

Business as **UNUSUAL** the 2SCALE project

Highlights 2015

2SCALE consortium

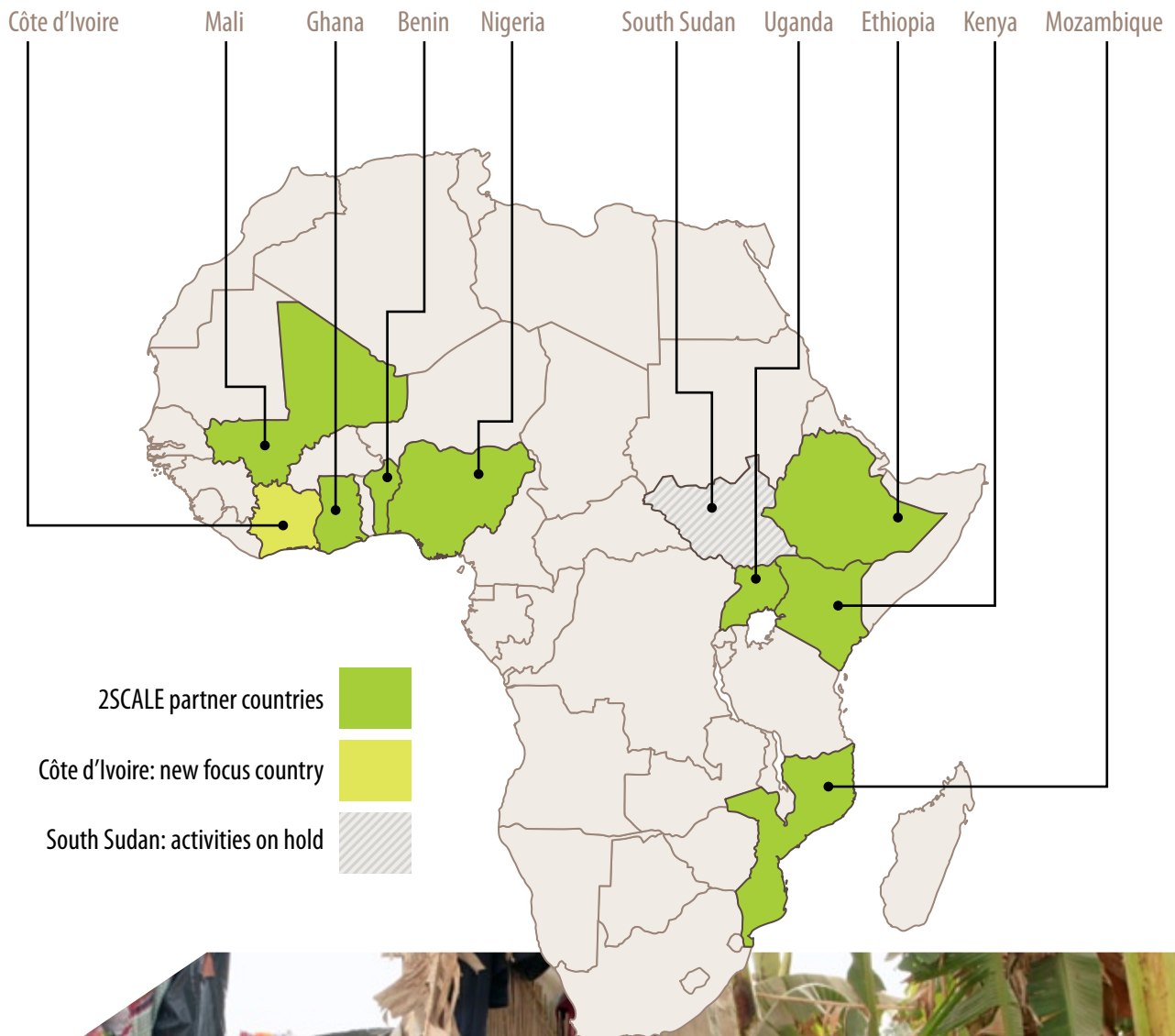
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Ministry of Foreign Affairs of the
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Home cooking for sale: member of a processing cooperative in Ghana, making soya cheese

BUILDING AGRIBUSINESS

Can profit and development objectives co-exist?

Can African smallholder farmers work with private firms for mutual benefit? Can these relationships last, without donor support? The answers, as the 2SCALE project has shown, are yes, yes and yes.

2SCALE is an agribusiness platform, active in eight African countries and about to begin work in a ninth. The Netherlands government provides half the budget. The other half is private investment. Multinationals, small businesses and farmer groups co-invest to expand business partnerships initiated with project support.

The core idea is **inclusive business** – partnerships that are viable, sustainable and equitable, with profits shared fairly. Project teams help create these partnerships. We identify a private firm that shares our inclusive-business agenda (not easy!). We connect the company to farmer groups and provide training, business linkages and other support to ensure that the partnership works. We call this the CASE approach (Competitive Agricultural Systems and Enterprises).

Essentially, 2SCALE creates networks that connect farmers to each other, to the market, and to other players such as banks, transporters, input suppliers and insurance companies. Once the network is in place, farmers can deliver consistent volumes of high-quality produce, while buyers can plan long-term, knowing their supply chain is secure.

The project has another twist: an emphasis on 'base of the pyramid' (i.e. low-income) consumers. The aim is to help private enterprises develop and market affordable, nutritious food products. To do this, we connect processing companies to food technology experts. Once a new product

is developed, we provide technical assistance (and some funding) for test-marketing.

- 2SCALE works with 353,000 farmers in eight countries. Nearly 40% of these farmers are women.
- Our partners include more than 1,200 firms, from multinationals to small community-based enterprises.
- 18 pilot programs in seven countries are helping to test-market low-cost, healthy food products.

WHAT, WHERE AND HOW

2SCALE was launched in June 2012 and will run until December 2017. It is implemented by a three-member consortium: the International Fertilizer Development Center, the International Centre for development oriented Research in Agriculture and the Base of the Pyramid Innovation Centre.

The portfolio includes 49 agribusiness partnerships in eight countries – Benin, Ethiopia, Ghana, Kenya, Mali, Mozambique, Nigeria and Uganda. Activities in Côte d'Ivoire will begin in 2016. Work in South Sudan is on hold due to security concerns and the lack of private investment.

Activities focus on four commodity groups:

- **Staple crops** such as maize, rice and cassava
- **Vegetables** and fresh produce, also potatoes
- **Oilseeds** such as soybeans
- **Livestock-related**, mainly dairy.

Because these commodity groups are important in every country, the potential impacts are huge. So are the opportunities to cross-fertilize, using experiences from one country to design programs in others.

MULTIPLE PARTNERS

2SCALE works with a range of partners, sharing skills and resources to reach more farmers and businesses. Partners include not only private firms and farmer organizations but also NGOs, government agencies, universities, international donors and others. For example in Benin, 2SCALE and the Netherlands-funded ACMA project jointly manage a guarantee fund that helps agribusinesses get loans. In Mali, we partner with USAID on a fertilizer-credit program that reached 1,300 farmers in 2015.

Experts from Wageningen University and the Rotterdam School of Management work with 2SCALE teams in six countries to improve partnership governance and scaling. Food technologists from the PUM program in the Netherlands help African companies develop new products such as flavored whey in Kenya and fortified corn-soya blend in Ethiopia.

Public sector institutions contribute in specific areas. For example the Ghana Agricultural Insurance Program is helping to extend the government's poultry insurance program to cover Guinea fowl (reared by 2SCALE clusters). In Kenya, scientists from Kenyatta University are helping to control a new nematode that threatens potato crops across the country. The Nigerian Institute for Trypanosomiasis Research offers unique expertise in tsetse fly control – without which dairy pastoralists would be unable to supply milk to FrieslandCampina.

We even work with the police: local administrators and the traffic police in Nigeria helped roll out an accreditation program for trucks transporting cassava from farms to a processing plant. Transit delays and rent-seeking were reduced, transport costs fell by 20%.

PRIVATE MONEY, PUBLIC GOOD

2SCALE was envisioned as an experiment to test whether private investors would buy in to the concept of inclusive business. Our target was to have every donor euro matched by a private-sector euro – and we exceeded this target by some margin. In 2015, three-quarters of project expenditure, including salaries and all operational costs, was funded by private investors.

Private co-investment in 2015 was more than €21.6 million, representing cash investments, staff time and

other resources contributed by private companies and farmers. Of the private investment, 88% came from large companies (mostly Dutch, some African) and the rest from farmers and small entrepreneurs.

Eldoville Dairies in Kenya invested €804,000 in a new factory and production line, which will enable them to absorb the milk produced by rapidly growing 2SCALE clusters. Solagrow-Ethiopia invested €748,000 in developing large-scale, mechanized seed potato farms with processing equipment. Nigerian Breweries built a new €2.9 million plant which will convert cassava from small-scale farmers into high-value maltose syrup for beer production.

In Ghana, HPW Fresh & Dry spent over €1.7 million on factory expansion and on providing inputs and training to mango and pineapple outgrowers. Farmers will produce



Partnerships, from production to sale

more and better fruits, while the company will improve quality and throughput.

Clearly, businesses see no contradiction between profit and development. Local sourcing – buying from smallholder farmers for processing and sale – boosts local economies as well as company bottom lines.



Dairy processors are scaling up, with new products, better processing and closer engagement with farmers

Dairy Innovations in Kenya

Eldoville Dairies is the lead in a multi-partner initiative that has become a model for inclusive dairy business not only in Kenya but also in Ethiopia, Mozambique and Uganda. The company buys fresh milk from 1,500 small-scale dairy farmers to produce cheese, yogurt and flavored whey. It has invested in a new processing plant which will become operational in mid-2016, increasing capacity ten-fold.

In May 2015, Eldoville launched Whey Cool – Kenya's first bottled whey drink, targeted at low-income families and schoolchildren as a healthier alternative to Coke. Product development was supported by a Dutch industry expert, seconded via the PUM program, who helped design new processes and train Eldoville staff.

Storability was increased from a few days to two weeks – a critical requirement for products that will be distributed mostly in low-income areas where neither households nor shops have refrigerators.

The partnership has helped scale out new forage hybrids, quality-based payment systems, and innovations such as biogas plants, drip irrigation and solar-powered milk coolers. Farmers have increased milk yields by 50%. The company has improved its milk-to-cheese conversion efficiency by 30%.

Feed shortages are a major problem for small-scale dairy, so one priority was to introduce new fodder crops. Farmers are testing different varieties of vetch, lupin, lucerne, sorghum hybrids, fodder oats, fodder millet and rye grass.

Seeds of the new varieties come from four 2SCALE partners: Barenbrug, Advanta, Kenya Seed and IITA. Forty fodder demonstrations were established, ranging in size from 25 to 700 square meters. More than 2,000 farmers were trained during 2015, on how to produce and store green fodder, hay and silage.

Field days have created enormous interest, allowing farmers not only to see the new varieties first-hand, but also to learn about other dairy technologies and to meet potential business partners. More than 1,000 farmers attended a field day in Nyandarua in May 2015, organized by Eldoville and the Ministry of Agriculture. The field day included 30 booths and displays by a host of private firms, research institutions and the County government. An interesting sidelight: at the field day Eldoville sold 700 bottles of Whey Cool.

LINKS IN THE VALUE CHAIN

2 **SCALE works at two levels:** cluster (local) and value chain (much broader). We help create **agribusiness clusters**, which are local networks that bring together the various actors – farmers, buyers, input suppliers, service providers, financial institutions and others – to create a platform for business. We also provide training, business support and linkages to buyers. At the value chain level, we work with a range of partners, helping to strengthen input and output markets, develop new distribution and marketing models and more.

In each case, we begin with an idea – the vision of a local entrepreneur, a group of farmers or a large private firm. We then provide support, linkages and advice to translate the idea into a viable, sustainable business. Wherever possible, we build on existing structures – for example, strengthening a local trade network (rather than creating a new one) to handle larger volumes or new products.

BUSINESS CONNECTIONS

Rice in Kenya. More than 11,000 rice farmers are part of a new network, linked to seed and fertilizer companies, equipment suppliers, extension services and banks. The Kisumu Rice Stakeholders Forum, established at a series of meetings sponsored by 2SCALE, will help turn agricultural potential into successful agribusiness.

The level of private sector interest reflects the commercial potential. Equity Bank is developing flexible loan packages with no collateral required for loans of up to €4,500. Research firm Afritec Seeds is testing 14 new high-yielding varieties. Field results suggest that farmers can increase yields by 30% and reduce seed rates by two-thirds. Nyabon Enterprises offers small tractors, power tillers and other

equipment for purchase or rental. Fertilizer manufacturer ARM/Mavuno has provided 11 tons of specialty blended fertilizers for demonstrations.

Vegetables in Benin. Vegetable ‘hubs’ are transforming the market for fresh produce. Over 23,000 2SCALE farmers have established five hubs, each specializing in a different crop: tomato, hot pepper, cabbage, onion and leafy vegetables. Each hub deals directly with large wholesalers. This has improved farmgate prices, reduced transaction and logistics costs and eliminated price uncertainties. 2SCALE also helped create a simple Excel database showing locations and available volumes. The database, maintained and updated by the farmers themselves, is helping to attract bulk buyers.

Dairy in Ethiopia. Back-and-forward linkages are giving smallholder farmers incentives to invest in agricultural inputs. 2SCALE brokered a partnership between dairy farmers, processor Family Milk and feed supplier AKF. Farmers buy feed on credit (supplied by AKF, distributed by Family Milk) and also have a guaranteed buyer for their milk. Similarly for potatoes: trader and processor ET Fruit has signed agreements with farmer cooperatives, committing to provide seed potatoes and later buy back the harvest.



Better rice: new hybrids in Kenya



Not chickenfeed — poultry feed is a huge market for soybean farmers and processors

Soybeans in Mozambique. 2SCALE match-making will enable soybean processor ACOF to increase its sales five-fold. The buyer is Novo Horizontes, a large chicken feed manufacturer. Deliveries will begin in 2016. To help ACOF gear up, 2SCALE is providing assistance with farmer mobilization and training. More than 1,000 new farmers (600 women) became ACOF suppliers in 2015. The company has recruited 20 coaches/agents who will provide extension support and also coordinate delivery of farm inputs before the season and collection of produce at harvest. The inputs include a new fertilizer blend, supplied to farmers on credit, to be repaid by ACOF through deductions from farmers' payments.

TECH SUPPORT

Two common challenges in smallholder agriculture: how to provide technical advice to farmers, and who will pay for this. We brokered a unique solution for the pineapple sector in Benin. 2SCALE supported a study in early 2015, followed by stakeholder negotiations on how to provide extension services to pineapple cooperatives. A team of 27 technical officers was recruited, trained and deployed, serving 7,500 farmers. Their salaries will be paid by farmers, through a levy system managed by the buyer, Promo Fruits. The levy is a specific amount per kilo of pineapples, deducted from farmers' payments. A similar scheme is being designed for the sesame sector in Mali and will be rolled out in 2016.

HEALTHIER VEGGIES

Pests and diseases wipe out nearly 80% of the potential yield on many small-scale vegetable farms in West Africa.



Pineapple farmers pay for knowledge

We worked with partner firm East West Seed to find practical solutions. Phytopathologists from East West's headquarters in Thailand visited West Africa to provide disease management training to 120 'lead' farmers from Benin, Ghana, Mali and Nigeria. The lead farmers, who host learning plots, have transferred this knowledge to thousands of farmers across the region. The East West scientists also collected more than 100 samples of diseased or pest-infected plants. Lab analysis helped develop recommendations on how farmers can identify symptoms early, and what control options are available.

In Kenya, partnership with the Dutch firm Koppert is helping to protect tomato crops from two major threats: the moth *Tuta absoluta*, which can wipe out crops entirely; and bacterial wilt disease. Koppert trained farmer groups in Kirinyaga and Kiambu counties on the use of traps and environment-friendly biopesticides to monitor and control *Tuta* populations. Koppert also provided soil treatment products to fight bacterial wilt, after lab analysis (conducted by another partner, Crop Nutrition) showed high disease infestation. Farmers report that losses came down significantly in 2015.



How to crack the market: branding workshop, Ethiopia

and transaction costs for buyers, further reducing the price that farmers receive. 2SCALE partnerships have helped expand storage capacity, reducing transaction costs and increasing profits for farmers as well as buyers.

In Ethiopia, the Sidama Elto farmer union has built five 500-ton community warehouses to store maize for sale to 2SCALE partner GUTS Agro. 2SCALE and GUTS provided funding support and cement; the farmers provided other materials, land and labor. In Mozambique, partner firm ACOF has invested €40,000 to build a series of small warehouses to facilitate distribution of inputs and collection of produce. In Mali, the Jabaseneton women's cooperative won a €77,000 grant (2SCALE helped

THE BUSINESS CANVAS

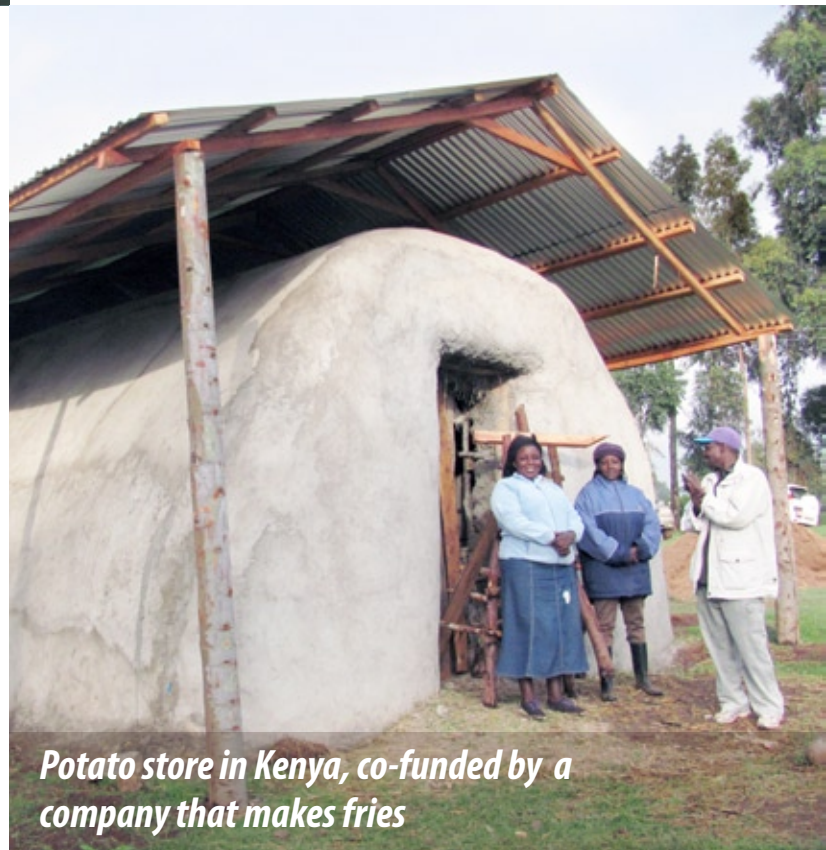
Every entrepreneur knows where she wants to go, but not necessarily how to get there. 2SCALE uses a new concept – the business model canvas – to help producer groups and small businesses articulate the “how”. Marketing teams work with partners to create a road map with concrete plans, time frames and realistic targets. This ‘business model canvas’ defines the value proposition (what are we offering? how is our product different?), customer segments, marketing strategy and ways to increase competitiveness.

We worked with 10 firms and producer groups in seven countries – Benin, Ethiopia, Kenya, Mali, Mozambique, Nigeria and Uganda. Their new business canvases have helped them focus on the most profitable markets or re-orient their marketing and distribution methods.

For example, the Nyakatonzi cooperative in Uganda built on market research (conducted by another partner) to scale up production of cottonseed cooking oil, for sale to small restaurants and bakeries. In Benin, Promo Fruits has a new strategy for direct marketing to low-income consumers, to complement their current focus on selling to wholesalers.

SAFE STORAGE

Lack of storage facilities forces farmers to sell immediately after harvest, at low prices. It also increases collection



Potato store in Kenya, co-funded by a company that makes fries

develop the grant proposal) to build a warehouse for onions. In Uganda, we worked with the Masindi farmer association to create a warehouse-receipting system to maximize the use of their 1000-ton facility. Farmers can now rent warehouse space and can also take loans against the value of the stored grain, repayable when they sell.



More than 10,000 women (and 24,000 farmers in all) supply to PROSEMA, the largest sesame processor in Mali

Open Sesame!

Farmgate prices of sesame in Mali have increased six-fold in the past seven years, fuelled by export demand. Yet, production is not growing quickly enough, and Malian processors and exporters are unable to source sufficient quantities.

“Europe and especially China, have millions of new middle class consumers for whom sesame oil is no longer a luxury, but a daily norm,” explains Soumaila Coulibaly, CEO of PROSEMA, the biggest sesame exporter in Mali. But how to break into this huge but highly competitive market? Through 2SCALE partnerships.

Until recently, PROSEMA was able to source barely 10% of its needs locally. Today it buys from smallholder farmers in 270 villages across the country. Ten new agribusiness clusters were connected to PROSEMA in 2015. 2SCALE continued a large-scale training program to improve yields and quality. The company increased its purchases six-fold, from less than 2,000 tons in the 2014/15 season to more than 12,000 tons in 2015/16. It plans to buy 20,000 tons next season. Challenges still remain, but each challenge is being directly addressed.

Networking. 2SCALE helped strengthen Bèné Yiriwali Bulon (BYB), a network connecting sesame farmers, PROSEMA and

government agencies. The ministry of agriculture plans to use the network as a foundation to build a broader industry platform to boost production and exports.

Side-selling. In 2015, PROSEMA distributed input loans of €46,000 to BYB members, to be deducted from farmer payments. But once the crop was harvested, farmers were tempted to sell to traders offering spot cash, violating their contracts with the company. As much as 84% of the harvest was side-sold. Rather than write off the relationship, 2SCALE worked with PROSEMA to rebuild trust through community meetings, posters and radio campaigns ahead of the August 2015 planting season. Farmers again signed contracts, with the company reiterating its commitment to support the local economy. In 2015, PROSEMA doubled its farmer network from 12,000 to 24,000, of whom 44% are women.

Crop insurance. Sesame production areas are drought-prone, with high risk of crop failure. 2SCALE, PROSEMA and PlaNet Guarantee worked together to roll out an index-based crop insurance program similar to the one used by 2SCALE maize clusters in Mali and Benin. In 2015, farmers paid €11,000 as insurance premiums. This number is expected to double in 2016, with 10 new clusters coming on board.



Oluyemisi Iranloye, head of Psaltry International, makes a pitch at the Food for Thought conference

Business Connections

A 2SCALE business conference in The Hague has opened the door to new business deals between food processors, importers, equipment manufacturers and banks.

The conference, *Food for thought: Made in Africa, for Africa*, was held in October 2015. It featured presentations by the CEOs of seven 2SCALE partner firms: AACE Foods and Psaltry International (both from Nigeria), Promo Fruits from Benin, GUTS Agro (Ethiopia), Fruittiland (Ghana), Shalem Investments (Kenya) and Acila Enterprises (Uganda). They were looking for business, but they also proved to be good ambassadors, showcasing the impact of 2SCALE on their businesses and the farming communities they support.

Following the conference, the entrepreneurs visited 27 Dutch enterprises in Utrecht, ranging from multinationals like Heineken to traders in second-hand machinery, from spice importers to companies making digesters that transform

organic waste into biogas. They also met with six large investors (Incluvest, Oikocredit, ICCO and others) interested in funding profitable but socially significant ventures.

The results are promising. Psaltry International (partnering with a Heineken subsidiary) will invest in the re-use of

organic waste for biogas and as fertilizer; Dutch energy experts will provide technical support. AACE Foods identified a new buyer for spices. The first samples, delivered in early 2016, are being tested for compliance with EU food safety regulations.

GUTS Agro began negotiations with manufacturers of soya extruders. Fruittiland met with the Dutch importers'

organization to boost citrus exports. Acila Enterprises and Shalem are negotiating with suppliers of processing machinery. Promo Fruits is discussing options for exporting juice concentrate to a Dutch multinational.

"Inclusive business is at the core of Dutch government policies on private sector development. The companies that are here today, have committed to inclusive business and to sourcing their raw materials from small-scale farmers supported by 2SCALE. 2SCALE functions as an incubator to nurture this kind of entrepreneurship. The role of the Ministry is to help them overcome the initial barriers and costs."

*– Jeroen Roodenburg, Ambassador,
Private Sector & Development Cooperation*



New Dutch varieties are available, linkages are in place, demand is growing rapidly

Potatoes for Profit

Agrico, a global leader in potato breeding, has developed a range of varieties for different uses, all suited to tropical conditions. 2SCALE clusters are growing eight new high-yielding Agrico varieties, multiplied in the country from seed potatoes imported from the Netherlands. This season, farmers planted more than 300 tons of Agrico seed potatoes, and sold the harvest for higher prices.

But this partnership isn't just about new varieties. It includes awareness campaigns, farmer training, improved storage, credit, and linkages with private firms supplying fertilizers, agrochemicals and farm machinery.

More than 1,200 farmers have been trained on improved production methods. Low-cost planting and harvesting equipment, introduced for the first time in Kenya, is generating huge interest. Low-cost potato storehouses are being scaled out with co-investment by traders and processors. The roll-out was so promising that Irish Aid is now funding a parallel program, implemented jointly with 2SCALE.

Seventeen demonstration plots were set up in farmers' fields and attracted more than 3,000 visitors, who saw for themselves that the new varieties Markies and Rudolph can yield up to 30 tons per hectare, compared to 7-10 tons

from traditional varieties. Two other demonstrations, established at a government training center in Nyeri, attracted 25,000 visitors.

In 2015, 2SCALE partner Sereni Fries introduced Kenya's first producer contracts for potatoes, and purchased more than 100 tons, paying 50% above market price. Sereni also introduced a unique loan scheme (facilitated by 2SCALE) in partnership with a microfinance agency. Farmers with Sereni contracts receive seeds and fertilizers on credit. Repayments are deducted from farmer payments at harvest.

The Agrico partnership has led to big changes in the potato sector. Before 2SCALE, there were no linkages between small-scale farmers and processors and little appreciation of variety characteristics – most farmers and traders distinguished only small vs large varieties. Now, farmers ask for specific varieties. 2SCALE clusters in Bomet, for example, want Destiny, because this variety is adapted to the local soil type and temperatures, and because processors are willing to pay higher prices for a spud that consumes less oil during frying.

PILOTS FOR THE POOR

2SCALE aims not only to help farmers and entrepreneurs grow, but also to develop affordable, nutritious food products for low-income families. Pilot programs in seven countries have helped create and market a range of products: flavored whey, high-protein cereals, carotene-rich vegetables. The pilots involve product development (processing methods, equipment specifications, and crop agronomy in some cases), supported with training, market research and advice on pricing, distribution and marketing. Several pilots focus on women processors and traders in the soybean, vegetable and cassava sectors.

Eighteen pilots were designed. Eleven were completed in 2015, seven are ongoing. Twelve new pilots will be launched in 2016, in response to requests by private-sector partners. The new pilots are in Ethiopia (dairy), Ghana (rice, mushrooms, groundnuts, cereals, soybeans), Kenya (cereals, dairy), Mali (vegetables), Nigeria (soybeans) and Uganda (cottonseed oil, soybeans).

I LIKE LIKIE

A new marketing strategy, using women entrepreneurs in a 'micro-franchise' system, is helping GUTS Agro market its corn-soya blend (developed with 2SCALE support) to poor urban consumers in Ethiopia. The blend, known as Supermom's, was launched in June 2015 in two cities, Hawasa and Adama. It is marketed by women vendors on tricycles, who sell door-to-door. The marketing plan is known as Likie, meaning 'just the right size'. Sales have been encouraging, and the saleswomen report that Likie tricycles have become instantly recognizable as a brand.

In early 2016 the Likie model will be rolled out in two more cities, Bishoftu near the capital Addis Ababa and Dessie in

the north. 2SCALE teams helped GUTS design a marketing campaign that will feature popular musicians and quiz contests on nutrition at local schools, with GUTS products as prizes.



WHEY COOL

In May 2015, Eldoville Dairies launched Whey Cool – Kenya's first packaged whey drink, available in three flavors. It's healthy, affordable, and converts a low-value by-product into a profitable line of business. Commercial whey production is not new; the challenge was to develop a product suitable for the low-income market. 2SCALE, working with the PUM program in the Netherlands, linked Eldoville to a Dutch dairy technologist who helped design the process, and increase storability (without refrigeration) from a few days to two weeks.

This partnership goes far beyond product development. It includes marketing support (road-shows, promotions, commercials) to the company and technical support to its farmers – new forage crops, biogas plants, drip irrigation, solar-powered milk coolers... Whey to go!



Taste tests confirmed that kangkong is not only nutritious and affordable, but also good to eat

Better Nutrition in Benin

Kangkong, also known as water spinach or swamp cabbage, is a leafy vegetable popular in Asia but previously unknown in Benin. 2SCALE introduced the crop in a pilot program that began in 2013 and has grown steadily.

Fresh vegetables are too expensive for most low-income families in Benin. The pilot program, in partnership with East West Seed, brought in high-quality seeds for field trials in the Grand Popo region. The trials showed that the new crop was well suited to Beninese conditions.

It is not vulnerable to insect pests, so less pesticide is needed. Farmers obtained large harvests (the plant can be cut multiple times) with almost no inputs, apart from manure applied at planting. The crop was then scaled out, promoted through local radio, posters and flyers.

Laboratory tests confirmed its nutritional value. Compared to cabbage, for example, *kangkong* contains nearly double the iron, 50% more protein and a hundred times more beta-carotene.

Kangkong can be grown year-round, and production costs are lower than almost any other alternative. But do consumers like it? 2SCALE teams conducted blindfold

tests with 150 people, comparing the new arrival with the most popular local leafy vegetable, African nightshade or *gboma*. A large majority preferred *kangkong* for its smell, texture and taste.

Augustine Koudikou, a mother of four, tried *kangkong* for the first time in 2015, and is now an enthusiast. "It cooks very fast, and hardly needs any seasoning. I can make sauce for six people by buying *kangkong* for only 100 francs. It tastes good with almost anything, maize paste, yam cossette paste, rice or gari."

Farmers are enthusiastic as well. Agbagli Basile, who has been a market gardener for many years, says *kangkong* is highly profitable. "I can harvest six to eight cuts with no fertilizers and very little pesticides. I only use chicken manure. I used to grow mainly *gboma*, but this is much better. From one hectare of *gboma* I earn 2.4 million francs. From one hectare of *kangkong* I earn 3.3 million."

BETTER FARMING, BIGGER HARVESTS

For most commodity value chains in Africa, the biggest challenge is supply. That is why agribusiness development usually begins at farm level, with new technologies to improve crop yields and quality. 2SCALE focuses on three areas: farm inputs (seeds, fertilizers), crop management and simple, low-cost mechanization.

NEW SEEDS

2SCALE farmers are cultivating new high-yielding varieties of vegetables, maize, rice, cassava, soybeans and fodder crops, introduced through partnerships with seed companies, research centers, national regulatory agencies and NGOs.

New sorghum, maize and rice hybrids are being tested by 2SCALE clusters in Kenya. More than 19,000 Kenyan farmers have purchased high-performance tissue-cultured banana seedlings from partner firm Stokman Rozen. New potato varieties from Dutch companies Agrico and HZPC are giving excellent results in Ethiopia, Kenya and Mozambique. Farmer groups in Ethiopia have been linked to a research center providing seeds of onion, tomato, pepper and haricot beans. A US-based seed company is testing a new sorghum hybrid in Uganda. In Benin, Ghana, Mali and Nigeria, vegetable varieties from East West Seed have resulted in higher yields, lower disease risk and better prices for farmers.

MORE EFFICIENT FERTILIZERS

Cassava farmers in Nigeria are using a new fertilizer blend specially formulated for root and tuber crops. The blend, manufactured by one partner (Notore) and distributed by another (Psaltry), is being sold at discounted prices. In Benin and Mali, partnerships with private firms are helping



Trained, equipped and ready: spray service providers in Ghana

to promote commercial organic fertilizers made from chicken manure and other organic waste. In Kenya, partner company ARM/Mavuno expanded its fertilizer distribution to new areas. In 2015, rice farmers purchased 60 tons of fertilizer briquettes (the technology was pioneered by a 2SCALE partner) and harvested 50% higher yields with one-third less fertilizer.

PEST CONTROL

Good news for farmers but not for pests: the Spray Service Provider program, introduced in Ethiopia, Ghana and Nigeria. In collaboration with CropLife Africa, we train young male farmers on pest and disease control. (No women, because of pregnancy-related risks.) Once trained, they offer spray services to farmers at affordable rates – increasing crop yields while creating new jobs in the community.

A pilot was implemented in Ghana: 100 young men from soybean, mango, pineapple and citrus clusters received training in safe application of pesticides and in business skills. CropLife certified 85 trainees who passed the tests, and provided them with a badge, protective gear and a ledger for keeping records. Nearly 70% of trainees are now selling their services to farmers from their communities, for multiple crops. By linking spray providers to its member companies, CropLife helps ensure that only genuine, registered pesticides are used. Similar pilots have been designed in Ethiopia and Nigeria and will be implemented in 2016.

FRIENDLY BACTERIA

Rhizobia are bacteria that stimulate the production of nitrogen-fixing root nodules in legume crops, essentially allowing the plant to make its own fertilizer, and significantly increasing yields. 2SCALE is helping to scale out this technology to soybean farmers in six countries.

In Nigeria, we partner with research center IITA and private distributors to produce and deliver inoculants. In Ethiopia, Mozambique and Uganda, inoculant suppliers have been linked with produce buyers and through them, to farmer groups. In Benin and Ghana, inoculants are produced by

the Université d'Abomey Calavi and distributed by several partners. Soybean farmers in Salaga, northern Ghana, have purchased more than 300 kg of inoculants in the past two seasons, more than in the previous two decades.

Field trials show that Rhizobium technology is easy to use – just mix inoculants with seeds before planting – and highly profitable. Inoculant costs €12 per hectare, and gives net gains of €80 to €200 per hectare depending on how well the crop is managed.

ENCOURAGING INVESTMENT

Even small investments in inputs give excellent returns, but many smallholders lack the cash to make these investments. 2SCALE works with partners to bridge this gap through credit and subsidy programs. For example in Mali, a financing arrangement involving 2SCALE, a USAID project and three financial institutions allows maize farmers to buy fertilizer on credit, using as 'collateral' their production contracts with 2SCALE partner SONAF. Farmers from 113 producer groups bought 1,700 tons of fertilizer in 2015, worth €195,000.



Plowing back the profits: credit linkages help farmers invest in technologies, inputs and labor

BUILDING CAPACITY

In 2015, 2SCALE capacity-building programs reached nearly 245,000 participants – of whom 46% were women. That’s a big jump from 2014: the number of participants has quadrupled, while the percentage of women has increased from 38% to 46%.

The numbers rose quickly because we use ‘cascade’ training (also known as training-the-trainers). First, we identify a coach for each agribusiness cluster: an experienced practitioner from the extension services, a farmer organization or an NGO, known and respected in the community. Coaches receive intensive training from 2SCALE staff and professional trainers, and then work with

the cluster to provide year-round mentoring and support. Coaches provide much more than technical advice. They help cluster actors develop local solutions to local problems, build relationships with other value chain actors, analyze costs and budgets and negotiate with buyers, suppliers, even with banks.

Women are particularly encouraged to attend training programs – with convenient locations and timings, women-only field days, special transport arrangements, even day care for young children whose mothers are participating.



East West Seed works hands-on, helping vegetable farmers improve yield and quality

TAILOR-MADE TUTORING

A total of 133 trainers and coaches work with 2SCALE clusters in seven countries – Benin, Ethiopia, Ghana, Kenya, Mali, Nigeria and Uganda. Clusters in Mozambique receive support mostly from partner firms, with 2SCALE staff providing back-up.

Capacity building programs combine hands-on field work with structured ‘learning workshops’. Workshop content and presentation are designed based on past experience with the particular crop or farming system. The training includes technical subjects (e.g. crop management), financial aspects and ‘soft skills’ to improve group dynamics, networking and governance. In every case, the curriculum is tailored to the needs of the cluster or partnership.

For example:

- **Benin**, maize partnership with SOCIA: Production cost analysis, pricing, collective selling, traceability, production contracts, financial institutions and procedures.
- **Ghana**, citrus partnership with Fruittiland: Transport costs and logistics, financial education, production cost analysis, pricing, local credit providers and products, development of business plan, prospecting new markets.
- **Nigeria**, spices partnership with AACE Foods: Economic analysis, reducing production and handling costs, record keeping, traceability, warehouse management.

“We cassava farmers never had a proper group before – every farmer acted on his own, and we had no power to bargain. Then we joined 2SCALE and Psaltry, and the coach opened our eyes. Now we buy herbicides and fertilizers in bulk at cheaper prices, we jointly rent tractors to plow our fields. We managed to get a bank loan at 9% interest per year – earlier, we had to pay 24%. Next year, we will bring all six clusters together into a common platform, so our voice will be even bigger.”

– Nasiru Oladokun, cassava farmer in Oyo State, Nigeria



2SCALE has a rigorous certification process for coaches, combining workshops, field training and practice

FINDING FINANCE

Business requires investment – but many small-scale farmers and entrepreneurs have neither the money nor the ability to access credit from banks and microfinance agencies. They are seen as poor credit risks because they lack assets for collateral and cannot (or so the banks believe) manage risk. 2SCALE helps address this problem in several ways – by facilitating bank loans to cluster actors, helping financial institutions develop new loan products and lending mechanisms, and building ‘financial literacy’ among farmers and agri-entrepreneurs.

More than 18,000 farmers and businesses in six countries received €10.9 million in loans during the year. In addition, several large loans are being negotiated, with disbursement expected in 2016. These include loans from Rabobank to Kenyan firms Kevian Ltd and Shalem Investments, totaling €10.5 million, and a €760,000 loan from Oikocredit and Root Capital to Malian company SONAF.

Access to credit has allowed 2SCALE partners to transform their operations. For example, the Nyakatonzi cooperative in Uganda produces large quantities of lint cotton, but lacked modern processing equipment for oil extraction (cottonseed cooking oil, highly profitable). 2SCALE helped the cooperative negotiate a €1.5 million loan to buy new processing equipment. The loan will enable Nyakatonzi to diversify from cottonseed to other oilseeds, double its production capacity and increase oil yields by 50%.

NEW WAYS TO LEND

2SCALE has helped design and test out-of-the-box financing mechanisms, for example tri-partite agreements where farmers receive loans at the beginning of the

season, without collateral, on the strength of a guaranteed market, i.e. a contract with a buyer who will purchase the harvested crop. The loan is repaid by the buyer, by deducting from payments made to the farmers at harvest. 2SCALE identifies a lender and helps negotiate the agreement, which specifies the responsibilities of each party, quality standards, delivery volumes, price, payment terms and conflict resolution methods.

In 2015, ‘tri-partite’ loans were disbursed in Benin, Kenya, Mali, Nigeria and Uganda. For instance, members of FUPRO, a maize cooperative in Benin, received a €150,000 loan to purchase seeds and fertilizers. The loan was provided by microfinance agency ALIDé based on a production contract between FUPRO and the buyer, maize processing company SOCIA.



Women's mutual credit group, Benin



This cluster took a bank loan to buy an irrigation system, and dramatically increased profits

Another innovation is reverse factoring, where a farmer group that has invoiced a buyer for products delivered, can 'sell' the invoice to a finance agency at a discount. Farmers thus receive their money immediately rather than waiting 30 or 60 days. The first pilot is being negotiated in Uganda, between sorghum farmers, Uganda Breweries (buyer) and Citi Bank. Farmers who supply Uganda Breweries will 'sell' their invoices to Citi Bank, on the strength of a guarantee by the brewery.

MONEY FROM FRIENDS

In addition to the formal credit market, we also tap the informal small-lending market. Essentially, we try to formalize these informal sources by helping to create Village Savings & Loans Associations (VSLAs), whose members contribute to a nucleus fund that can be leveraged to obtain larger loans from commercial lenders.

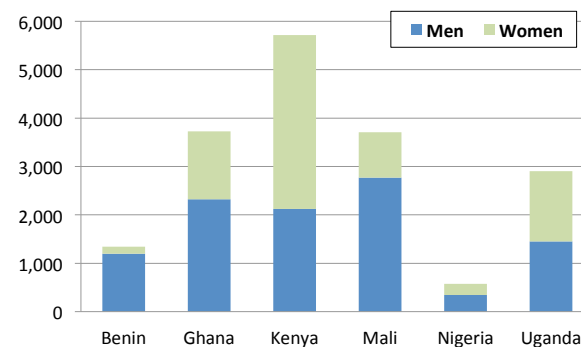
Women from traditional Fulani communities in Nigeria formed their first-ever VSLA this year and will launch a group-based commercial venture in 2016. Women vegetable farmers in Benin have formed collateral groups (*caution solidaire*), where the group guarantees loans taken by individual members. More than 11,000 farmers from Ethiopia, Kenya and Uganda received VSLA loans in 2015.

FINANCE TRAINING

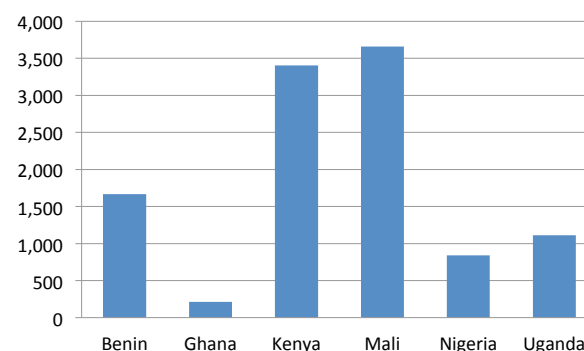
Small farmers and entrepreneurs are often intimidated by bank procedures. 2SCALE works with partners to conduct financial literacy training that covers enterprise management (record-keeping, analyzing and documenting viability) as well as loan requirements and procedures.

For example in Kenya, following training conducted by Faulu Bank, 600 sorghum farmers opened bank accounts and received a comprehensive input-loan-and-insurance credit package. Dairy farmers were linked to four credit providers — Umati Capital, Equity Bank, Inuka Africa and Root Capital — who are keen to expand lending to the dairy sector in Kenya. 2SCALE teams helped the farmers develop proposals for loans to upgrade herd genetics, processing capacity and other areas. The Nyamarura cluster now has a new milk cooling tank financed by Root Capital, and has significantly reduced spoilage losses.

Number of loan beneficiaries in 2015



Loans disbursed (in € thousands) in 2015





EMPOWERING WOMEN

Women work, men take the profits. This is true, to varying degrees, in most value chains in smallholder agriculture. Social and cultural barriers — land ownership, financial control, inheritance customs and many more — limit the ability of women to participate in, and benefit from, agricultural markets.

Despite these challenges, 2SCALE is beginning to make a real impact in empowering poor, poorly educated women. We use a pragmatic approach: first identify the barriers in a particular community or value chain, then design simple, socially acceptable measures to bring down these barriers.

Consider capacity building. 2SCALE training programs are constantly tweaked to encourage women to participate. Coaches and facilitators, who understand the community well, begin with awareness campaigns. Once the roll-out begins, women's groups are preferentially selected to receive training. For unisex groups, liaison with the project is done through women members wherever possible. Special arrangements are made to transport women to the training venue — in some cases, vehicles are reserved for women only. Women are allowed to bring their young children to the training; day care is provided during the most intensive sessions.



Women drive the trade chain in many commodities

When a new technology is being introduced, we select demonstration fields that belong to or are managed by women. In 2015, we began conducting women-only (or mostly-women) field days in addition to regular field days where both sexes are welcome.

In Nigeria and Benin, 2SCALE collaborates with government and NGO literacy programs, linking them to 'our' women's groups. This initiative, which began in mid 2015, is already showing results — better knowledge retention, more accurate record-keeping and more engagement, e.g. suggestions on the training curriculum or choice of technologies to be tested.

This is still a work in progress. But engagement with the community — especially with male elders — has shown that perhaps the barriers are not as formidable as they appear. Several communities have agreed on quotas: no training program will proceed without a 'quorum' of women.

PLANNING FOR TRANSFORMATION

Groups usually perform better than individuals. A key focus of 2SCALE capacity development programs is to help women form and manage groups to reach larger markets, negotiate better prices and benefit from group-based government or NGO programs.

In Benin, women soybean processors have transformed their businesses with help from 2SCALE. They negotiated contracts with grain suppliers and launched a marketing campaign with radio broadcasts, cheese-tasting events and remodeled shop displays. The Elevagnon group increased its sales of soy cheese by 38% compared to 2014. The Zogbodomey cooperative increased incomes by €5 per day per member.

In Ethiopia, women entrepreneurs are making money while helping to promote good nutrition in poor households. A unique marketing model, developed with partner firm GUTS Agro, involves women retailers selling door-to-door. The women are given uniforms, tricycles to transport goods and stocks on credit, as well as training on basic accounting and child and maternal nutrition. The program covers four cities (Hawasa, Adama, Bishoftu and Dessie) and a range of products from salt to high-protein corn-soya blend.

In Mali, 275 women, members of rice processing cooperatives, were trained in improved processing methods (quality of paddy at source, storage, steaming techniques). They have replaced traditional parboiling methods with better alternatives, improving quality while reducing energy costs. They have also negotiated better terms with rice suppliers, leading to higher profits.

In Kenya, 190 women vegetable farmers were trained in production technologies, in partnership with seed companies. The training covered new seed varieties, crop management, drip irrigation, markets and pricing. Almost every trainee has substantially improved yields and quality. New groups are being formed, and are coordinating their schedules to ensure year-round deliveries.

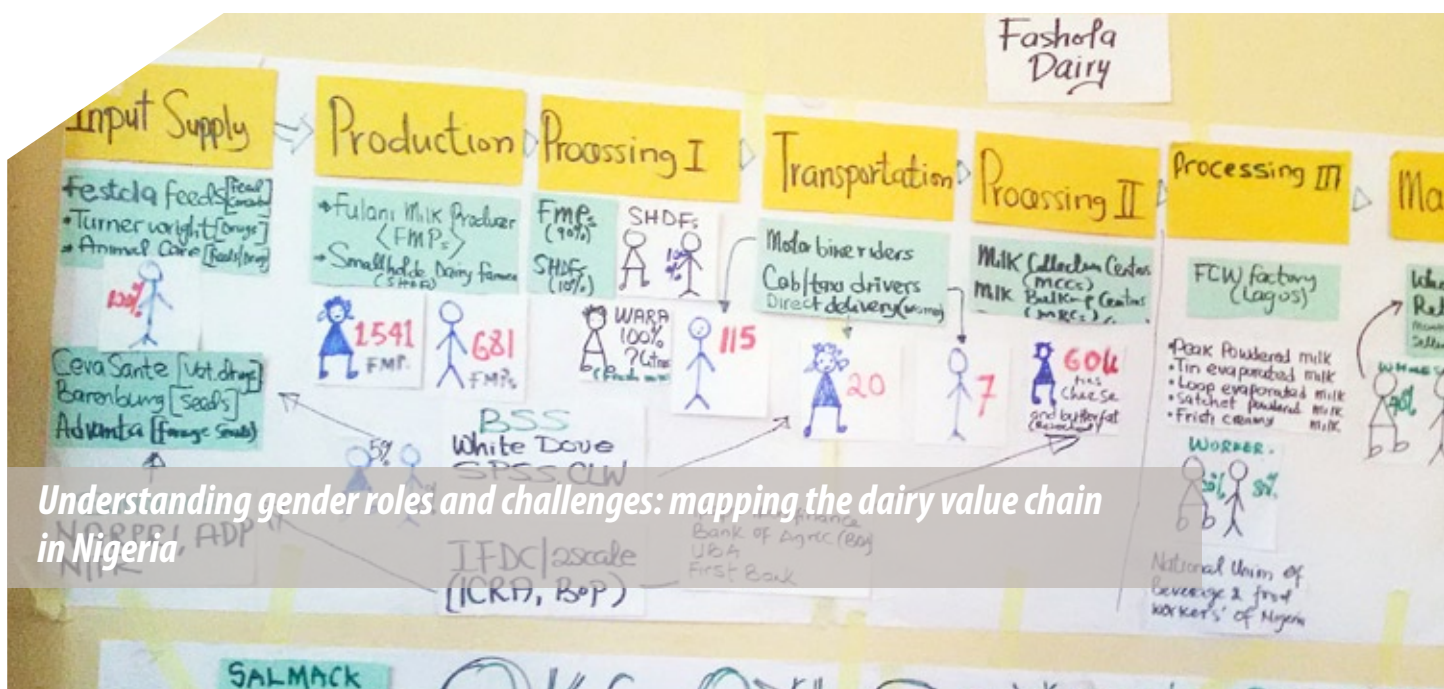
In Nigeria, the 2SCALE-FrieslandCampina partnership has created not only money but time. Fulani women have moved away from traditional (and laborious) cheese-making, and instead sell fresh milk – freeing up time that could be used for other purposes. 2SCALE helped design a pilot scheme where the women work as part-time retailers selling FrieslandCampina products. The pilot involves 250 women in four clusters. FrieslandCampina has agreed on terms, including discounts and promotional material. Sales will begin in 2016.

WOMEN EMPOWERING WOMEN

Shalem Enterprises is a woman-headed Kenyan firm that trades and processes sorghum. It buys from smallholder farmers through a network of agents. Of the 42 agents, 30 are women.

Meet Mary Karee, Shalem's star agent. Mary began as a shop assistant, then graduated to purchasing agent. In 2012 she received seed capital from Shalem, and found she had the Midas touch. "For a long time I was struggling to make ends meet. I was delivering only one or two bags at a time." Now she handles sorghum worth €50,000 each season. In the past 2 years, she has acquired a grain store and a shop selling seeds, fertilizers, agrochemicals and farming tools.

But no matter how busy she is, she makes sure to spend part of every day with women from her 2SCALE cluster in Kwangombe, Meru county, providing farming advice, market information and contacts, and mentoring young women who want to set up a business. Mary is an unofficial ambassador for 2SCALE and Shalem, and a model for budding women entrepreneurs.





Equal pay for equal work – 2SCALE brokered a 50% wage increase for women employees

Women and Wages

ESOP is an agricultural cooperative in Lalo, Benin, that purchases rice from small-scale producer groups for grading, packaging and resale. The key step is hand-sorting, to select the best grains for premium markets. Sorting is done mostly by women, at very low wages.

To address this problem, the 2SCALE team in Benin first examined costs and margins to understand whether ESOP and other processors could afford to pay more. Grading accounts for only 6% of processing costs – implying that higher grading costs (higher wages) will not seriously affect the company's profitability.

Next, 2SCALE contracted a study to understand the wage structure and gender-based separation of tasks. Sorting is done almost entirely by women, while men are responsible for other tasks such as dehulling and packaging. Hand-sorting is taxing and laborious, but the women earn only 1,250 FCFA per day on average. ESOP's male staff, doing similar jobs, earn more than 4,000 FCFA.

The findings were discussed with the company management and with the women employees; first in separate groups, then in 'plenary'. The 2SCALE team, which moderated these discussions, used a soft approach, simply laying out the facts and leaving the decision to the company.

The result? ESOP increased the women's salaries by 50%, from 1,250 to 1,875 FCFA per day. That is still only €70 per month, and gender disparities still remain. But the women are grateful that a beginning has been made.

"The money was so low, we had to often borrow from others just to meet our daily needs," explains Lucienne Hossou, a rice sorter at ESOP. "That is why most sorters resign after a few months. With this increase, because of 2SCALE, we can breathe a little bit better."

SMALL FARMERS, BIG DREAMS

Who is a typical 2SCALE farmer? Here's a snapshot, based on interviews with 2,400 farmers in six countries: Benin, Ethiopia, Ghana, Kenya, Mali and Uganda.

Big families. The typical household is headed by a man in his early to mid-forties (40% are headed by a woman) and has between five and eight members. Households are generally larger in West Africa than in East Africa, partly because there are fewer nuclear families, i.e. more people live and eat together in the same homestead. For example, the average 2SCALE household in Mali reports 25 members.

Small farms. In most countries the typical farm is 3 to 5 hectares, located 10-15 km from the nearest town. That creates two challenges – small quantities harvested, high transport costs to market. Most of the crop (70% to over 90%) is sold to traders who travel from farm to farm, aggregating produce for resale. Our work is designed not to overthrow the system but to make it more transparent and equitable, e.g. helping farmers and buyers negotiate production contracts at fair terms.

Strong networks. In all six countries 2SCALE farmers are far more likely, compared to non-project farmers, to belong to a farmer organization. There are several reasons for this, but a key factor is 2SCALE's emphasis on building social capital: mobilizing farmers into groups and providing advice on registration, management procedures and other areas. For example in Uganda, nearly 70% of 2SCALE farmers belong to a group, compared to less than 1% of non-project farmers.



Emerging businesses. Trade, remittances and other non-agricultural sources account for a big share in the family's total income. These families are already entrepreneurial, and becoming better at it. Training on book-keeping and enterprise management, provided in the context of 2SCALE agribusiness clusters, is helping these households increase efficiency and profits in their non-2SCALE enterprises as well.

A brighter future. Impact analysis suggests that 2SCALE is working. Numbers are growing – more farmers, higher yields, larger volumes traded. Farmers are optimistic. There is no easy way to measure optimism, but we tried. In all six countries, the majority of farmers interviewed – 70 to 90% in almost every country – say they will increase their farm investment next season.

PARTNERSHIP PORTFOLIO

The project portfolio comprises 49 agribusiness partnerships in eight countries. Each partnership is led by a private firm or a producer/processor group. Each partnership connects multiple players – farmers, buyers, financial institutions, entrepreneurs (mostly small-scale) selling seeds, fertilizers and other inputs, and service providers offering training, transport, tractor rental, crop insurance...

Some partnerships are 'local', for example a farmer cooperative selling to a local processor. Others are much broader; activities with East West Seed, for instance, involve more than 40,000 farmers in four countries.

BENIN

Pineapple | Lead partner: Promo Fruits – Promo Fruits purchases from smallholder farmers to produce fresh (not from concentrate) pineapple juice for the regional market. A strong growers' association has been established, and has introduced the country's first levy system – funded by farmers – to pay for extension staff. Farmers have cut harvest-and-handling damage by half, and are working together to ensure year-round harvesting.

- New factory established with an Oikocredit loan facilitated by 2SCALE. Two new packaging lines (cans and paper cartons) are operational
- 10 clusters active, with 7,745 smallholders and laborers (27% women)
- 20 action-research programs, substantially improving fruit quality
- Pilot program to test-market fresh juice for schoolchildren

ETHIOPIA

Maize & Soybeans | Lead partner: GUTS Agro – GUTS purchases maize and soya from over 20,000 smallholders to produce a range of food products. This partnership has introduced not only processing and distribution innovations but also new varieties, crop management methods, fertilizer blends, and tools such as moisture meters and row planters. Partners include farmer unions, research institutes, Hawasa University and government agencies.

- Supermom's corn-soya blend launched in Hawasa and Adama cities. Roll-out in two more cities in early 2016
- Unique distribution model with Likie women micro-entrepreneurs
- GUTS Agro contracted to purchase €1 million worth of maize and soybeans from 2SCALE clusters
- More than 5,000 farmers trained in 2015, using local-language training manuals developed by 2SCALE





Soya brochettes, Ghana

GHANA

Soybeans | Lead partners: five farmer cooperatives – This partnership has helped strengthen production as well as processing. 2SCALE support focuses on two groups – women processors making soy-based food products and producer cooperatives seeking to increase production to meet growing demand. Processors are marketing new food products (e.g. soy brochettes); producers have adopted technology innovations (e.g. Rhizobium inoculation) to increase yields.

- Five clusters, more than 12,000 farmers (5,200 women)
- 2,300 tons delivered to large-scale processors, against initial orders of 800 tons
- Women processors have formed a savings group to access commercial loans
- Local entrepreneurs have emerged, who provide crop protection services to farmers at affordable rates

KENYA

Rice | Lead partner: ARM Holdings/Mavuno – This partnership with a local fertilizer manufacturer has helped increase rice yields with a package that combines efficient fertilizer technologies, new varieties, better agronomy and mechanized seeding. The key technology is fertilizer deep placement (FDP), which offers 30 to 50% higher yields with one-third less fertilizer. Activities focus on irrigated rice in Kirinyaga and Kisumu counties.

- Farmers bought more than 60 tons of FDP briquettes in 2015, increasing yields while reducing environmental damage from fertilizer runoff

- Low-cost, labor-saving FDP applicators distributed to 220 farmers, very positive feedback. Larger scale-out planned for 2016
- New fertilizer blend introduced, with micronutrients in addition to NPK
- New rice hybrids: 195 demonstration plots established in collaboration with research firm Afritec Seeds

MALI

Potatoes | Lead partners: trader cooperatives Mali Yiriden and URCEP – The lead partners buy from smallholder farmers for resale locally and export to Burkina Faso, Ghana, Nigeria and Togo. This partnership has helped improve competitiveness in the potato value chain with new technologies, better farmer-trader linkages, larger credit flows and capacity building for farmers and traders.

- Both cooperatives earned record revenues in 2015: URCEP €198,000, Mali Yiriden €1.67 million
- More than 3,000 farmers using new varieties, improved production methods, better post-harvest management and storage
- Credit linkages: fertilizers worth €110,000 distributed on credit, financial institutions disbursed an additional €200,000
- National umbrella body created, and successfully lobbied for regulation of potato imports, resulting in better prices for local farmers



Potato cooperatives: record sales

MOZAMBIQUE

Dairy | Lead partner: Agromaco – This partnership builds on 2SCALE experience in Kenya with forage crops and fodder/silage production. It has helped improve yield and quality in the smallholder dairy sector and enabled the lead firm to compete with imported milk. In addition to buying fresh milk, Agromaco will supply dairy feed and provide farmer training. Partners include dairy processor Danmoz and the NGO Land O'Lakes.

- Agromaco is installing two new plants to produce sterilized milk (capacity 1000 liters/hour) and dairy meal; will be operational in 2016
- Agromaco linked with another 2SCALE partner, ACOF, for the supply of soybean cake (estimated demand 4,000 tons per year) for dairy meal
- New flavored milk products developed, targeting BoP consumers. Test-marketing will begin in 2016
- Lead firm and the farmer association have developed business plans (with 2SCALE assistance), seeking bank loans for expansion



Cassava processing, Nigeria

NIGERIA

Cassava | Lead partners: Psaltry International & Nigerian Breweries – This partnership has created a huge new market for smallholder cassava farmers. Psaltry purchases fresh cassava tubers to produce starch for sale to Nigerian Breweries (Heineken subsidiary). Partners include fertilizer manufacturer Notore (new fertilizer blends), research center IITA (high-starch varieties), finance



Dairy farmers learn about zero-grazing

providers and others. Six clusters are active in Oyo state in south-west Nigeria.

- Psaltry invested in a new production line, increasing capacity from 6,000 to 15,000 tons/year
- Farmers delivered 28,250 tons of tubers, compared to 21,800 tons in 2014
- 968 farmers trained in 2015; adoption of improved practices and inputs rose from 16% in 2014 to 44% in 2015
- Mechanized cassava planters and harvesters introduced for the first time in Nigeria: substantial savings in time and cost

UGANDA

Soybean | Lead partner: RECO Industries – This partnership, launched in September 2015, aims to scale out improved soybean technologies, support farmer mobilization (including registration and legal procedures) and assist the lead firm to expand its outgrower network and its range of soya food products, targeting children and BoP consumers. Five clusters are involved, built around district farmer associations that have previously worked with 2SCALE partners.

- 165 producer groups in five districts, supported by 10 enterprises providing inputs and services
- 20 new producer organizations registered in 2015
- Technology package developed (new varieties, Rhizobium inoculation, optimal planting density), roll-out in 2016



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