario is that buyers, e.g. an international food retailer, are the main force pushing for the engagement of smallholders in the value chain. Usually, the buyers' motive is that they are short in supply of primary products. This motive is sometimes paired with arguments of (corporate) social responsibility (CSR). In all cases, it is important to separate procurement of supplies motives from CSR-related motives. The latter address a limited group of target beneficiaries (e.g. building a school in a producer region), while the former are often able to generate a more sustainable impact on the businesses that smallholders engage in.

"Outgrower schemes" in which a buyer provides seeds and fertiliser or alternatively credit as well as agronomic know-how to "outgrowing" farmers, are a special case. The "outgrowing" farmers, in turn, produce according to a particular protocol and are obliged to deliver the product to the buyer's collection centres where, if compliant to quality standards, the product is paid, sometimes with delay and after reducing the advanced payments. Outgrower schemes are an efficient method to quickly provide farmers with the necessary technology and inputs to engage in value chains. However, they are vulnerable because payments and credits must be monitored but reliable accounting systems, sometimes covering a large number of smallholders, are expensive to maintain. Often, buyers are not willing to manage accounts of a large number of outgrowers relying on farmer organisations, credit schemes and/or development agencies which are also prone to mismanagement and conflicts. Outgrower schemes are particularly vulnerable because smallholders may decide to side-sell avoiding repayment of debts.

Another scenario is that suppliers of agricultural inputs such as seeds and fertiliser seek to engage smallholders in value chains to extend sales. In some cases, it is also the smallholders themselves who initiate their engagement in a value chain and seek buyers to purchase their products. Finally, there are many cases in which governments and development agencies are the drivers of smallholder engagement based on the understanding that subsidising the smallholders' integration in the value chain will lead to social benefits. The latter has also led to the very common model of development agencies partnering with large buyers, enabling the participation of smallholders in value chains. However, the latter model has been criticised in a range of cases where the development agencies have been subsidising all activities to help smallholders comply with standards while the private buyer reaps the benefits of sourcing more higher quality products at no additional costs.

Who should initiate smallholder engagement? Often, the argument

Common practice – the lead buyer approach

Many governments and development agencies find it difficult to choose the appropriate entry point for engaging smallholders. One common approach is to pick a lead buyer and support value chain development through that company. For example, a lead firm with connections to markets, e.g. a cassava starch processing company in Colombia, receives support through development agencies to source cassava from local farmers. The development agency helps the lead firm to provide technologies to farmers, including the arrangement of advances for production inputs such as seeds and fertilisers.

Lead-firm approaches have the advantages that support by development agencies can easily be organised and all money can be channelled to one company instead of dealing with a large amount of primary producers. In many cases, however, development agencies also support the primary producers as the lead company is not able to provide technical training to large producer communities.

is made that lead buyers are the only appropriate drivers of smallholder engagement. However, the point is made here that any of the above, individually or jointly, can initiate such smallholder engagement, and, more importantly, that smallholder engagement is beneficial to value chain actors in general and to the smallholders in particular. This depends on a range of factors and can only be established on the basis of thorough analysis.

What makes smallholders benefit?

Engaging smallholders in value chains, e.g. via a lead buyer approach, must not necessarily result in benefits. Various studies have shown, for example, that the costs of certification can be higher than the benefits from selling a product to international buyers. Below are a number of considerations that one can make to better understand the benefits smallholders might have from value chain engagement:

In the case of self-reliant smallholder production, engagement in the value chain brings the advantage that smallholders can sell a product at a fixed (and possibly higher) price. However, the engagement of smallholders often comes with an additional cost related to a new system of production and the efforts to comply with certain standards. Frequently, smallholders can only apply the new way of production after intensive capacity building and through additional investments in inputs and equipments. For example, the production of soybeans for the international market would usually require the application of zero-tillage cultivation and the purchase of Roundup Ready soy varieties. This practice requires substantial capital and larger parcels of land. In the end, it is the individual cost-benefit ratio of each farmer that determines whether engagement makes sense. For some farmers, it may be more beneficial than for others.

When training and capacity strengthening of smallholders is required, the related project costs need to be compared with the overall benefits of engaging smallholders (the accumulated individual cost-benefit ratios). If only a small number of farmers engage in a value chain and each earns a couple of dollars more, an expensive project that fosters the engagement of these smallholders may not be justified.

Some practitioners in development argue that there is often no alternative to an engagement in the value chain following a "grow or perish" logic. Indeed, local markets may sometimes not be an alternative for products that only get appropriately remunerated when they enter global value chains. However, smallholders often benefit from local markets where products of less quality can be sold parallel to value chains to which the better-quality products can be channelled. For example, second-grade mangoes from Ghana that do not meet export criteria can be sold on the local markets, sometimes at even higher prices than the first-grade export mangoes. In all cases, engagement in value chains can be a necessary condition for smallholders to maintain agricultural production when they provide a sure market outlet for products.

It is also important to balance the effects of engaging smallholders in the various segments of the value chain. Employment created at the level of processing (for example a couple of hundred jobs) may constitute a small benefit in relation to tens of thousands of smallholders benefiting from higher prices for their products. Another consideration is that employment in regions with only underpaid jobs may provide an important push to the labour market. Contrarily, if the salary lies minimally above other job opportunities, the benefit for workers may be negligible. Employment targeting women labourers can be important for gender empowerment.

In summary, the main parameters to be taken into consideration to evaluate the benefits from smallholder engagement in value chains are the following:

- the product price being paid to smallholders,
- the costs of smallholder production complying with buyer criteria,
- the costs of training and capacity building necessary to enable smallholders engaging in value chains,
- the number of smallholders that will be able to engage in the value chain (also in relation to the ones that may fall behind),
- the employment effect on engaging smallholders in primary production and other segments of the value chain.

Success factors

What works and what does not in engaging smallholders in value chains? This question is at the heart of many debates among development agents and value chain developers. Here are a number of recommendations based on the author's experience:

- Engagement of smallholders can work for all value chains except for those ones in which smallholders find it too difficult to produce according to the required standards or where doing so requires just **too much in terms of efforts and capital**. Possibly, with the exception of some individuals, a smallholder community will not be able to produce sophisticated products such as Swiss watches or Kobe beef. However, smallholders around the world should be able to engage in the production of fruits, vegetables, cereals, roots and tubers and pulses as well as animal products for national value chains and export, and many studies have shown that they can even be more efficient in doing so than large producers.

- The integration of smallholders in value chains works well where the **"engagement rent"** provides a substantial benefit that is significantly higher than the benefit from producing while being excluded from value chains. In other words, the effort of engagement has to pay off and there needs to be a clear perception about this fact among the smallholders.

- The engagement of smallholders usually requires **substantial investments** in capacity strengthening. Smallholders often live in a reality where risk aversion and scarcity of resources prevail. Changing the way of production requires time, continuous coaching, eventually some subsidies and interaction among smallholders as well as with peers to build trust in and knowledge about the new production procedures.

- Initiatives that only have smallholders complying with buyer standards are unlikely to produce benefits for smallholders. They should be matched with efforts that help smallholders **improve** their **businesses** through cost reductions and better organisation of work. For example, large processors of dairy products have learned that simply focusing on smallholders' compliance with quality criteria does not help extend the procurement of milk. In response, they have engaged in advisory services which help farmers to improve the quality of milk while also rendering milk production more profitable.

- Engaging smallholders in value chains does make sense where the **market for the final product** is large enough to include a reasonable number of smallholders. If the majority of smallholders are left out, engagement schemes will rather cause frustration and disequilibrium in production areas. This argument can be extended to some of the niche market products such as specialty foods and organic and fair-trade products. If such products only benefit a very small part of the smallholder population, leaving the majority without income options, there is not much sense to pursue them.

- **Contractual arrangements** help to fix commitments of buyers in outgrower schemes. In most cases, however, smallholders may not appreciate the logic of written contracts, which are also difficult to enforce in the socio-cultural environment of many developing countries. Instead, building **trust** between buyers and smallholder producers is of paramount importance and leads to non-written agreements that build the basis for sustainable businesses.

- In cases where lead-buyers and suppliers collaborate with governments and development agencies, the **partnership** needs to be thoroughly **negotiated**, and the investment of the private sector should be clearly earmarked. The details should be fixed in a contractual arrangement. In no circumstances should governments and development agencies embark on quick arrangements that favour a single buyer or even guarantee individual buyers exclusive purchasing rights. Often, options exist to work with networks of buyers, enabling integrated value chain development benefiting a whole spectrum of value chain partners.

Conclusions

Engaging smallholders in value chains can generate benefits for smallholders as well as for buyers, suppliers and other actors in the value chain, but it does not have to. Some of the conditions that lead to real benefits for smallholders have been discussed above. However, a satisfactory answer to the question of whether the "engagement rent" is high enough can only be given on a case-by-case basis.

Marketing smallholder vegetables in Punjab, India. Photos: F. Hartwich

Land investment for maximum impact

The discussion on the type of land investment and agricultural intensification that best address both food security and sustainability should be based on a broad definition of "investment" which accommodates the realities of smallholder farming.

The tremendous production growth in the second half of the last century was underpinned not only by scientific plant breeding but also by oil-based mechanisation and the increased use of agrochemicals. It is becoming clear that, for all its successes in terms of yield, the agricultural model which is based on these drivers comes at a very high social and environmental cost. Not only has it led to an extreme concentration of land and other natural resources in many regions, but it has little to offer small-scale farmers and is increasingly destroying its own resource base. Soil degradation affects 33 per cent of cultivated areas worldwide to a greater or lesser extent (FAO 2012) and the number of chronically undernourished people has increased in recent decades. The growing consensus is that, in order to both feed a growing global population and also retain our resource base, we have no option but to intensify crop production and at the same time make the transition to true sustainability. In this context there is increasing discussion on the types of land investment which are called for.

Benjamin Luig
Advisor Agricultural Policies/
Development Policies Department
Misereor e.V.
Aachen, Germany
Benjamin.Luig@misereor.de

What kind of efficiency are we talking about?

The argument about the need to increase production is still being bandied about in an effort to justify the current wave of large-scale land investment: 870 million people are already going hungry. Our ability to feed 9.1 billion people by the year 2050 depends on additional food production without the expansion of cultivable land. As "big" is equated to "efficient", it is argued that land leases on a completely new scale are called for. It is true that as far as productivity per unit of work is concerned, there is a world of difference between large-scale industrial agriculture and small-scale, under-capitalised family farming. Today the ratio of productivity is 500:1 and, as a result of mechanisation, has increased 50-fold in less than a century (Mazoyer/Roudart 2006). But what kind of efficiency are we talking about here?

The current debate on land investment has so far ignored an important theory discussed by agricultural economists since the 1960s: that there is an inverse relationship between farm size and land use efficiency. This theory, which originates from Russian agrarian economist A. V. Chayanov, suggests that as farm sizes increase, yields per hectare decrease. The overwhelming majority of empirical studies to date on this issue confirm his assumptions. For instance, Unal (2008) analysed the data from a World Bank household survey of more than 5,000 farms in seven regions of Turkey. On aver-

Photo: J. Boethling

Raising productivity should not be the only reason for land investment; resource conservation – such as terracing – is equally, or even more important.

age the smallest households (less than 2 ha) were nine times more productive per unit area than the largest agricultural holdings. Drawing on this study, Unal is highly critical of the market-based land consolidations imposed in Turkey since 2001 under the Agricultural Reform Implementation Program (ARIP). Instead she recommends land redistribution in favour of smallholdings, accompanied by technical and financial assistance from the state. Other studies have confirmed this finding (e.g. Eastwood et al. 2010 fundamentally, Caletto et al. 2010 for Uganda, Thapa 2007 for Nepal). Several reasons are quoted for the greater efficiency of small farms, including:

- The higher intensity of family labour compared to wage labour.
- The high monitoring costs involved in wage labour.
- The lack of economies of scale for many agricultural products (with the exception of a few plantation crops such as sugar cane).
- Intimate knowledge of local soil conditions on family farms.
- Greater production flexibility in smaller, labour-intensive and knowledge-intensive systems, for instance the potential for forms of intercropping.

However, a clear distinction must be made between the greater efficiency of land use in the narrow sense and input-output relationships in the broader sense. By and large, major investors in land can operate much more profitably than small family farms as they have better access to factor markets and target markets. Nevertheless if we wish to cultivate our increasingly scarce fertile land efficiently in the future, we must achieve the maximum output per hectare rather than the maximum output per unit of work – for which small-scale operations are better suited than mega-farms. The crucial question is how to best support and capitalise small farms? At the same time this means that appropriate investments are required in order to realise their considerable potential to increase productivity.

Non-monetary investment

Investment in land must be resource-efficient. This is the reason behind increasing efforts by agribusiness groups on policy forums to have their own "key technologies" recognised as guarantors of sustainable soil management. Whether it is the development of genetically-modified rice with an enhanced capacity for photosynthesis, the use of drought-resistant maize (Collins/Chandrasekaran 2012) or forms of conservation agriculture – non-plough tillage combined with the wholesale use of genetically-modified crops and herbicides (Misereor 2011) – new technologies are constantly being hailed as the silver bullet to bridge the great divide between sustainable resource management and production intensification. What these technologies have in common is not only that they tend to define sustainability in very narrow terms (e.g. soil protection at the cost of on-farm biodiversity) but also that they are promoted by powerful global actors who wield great influence over political decision-making processes (e.g. the Gates Foundation).

In contrast, however, there are approaches and investments which address productivity increases and resource management with a variety of measures which are adapted to local conditions. Such investments are frequently of a non-monetary character, but are knowledge-intensive and in many cases also labour-intensive. They include the production and use of natural fertilisers, the erection of protective hedging compatible with the landscape, terracing, the construction of water retention systems, agroforestry practices, water-saving irrigation, integrated plant protection and participatory forms of seed produc-

Photo: L. Ringhofer

A native bean nursery in the Ecuadorian Amazon. Higher investments in research into non-commercial crops could make a major contribution to food security.

tion and distribution. There is growing empirical evidence for the tremendous potential of these forms of intensification (e.g. Godfray et al. 2010, Altieri 2012). However, in many cases they are of a non-monetary nature and rarely appear in official statistics; this impedes the scaling-up of such measures.

Locality of investments

Land investment does not occur in a vacuum. It is made with the aim of selling cultivated crops on markets. When evaluating various land investments with a view to food security, target markets need to be taken into account, along with the food systems (local, regional, supra-regional) in which the investment is embedded. Discussions often ignore this simple fact. Aggregated global or national yield data is then put forward to simplify the argument. Large-scale investment in the cultivation of rice for export by Asian investors in Africa, for example, can do little to help local food security, except perhaps by creating jobs. In order to fight hunger, it is vital to prioritise investment in food production which reaches those regions where food security is particularly at risk. A large proportion of the rural population in developing countries still lives in marginalised regions. These include regions with difficult natural conditions, mountainsides and arid areas, but also those which are a long way from major input and output markets. It is estimated that 45 per cent of rural communities in the developing countries live at least four hours by car from major markets (Oxfam 2009). Farmers in these areas are often extremely adept at adapting to their precarious natural environment. Land investment in these regions rarely achieves the yields of high-potential areas, but is often more important in relative terms because it occurs where food is scarce and it is vital to generate extra income. Frequently these investments are in non-commercial crops such as rice, beans, cassava, purslane, sweet potatoes or millet, which are fundamental to food security in certain marginalised regions. However, as these crops are traded on informal markets there have so far been very few programmes and very little research on intensifying their cultivation. Such intensification could provide a tremendous boost to local food security.

Policy challenges

In summary, the debate on land investment needs to take the following issues into account: first, the optimal farm size for high per hectare yields lies in the domain of the small family farm; second, non-monetary as well as monetary forms of investment in cultivation are key; third, investments should be assessed according to locality and then according to the market structures in which they are embedded.

What type of language should policy-makers cultivate to endorse specific local solutions as an investment in resilient farming, and to promote their spread? The requirement to develop a broadly-defined and yet discerning appreciation of "investment" in agriculture is proving a major challenge. The FAO's Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests could offer a good basis for an open and non-ideological debate. They point out that governments should not just respect and protect informal land use rights, but should also actively promote investment in small-scale farming. In addition they emphasise redistributive land reforms as an option. Above all the current debate about agricultural investment must take into consideration that the 1,500 million small farmers around the world form the backbone of the food system in most regions. Country studies in Bolivia, Ecuador and Brazil have shown that 60 to 80 per cent of the staple foods and more than 50 per cent of dairy and meat products come from smallholder farms (Quan 2011). There is no doubt that agriculture must become more productive and at the same time more sustainable. But these solutions must be developed by the farmers and with the farmers, not against them.

Measuring the impact of investments

In the last decade, the scale of agribusiness in the world economy has increased at a considerable pace, given the increasing demand for food due to demographic growth, the change in consumption patterns in emerging economies and the use of crops for green energy. In particular, over the past decade, market demand for sustainable agriculture products has grown at a high rate, including several sectors experiencing growth of 40 per cent per annum over the last five years (e.g. the forestry and coffee sectors).

This market growth offers the possibility of new, higher value and more stable trading relationships for producers' organisations and for small and medium enterprises (SMEs) in developing countries. It represents a potential gateway for poverty reduction and development. In this context, a growing number of investors, international businesses and leading local enterprises are increasingly influencing value chains dynamics and market growth. More and more sustainable agriculture SMEs in developing countries are investment targets. Impact investors see a significant opportunity to invest based on financial returns, a perceived reduced exposure to risk, and the generation of social and environmental benefits. This trend is essential for increasing and expanding agriculture SME finance.

However, as more investors become involved in these high-performing markets, there is a growing demand to answer key questions regarding the financial performance and the impact of such investments, and how it should be measured and managed through the investment process.

Measuring the impact of investments in agricultural SMEs is therefore a major factor in increasing investment and risk mitigation. Sector information collected through regular reporting, analysis and benchmarks could significantly contribute to a better understanding of the agri-business model, chain dynamics, market performance and how investors might mitigate risks. It could also be a valuable input for the design of better and more tailored financial products and schemes for agricultural SMEs and chain stakeholders.

In 2011, the Finance Alliance for Sustainable Trade (FAST) developed the Shared Impact Assessment and Measurement Toolbox (SIAMT), a common framework for investors, financial institutions and SMEs to monitor and report the social, financial and environmental performance generated from financing activities in sustainable value chains. FAST SIAMT Version 1.0, focusing on agriculture, was developed in partnership with IRIS (Impact Reporting Investment Standards, an initiative from the Global Impact Investment Network) and COSA (Committee on Sustainability Assessment), ensuring alignment with their SME-level metrics and farm/household-level metrics respectively.

FAST SIAMT 1.0 includes 112 indicators for assessing outputs and outcomes of investments in sustainable agriculture, at both SME and farm/household level. It also includes data collection protocols adapted to each indicator and a user-friendly template for data input, available in English and Spanish.

From these, a group of 21 core indicators was prioritised by financial institutions, international investors and industry stakeholders for common use and universal alignment. Industry players are increasingly using a set of these core indicators in their impact measurement practices with their SMEs clients, and have started reporting data to FAST.

To help improve the effectiveness of reporting practices, FAST is currently involved in sector outreach and supporting financial institutions, investors, SMEs and other stakeholders in the adoption of this framework and its tools.

The reported impact data contributes to FAST Market and Impact Information Services, which include the development of benchmarks, reports and sector-wide analysis on the performance of investments in sustainable agriculture SMEs. By providing greater transparency, FAST is able to promote increased capital flow in the sector, and improve the effectiveness of investments.

Cristina Larrea
Project and Business Development Manager
The Finance Alliance for Sustainable Trade (FAST)
Montreal, Canada
Cristina.larrea@fastinternational.org

About FAST

The Finance Alliance for Sustainable Trade (FAST) is an international, membership-driven, non-profit organisation that aims at increasing the number of sustainable SMEs in developing countries who can successfully access affordable trade finance and related financial risk management tools. FAST strategic services and products include:

a) providing market and impact information on sustainable agriculture markets and the SME finance industry;
b) facilitating capital flow in sustainable agriculture value chains through a SME pre-selection and a match-making live process (this process also made virtual as of early 2013);
c) opening industry networking opportunities at the local and global levels.

For more information, please access: www.fastinternational.org

Welfare effects of the spread of modern food supply chains

Investments in food supply chains of developing countries are changing the way food is produced and traded, and are causing a rapid spread of so-called modern food supply chains. This has important welfare implications for rural households. The effects can come in various ways, through product and labour markets, and through direct and indirect mechanisms. The author documents these different effects for a case-study of fresh vegetable exports in Senegal.

Over the past decades, the integration of developing countries in global markets has accelerated with increased participation in international trade and growing inflows of foreign direct investment, resulting in swift changes in agri-food systems of developing countries and a rapid expansion of so-called modern food supply chains. These modern food supply chains comprise the production and trade of high-value produce, usually destined for export to high-income markets or for supermarket retail in high-income urban market segments. Modern supply chains are expanding rapidly across developing regions as global trade in high-value agricultural products – such as fresh fruits and vegetables, fish and seafood products – increases sharply and supermarkets mushroom across developing countries. These modern food supply chains are characterised by the use of high standards to govern quality and food safety throughout the chains, high levels of vertical coordination – including contract-farming – in the chains, a high degree of consolidation of the supply base and agro-industrial processing. This is in contrast to more traditional food supply chains that are governed through spot market transactions involving a large number of small traders.

Effects on product markets and labour markets

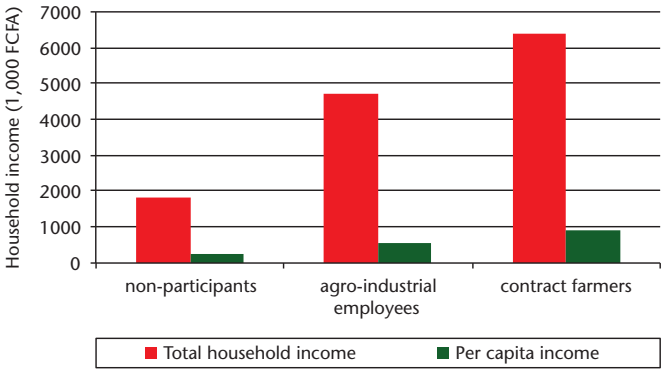
The growth in modern food supply chains has induced a sharp debate among academics, policy-makers and the development aid community on the overall welfare implications. Some authors see this process as an engine for rural income mobility and poverty reduction, while others argue that it exacerbates existing inequalities and fails to create direct gains for the rural poor. In order to understand the overall welfare implications of the growth in modern food supply chains for rural households, it is necessary to take into account and distinguish between several different effects. First, rural households are affected by the emergence of modern food supply chains through product markets; more specifically through the participation (or not) in the production and marketing of high-value produce for export or supermarket retail. Second, rural households can be affected through labour markets if the emergence and growth of modern sup-

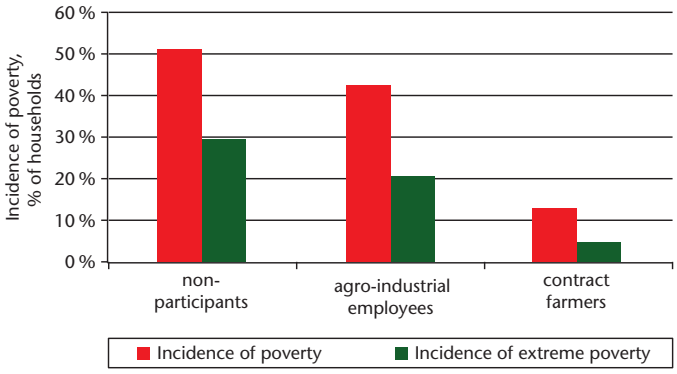
Female employment in the export agro-industry can significantly increase primary school enrolment.

Photo: M. Maertens

Miet Maertens
Division of Bioeconomics, Department of Earth and Environmental Sciences
KU Leuven, Belgium
Miet.Maertens@ees.kuleuven.be

Growth of the bean and tomato export supply chains: Household level income and incidence of poverty





ply chains is associated with increased rural employment in emerging modern agro-industries. This can include employment on the fields of large-scale industrial farms or employment in post-harvest handling and processing, including labour-intensive activities such as sorting, grading, washing and labelling.

What is influencing household welfare?

Participation of rural households and smallholder farmers in modern supply chains – either through product markets or through labour markets – does not necessarily say much about the impact of such participation on household welfare. The welfare implications depend on the direct and indirect gains rural households can derive from this participation, and on spill-over effects in the broader economy. First, direct effects are most straightforward. Participation in modern supply chains through product markets might directly benefit farmers' income if product prices in these chains are higher. Contracted farmers are also affected by the provision of inputs, credit and farm assistance by the contractor company. This enhances access to inputs and working capital for farmers, reduces their production and marketing risk, improves their access to technology and typically results in higher productivity. In addition, the wages earned by workers in agro-industrial companies add directly to household income. Second, indirect household-level effects are possible through technology and managerial spill-over effects from export crops to non-export crops and plots, and through investment of incomes from modern supply chains in other farm and non-farm activities. Also, indirect effects in the broader economy might exist through increased incomes from export production and wage employment leading to increased consumption of locally produced goods and services.

Case studies from Senegal

The author has analysed the product and labour market effects of the spread of fresh vegetable export supply chains in Senegal and has looked at direct as well as indirect effects. The case-studies include bean exports, originating from the Niayes region, and tomato exports, coming from the Senegal River Delta area. The export of beans from Senegal quadrupled over the past decade, from slightly more than 1,000 tons in 1998 to almost 5,500 tons in 2008; the export of tomatoes increased from slightly more than 500 tons in 1998 to almost 10,000 tons in 2008. The main destination countries for this produce are France, the Netherlands, Belgium and the UK. There are some differences in the structure of the export supply chains of beans and tomatoes. In the bean export sector there are some 25 exporting companies, a mixture of smaller and larger exporters. As a result of increasing standards and as part of a corporate strategy to become GlobalGAP certified, the largest exporters have changed their sourcing strategies from relying on contract-farming with smallholders to vertically integrated estate production of their own. This has substantially changed the structure of the bean export supply chain. It is estimated that the share of export produce that is sourced from smallholder contract schemes decreased from 95 per cent in 1999 to 52 per cent in 2005. The tomato export sector is dominated by one multinational company that was established and started exporting tomatoes from Senegal to the EU in 2003. The tomato export supply chain is completely vertically integrated. There is no procurement from smallholders, and production, processing, trade and distribution are completely integrated within the subsidiaries of the multinational company. The multinational holding aims at high-standards production through certification by different schemes, including GlobalGAP, BRC (British Retail Consortium) and Tesco's Nature Choice.

Focus on five welfare effects

The welfare effects of the growth of the bean and tomato export supply chains for local households are diverse, and include product and labour market effects, and direct and indirect effects. Through the collection of survey data and statistical analyses, the author has

disentangled some of these effects. The intention is not to give a complete list of all possible effects but to point to some important mechanisms through which a welfare impact is created. Overall the results indicate that labour market effects and indirect effects, coming about through different mechanisms, are quite important in generating positive welfare effects for rural households and for creating spill-over effects in the rural economy (see Figures on page 21).

First, in the bean export supply chain, rural households benefit through both product market and labour market effects. Around 750 smallholder farmers and 12,000 workers participate in the bean export chain; the former as suppliers of produce in contract-farming schemes and the latter as workers on the estate farms and in the processing centres of the exporters. Both participation in contract-farming and participation in agro-industrial employment have resulted in significantly higher incomes. It is estimated that contracting with the export sector leads to incomes that are 110 per cent higher than the average income in the region, while for employment in the export industry this is 60 per cent. The observed shift in supply chain structure from smallholder contract-farming to large-scale vertically integrated estate production has resulted in a stronger poverty-alleviating effect. This is the case because the poorest households mainly participate and benefit through labour markets while participation in contract-farming is biased towards relatively better-off households.

Second, in the tomato export sector in Senegal, rural households only benefit through labour-market effects, as there is no contract-farming and procurement from smallholder farms. The export company employs slightly more than 3,000 workers on its fields and in the processing unit. These are mainly seasonal workers and day-to-day labourers who are recruited from nearby villages. It is estimated that employment in the tomato export industry leads to incomes that are about 50 per cent higher than the average income. As participation in employment includes poorer households as well, these effects on income ultimately result in reduced rates of poverty and extreme poverty.

Third, employment in the bean and tomato export agro-industry benefits rural households directly through increased income from wages, but also indirectly through investment linkages at the household level. In the case studies, it was observed that wages earned in the export chains were partially invested in the households' own farm businesses, leading to higher outputs and farm incomes. An analysis shows that households with access to wages from the export agro-industry cultivate their land more intensively and use 75 per cent more agricultural inputs, leading to higher agricultural output. This is an important indirect effect, indicating that there are important linkages between the export supply chains and the local food supply chains. Export production on large-scale estate farms does not jeopardise food production for local consumption but in fact even stimulates local food production through investment linkages.

Fourth, employment in the bean and tomato export industries in Senegal has important indirect gender consequences. A large share of the employees in these sectors is female, 90 per cent in the bean sectors and 60 per cent in the tomato sector. The development of the export supply chains has led to a feminisation of the rural labour market in the case study areas and to a reduction (albeit not an elimination) of direct and indirect gender discrimination in these labour markets. Survey data reveal that the gender wage gap in export industries is three to six times lower compared to other employment sectors. Moreover, it was observed that wages earned by women in the export industries importantly contributed to female empowerment within rural households, resulting in changes in the consumption pattern of households.

Fifth, female employment in the export agro-industry increases female bargaining power in the household, and this has important consequences for children. The school enrolment of primary school-aged children was found to be importantly affected by this increased female bargaining power. It has been estimated that female employment in the export agro-industry increases primary school enrolment by 26 per cent points. This effect was found to be equally large for boys and girls. These are major, important effects. They indicate that through the creation of female employment, the growth of modern export supply chains in Senegal has indirectly contributed to the second and third Millennium Development Goals of universal primary education and elimination of gender disparities in primary education.

One main conclusion that the author draws from the research is that the growth in modern export supply chains in developing countries can bring about important positive welfare effects for rural development and poverty reduction, and that these effects can come in various ways through product or labour market effects and through direct and indirect effects. Indirect effects and labour markets effects can be quite important and should be considered in evaluating the contribution of modern food supply chains to welfare and development. This implies a need for supporting the development of modern food supply chains in poor countries. This requires a recognition of the importance of private investments in agri-food supply chains, and of the importance of labour market effects in policy thinking and programme strategies.

More information on school enrolment rates and a list of references is available at: **www.rural21.com**

The supermarket revolution and smallholder farmers

Agricultural supply chains in developing countries are undergoing a transformation towards higher-value products, stricter standards, and vertical integration. This can have far-reaching consequences for rural development. Recent research has concentrated on the export sector. But domestic supply chains are changing, too, often driven by supermarkets and their procurement channels. In many developing countries, supermarkets are expanding very rapidly, so the term "supermarket revolution" is sometimes used.

We have analysed impacts in the Kenyan small farm sector in a project funded by the German Research Foundation (DFG). We collected data from 400 randomly selected farm households in Kiambu District, where the two biggest Kenyan supermarket chains, Nakumatt and Uchumi, source vegetables for their stores in Nairobi. Foreign supermarket chains so far play a minor role in Kenya. Our sample includes farmers that supply vegetables to supermarkets as well as farmers that sell in traditional channels.

Farmers produce leafy vegetables, including exotic ones such as spinach and kale, and indigenous ones such as *amaranthus* and black nightshade. Traditional sales are spot-market transactions between farmers and traders without any prior agreement. Depending on the demand and supply situation, prices are subject to wide fluctuation. In contrast, supermarkets have contractual agreements with farmers regarding prices, quality, hygiene, and consistency in supply. Prices are usually higher and more stable than in traditional channels, but supermarkets make their payments only once a week. Supermarkets refuse delivery from farmers who are not supplying regularly or do not meet the contractual standards.

Our analysis shows that participation in supermarket channels has a positive impact on farm productivity. Higher output prices and market assurance increase farmers' ability and willingness to upgrade their technology, including use of high-quality seeds, more organic fertiliser, and better irrigation equipment. Supermarket participation also increases scale efficiency: due to reduced marketing risk, farmers tend to specialise, harnessing economies of scale. We also examined impacts on household living standards. Participation in supermarket channels causes average gains in per capita income of almost 50 per cent. Thus, poverty rates among supermarket suppliers fell by 20 per cent.

Supermarkets also have positive rural employment effects. The special supermarket requirements entail intensified production and post-harvest handling, increasing farmers' demand for hired labour. Participation in supermarket channels increases hired labour use by over 60 per cent. Especially women find more employment, as female labourers are preferred for certain operations such as cleaning and bundling the vegetables. Women's access to paid employment tends to increase their economic independence and control over income. These findings suggest that the supermarket revolution can contribute to agricultural growth in the small farm sector and broader rural development. However, supermarket procurement channels in Kenya are still evolving. Follow-up research will have to analyse whether or not the benefits are sustainable. Moreover, when developments expand geographically, disadvantaged households may be bypassed. Better educated and trained farmers are more likely to be involved in supermarket channels. Moreover, good infrastructure and access to public transportation and credit are factors that facilitate participation. Hence, typical market access constraints will have to be addressed to avoid undesirable social outcomes.

In Kiambu, an international NGO has promoted collective action among farmers, also providing special training on supermarket requirements, an advance payment scheme, and related institutional support. These activities reduce transaction costs and contribute to making farmers more reliable trading partners for supermarkets. Such efforts should be sustained and scaled up for better linking smallholders to emerging value chains.

Prof. Dr Matin Qaim
University of Göttingen, Germany
mqaim@uni-goettingen.de

Dr Elizaphan J.O. Rao
ILRI, Nairobi, Kenya

Further Reading:

Rao, E.J.O., B. Brümmer, M. Qaim (2012). Farmer Participation in Supermarket Channels, Production Technology, and Efficiency: The Case of Vegetables in Kenya. American Journal of Agricultural Economics 94: 891–912.

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Smallholders from Kiambu District supply Nakumatt stores in Nairobi.

Photo: J. Boethling

Large-scale agro-processors in sub-Saharan Africa: A catalyst for pro-poor growth?

Several trends indicate that the significance of large-scale agro-processors in the food value chains of sub-Saharan Africa (SSA) is going to increase. At the same time, the conditions for a good integration are not particularly favourable. The following article describes where the difficulties are and which principles should be taken into account to accommodate these actors in the African food sector.

Agro-processing (and other post-harvest treatment of agricultural products) is one of the four pillars of agro-business, together with agricultural input supply, machinery and equipment, and services such as finance and trade. In many agro sub-sectors, a trend towards larger units is observed (according to the United Nations Industrial Development Organization UNIDO, an enterprise is considered large if it has more than 100 employees in developing countries and 200 in developed countries).

The reasons are manifold, coming from different sides – consumption, production, and the economic and regulatory framework (keywords: supermarketisation, demand for processed and convenience food, economies of scale, technological progress, fixed costs, health, environmental and social standards and regulation, traceability). These factors are particularly at work in processing for industrial products, but also in many food mass markets.

Dr Michael Brüntrup
German Development Institute/ Deutsches Institut für Entwicklungspolitik
Bonn, Germany
Michael.Bruentrup@die-gdi.de

Trends of large-scale agro-processing in SSA

Large-scale processing, at least in terms of a first processing stage, is common in many export-oriented value chains (e.g. cotton, vegetable oil, sugar) since economies of scale, the structure of concentrated demand of second-stage processors and retailers as well as regulations and standards in the final destination markets support size. In some markets, such as the classical tropical products coffee, cacao or tea, first-stage small-scale processing structures coexist with larger ones, and their semi-processed outputs are channelled through systems of standards and auctions towards the large processors in the North.

In contrast, markets for locally procured and processed food products are still dominated by small, often informal actors. It is estimated that 60 per cent of the African labour force are at least partially involved in small-scale food processing, most of them women. This can be explained by the historical underdevelopment of several of the above-mentioned demand factors, in particular low urbanisation, low household incomes and, thus, low demand for processed, branded, standardised food products. In addition, supply problems are important: the procurement of large amounts of agricultural products of standard quality and in a timely manner in SSA is difficult due to many reasons: small farm sizes and dispersion of producers, lack of reliable marketable excess production due to numerous difficulties of smallholder farmers, low number of functional cooperatives or other types of farmer groups, shortage of advanced production technologies, absence or non-respect of standards and regulations, information problems and other high transaction costs in rural areas and along the food chains.

With the gradual change of local food demand and markets (keywords: high growth rates, new middle class, record urbanisation), the situation described has started to change at the demand and retail level. Large supermarket chains have been observed to make a dent in urban markets since the 1990s, particularly by South Africa, which has a strongly developed industrialised food market and an active expansion policy. South African companies are said to control 80 per cent of the processor sector in SSA. But also, some local companies and those from other nations have become active.

However, the above-mentioned strong supply side problems in sub-Saharan Africa (SSA) suggest that,

even where demand for industrialised processed food products arises, this is often served more easily by importing processed food than by processing of locally procured commodities. But importing food is often costly, does not allow an exact fit for consumer preferences, and is further handicapped by trade and food regulations. Thus, large local retailers have increasingly tried to procure locally. This has opened up opportunities for the processing industry. Another important driver for this trend is a change in perception of risks and opportunities of doing business in Africa generally. Some public policies and investments are supporting large processors in particular: the abolishment of internal trade barriers, regional and continental trade agreements, infrastructure and communication, common standards and protocols, reduction of bribery at customs, trade facilitation, transnational financial services, and the like.

In summary, agro-processing investments by both international foreign direct investors as well as local companies have been found to increase progressively since the mid-90s. Cross-border mergers and acquisitions in the food-processing industries in Africa increased from 27 million US dollars (USD) in 1991/95 to 1,400 million USD in 2007 (almost 13 % of all developing countries). Foreign investors targeted rice, wheat and oil crops as well as sugar and floriculture in particular.

The food price crisis in 2007/08 and the rising agricultural price trends since then have certainly played a major role in incentivising investments in the African food sector in recent years: they have renewed the attention for natural resources and agriculture, and SSA has been discovered as the single largest potential pool of as yet underdeveloped natural resources for increasing world food production. The rush for agricultural land by international investors is an indicator of that perception. While these are strongly debated, large agro-processors receive less criticism, and many policy-makers and donors see them as important instruments for a modernisation of food value chains, securing supply and reducing poverty. Currently, thus, a new wave is emerging of agro-business interest for, and in, SSA, often supported by donors.

Different models of interaction: impacts and risks

There are several fundamentally different ways how large-scale agro-processors may interact with and impact on national economies. One strain is through products and prices on consumers, one is with competing small-scale processors, another is on suppliers, and yet another is linked to the political economy of the food sector.

Arguably, the most important strain is with suppliers, in particular farmers, because the presence of large processors changes several fundamentals in the relations, rules, logics and power structures within the food value chains. The number of producers in a food value chain is much larger than the number of direct employees in the processing industry. For instance, in the European Union, for which the numbers are readily available, more than 80 per cent of food, beverage and tobacco sector employment is in agriculture, and less than 3 per cent in manufacturing, though the value addition of each is about 25 per cent. The mode of commodity production – large or small-scale farming – will also strongly influence the environmental impacts.

There are several ways (large-scale) to link agro-processing to primary production. These reach from arms-length trade on anonymous markets to complete control of procurement on fields owned by the businesses themselves (see Figure on page 26). Which form is appropriate, preferred and finally realised depends on many factors, several of which are under the direct control of the processors. The United Nations Conference on Trade and Development (UNCTAD) has developed the OLI paradigm to classify factors into: **O**wnership-specific advantages of a large corporation to produce a certain good, **L**ocational factors that specify production and investment condi-

Photo: J. Boethling

In tea production, small-scale processing structures coexist with larger ones.

tions of a specific country and site, and considerations to Internalise operations (or to licence or contract them out). Although this concept allows for a very broad categorisation of factors and a reflection of issues such as supply capacities, market and regulatory requirements, some issues in farmer-processor relations in SSA warrant special attention.

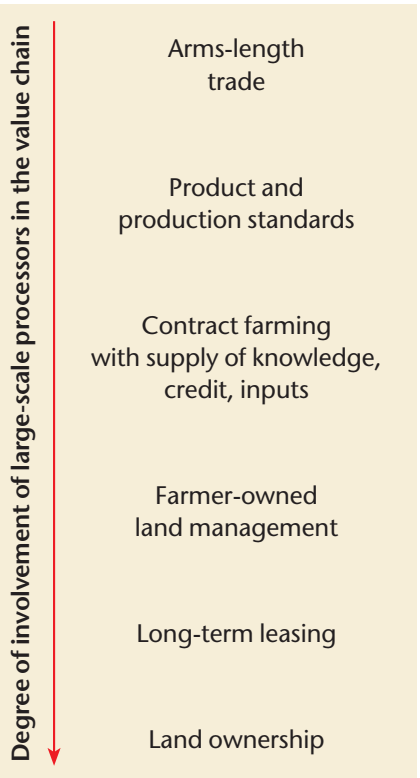
- As indicated, supply-side weaknesses of smallholder agriculture explain why and experience tells that arms-length trade is rarely able to satisfy the demand of large-scale food processors.

- One particularity of agricultural value chains is that land is a very special kind of investment good that is especially delicate in SSA due to its social, legal, political, ecological, cultural and even religious properties. The observations around the new rush for large-scale land acquisitions and the global public outcry, contrary to most other forms of investment, demonstrate this uniqueness. In addition, agricultural cultivation does not regularly show strong economies of scale. More capital, better production technology and input use of large cultivators are often more than compensated by disadvantages in labour surveillance, risk and management costs. Smallholders are more flexible, and can exploit cheap family and local informal labour and crop at the margin. They are small, vulnerable and poor, but efficient.

- Another particularity in SSA is the historic legacy which still strongly influences present agri-food structures. Many present-day agro-processing enterprises have derived from privatisation of former parastatals in the frame of Structural Adjustment Programmes (SAPs) and further mergers and acquisitions. These structures have established deep-rooted habits, dependencies, institutions and policies. Thus, there is quite a strong path dependency in some sub-sectors.

In summary, large agro-processors are torn between centrifugal, centripetal and stationary trends when considering whether or not to get primary production under their direct control. In many cases, a not completely integrated model will be the best (available), where farmers have to be supported in one way or another, by organising them, by providing training beyond public extension services, or by supplying additional services, inputs and credit in the frame of a contractual arrangement (see article on pages 12–15). If supply is risky and circumstances are unfavourable, an agro-processor, particularly one with high fixed capital investments, may even want to produce a larger share of the primary products himself. This is the rationale for large-scale land acquisitions by many large-scale processors. In sugar, for instance, a rule of thumb is 70–80 per cent of one's own production to protect an investment which can easily reach a hundred million USD.

Options for linking (large-scale) agro-processing to primary production



Successes and failures

Looking at the present developments of old and new processor-smallholder interlinked models, the balance is quite mixed. After SAPs, privatised agro-processors could, in some cases, strengthen their efficiency, often by adjusting (formerly excessive) jobs, wages and other costs (e.g. sugar estates and mills). Some disappeared (many government-controlled cooperatives or tomato processing in West Africa) or could only be rescued with additional government interventions (e.g. cashew in Mozambique). In many instances, a long series of adjustment steps took place, successively disentangling and dismantling the many functions of integrated state-controlled structures, and often in an attempt to rescue the core large-scale business. In yet further cases, government (co-) ownership continues to exist (e.g. in cotton ginneries in several West African countries).

The few more recent investments are showing mixed success, too. Export horticulture global value chains starting from a few SSA countries, which include some processing, are success stories in Kenya and Ethiopia but less so in West Africa (although there are some). The supply of local supermarkets and related formal food chains is often successfully taking place in fresh fruit and vegetable products, for instance, although these are frequently specialised medium-size enterprises, given the still small volumes on national markets. However, there are a few successful large-scale ones, often connected to export chains. In contrast, the first wave of biodiesel producers, mostly based on the Jatropha plant, whether from their own plantations or from smallholder production, largely failed all over SSA, for a number of reasons including low experience, a

wrong business model and/or (wrong) interventions (or lack of them) by governments.

Farmers have been strongly affected by changes, successes and failures of agri-processor structures, although it is often difficult to disentangle processor-specific issues from wider sub-sector reforms in the complex SAP-related processes. In some instances, the SAP liberalisation was beneficial, achieving higher prices through high efficiency in processing but also through some other channels (trade, exchange rate, price policy). However, in a number of cases, the guaranteed outlet to a processor had been important in stabilising prices and gaining access to technology, training, inputs and credit. Farmers lost these advantages with the disappearance of the monopsonist, since smaller buyers have not delivered these, either for lack of their own access or because the side selling (risk) overwhelms all advantages of fostering supply in the remaining atomised market structure.

Experiences further show that private large processor companies in the agricultural sector are no easy political partners. There are risks of unfair contractual relations with farmers, manipulation of competition and trade policies, etc. In SSA, this is accentuated by a low level of capacities of state authorities to create a level playing field for making business and imposing contract execution, as well as widespread corruption. This must not necessarily be unfavourable for farmers and workers, but for consumers and overall welfare.

Conclusions

Large-scale agro-processors face very different situations in SSA, depending on the products and markets. Though some exist for a long time, conditions are generally not favourable for them. In the longer run, however, they are projected to grow due to long-term trends in demand, technology, markets, policies, regulation and private standards, both for export and for internal markets. Africa would be forfeiting some market segments if it were not adjusting to accommodate them. Policies can partially shape the occurrence, behaviour and impacts of large-scale agro-producers, but they are difficult partners in the generally small economies with weak business partners and weak government structures.

Private-Public Partnerships (PPPs) within a strategic framework of improving entire sub-sectors nationally or regionally may work best to create appropriate spaces for new large-scale processors. Some of the new alliances emerging seem to endeavour such PPPs. However, given the complicated nature of procurement and land ownership structures in SSA, the most important partners will be farmers, and they will also widely determine the overall social impact of such partnerships (though competing small-scale processors and consumers should not be forgotten). Thus, they should be full-fledged partners in the emerging coalitions, or Peasant-Public-Private Partnerships (PPPPs). These will be faced with many difficulties due to very different characteristics in terms of social, informational, technical, financial and power attributes and different time horizons, expectations and goals. The state, and particularly donors, have to handle the difficult role of assuming a facilitating, neutral role, letting the private partners negotiate and carry out commercial activities, while at the same time supporting the weaker partners – the farmers. In addition, they may supplement infrastructure, materials, technology and services that are in short supply and beyond control or capacities of the private partners.

Agro-processing investments in sub-Saharan Africa have increased progressively since the mid-1990s.

Photo: J. Boethling

On a more general level, care has to be taken how to balance the roles of such large players within the entire food sector. Though there may be trends towards products and value chains in which large-scale processors have a comparative advantage or are even the only feasible option, most of SSA's food markets are and will be dominated by more informal value chains and channels now and for a long time to come. These can be very efficient, they are often the better choice in social terms, they are less problematic in political economy terms, and they can improve. Support for this part of the food chains is possibly more complex, but also worthwhile, including through regulation of large actors. To select the right balance between the different segments and actors is certainly a very important and difficult task. The insight that most SSA countries are not yet ready to design and implement good industrial policies for the general welfare must give rise to concern. However, not reacting will not be the better option – thus, an attempt must be made to ride the dragon.

The GIZ partnership farming approach: A future for smallholder farming?

Smallholders need support to develop their farms in an increasingly competitive market environment. Germany's GIZ has developed a partnership approach enhancing interaction between farmers and receiving hands and providing benefits for smallholders such as better incomes through better farm practice/management and opportunities for farmers to become self-sufficient decision-makers.

With the emerging agricultural market opportunities (increasing prices and demand for sustainability) in developing countries, there is the unique chance, but also the need, to support smallholder agriculture and rural areas as a whole to benefit from this market development. At the same time, it is essential to modernise and optimise smallholder farming systems and to produce more from less, while doing so in an environmentally sustainable, efficient and socially just manner. Acting as a manager, the farmer plays the decisive role in this system. Commercial farming has been promoted by various actors as a key means to improve the livelihoods of smallholders around the globe. Agricultural projects attempt to build capacity by providing or enabling solutions to the target context where, in most cases, smallholders are subject to inferior conditions regarding intrinsic and extrinsic factors in optimising their farming.

Fully market-oriented and demand-driven project designs use the classic value chains approach as analytic tools, but turn the perspective for implementation around: from consumers, industry and traders to farmers. So the value chain starts on the market side and ends with the farmers and the input suppliers.

The GIZ partnership farming approach provides a holistic and long-term sustainable solution, through investment in farm system management, capacity building, production modernisation and strengthened linkages between buyers, traders and farmers.

Smallholders and agribusiness

The partnership farming approach has been developed by combining lessons learned from the long-term experience that GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit) has gained in optimising agricultural supply chains, market-oriented smallholder development programmes and private sector cooperation projects. Partnership farming is based on the awareness that the paradigm change towards a closer interaction between agribusiness and smallholders to create large impacts is about to expand from upscale niche products into commodity markets through high quality standards and shortages of agricultural raw materials. The approach seeks to synergise the strengths of smallholder farmers and national and international agricultural processing companies (agribusiness).

Doing so solves the weaknesses of both parties. The typical constraints

Farmer training in the field.

Photo: Y. Kukeawkasem

Dr Thomas Breuer
Sector Project "Agricultural Trade and Private Sector Cooperation in Rural Areas"
Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
Eschborn, Germany
thomas.breuer@giz.de

Dr Yotsawin Kukeawkasem
Smallholder Farming and Agribusiness Expert; GIZ Consultant
Neuberg, Germany
yotsawin@gmail.com

that smallholders face in farming are small plots of land, poor farm management and input knowledge, limited, if any, access to financial means, and use of improper quality or insufficient farm inputs, i.e. seed, seedling, animal breed, feed, fertiliser, etc. Thus the farm yield of smallholders is rather low and often produces poor quality. Agribusiness is faced with the problem of low quantity and quality of smallholder production and the large transaction costs when it comes to e.g. the introduction of produce and sustainability standards.

Processing companies normally hold superior attributes compared to the smallholder and know the market demands. Cooperation between the smallholders and processing and trading companies by sharing mutual interests and benefits like higher quantities, qualities and prices can lead to a win-win situation for both parties and for the national economy as a whole. The partnership farming approach promotes a sustainable agriculture and contributes to improving farmers' agricultural know-how, which is necessary to access high-quality domestic and international markets.

GIZ partnership farming project in Thailand

Eighty per cent of the oil palms in Thailand are cultivated on smallholdings. The GIZ Sustainable Palm Oil for Bioenergy project in Thailand cooperates with four oil mills and 1,000 smallholders. The focus is on production management, sustainable growing methods and improving yield. The smallholders also benefit from improved health and occupational safety. The methane produced as a by-product of oil extraction is used as fuel and helps reduce greenhouse gas emissions elsewhere. The oil mills have excellent greenhouse gas balances and now meet international guidelines on greenhouse gas reduction. The first sustainability certificates for palm oil from Thailand are already available.

An impact study conducted by Prince of Songkla University/Thailand clearly stated that the project was creating many benefits for those involved in the project along with its spillover. The smallholders participating in the project were very positive about the knowledge they had gained from the project. Yield increased by 2.5 tons of fresh fruit bunches per hectare on average. Both oil extraction rate and the relationship to the partner mills have improved.
For more information on the project and the study, see:
www.rural21.com

A farmer presenting his membership card to retain full benefit from the palm oil mill.

Photo: giz

Key factors and activities for a successful partnership farming project

If a partnership farming project is to be successful, the requirements listed in the following have to be met.

- A macro-economic framework for strong agricultural-based poverty reduction and rural development.
- A combination of smallholder production in the field with large-scale activities in processing (economies of scale, which is important for commodity markets).
- The establishment of long-term interdependence and trustful business partnerships where mutual interest, benefits, and information are shared (not necessarily on a contractual basis) rather than spot-market relations.
- Technical knowledge and technology transfer from agribusiness to smallholder groups.
- Farming as a business, with farmers as agripreneurs.
- Next to commodity specific training, basic agricultural education should be provided.
- An inclusion of agricultural labour.
- Direct business relations between farmers and the processing companies (minimising the involvement of middlemen).
- An implementation strategy aimed towards sustainability of farmers, starting out from mutual benefits:
  a) Increase productivity (t/ha) to ensure total output for companies and income for farmers.
  b) Improve quality (grades) via quality-based price premium incentives.
  c) Organise joint and quality procurement for agricultural inputs for the farmers.
  d) Internalise sustainability practices for a sustainable livelihood and community, i.e. occupational health and safety, labour welfare, high conservation values, etc.

To assure that these characteristics are met, a number of essential activities need to be performed:

a) Conduct a professional analysis for sustainable markets.
b) Define the situation with a participatory appraisal and/or scientific baseline study to assess its essentials and the needs of target farmers.

c) Ensure farmers' group formation with a focus on production optimisation. Develop farmer-friendly and practical training and education materials for distribution.
d) Set up a system to disseminate good practice aspects incorporating local farm advisers (FA). FAs should be from the production region and be familiar with the farming business (ideally as farmers' sons and daughters) to secure a strong day-to-day working relation.

- Public funding should be provided as seed money for further development, but with a clear exit strategy for such funding right from the beginning.

The goal of the partnership farming concept is to enable farmers to become self-sufficient decision-makers, "agripreneurs", which allows for a more flexible production system and highlights farming as a profession by choice and not by inheritance. Partnership farming promotes the capacity of farmers to adopt modern agricultural practices and enhance the international competitiveness of smallholder agricultural production.

The difference: farmers and agricultural labourers as long-term partners

The major difference and the improvement that the partnership farming approach offers in contrast to the usual contract farming arrangement is that the buyer is willing to contribute to a broader agricultural education for farmers. The farmers are seen as strategic partners for the agribusiness, and therefore the companies should also invest in the development of their partner farmers.

The processing partners in the Partnership Farming system combine their practical production farm advisors with the co-ordination and organisation of public extension and training systems to provide the farmers with holistic agricultural knowledge which can be applied to a variety of commodities and production systems. To sustain knowledge sharing amongst the partners in the production system, an exchange platform needs to be facilitated to ensure a learning community between buyer/processor, farmer and agricultural labourer for improved agricultural production.

Partnership farming emphasises the value and importance of relationships between several levels in the production system, including farmers, labourers, processors, buyers and the environment. The collaboration between the different actors in the production system strengthens the agricultural labourers and improves their knowledge base and income situation. Often, the needs of agricultural labour are not met or not even targeted by extension services. But in many farming systems, the agricultural labourers are a key factor to implement change in production in terms of productivity, quality and natural resource management. This is why the partnership farming approach incorporates agricultural labourers in the training and education activities. Trustful and respectful working relationships between all the actors in the partnership farming system and a sustainable use of natural resources guarantee a sustainable welfare base for both present and future generations.

Regional seminar on partnership farming in Asia

In 2011 and 2012, GIZ Thailand held two seminars on "The future of smallholder farming in agribusiness" in Krabi. The seminars were carried out and attended by representatives from various institutions, such as international donors (e.g. International Finance Corporation – IFC, UN Food and Agriculture Organization – FAO, European Union – EU), implementers (e.g. SNV, Solidaridad, WWF) and the private sector (e.g. Sime Darby, PTT), etc. with the aim to create:

1. an understanding of the challenges that current global trends pose to smallholders, and how best to counteract them;
2. knowledge of how to successfully facilitate smallholder farmers becoming agricultural entrepreneurs;
3. enhanced capacities in agribusiness project analysis, planning, management and monitoring;
4. the ability to apply the concept of partnership farming in practice.

The participants have clearly seen that the partnership farming approach could have very positive impacts for smallholders thanks to:

- better farm practice, farm records, cost reduction on fertiliser due to appropriate use and group purchase via the agribusiness,
- income increased via higher productivity and improved quality, and
- an interactive platform between smallholders and trading partners, and learning and exchange among the groups.

A farm advisor of the project with his fresh fruit bunch. Photo: giz

Contract farming: Some fundamentals to be considered in contract design

Contract farming agreements are forward contracts specifying the obligations of two business partners: the sellers' (farmers') promise to supply and the buyers' (processors'/ traders') promise to off-take agricultural produce as agreed. With regard to substance, form and the process of concluding such arrangements, farming contracts are quite variable: they may be established in verbal or written form; they may be concluded by individual farmers or by farmer groups; the description of obligations may remain quite vague or be reasonably specific; the arrangements may be based on renewable seasonal negotiations or on long-term business relations; the specifications may be based on case by case negotiations or on a sub-sector code of practice. Whatever process applied or contents itemised, to ensure sustainability, successful farming contracts have to be designed in a way that promises benefits to both contract parties.

Given the diversity of produce features and geo-climatic situations, business cultures and entrepreneurial capacities, socio-economic structures and business environments, it is obvious that there is no one-size-fits-all blueprint for designing farming contracts. Furthermore, experience shows that a farming contract is not worth the paper it has been written on if there is no trust between farmers and buyers.

Margret Will
Consultant
Schenefeld/Germany
margret.will@gmx.net

Till Rockenbauch
GIZ Sector Project: Agricultural policy and food security
Bonn/ Germany
till.rockenbauch@giz.de

Trust is decisive for the willingness to honour agreements and for reducing moral hazard problems such as diversion of inputs or side-selling (often in response to poaching by competitors), unduly imbalanced negotiating power or biased rejection practices. **Contract farming is a business, in which farmers and buyers share risks and benefits.** For making contract farming a sustainable business, the following principles have to be acknowledged:

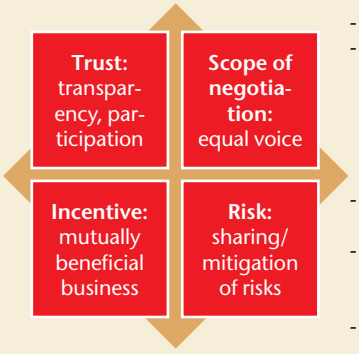
- **Trust:** appreciate that trustful relations are the foundation for success and that trust builds on fair give-and-take relations and open communication;
- **Scope of negotiation:** understand that farmers need to have an equal voice in contract negotiations and conflict settlement;
- **Incentive:** recognise that farming contracts are clear-cut commercial agreements that can sustain if both parties realise a cost-benefit 'plus';
- **Risk:** realise that contract farming bears risks requiring arrangements for sharing and minimising risks of conjoint investments according to the capabilities of contract partners.

Business principles and basic elements for designing contract farming agreements

Legal elements:
- Freedom to contract: it is the free decision of farmers and buyers to conclude a contract and negotiate contract details
- Good faith: the honest intention of both parties not to cause damage to each other can be trusted
- Termination: the conditions of contract expiry need to be specified
- Force majeur: in case of unforeseeable/ exceptional situations, a non-performing party can be exempted from liability
- Performance: both contract parties are bound to realise their obligations as specified
- Non-performance/ compensation: consequences for any party's failure to meet obligations are to be specified
- Dispute settlement: agreement on ways to settle contractual disputes (mediation, arbitration, prosecution)

Farmers' obligations:
(individual farmers or farmer groups)
- registration (name, acreage, etc.)
- product quality
- cultivation practices (e.g. Good Agricultural Practice – GAP)
- supply volume (incl. share to be supplied to buyer and share to be freely used/ marketed by farmers)
- supply date/ calendar
- record-keeping (probably as annex: detailed GAP, list of tolerable pesticides, etc.)

Business principles:



Buyers' obligations:
- name, location, etc.
- off-take volume
- embedded services (inputs, extension, market information, certification support, packaging material, credits)
- field monitoring/ spot checks
- quality control mechanism/ grading criteria
- feedback on performance/non-performance

Pricing specifications:
- production costs/ farmer margins
- flexible or fixed rates
- quality premiums or deductions
- costs for inputs/embedded services and cost recovery details

Marketing specifications (responsibilities/arrangements):
- harvesting/ grading/ packaging
- rejection criteria/ tolerance levels
- collection infrastructure/ procedures
- transport organisation

Payment specifications:
- mode (e.g. cash/ in-kind, individual/ group transfer)
- timing (e.g. down-payment, staged payment, payment on delivery)
- records of deliveries/ payments

Rural advisory services – an essential for successful investment

No doubt advisory services play an important role in rural development. However, efforts made in establishing such services have not always met with success. Assessing local factors, recruiting suitable staff, and finding the right structures for provision and financing are among the issues that count in developing sustainable advisory services.

Rural advisory services (RAS) and training are critical knowledge sharing institutions that help to support responsible investments in value chains and innovation systems. RAS are crucial to putting farmers' needs at the centre of rural development, ensuring sustainable food security and poverty reduction, and dealing with risks and uncertainty.

There is renewed attention on the importance of advisory services and extension in rural development processes, including value chain development. This is due in part to new challenges such as climate change and globalisation. These challenges imply new roles and therefore new capacities for rural advisory services and the clientele that they serve. Training institutions are important too, for developing these new capacities and for enhancing existing ones.

While it is clear that rural advisory services and training are very important for effective value chains, there are critics who say that these services have failed. For instance, much effort was put into the training and visit system to professionalise government extension, but in the end it was not financially sustainable. In past years, people have questioned the relevance and competence of mainly public RAS to deal with contemporary challenges. Governments responded to these criticisms by downsizing public extension, decentralising public extension to local administrative units, withdrawing from funding and delivery, and promoting privatisation (mainly cost recovery and outsourcing).

Meanwhile, the extension landscape has also undergone changes, becoming more pluralistic with the increasing participation of the private sector (dealing with agro-inputs, agri-business, financial services), non-governmental organisations (international as well as local), producer groups, cooperatives and associations, consultants (independent and those associated with or employed by agri-business/producer associations), and ICT-based services. All these have brought additional resources for RAS and also new knowledge, skills, and expertise. However, this pluralism has also resulted in additional challenges of ensuring quality, providing technical backstopping, and ensuring collaboration and synergy between diverse RAS providers.

Rural advisory services and their role in value chains

Rural advisory services, also called extension services, are the different activities that provide the information and services needed by farmers, their families, and other stakeholders in rural settings. Advisory services help rural people develop their own technical, organisational, and management skills and practices to improve their livelihoods and well-being. This includes support and advice related to farm, organisational, and business management, and facilitation and brokerage in rural development and value chains. RAS include a diversity of actors from the public, private, and civil society organisations who provide support to rural communities.

Looking for the perfect mix

What then is the right mix of providers and sectors to achieve sustainability? Unfortunately there is no correct answer or simple formula to achieve this. There are many possibilities for both providing and financing advisory services. For example, in Kenya, the government extension services have

Dr Kristin Davis
Executive Secretary
Global Forum for
Rural Advisory Services (GFRAS)
Lindau, Switzerland
kristin.davis@g-fras.org

little operational funds but they do have a good number of well-qualified staff. The dairy-goat project FARM-Africa (a non-governmental organisation) had funds but no staff. Thus they used the government staff and provided them with lunch money and transport. Alternatively, the public sector could hire private consultants to provide services. To determine a good mix, designers should consider a structure based on the major characteristics of advisory services, which include: (a) governance structures, (b) capacity, management, and organisation, and (c) advisory methods. Four sets of conditions also need to be considered when deciding on these characteristics: (1) the policy environment, (2) the capacity of potential service providers, (3) the type of farming systems and the market access of farm households, and (4) the nature of the local communities, including their ability to cooperate.

As an example, if one wanted to implement farmer field schools, which are farmer-centred groups where learning takes place in the field, one should consider the cost and human resources available. Farmer field schools are effective but can be costly; thus they should be used for complex technologies that require substantial hands-on learning (such as integrated pest management). Farmer field schools also depend on high social capital and require specially trained facilitators. If one has relatively simple advice (e.g. recommended planting spacing or fertiliser requirements), then it may be more useful to use radio or flyers.

With this approach it is clear that there is no such thing as a 'one-size-fits-all' model. Rather, approaches to RAS and training should be flexible and tailored to suit local conditions. This then requires more skills, and not just technical skills, but 'soft' skills such as critical thinking, and has implications for the need for training and continuous learning. Training is needed at various levels. Basic training in sciences and communication should be the realm of higher-level secondary training and colleges. Specialised training for extension staff can be found at training colleges and universities. Several countries have modular training that allows certificate holders to continue on for university degrees. Continuous upgrading of skills must also take place, either through on-the-job training or special programmes such as that of the Sasakawa Africa Fund for Extension Education (SAFE; see www.safe-africa.net).

Advisory services help rural people develop their own technical, organisational, and management skills and practices.

Photo: Zoonar/W.G. Allgoewer

The pivotal issue of financing

Finally, what about sustainable financing – is this possible? Who should pay for advisory services? How do we deal with high cost of human resources? And how do we maintain political commitment? RAS projects have shown that the injection of project resources can mobilise service provision for a short period of time, but that the sustainability of these projects has generally been poor. Political will is key to long-term institutional support.

The spread of the Internet and mobile phones has shown the potential for enhancing access to information about markets, weather, and technological options, and improving communication among stakeholders. However, even these new ways to access information need to be anchored in an understanding of the need for a stable, institutionalised extension infrastructure for farmers and their families that will continue to exist. A weather forecast is important, but may only be useful if the farmer can discuss the implications of that forecast for what to plant, how to plant it, what the market is for the new variety, and how to reach those new markets. ICT options allow us to reach more people, but should be used with care to not exclude illiterate and women farmers.

There are several elements to sustainable provision and financing of services. These include government commitment and the use of alternate providers such as farmer organisations, NGOs, and the private sector. Effective forms of financing also exist, such as taxes and levies, and the use of basket funding in the case of donor-supported interventions. The farmer field schools in East Africa have introduced the self-financed and the semi-self-financed models for better sustainability. There is also a need for providing the evidence that extension and advisory services do contribute to the sustainable reduction of hunger and poverty, and for showing well-documented examples of RAS that works.

For more information on providing and financing rural advisory services, see the IFPRI publication 'From best practice to best fit', available at: **www.ifpri.org/sites/default/files/publications/dsgdp37.pdf**

Sustainable land grabs?

Large-scale land transfers are not a development option

At root, hunger is an issue of distributive justice. Large-scale land acquisitions exacerbate this problem at four levels:

1. Access to and control over land and water resources rapidly become concentrated. This is now accepted by development experts, although just a few years ago redistributive agrarian reform was part of a global consensus on development, even though, significantly, the instruments for implementing it were hotly debated.

2. Public money and resources are diverted from directly supporting the rural poor to supporting large-scale land transfers. This takes place, for example, by means of certification schemes and corporate social responsibility (CSR) initiatives, straightforward investment strategies such as the G8's New Alliance for Food Security and Nutrition, or loss of income resulting from blanket long-term tax rebates.

3. By far the largest share of the profits and earnings goes to the investors. A study* on the case of Addax in Sierra Leone, for example, has revealed that 93 to 98 per cent of future profits go to the investors. The slim pickings that remain are shared out between national government, regional authorities, future land workers and a number of former land users.

4. Distributive injustice is based on power asymmetries, on discrimination and on marginalisation. Large-scale land acquisitions are driven by the interests of the "investors". The interests of the local population, if considered at all, are adjusted to fit the investment plans later. This is the opposite of empowerment, and its effect – exactly like loss of control over land – is to reinforce power asymmetries.

Olivier De Schutter described large-scale land transfers in polite terms as the "least desirable option". The justification put forward by advocates of a win-win notion of land grabbing should also put us on our guard: it is difficult to find anyone who thinks these large-scale land acquisitions are the best development option. The often rather desperate attempt to give a positive sheen to land grabbing is based on the argument that public money is in short supply and the "financing gap" for much-needed investment in the agricultural sector can only be bridged by "investments" of this sort.

Roman Herre
Policy Adviser Land & Agriculture
FIAN Deutschland e.V.
Cologne, Germany
r.herre@fian.de

The causality suggested by such arguments must be called into question. How much money goes into which sectors is a political decision: during the financial crisis, the USA and Europe poured 11,000 billion US dollars (USD) into bank rescue packages. In contrast, the amount spent on development assistance since 1970 is just 2,600 billion USD – with another 3,300 billion USD in promised funding that was not delivered. It is a similar story within the development assistance sphere itself. Why shouldn't we raise the level of development assistance spent on the agricultural sector to 20 per cent again, as was the case 30 years ago? The national governments of developing countries invest only a very small amount in the agricultural sector. In contrast, the EU and the USA are prime examples of how public money can be mobilised for the sector.

For all these reasons, the debate on investment in the agricultural sector urgently needs to be set to rights again: farmers are the most important investors in the agricultural sector. They invest money, labour and know-how on a daily basis – and they do so in an environment which is increasingly discriminating them. Human rights obligations require governments to actively support these groups and equally to actively involve them in designing development strategies. Such strategies will vary according to regional circumstances. They might include establishing an affordable state storage system for farm produce, strengthening existing farmers' markets, promoting agricultural cooperatives, procurement agreements between public-sector institutions and local farmers, training to promote farming practices that are sustainable, have low capital input and are adapted to local circumstances, (re)distribution of land, and many other things that are rarely the targets of support nowadays.

We need to shake off our blinkers and shift our focus away from the question of how to make large-scale land "investments" sustainable. Instead we must ask ourselves the truly underlying question of development policy: which strategies (in this case: which types of investment) are best suited to combat hunger and to empower marginalised groups – especially smallholder farmers – to realise their right to food and to enable them to feed themselves?

**See: Bread for all (2011): Land Grabbing: The Dark Side of "Sustainable" Investments.*

SRI – the solution for small farmers in India?

Despite criticisms, the System of Rice Intensification (SRI) is gaining popularity among small and medium farmers in India not just because it has high potential in increasing rice yield, but also because it uses much less seed and water.

Rice is the staple food for the majority of the population in developing countries, and for India, this grain contributes 65 per cent of the total food grain production in the country. Researchers have constantly been working towards developing better and efficient grain production techniques that will not just produce a good yield but also use smaller quantities of natural resources in the process. The System of Rice Intensification (SRI) is emerging as a potential alternative to traditional flooded rice cultivation. In a country like India, where it takes about 70 per cent of the country's groundwater to produce this rice, opting for a technology that uses much less water makes perfect sense. Water is increasingly becoming the single most limiting factor in the production of food grain, especially in rain-fed locations, and despite irrigation, use of pest-resistant high-yielding varieties and high inputs of fertilisers and pesticides, rice yield is plateauing.

Paddy cultivation in India has always been traditional, and farmers believe that rice is an aquatic plant and grows best in standing water. While this is not the case, it can survive in water. Under SRI, paddy fields are not flooded but kept moist in the vegetative phase. Later stages require that only an inch of water is maintained, suggesting that just about half as much water as normally applied in irrigated rice is required. So when SRI was introduced, it was received with plenty of cynicism because it deflated all the myths of cultivating rice.

While agreeing on some of the points raised by critics like Achim Dobermann, Deputy Director General Research, International Rice Research Institute (IRRI), on uncertainties regarding the effectiveness of SRI and his opinion that it is just an existing system of conventional agricultural practices, R S Shanthakumar Hopper clarifies: "Fluctuating results in yield do exist because SRI has different connotations for different land types, but these limitations do not mean that it can be written off. Effectiveness lies in good land and water management." Hopper stresses that, "We have to look at SRI in the context of climate change; it works excellently in rain-fed areas!"

Dr Hopper is Programme Director with M S Swaminathan Research Foundation (MSSRF) and heads the JRD Tata Eco-technology Centre, a not-for-profit Institute that specialises in the use of science and technology in an attempt to sustain human livelihood and, in the process, conserve nature. The Centre conducts research and development in areas of food security, biotechnology, etc.

More rice through SRI?

Farmers in India still swear by the conventional methods of cultivating grain that involves initial ploughing, and then smoothing the field using fertiliser consisting of cow dung. The seeds are transplanted by hand, and care is taken so that the soil remains wet and the crop remains submerged at all times.

A farmer using a Konoweeder on his SRI field.

Photo: S. Rajeesh

Sangeetha Rajeesh
Journalist
Chennai, India
sangeetharajeesh@gmail.com

SRI: Six practices to be followed without any compromise for the best results

Transplanting young seedlings: Transplanting 10 to 12 day-old seedlings to preserve potential for tailoring and rooting.

Planting single seedling: Planting seedlings singly very carefully and gently rather than in clumps of many seedlings.

Transplanting at wider spacing: Spacing them widely, at least 25 x 25 cm from plant to plant and as well as row to row, resulting in the spread of roots and aquiring more nutrients from the soil. This causes more tillers to be produced, and hence more grains.

Hand weeder to aerate the soil: Using a simple mechanical hand weeder (Konoweeder) to aerate the soil as well as to control weeds; this helps in vigorous root growth.

Keeping soil moist: Keeping the soil moist but not continuously flooded. Draining out excess water since there is no need to maintain standing water.

Use of organic manure: Green/ organic manure or compost to improve soil quality and fertility, soil aeration and microbial activity.

Contrary to the popular view that higher rice yield is only possible with high investment in seed, irrigation and big doses of fertilisers and pesticides, the SRI method of cultivation produces higher yields with less seed, less water and an emphasis on organic manure.

SRI, a combination of several practices (see Box), is simply changes in nursery management, the time of transplanting the seedling, as well as water and weed management. It is very similar to the conventional method of cultivating the rice crop but emphasises specific agronomic exercises in the process. Thus, it is more a *system* of cultivating the rice crop. Several field practices have been developed around these components to suit land and water quality as well as availability.

"This system of cultivating rice has already helped millions of farmers to at least double their yield if not anything else," says R. Rengalakshmi, Principal Coordinator, Gender & Grassroots Institutions with MSSRF. She adds that MSSRF has been promoting the SRI method in villages in the States of Tamil Nadu and Orissa since 2000, and that "acceptance has been encouraging, but not without tremendous effort to prove that the technique actually brings excellent results."

Formal experimentation on SRI in India started in 2002–03. The method is rapidly gaining ground, with State Governments supporting it in Tamil Nadu, Andhra Pradesh, West Bengal, Jharkhand, Orissa, Chhattisgarh and Gujarat. "SRI is working well in Tamil Nadu because farmers get a package subsidy, mainly for seeds, if they use the technique", Rengalakshmi says.

In the state of Uttar Pradesh, the Kharif crop is cultivated on 90 lakh (1 lakh = 100,000 hectares) of land of which 59 lakh is under paddy cultivation. Rice is a major crop. If the SRI method is adapted by farmers for paddy cultivation in Uttar Pradesh, this will not only potentially cut water requirement for paddy cultivation by 50 per cent but also boost rice production by 50 per cent.

"It's not meant for high irrigated areas or low lands," Dr Hopper says. "It is not as good a success story if you implement SRI in paddy fields in the plains." Rice cultivation in the hills of Orissa is another good example of how SRI works in highlands. Sakuntala Sabaro of the Saora Tribe, from Tumulo village, Gajapati District, Orissa, was instrumental in changing the mindset of the Tumulo farmers towards adopting SRI, freeing them from their low-yield perennial problem. Sakuntala's fields were on the hilly regions, and she sowed on terraced land using SRI principles. "I saw three times the yield when compared to the conventional method of cultivating rice," she confirms. It was her success that motivated about 25 farmers to adopt SRI in Tumulo village.

How SRI benefits the small and marginal farmer

With support in the form of subsidies from State Governments, farmers across India are more than willing to at least experiment with the technique. Farmers in Sorapet village in Pondicherry took to SRI after much convincing. Ponnurajan Manickam owns four acres of land, Sambasivam Varadhan about three and Anand Arumugam around two acres. These small farmers have all been cultivating rice using the SRI technique for close to two years now. Sorapet is a water-sufficient village, so SRI is possible for more than one season. "Last season, I used just three kilograms of seed instead of my usual 50 kilograms for one acre in conventional rice cultivation," reveals farmer Sambasivam, "yet there was an excellent yield!"

Seventy-seven-year-old Rajaram Reddiar was the first farmer in Sorapet village to start cultivating rice using SRI in 2004. "Every four days a till should sprout, and finally there should be anything between 30 and 50 tills," he informs. "That's when the farmer can benefit from this system of paddy cultivation." He says that he is doing well only because he cultivates SRI on one acre of land and gives it undivided attention. "It's really impossible to use the SRI principles on large lands because the system is too technical and labour- intensive," he explains.

Many marginal farmers have also turned to SRI in rain-fed villages such as Thalingji, Naivaipatti and Keelaen-

nai. Plot sizes average about one half to two acres, and most of them barely cultivate enough for self-consumption, let alone to sell in the market. The season lasts for about six months when there is rainfall, and for the rest of the year, farmers leave their villages to work as casual labourers in cities or with landlords.

Low investment and high yield

In SRI fewer plants per unit area are required when compared to conventional paddy cultivation:

Particulars	Conventional method	SRI
Spacing	15x10 cm	25x25 cm
No. of plants per sqm	66	16
No. of seedlings per hill	3	1
No. of plants per acre	792,000	64,000
Seed requirement per acre	20 kg	2 kg

SRI encourages organic manure, so less money is spent on fertilisers and plant protection chemicals. The farmers usually cultivate sun hemp and then mow it down just before it begins to flower. This is a good source of green manure. Since weeding by hand is tedious and expensive, most farmers opt for a hand weeder (Konoweeder). Periodical weeding not only removes weeds but also cuts the rice crop roots, allowing new roots to grow, thus resulting in more tills, with the crop receiving nutrients from deeper layers of the soil.

Committed man-days for transplanting and weeding are expensive. But with the recent introduction of a Transplanter, a device for quick and efficient replanting of seedlings, the farmer need only pay 4,200 Rupees (approx. 60 euro) per acre, i.e. half of what he or she spends on manual transplanting. The Transplanter is privately owned, and booking in advance is required.

Mindset of farmers – a challenge

Principles of applying a minimum quantity of water and the individual transplanting of very young seedlings in a square pattern are opposed to traditional practice. Farmers find it difficult to change over easily.

Ras Vettai, a small farmer from T Malaipattai village in Pudukottai District, Tamil Nadu, confesses: "I cultivated rice using SRI in 2010 and was happy with the results, but did not continue this in 2011 because the process required continuous crop care, and I found it difficult." This year, however, Ras has planted a nursery for SRI but has also prepared a bed of rice seed for conventional cultivation. "I know that SRI is a good technique and brings good yield, but for generations, my family has been with conventional rice growing, and it has never let us down either," he smiles. "Neither does it require too much care. I can plant and leave the field for days. There are just too many restrictions in SRI."

There are many farmers like Ras Vettai who find it difficult to fully adopt SRI. Most of them are stuck between the two technologies and end up applying both methods of cultivating rice. SRI concepts and practices have continued to evolve in rainfed conditions. Reluctance is not because of farmers not believing in SRI, but because the system requires sincere commitment to the technique and precise following of instructions in the given time periods.

The real challenge comes during the transplanting stage, and farmers are not used to keeping to precise measurements. Transplanting the seedlings singly with their roots intact, while the seed sac is still attached, is another area of reluctance. Farmers in India have traditionally replanted in bunches.

Conventionally, women do the replanting, simply using their hand to dig a deep enough space to accommodate the rice seedlings bunched together. But SRI requires that the seedling be placed at 1–2 cm in the ground at the appropriate point on the planting grid.

A manual weeder is then operated at intervals of 10–12 days after replanting. This is a welcome change from traditional hand weeding, although conventionally, weeding is not done so often. The root zone is kept moist and not submerged for SRI, another challenge for the farmer.

Under excellent management, even 100 fertile tillers per plant can be achieved; however, the pros and cons of SRI are still being debated. In the meantime, State Governments in India are encouraging farmers via subsidies to try out SRI in a small way and be convinced of the benefits before going full-fledged into this system of rice cultivation.

Farmers in T Malaipettai village using the marker in preparation for transplanting.

Photo: S. Rajeesh

Striking a balance between forest, climate, and people?

With their public payment schemes, some Latin American countries like Costa Rica or Mexico are well represented in the REDD/REDD+ debate. One of the more recent initiatives is Ecuador's Socio Bosque programme. Vested with high hopes, this innovative pro-poor conservation initiative seeks to balance environmental efficiency with poverty alleviation. Almost four years after its launch, this article provides some insights.

While Integrated Conservation and Development Projects (ICDP) were exemplar of the 1980s, a paradigm shift in the 1990s paved the way for direct payments for the conservation of ecosystems. The concept of Payment for Ecosystem Services (PES), more targeted and conditional on compliance than most of the earlier integrated approaches, is especially well-known. Two of what are probably the most prominent public payment schemes in Latin America have been Costa Rica's large-scale FONAFIFO fund, initiated in 1997, and Mexico's programme of payment for Hydrological Environmental Services of Forests launched in 2003. FONAFIFO makes direct payments to private landowners through renewable, multi-year contracts in return for forest conservation, reforestation, agro-forestry and natural regeneration management. Mexico's programme, on the other hand, initially focused only on areas of hydrological importance, but later expanded its target areas to also include areas under deforestation threat. More recently, discussions on public conservation payment schemes have increasingly recognised their potential to balance conservation with poverty alleviation efforts. One such effort has been undertaken by the Ecuadorian government and has so far been hailed as quite a success story: the Socio Bosque Programme launched in 2008.

Lisa Ringhofer
Consultant
Vienna, Austria
lisa_ringhofer@yahoo.co.uk

Voluntary, transparent, and participatory

Socio Bosque, a public payment programme that has grown enormously since its inception in November 2008, has the specific objective to combine ecosystem conservation with poverty alleviation measures. It is part of Ecuador's national REDD+ strategy that is currently under construction and thus sheds light on possible benefit-sharing mechanisms propagated by REDD+. Its design is fairly straightforward and based on the principles of voluntariness, transparency and participation. It transfers direct economic incentives per hectare of native forest and other ecosystems to individual landowners and local and indigenous communities who voluntarily commit themselves to comply with clearly defined conservation activities. Incentive levels follow a transparent and simple system, as payments are fixed according to the size of the area put under conservation. The highest incentive – 30 US dollars (USD) per hectare and year – is paid for the first 50 hectares of conservation area, and decreases to USD 20 and less per hectare and year with an increase of the area size. Another crucial element of Socio Bosque is the fixed duration of agreements of 20 years in order to ensure long-term commitment by the participants. After this period and following a thorough evaluation, all contracts can be renewed. Such a clear procedure was also meant to reach the poorest of the poor and trigger the participation of especially indigenous communities who would otherwise probably be left out. Its novelty as compared to previous public payment schemes is the spatial targeting, on the one hand, and the use of social investment plans, on the other hand.

The spatial targeting has the advantage of indicating areas with high, medium and low priority, thereby covering the whole national territory. The social investment plans have been designed as a specific tool for tracking poverty alleviation processes. The beneficiaries of the programme need to indicate how they would use the monetary incentives; they are free to choose investments according to their own needs and preferences. To date, the Socio Bosque initiative has formed alliances with conservation and development NGOs, and community-based organisations in order to ensure the highest socio-economic impact for its participants. These partners are active in providing information and preparing documentation for applications, identifying conservation areas, and delivering trainings on participatory decision-making processes.

Ecuador's promising political climate

For those familiar with Ecuador's political climate, it comes as no surprise that the programme was designed there. With the enactment of the 2008 constitution, Ecuador became the first country in the world to codify the rights of nature, recognising the inalienable rights of ecosystems to exist and flourish. With this framework, which is based on the concept of *"buen vivir"*, or good living, Ecuador's current national development plan (*Plan Nacional para el Buen Vivir*) has the specific goals to decrease the national ecological footprint and reduce poverty, especially in rural areas. And, with a total surface of 26 million hectares, Ecuador still has around ten million hectares of native forests left that generate important ecosystem services. At the same time, the country currently faces one of the highest deforestation rates in South America. The need for (political) action, therefore, triggered a comparatively fast implementation process of the programme: it only took six months from its first design in March 2008 to its official launch through a ministerial agreement in November 2008.

The programme is operated by the national Ministry of Environment, with its headquarters in Quito and several outreach offices all over the country. All costs of the programme are covered by public funds, and the total budget for the first years of operation accounted for USD 8.5 million. As of October 2011, more than 600 agreements had been issued, and many of the community agreements involve indigenous communities such as the Kichwa, Shuar Cofán or Shiwiar. In terms of size, more than 540,000 hectares are now officially enrolled in the programme; this is virtually the same conservation area as that of the FONAFIFO programme in Costa Rica that was launched more than a decade earlier! Various other Latin American countries have since manifested their interest to learn from the Socio Bosque programme as one crucial element to be combined with other activities, such as territorial planning and the strengthening of legal and institutional frameworks, in order to ensure a successful implementation of their own national REDD+ strategy.

Photo: L. Ringhofer

Nearly a quarter of the monetary incentives related to the Socio Bosque Programme was invested in productive activities.

What is REDD and REDD+?

REDD stands for **R**educing **E**missions from **D**eforestation and Forest **D**egradation. It is a set of policies, institutional reforms and programmes that provide developing countries with monetary incentives to reduce greenhouse gas emissions and enhance economic growth by halting or preventing the destruction of their forests.

REDD+ stands for **R**educing **E**missions from **D**eforestation and Forest **D**egradation "plus" conservation, sustainable forest management and enhancement of forest carbon stocks.

Conditionality – the necessary evil?

Some critics of this programme condemn its rather harsh "carrot-and-stick" approach. Rigorous measures, the defenders of the programme say, must be in place so as to ensure its success. Depending on the severity of non-compliance, the agreement may either be terminated indefinitely or, in case of minor issues of non-compliance, incentives may be reduced or suspended immediately. More so, all these beneficiaries then get "blacklisted", as all incidents of non-compliance are documented in the publicly available operations manual of Socio Bosque. In case

a participant decides to retire before the end of the 20-year agreement, a fraction of the total incentive received so far needs to be paid back. There are also contested views on the monitoring of the agreements. All monitoring should primarily be done through field visits, while aerial photography should additionally help with monitoring the maintenance of conservation areas. Both measures, however, are costly and some of the outreach workers also lack the necessary monitoring skills. It is estimated that less than half of the indigenous Shuar beneficiaries in the tropical humid forest areas have ever met any of the programme staff. Also, Socio Bosque still lacks the design of biological monitoring indicators. These would, however, be important in light of the programme's interest in measuring ecosystem service improvements.

Towards a pro-poor development path

As a pioneer in putting equal weight on conservation and poverty alleviation, to what extent has the Socio Bosque Programme so far reached a balance between environmental efficiency and social equity?

In order to measure progress in poverty alleviation, data on basic needs are used, which were readily available at the local level. A review of the social investment plans in December 2011 shows that 37 per cent of the monetary incentives were used for investments into basic needs (like housing, health or education), while 23 per cent were invested in productive activities (like agriculture, eco-tourism or community banking), 22 per cent in conservation (like patrolling equipment or demarcation activities), and 18 per cent in the organisational development of the various groups involved. This also indicates a possibility for a multiplier effect that would transcend the direct economic value itself. Now, the next step would be to monitor how these inputs actually contribute to improved human well-being.

Social equity, however, also entails equal access to the programme and a fair distribution of benefits. Access to the programme is provided through the presentation of a formal land title, but some poor people or indigenous groups may not have an official title of their land. Although a large-scale land titling programme is currently being implemented by the government, at the moment, it seems as a rather slow, costly and time consuming process. Also, poor smallholder families may not even have enough land to set aside for conservation. Another obstacle to direct participation in the programme is the fact that reaching the poorest of the poor may be challenging if they live in remote communities that have little or no contact with government institutions. Critical voices also raise the issue of fairness. Although fair distribution is addressed by Socio Bosque through decreasing payments per hectare with increasing size of the conservation area, statistics reveal that on several occasions, the programme has rather benefited larger wealthier landowners.

And what have the ecosystem benefits been so far? While it is still early to monitor the specific benefits for carbon storage, biodiversity conservation and water regulation, a preliminary study of 2010 carried out by the UNEP World Conservation Monitoring Centre provides some positive signals. It indicates that the areas where the programme is already active store over 5 per cent of the country's total biomass, with the first and second priority areas of Socio Bosque jointly storing 62 per cent of the national biomass carbon. The third priority areas of the programme contain about 14 per cent of the national biomass carbon, though with an upward trend.

In summary, it seems that Socio Bosque is more than a simple "marriage of convenience" between forest conservation and people. While critical voices must undeniably be heard and concrete measures taken to ensure inclusive development for all, one cannot deny the programme's potential for becoming a crucial element in Ecuador's incentive-based national REDD+ strategy.

Photo: L. Ringhofer

Native coconut tree nurseries of the indigenous Shuar.

Empowering rural traditional sex-workers in Rajasthan

Some communities in rural India have maintained female sex work for generations. Despite a number of privileges, the women involved are subject to strict rules in their communities. A project called Saksham (empowerment), with a focus on HIV prevention, is to help them claim their rights and enhance their social status.

Sex work is one of the oldest professions. It is hard to trace its origin, expansion and colours, also in Rajasthan, India's largest State. However, the notion of traditional female sex-workers existing in some of the districts has its own context and customs. Through generations, communities like Nat, Kanjar, Sansi, Banchada, etc. have been involved in female sex work, and they and the tradition have become a "normal" element of local society. The communities sustain the profession through sex-work places located mostly in rural set-ups and, loosely, around the major towns.

A glance at history

Historically, the communities of Nat and Kanjar are linked to royal families. As court dancers, the women used to be available for entertaining the king and his associates, and they often served the special visitors in the royal court. The entertainment they offered also included acrobatics and games, and they were under the sponsorship of royal heritage. As times and power structures changed, the women lost both their role and their royal connections. The final blow came with the abolition of kingship in 1952. Later, these communities settled in different rural pockets of the State, mostly in the lands gifted by the king, and started doing sex work as a profession, to earn a living. Now, their dancing culture and other forms of entertainment were being offered to the masses, and the profession gradually assumed its present characteristics.

Status of women in the communities

The families in these communities totally concur with sex work, and in most households, the female sex-worker becomes the chief bread earner. The system encourages early pregnancy and multiple offspring, enabling the involvement of women's children in sex work and ensuring future economic stability, which is based on the active involvement of the family and its highly organised network.

As potential bread-earners, the women enjoy a number of privileges, such as wearing chappals or using cots, while women who are not engaged in sex work have to be barefoot and usually sleep on the floor. However, the sex-workers are under strict control through a rigid community framework with exclusive rules and regulations. Women have no right to form a group, and any group activity is seen with suspicion. Everything depends on the consent of Caste Panchayat, an assembly of unelected elders. In spite of travels to different parts of the country or even abroad, they are virtually shut off from the outer world, have hardly any freedom to move around and are under

Court dancer in the Chitrashala Palace in Bundi, Rajasthan.

Photo: Serena/Iaif

Alok Kumar Mathur
Indian Institute of Health Management Research (IIHMR)
Jaipur, India
akmathur@iihmr.org

Photo: A. Mathur

Photo: A. Mathur

CBO and NGO workers at a peer educator conference (r.). State Government officials visiting a conference exhibition (l.)

extreme control. There is no scope for marriage, although the women can bear children at an early age, through stable partners, and according to their wishes.

Furthermore, the communal settlements of these communities within a definite geographical location are more comfortable for the women since they thus face the least discrimination from the mainstream population. However, their having practically no contact with the general population and enjoying only a minimum of education results in a virtual absence of self-identity and self-esteem. Over generations, they have been conditioned to what appears to them as a normal life, and alternatives seem to be quite inconceivable from their angle. The majority of families in these communities are solvent and relatively self-sufficient as most of the girls in their prime go to major cities like Mumbai, Delhi, Surat and Dubai etc., where they earn a huge amount of money, the lion's share of which goes straight to the family via the assigned network.

Male hegemony

Alongside the strict socio-cultural boundaries, the rural set-up of these communities in distant pockets in isolation from the general population forms the basic structural barrier. The concrete wall of male hegemony still prevents women from making themselves heard and cracking the nutshell. The community leader (*Sarpanch*), always a male, takes the final decision, and the women never dare to go against him. There are many stories of women seeking to marry outside the community or against the will of the family head, acting against any male member of the community, or flouting other community rules who were subject to harsh disciplinary measures, such as exorbitant fines, eviction from the community or deportation to other places under tight surveillance. The girls going to metropolises are also completely under the control of agents directly in touch with their families.

The *Saksham* project

The spread of HIV/AIDS epidemics in the rural population and sexual transmission of the disease makes awareness raising among sex-workers especially important. In the Alwar district of Rajasthan, the prevalence of rural traditional female sex work and the exposure of sex-workers to risks required a proper intervention. Further, in a population where sex work is a tradition, the notion of sustainability was given constant consideration.

> ***"Earlier, I dared not say that I am a sex-worker, but after being with Saksham, I can openly say that I am a sex-worker and have my rights. I feel so free. There always used to be a fear that others would come to know about my means of livelihood."***
>
> *Bina*

Saksham, an India-Canada collaborative HIV/AIDS project funded by the Canadian International Development Agency (CIDA), was introduced in Rajasthan in 2001. The project aimed to mitigate the impact of HIV/AIDS on vulnerable groups by strengthening the capacities of key stakeholders. Focusing on and addressing rural traditional female sex work, it was initiated in three districts of Rajasthan – Alwar, Jaipur and Tonk. The main pillars included awareness-raising and sensitisation, prevention programmes for a particularly vulnerable sub-population, counselling and testing, a sexually transmitted infection (STI) management system, and care and support, including hospital and community based care.

The initial process comprised a rapid ethnographic assessment, situation assessment, mapping, a behavioural survey, and monitoring and evaluation to identify and develop strategies based on contexts and locations. In the operationalising phase, Saksham reached out to different sex work places using models based on contexts. The process of awareness raising included the basics on the importance and proper use of condoms, their proper disposal, STI referral and treatment, reducing police harassment, and promoting a non-stigmatising environment for active female sex-workers. It also elaborated alternative employment of retired sex-workers, reproductive health and information, functional literacy and numeracy for children between 6–9 years of age and life skill education programmes for pre-adolescent boys and girls. For prospective professional sex-workers, the project designed a link to HIV/AIDS prevention, care and support in partnership with local NGOs.

The project appointed around 25 *sahcharis* (Friends) per district and gave them proper training on the issue. Many of the *sahcharis* were illiterate, and were sex-workers of the same age and from the same community and villages. They organised monthly meetings with other sex-workers to educate and deal with various issues in different sex work sites, to meet with doctors, for information sessions and to share one's

joy and sorrows. These sessions enabled the target population to be further and better mapped, understood, responded to and educated. Following these programmes, several *sahcharis* expressed willingness to elaborate on their responsibilities and got their groups formally registered in Alwar.

Dawn of new era

This registered women's grassroots organisation took over greater control over its operations from the government and empowered itself to face the situation within the system of tradition. Activities also focused on the retired sex-workers and boys and girls by forming the groups *Spandan*, which provides life skills and education for adolescents, and *Sparsh*, for alternative income generation activities of retired sex-workers. Then the project *Saksham* formally rolled out in 2006, after six months of prior assistance in handling the programme, referring responsibility and management to the local community based organisations (CBO)s, and overall responsibility to the Government of Rajasthan.

A wand of empowerment in Rajasthan

In Alwar, the CBO resulting from the India-Canada collaborative HIV/AIDS project (ICHAP) is known as *Saksham Mahila Samiti* and came into existence in 2006. The existing peers from the project became members and office-bearers, and subsequently elected some community members to give it a shape.

Frequent meetings were organised to develop a collective vision, insights among the participants about the ownership of their organisation, an understanding of the democratic decision-making process, decentralisation, and roles and responsibilities of the board members, who were also provided with orientations on how to oversee the programme components and monitor the transmittable infection activities.

In addition, informal discussions focused on developing "shared identity" as a "sex-worker community". Through informal meetings and group discussions with the community, the importance and process of stakeholder negotiation were further discussed. Gradually, community members became comfortable with their collective identity as a sex-worker community, which fostered ownership of their organisation.

> *"In my field site, Sodawas village, the police working in the area recently called me to ask where I used to take the group of sex-workers every day. I showed them the work we were doing for mapping. They were so impressed by our work that they often come now to get material and pick up condoms."*
>
> *Beena*

Apart from organising events, office-bearers of the CBO have now begun to take a keen interest in attending trainings to increase their knowledge and take their responsibilities seriously. Thanks to the enabling environment within the Saksham office, a group of Men having Sex with Men (MSM) and transgenders started meeting in late 2011 to share their experiences and formed the MSM CBO *Saksham Nayi Zindgi*, a process mentored by Saksham.

Lessons learnt: Some basic principles

1. The involvement of the local population simplifies the transfer of the idea, which would otherwise retain certain gaps. The management structure is flat, with less hierarchy, but can integrate sex-workers from the existing system.
2. The goals must be broken down into specific tasks, and the responsibilities should be assigned to specific persons for implementation in a well-defined timeframe. This will allow them to recognise the importance of health and the associated risks and vulnerabilities in the profession. Here, the communities formed have acquired self-awareness and voice, enabling them to decide or at least choose in certain manner while involved in the profession.
3. Capacity building was possible as the majority of CBO staff, including senior level executives, were from within the community. CBO office-bearers and members have developed capacities regarding children's education and general involvement with the clients and the community.
4. In the process of spreading awareness and developing routines, the ideas and the image reach out not only among female sex-workers but also among the MSM.
5. Responsibility lies with the State-level body, i.e. Rajasthan State Aids Control Society (RSACS). Decentralised management needs to be practised by the CBO, which is ultimately an effective level of management. Here, through the construction of organisations and CBOs, *Saksham* has succeeded not only in creating awareness of and preventing HIV/AIDS epidemics, but also in contributing to developing self-awareness, teaching social problems and rights, showing paths to choose and mainstreaming the so-called marginal communities or groups.

Synergy has its significant role. The community based organisation *Saksham Mahila Samiti* has realised that whether male or female, community members all share the same identity of sex-workers and face similar issues. *Saksham Mahila Samiti* acts as a base for and agent of empowerment, not only for female sex-workers, but also for men having sex with men, as the formation of *Saksham Nai Zindagi* has demonstrated.

Improving livelihoods and resilience through community watersheds

Improved water management offers a range of benefits to people living in the dryland tropics, where water is scarce. Watershed programmes based on active participation of the rural population bear the potential to ensure food security, contribute to economic growth and help conserve natural resources. An ICRISAT programme in India provides an example of a science-led, knowledge-based approach in this field.

The word "drought" no longer triggers spells of anxiety or fears of falling into the poverty trap for 270 farming families of rainfed Kothapally village in Andhra Pradesh, India. Their confidence stems largely from an active involvement in the unique Adarsha (ideal) watershed programme that was initiated by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) 13 years ago. And the payoffs of their involvement have been enormous. When the drought in 2002 led to a drastic decline in the share of agricultural income of non-watershed families in Kothapally village from 44 to 12 per cent, no ripple effects were felt by the farmers who had participated in the programme. In 2001, two years after the launch of the watershed project, the average household income in the village was 795 US dollars (USD) compared with 622 USD in the neighbouring village.

Rainfed agriculture is the source of most of the food from 80 per cent of global agriculture for poor communities in developing countries, and its importance varies regionally (95 % in Africa and 60–65 % in Asia). With growing evidence of global warming and its associated impacts on climate change, the existing water scarcity scenario is getting exacerbated by increasing rainfall variability. Hence, developing water resources, expanding irrigated area with a minimum of environmental impacts, and enhancing food production with progressively diminishing water supplies are a major challenge (see Figure on page 45).

Fully aware of the existing yield gaps and a lack of knowledge among small and marginal farmers, ICRISAT and its partners developed innovative, farmer-centric, knowledge-intensive soil, water, nutrient and crop management options at the watershed scale through community participation. A consortium model was adopted with partners including international, national, governmental and civil society organisations (CSOs). The programme used a holistic approach that involved (i) conservation, upgrading and utilisation of natural endowments such as land, water, plant, animal and human resources in a harmonious and integrated manner with low-cost, simple, effective and replicable technology and (ii) reduction in inequalities between irrigated and rainfed areas and poverty alleviation.

A combination of people-centred interventions, up-to-date science tools that enrich watershed programmes and capacity building that enables them to develop adequate adaptation strategies drawing on a combination of

Watersheds: Saviours in the harsh, water-scarce dryland tropics.

Photo: ICRISAT

William D. Dar
Director General

Suhas P Wani
Assistant Research Program Director & Principal Scientist (Watersheds)

International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)
Patancheru, India
s.sitaraman@cgiar.org

Principles of watershed management

The major objectives of watershed management are the conservation, up-gradation and utilisation of natural endowments (land, water, plant, animal and human resources) in a harmonious and integrated manner with low-cost, simple, effective and replicable technology; generation of employment; reduction of inequalities between irrigated and rainfed areas and poverty alleviation. It effectively addresses the problems of rainfed areas that are hotspots of poverty, malnutrition, food insecurity, with severe land degradation, water scarcity and poor social and institutional infrastructure, and is a potential engine for agricultural growth and development in these areas. Management of natural resources at watershed scale produces multiple benefits in terms of increasing food production, improving livelihoods, protecting the environment, addressing gender and equity issues along with biodiversity concerns.

Its components include a knowledge-based entry point activity that is undertaken to build rapport with the community; *in situ* and *ex situ* conservation practices; integrated nutrient and management and integrated pest management to maintain soil fertility, manage pest and the environment; crop diversification and intensification through the use of advanced technologies, especially good variety of seeds, balanced fertiliser application and supplemental irrigation; integration of agriculture (on-farm) and non-agriculture (off-farm) activities; and capacity building, among others.

ICRISAT has adopted a holistic and participatory consortium approach that brings together various partners with expertise in different areas to expand the effectiveness of watershed initiatives and interventions.

local knowledge were some of the key features of ICRISAT's involvement in watershed development. Based on participatory assessment of the constraints faced and potential as well as yield gap analysis using crop simulation models in consultation with the community, interventions such as rainwater harvesting, soil moisture conservation, soil fertility management, use of drought-tolerant high-yielding varieties, land and water management practices and integrated pest management options were introduced in partnership with the community (see Box above). The model was started in India and scaled out in China, Thailand and Vietnam.

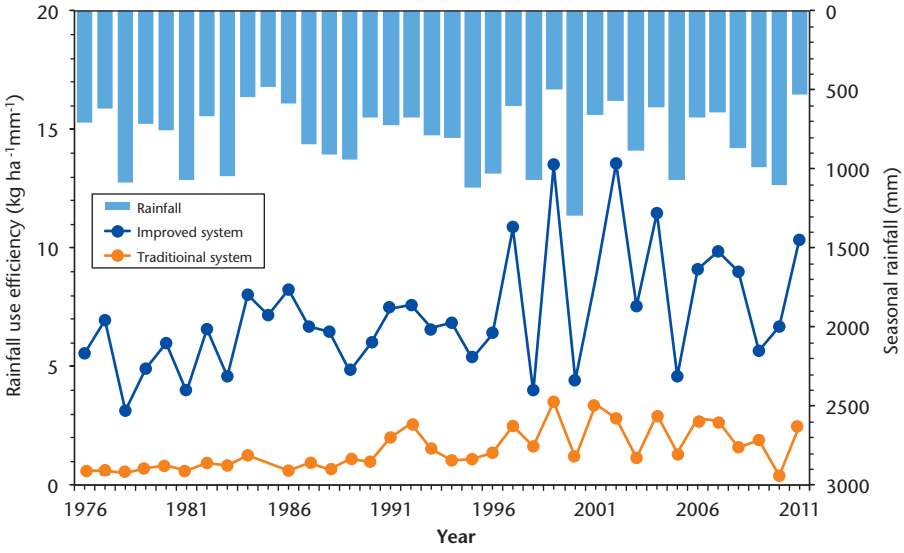
A range of positive effects

Improving water availability. The ICRISAT model ensured improved productivity (see Figure on page 46) with the adoption of cost-efficient water harvesting structures as an entry point for improving livelihoods. This was made possible with the efficient management of rainwater and *in-situ* conservation, establishment of water harvesting structures and improved groundwater levels. In Bundi, Rajasthan, for example, water levels in the wells were enhanced by an increased groundwater recharge of 5.7 metres, which permitted an expansion in the irrigated area from 207 to 343 hectares. In Kothapally watershed, the groundwater level rose by 4.2 metres in open wells (see Figure on page 46, below).

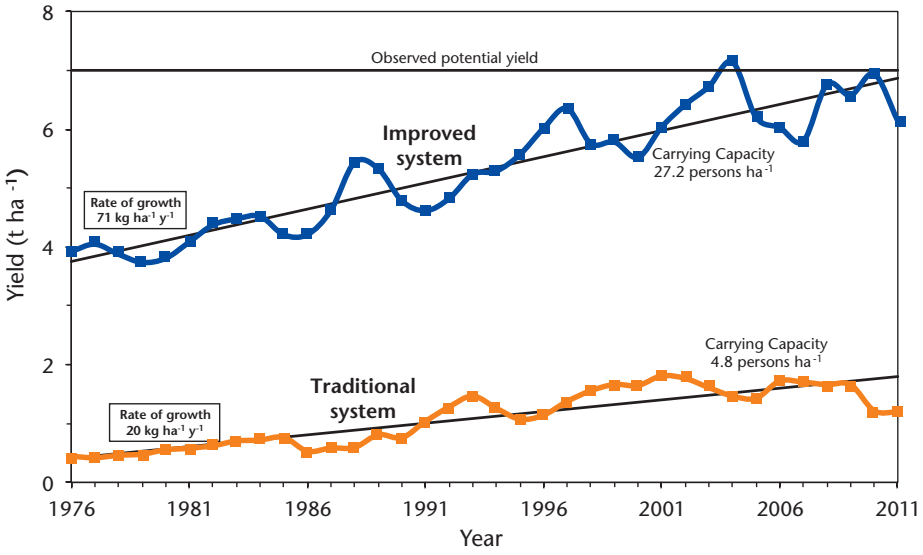
The construction of check dams was based on the community needs and executed by the villagers themselves. Due to increased groundwater recharge, an additional 200 hectares in the rainy season and about 100 hectares in the post-rainy season were cultivated with different crops and cropping sequences. The effectiveness of improved watershed technologies was evident in reduced run-off volume, peak run-off rate and soil loss and improved groundwater recharge. For instance, in Tad Fa watershed in Thailand, contour cultivation, vegetative bunds and fruit trees grown on steep slopes reduced seasonal run-off to less than half and soil loss to less than one-seventh as compared to the conventional system.

Income generation. Income generating options for the landless and women in Kothapally and other benchmark watersheds have included the setting up of village seed banks through self-help groups, value addition through seed material, product processing such as dhal making (a preparation of pulses), grading and marketability, poultry rearing for egg and meat production and vermicomposting. An average household income of 1,066 US dollars (USD) was generated from crop diversification and other systems in the watershed

Increased rainwater use efficiency in low-rainfall years in a long-term experiment at the Heritage watershed site, ICRISAT-Patancheru, India.



Grain yields in the Vertisol heritage watershed at ICRISAT, where integrated water resources management techniques were employed, compared with those where traditional farmers' practices were used.



compared to 734 USD in the non-watershed, reflecting an increase of 45 per cent due to watershed interventions.

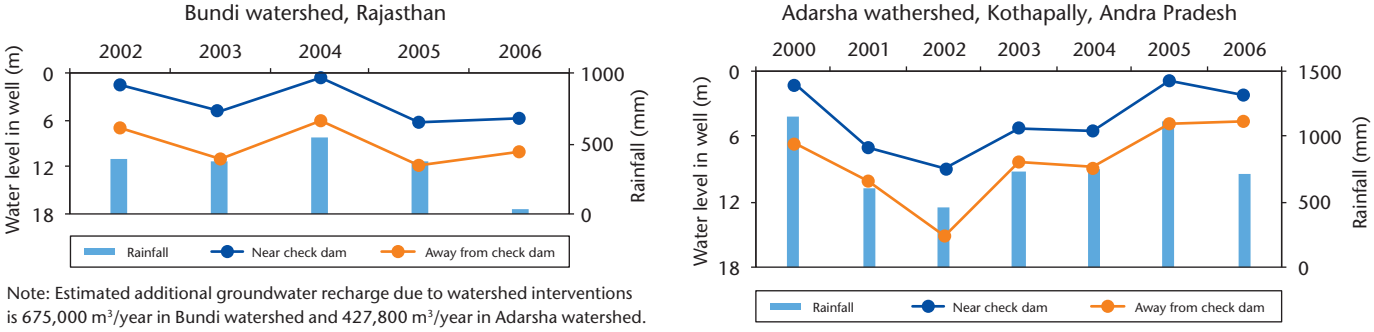
The consortium's success in Kothapally led to its replication elsewhere in Andra Pradesh and in the other Indian states of Karnataka, Madhya Pradesh, Rajasthan and Jharkhand. Between 2000 and 2003, investments in new livelihood enterprises such as a seed oil mill, tree nurseries, and vermicomposting increased average income by 77 per cent in Powerguda, another poor village in Andhra Pradesh. Impact assessment studies for Andhra Pradesh's Rural Livelihoods Program (APRLP) in five districts with improved watersheds revealed impressive returns of 608 million USD in ten years for four major crops (sorghum, groundnut, pigeonpea and maize).

Improving soil health. ICRISAT and the Government of Karnataka have opted for a knowledge-based mission mode initiative by forming a consortium and a network of stakeholders to share their knowledge on weather and soil health and improved management practices covering all the 30 districts of the state. During 2011, the soil test-based nutrient management interventions, along with improved seeds, seed treatment and use of biofertilisers, led to a 21–66 per cent increase in crop yields covering three million hectares. An innovative extension system was used as well as an institutional arrangement to empower the farmers through the Rytha Samparka Kendra (the state's extension service centre), farm facilitators and innovative supply chains. The approach has benefited 3.3 million farmer families since 2009 through increases in productivity of 21-66 per cent thanks to the farmers' new practices. For the Government of Karnataka, this translated into an annual agricultural growth rate of 5.9 per cent during 2009–10 and 11.6 per cent growth during 2010–11. During 2011, three million hectares were covered in the rainy season, and the economic returns were to the tune of 130 million USD.

Introducing micro-enterprises. Consortium partners introduced a number of micro-enterprises such as vermicomposting, biopesticide production, livestock rearing, nursery raising and wasteland development using biofuel (Jatropha) plantations for women self-help groups (SHGs) in Kothapally. Lakshmi, once a poor farm labourer, today earns 36 USD per month from vermicomposting. She has inspired and trained 300 peers in 50 villages of Andhra Pradesh and was honoured as Fellow of the Jamshedji Tata National Virtual Academy for Rural Prosperity for empowering women.

Conserving biodiversity. Pronounced agro-biodiversity impacts were observed in Kothapally watershed, where farmers now grow 22 crops in a season with a shift in cropping pattern away from cotton (200 ha in 1998 to 100 ha in 2002) to a maize/pigeonpea intercrop system (40 ha to 180 ha).

The impact of watershed interventions at groundwater levels at two benchmark sites in India



Note: Estimated additional groundwater recharge due to watershed interventions is 675,000 m^3/year in Bundi watershed and 427,800 m^3/year in Adarsha watershed.

In China and Thailand, the watershed projects resulted in changes in cropping systems such as the addition of new crops (legumes and fruit trees), new varieties, and adjustment in the cropping calendar and new investments in aquaculture and poultry.

Crop-livestock integration. Better crop-livestock integration is another tool for poverty reduction. The Lucheba watershed, located in Guizhou province in Southern China, has transformed its economy through modest injections of capital-allied contributions of labour and finance to improve its roads and water supply. With technical support from the consortium, the farming system intensified and diversified from rice and rapeseed to tending livestock and horticultural crops. Forage production, especially wild buckwheat as an alley crop, is a good forage grass for pigs and has controlled erosion and increased farm income.

Policy impacts. ICRISAT's consortia experience has positively influenced recent policy reforms on watershed management in various Asian countries. The Indian Federal National Farmers Commission has made recommendations to the Government based on ICRISAT's consortium watershed model. An ICRISAT-led consortium undertook a comprehensive assessment of impact of watershed programmes in India. Watersheds recorded an average benefit-to-cost ratio of two, with an internal rate of return of 27 per cent. Only one per cent of the watersheds studied showed less than one benefit-to-cost ratio in the country. The assessment demonstrates that community watershed management is a growth engine for the development of dryland areas.

Conclusion

The Adarsha watershed's broad vision emphasises the fundamental importance of improved water management in a warming world. What has made the project model unique, replicable and so successful is the combination of technical solutions supplied by ICRISAT with community empowerment and socio-economic development. Watershed programmes can indeed ensure food security and add to the sustainability of natural resources when projects are executed based on scientific knowledge and with the participation of the rural population, as was done in Kothapally.

In brief

Crop pests can bring benefits

Studies on Indonesian cacao plantations have shown that the feared cacao bug which saps and damages cacao pods has a positive overall balance. Its presence leads to lower infestation by another pest which has a far greater impact on the cacao harvest, Agro-ecologists from Goettingen University (Germany) discovered.

The conspicuous, bright-orange cacao bug (*Helopeltis sulawesi*) is often controlled using insecticides entailing high inputs. It draws plant juice out of the cacao pod, and when the infestation rate is high leads to scarred, hard outer tissue. In contrast, the cacao moth *Conopomorpha cramerella* causes far greater damage. The moth is small, well camouflaged and nocturnal. The moth's small larvae bore through the shell and enter the flesh, on which they then feed. Infested pods have far less beans and deliver a lower quality cacao. Field trials and laboratory experiments at Goettingen University have now shown that the borer moth avoids cacao pods whose surface has been scarred by the cacao bug. Plantations with a high infestation of bugs incurred far less damage from borer moths – and a medium-scale infestation finally lead to better harvest yields. *(wi)*

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Imprint

Rural 21 –
The International Journal for Rural Development

Published by:
DLG-Verlag GmbH
Frankfurt, Germany

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Editor in chief:
Silvia Richter, s.richter@dlg.org

Editorial staff:
Angelika Wilcke, a.wilcke@dlg.org
Ines Lechner, i.lechner@dlg.org
Olive Bexten, o.bexten@dlg.org

Editorial office:
DLG-Verlag GmbH
Eschborner Landstraße 122
60489 Frankfurt, Germany

Translated by:
Michael Gardner
Christopher Hay
Tazir International Services

Distribution, advertising:
DLG-Verlag GmbH
Eschborner Landstraße 122
60489 Frankfurt, Germany

Layout:
Petra Sarow,
Munich, Germany

Printed by:
Schleunungdruck GmbH
Eltertstraße 27
97828 Marktheidenfeld
Germany

FSC www.fsc.org MIX Paper from responsible sources FSC® C105039

Rural 21 is published four times per year.
The subscription rate is 33.– Euro (Germany), 37.– Euro (EU countries), 51.– Euro (non-EU countries) and 8.30 Euro per issue, plus postage.

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