Improving smallholder income from domestic food markets

1 A growing demand: the need to be competitive

Many African economies still depend heavily on export crops, such as cocoa, tea and coffee. However the development impact of agricultural exports, compared to sales in domestic markets, is subject to debate (KIT, 2012). For African farmers, the greatest opportunities seem to be found in the rapidly growing domestic food markets. Population increase, urbanization and an expanding middle class underpin a booming demand for food. By 2050, 60% of Africans – about 1.2 billion people – will live in cities, compared to 28% in 1980 (FAO, 2009). These urban populations already demand a diverse range of higher-quality food, with processed food becoming increasingly popular. Moreover, dietary patterns are changing towards foods with more calories, fats and protein (Reardon & Timmer, 2007). For farmers and small and medium enterprises (SMEs) in Africa, the opportunities found in domestic food markets will soon dwarf those of exports. However, to encourage smallholder farmers to take advantage of domestic markets requires investment in their capacity and business.

The Common Fund for Commodities (CFC), with co-funding from the OPEC Fund for International Development (OFID), particularly targets commodity sectors that cannot achieve their potential because of limitations in finance and other types of support. The Fund finances projects for smallholder farmers, as well as SMEs, involved in commodity production, processing and trade, to enhance their competitiveness. In this paper, we shed light on the strategies of three CFC projects that aimed at enhancing the competiveness of smallholders in a domestic food market (potato, rice and dairy). The three projects used a similar strategy: increase productivity, add value at farmer level, and develop marketing arrangements. We will briefly present and discuss the strategy for each of the projects, highlight some of the innovative practices and key successes, and draw attention to challenges for sustaining the achievements of the projects.

Wealth Creation Potato Project

Commodity ***Potato***
Countries ***Ethiopia, Kenya and Uganda***
Aim ***Enhance the competitiveness of the East African potato sector and small-scale potato producers***

Key achievements:

- 2,615 farmers are trained in seed production across the three countries.
- 2,900 t of certified/quality seed are produced by the seed multipliers in the three countries.
- Supported Solagrow PLC in the set-up of seed potato outgrower scheme.
- 127 diffused light stores constructed.
- Aeroponics units, co-funded by the project, are established and put into routine use, resulting in the production of more than 20,000 mini-tubers in Ethiopia alone, to date.
- 279 (179 male/100 female) extension workers and farmer trainers are trained as facilitators of farmer-group learning on seed quality management.
- 253 farmer groups with a total of 6,600 members have been trained since the beginning of the project.
- Three crisp processing companies - Deepa Industries Ltd, NORDA Ltd and Chirag Ltd - in Kenya and one - TomCris in Uganda - are assisted in improving their supply from smallholder producers.
- Nine local potato stakeholder forums are established.

Competitiveness issue: potato processors and wholesale buyers chose to purchase from traders rather than more directly from smallholders.

Strengthening the productivity and competitiveness of the smallholder dairy sector in Lesotho and Zambia

Commodity ***Milk***
Countries ***Zambia and Lesotho***
Aim ***Strengthen the position of resource-poor smallholder dairy producers in the dairy value chain***

Key achievements:

- 901 farm households have benefitted directly.
- Farmers are trained in producing improved animal feed and in milk quality management.
- The price paid to the milk collection centres has increased from US$0.39 to US$0.49 in Zambia.
- In Lesotho, the only formal dairy processor in the country increased the intake of milk from Mafeteng from 52,000 to 95,000 litres, an 83% increase.
- In Zambia, Parmalat tripled its annual intake from smallholders from 920,000 in 2007 to 2.65 million liters in 2010.
- Dairy King in Lusaka increased its milk intake from Mapepe milk collection centre over seven times, from 46,000 to 375,000 litres per year.

Competitiveness issue: smallholder dairy farmers mainly sell their milk on the informal market, but the growing formal market offers opportunities for higher income.

Improving the competitiveness of rice in Central Africa

Commodity ***Rice***
Countries ***Cameroon, Central Africa and Chad***
Aim ***Improving food security and rural incomes, and reducing dependency on rice imports***

Key achievements:

- Seed systems are redesigned and rebuilt.
- NERICA varieties are tested and adopted: 178,757 farmers are supplied with improved seed.
- 56 farmer groups are established.
- 508 processors of rice-based products are trained.
- 6 rice processing centers are established.
- More than 30,000 farmers improved yields by at least 50%, from less than 0.8 to 2 tonnes/ha for upland rice, and from less than 2 to more than 6 tonnes/ha for lowland rice.

Competitiveness issue: rice bought by urban consumers is mainly imported, a missed opportunity for local producers.

3 Strategies to enhance competitiveness of smallholder farming

Enhancing the competitiveness of smallholders requires products (e.g. paddy rice, seed or ware potatoes, or milk) at an attractive price, that meet the preferred characteristics as defined by the buyers. Three parallel and synergistic intervention areas enhance smallholder competitiveness: increased productivity, value addition at farmer level, and improved marketing arrangements. Each project initiated a mixed package of interventions in each area (see Table 1).

3.1 Increasing productivity

Improved starting material

Lack of improved starting material is one of the first obstacles preventing smallholder farmers from realising the full potential of their crops. All three projects therefore introduced improved starting material, for potato, rice and fodder respectively. In the rice project, new Nerica rice varieties - were tested and selected for upland and lowland cropping systems, and seed multipliers were trained. The potato project not only promoted new varieties, but also worked to improve the quality of seed potatoes

Table 1: Enhancing competitiveness

Opportunity		Potato Project	Rice Project	Dairy Project
Productivity increase	**Improved starting material**	• Testing and promoting new varieties • Production of quality seed by seed farmers • Seed multiplication by aeroponics • Seed quality management by ware farmers • Diffused light storage for seed	• Testing and promotion of NERICA varieties • Seed system improvement • Training of seed multipliers	• Seed for protein rich feed production is made available
	Improved production practices	Training farmers in: • Crop husbandry • Integrated pest and disease management • Seed quality management	Training farmers in: • Crop husbandry • Composting and green manure • Integrated pest and disease management	• Improved cattle feeding
Farmer value addition	**Quality improvement**	• Improved ware potato quality to respond to processor demand	• Improved rice cleaning in processing centres	• Milk quality control system established • Cooling equipment introduced
	Value addition		• Improved parboiling, husking, polishing and grading • Rice flour production • Promotion of rice-based by-products	
Marketing improvements	**Develop marketing arrangements**	• Facilitate deals between farmers and crisp processors	• Linking producers, traders and processors	
	Organizing producers and other actors	• Local potato stakeholder platforms initiated	• Co-owned (traders, farmers, processors) processing centres established	• Farmer cooperatives formed and strengthened
	Bulking produce	• Group marketing to processors attempted • Collection systems developed by processors	• Processing centre supply system developed	• Milk collection centres established and improved • Collection system developed

used. Aeroponics, an advanced mini-tuber production system, was introduced. The system has a seed multiplication rate five times higher than conventional multiplication in a screen house. Additional efforts were made by the project to improve successive generations of seed multiplication, by supporting the development of seed businesses in order to improve the availability of affordable, high quality seed potatoes to smallholder producers. In the dairy project, seed for leguminous crops was distributed, to introduce farmers to the practice of producing protein-rich feed for their livestock.

Good farming practices and integrated pest and disease management

Productivity, as well as quality, can often be enhanced through improved crop and animal husbandry, from seed selection to postharvest practices. In the potato project, a number of techniques were promoted: correct plant spacing, seed quality maintenance through positive selection, integrated pest and disease management, and regular replenishment of seed stock from a reliable source. In the dairy project, farmers learned how to feed their cows to obtain the highest quantity and quality of milk. And in West and Central Africa, farmers were involved in rice variety selection and received training in rice cultivation and quality management.

Berga Lemaga, project coordinator of the International Potato Center (CIP): "The reason behind the success of the project is the fact that people love to eat potatoes and are willing to pay for it"

A reduction of losses, as a result of improved pest and disease management, does provide opportunities for increased farmer revenues. In the case of the potato project, management of bacterial wilt, viral disease and late blight were important determinants of yield. The project promoted an integrated management strategy for these diseases. Farmers were trained to combine the use of resistant varieties, proper seed quality management, and optimum use of fungicides (both environmentally and economically) to minimise crop losses.

The combination of high quality starting material and improved crop and livestock husbandry practices proved to be a good recipe. In four years, the productivity per cow and yields of potatoes and rice have increased. Daily milk productivity of the direct beneficiaries rose from 8.8 to 10.9 litres per cow in Lesotho and from 3 to 5.5 litres in Zambia. In the potato project, yield increases were realized as a result of project activities in each of the three participating countries. The project showed that the right combination of starting material and farming practice could easily double yields under smallholder conditions. In the rice project, yields are said to have increased from 0.8 tonnes to 2 tonnes per hectare for upland rice and from less than 2 tonnes to more than 6 tonnes per hectare for lowland-irrigated rice.

3.2 Value addition at farmer level

The projects worked to increase the margin gained by producers per unit of product, by ensuring the product was well demanded in the market. Quality enhancement and farmer processing are opportunities to increase both the marketability and profit margin of each product.

Quality improvement

In domestic markets, the largest share of the surplus produced by farmers is often traded as a non-specified product, without any specific quality rating. However, in the context of increasing domestic market demand, smallholder farmers may earn more if they supply the processing industry or urban food markets with a specifically demanded quality of produce. Processing industries, but also, increasingly, urban markets require a quality standard that is often higher than that of the bulk market. This provides an opportunity to smallholder producers to specialize and gain additional income. To sell their products to these higher-end markets, smallholder producers need to enhance the quality of their produce, beyond the average quality supplied in the bulk market. Quality enhancement is a relatively risk-free strategy for attempting to increase margins. It is closely linked to the core business of farmers - crop and animal production - and, other than market intelligence about the desired quality, it requires relatively little cash investment, making it affordable to cash-strapped smallholder producers.

In Kenya, farmers in Bomet district became suppliers of quality potatoes for the crisp processing industry. They produced potatoes fit for crisp production by growing a specific variety (Dutch Robyn) and letting the crop mature fully, which many farmers in the country do not do. Through the project, producers learned how to gain this edge in the market, and were stimulated to improve their production practices to respond to crisp processor demands.

In the dairy project in Lesotho and Zambia, milk quality was a major constraint for smallholders competing in the formal dairy sector. To improve milk quality to the required standard, a collection system and cooling equipment were required. The project equipped milk collection centres (MCCs) with cooling facilities and transportation, and facilitated quality control through the involvement of a milk quality and safety control laboratory. As a result, dairy processors were persuaded to purchase milk originating from smallholders.

Roadside potato retailing, Uganda

Farmer managed processing

In the rice project in Central Africa, six rice service centres were established to simultaneously improve quality, as well as initiate farmer-managed processing. The centres enhanced the quality of rice through improved cleaning, grading, husking and polishing of the rice using improved equipment. This resulted in a higher quality product and a lower proportion of broken rice, which made locally produced rice more competitive with imported rice. Secondly, the service centres pioneered value adding by processing the broken rice into flour, from which biscuits, cakes and other products can be made, which are being sold in local markets for a premium compared to the raw product.

3.3 Developing marketing arrangements

The potato, dairy and rice projects invested in actively linking producers to buyers. In the potato project, efforts were made to link producers directly to a processor that had previously sourced only from the wholesale market. In the dairy project, smallholders were linked with processors that previously only sourced from larger producers. Producers involved in the rice project were linked to traders and were even made joint shareholders in the cooperatives that run the rice service centres. These centres organize input supply and rice marketing, and provide rice processing services.

Equipment in a rice processing center

Training of technicians on equipment maintenance

In Kenya, the potato project attempted to link farmer groups to a potato crisp processer, Deepa Industries Ltd. Deepa Industries was seeking a more constant supply of high quality potatoes by engaging directly with producers. Ultimately, contracting individual farmers proved to be more efficient than working with group contracts, as not all group members were able to consistently deliver the quality required. Farmers still take part in training and procure inputs as a group, but which processor they sell to is now an individual affair. This should not be considered a failure. Collective action is difficult to organize and even harder to maintain. Economic activity which does not require collective action is best left in the hands of the individual farmers.

In the case of dairy however, individual marketing was a serious constraint for competitive participation in the formal dairy market and collective bulking was a necessity. Zambia was already equipped with a professional, private, processing industry. However the private processors only procured milk from large-scale farmers. Quality improvement and informing dairy processors that sourcing milk from smallholder cooperatives could be profitable, laid the foundations for fruitful collaboration. However, in Lesotho, such a private sector was not present and farmers were confined to the informal market or to selling to the state owned processing company that was in decline.

Improved marketing arrangements, in combination with preferred and quality products, have strengthened the position of farmers in the chain and led to higher prices in both the formal and informal markets. Bulking of milk by MCCs has proved to be an effective source for commercial dairy processors such as Parmalat, Dairy King and FINTA. They offered a premium price, and this opportunity of selling to the formal market has also improved the power of farmers to demand higher prices in the informal market.

Similarly, by buying directly from producers, the potato processor in Kenya has empowered potato farmers in Bomet. The formal market outlet has also increased prices in local markets as a consequence of farmers' increased bargaining power. In addition, the area has become even better recognized for producing potatoes fit for crisp processing, resulting in competition between buyers. Intermediary traders previously exploited the farmers by putting potatoes in bags of up to 180 kg instead of the recommended 110 kg, with payment per bag. Standardized bags and scales provided by the company, and fixed prices, increased transparency and encouraged producers to stand up for their rights.

In the rice project prices for processed rice are higher and marketing relations between smallholders and traders have been intensified by joint cooperatives. There are, however, substantial costs involved in maintaining the processing centers and cooperatives, and the processing centers have to proof to be both economic and organizationally sustainable beyond the project life.

4 Conditions for impact at scale

The three projects have generated impressive results, reached numerous farmers and laid the foundation for improved incomes and livelihoods of smallholder farmers. However, sustaining these achievements and even scaling up activities

beyond the end of the project life and in other countries will face several challenges. Some essential pre-conditions for continued and increasing impact can be deduced from the three projects, namely: an enabling environment, maintaining innovation capacity and involving the private sector.

Enabling environment

For commodity sector interventions to be successful, the policy environment should be enabling. The dairy development project, for example, has been very active in involving and guiding different government ministries in Lesotho and Zambia. It facilitated the establishment of a dairy act and the creation of the Dairy Board of Zambia, representing dairy sector stakeholders. In Lesotho, advocacy based on the project's successes paid off: the government made dairy development a national priority.

In Kenya, potato sector development is high on the agenda of the Ministry of Agriculture with regard to its strategy for food security and commercial agricultural development. It is already the second most important food crop and the major cash crop for smallholder producers in the Kenyan highland areas. The Ministry of Agriculture has willingly assisted potato farmers and made its extension officers available to the project. Researchers from the Kenya Agricultural Research Institute (KARI) and the International Potato Center (CIP) were also made available.

Developing and maintaining the capacity for agricultural innovation

An important strategy for continued post-project impact is the improvement of agricultural advisory services. The potato project invested in training of public extension officers and farmer trainers, who have the mandate to continue training smallholder producers in improved potato husbandry. Similarly in the rice project in Central Africa, public extension officers trained NGO workers who were responsible for training farmer groups. In the dairy project in Zambia, a public-private initiative, the Golden Valley Agricultural Research Trust (GART), which is part of the national agricultural research and extension system, was responsible for extension and advisory services, for which it employed its own extension officers and veterinary assistants.

Trained farmer groups form an important resource for continuing farmer-extension collaboration. Farmers inform the extension officers when they are confronted with difficulties and new field experiences, and thus contribute to the development of relevant advisory services, adapted to the needs and conditions of farmers. This is key to continuing agricultural innovation.

From a competitiveness point of view, continuous innovation is required to be able to adapt to changing markets. The sustainability of development and dissemination of new practices is a chal-

Training in improved farming practices

lenge. In Lesotho, for example, extension officers were paid by the project, which cannot be sustained, while smallholder farmers are not included to pay for training in the near future. Institutionalisation of activities that have been introduced by a (temporary) project is difficult. It is, however, possible. The potato project, for example, initially paid the field allowances of extension staff to facilitate the implementation of farmer group training. By the end of the project, however, the respective public advisory service mechanisms had integrated the farmer group training activities in the regular activities of the Ministry of Agriculture, thus assuring a continued increase in impact beyond the project life.

Sustainable use, depreciation and replacement of equipment

The sustainable use, depreciation and replacement of introduced processing equipment require sound financial management as well as technical expertise. Having farmer cooperatives taking up activities higher up in the value chain, such as processing, sounds attractive but requires funds, management skills and specific knowledge. The collective nature of cooperatives is a disadvantage for sound use, maintenance and management, both technical and financial, of processing equipment. It can be more effective to involve private companies, which have the necessary funds and skilled personnel. For example in Zambia, private processing companies are effective intermediaries between farmers and the final markets. There are cases however, where there is no pre-existing private processing industry, in which case processing by cooperatives is one of the options to consider, as in the case of the cooperative processing centres in the rice project.

Market opportunities as a pre-requisite for intervention

The main common denominator in the three projects is a growing domestic market for the three commodities. This does provide for the most important of all incentives to innovate: the promise of improvements in income. As said, current developments in sub-Saharan Africa, especially urbanization, create a growing demand for food crops, which is presenting itself as a major driver for change in agricultural systems. The three projects show that, with a combination of relatively simple interventions to improve productivity, enhance quality and create new market linkages, important impacts on smallholder livelihood can be achieved.

KIT, 2012. Domestic versus export markets: challenging the holy grail. Royal Tropical Institute Policy Brief 1.
FAO, 2009. The State of Food and Agriculture. Rome, FAO.
Reardon, T. and C.P. Timmer. 2012. The Economics of the Food System Revolution, Annual Review of Resource Economics, 14: 225-264.

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Milk delivery at a milk collection center