Info Note

Scaling climate-smart agriculture: Towards co-creating business models in the input supply chains and finance chains

Cor Wattel, Marcel van Asseldonk, John Gathiaka, Richard Mulwa, Lia van Wesenbeeck, Remco Oostendorp, John Recha, Maren Radeny and Jonne Bosselaar

NOVEMBER 2019

Key messages

- There is potential for scaling out CSA practices through collaboration between smallholder farmers and commercial parties.
- Input suppliers, banks and farmers see opportunities to intensify business with each other. However, their propositions do not automatically match with each other.
- Co-creation processes can link the insights from robust research with stakeholder consultation and motivation, and can be a promising route to develop CSA scaling pathways.

This Info Note presents an exploration of CSA scaling options in the Nyando Basin area of Kisumu and Kericho Counties in Kenya, through partnerships in the value chain. It is part of the NWO-CCAFS research project "Climate-Smart Financial Diaries for Scaling in the Nyando Basin, Kenya", led by the Amsterdam Centre for World Food Studies, in consortium with Wageningen Economic Research, University of Nairobi and the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) in East Africa.

Background

When we strive for out-scaling and upscaling of CSA practices, one of the possible pathways is to create scale through the private sector. Getting the private sector on board can create larger investment capacity, as well as broader outreach and scale of operation. Such private sector actors could be value chain companies, including input suppliers, as well as financiers and investors in the financial value chain.

This study explores the potential for such private sector partnerships in Nyando. Nyando is dominated by smallholder farming with households owning about one hectare of land, and commercial firms are only present to a limited extent. We explore the potential for increased business between value chain companies and smallholder farmers, and between financial institutions and smallholder farmers. The underlying assumptions are that:

- Partnerships between smallholder farmers and private sector (commercial parties) can contribute significantly to scaling of CSA;
- Increased business between commercial parties and farmers is driven by viable business models that offer profits and advantages for both the farmers and commercial parties.

Methods

We conducted interviews with locally active input suppliers (4) and with financial institutions (2). We elicited their perspectives: how their business with smallholder farmers could be increased in a profitable way, and how that would relate to scaling CSA. The anonymised results of these interviews were discussed with a diverse group of farmers (comprised of male and female), in two community workshops with a total of approx. 135 farmers (51 in Kericho County and 84 in Kisumu County). The farmers were asked to reflect on the perception of the commercial parties, and were stimulated to discuss their own views on increasing their business with commercial parties and how that could benefit them. In the same community meetings, we also shared some interim results of the financial diaries (after - 31 weeks of data collection), and validated these early results with the farmers. Some key results of the interviews, community

NWO Netherlands Organisation for Scientific Research
Food & Business Knowledge Platform
CGIAR RESEARCH PROGRAM ON Climate Change, Agriculture and Food Security
CCAFS

meetings and financial diaries are reported in this Info Note.

Overview of revenues and credit use

Early 2019 a weekly 'climate-smart financial diaries' survey was started among 122 households in 7 CCAFS Climate-Smart Villages (CSVs) in Nyando. The on-going survey interviews all persons in the household that earn an income, and is carried out on a weekly basis for 52 weeks. It includes questions about inflow and outflow of cash during the week, as well as the financial relations for savings and loans, and the application of CSA technologies and practices.

The preliminary findings (after 31 weeks of data collection, from mid-March to mid-October 2019) indicate a gendered division of revenues (Figure 1)[1]. The median revenues over the entire period amounts to 16,000 KES (USD 157) for female and 33,000 KES (USD 324) for male household members respectively, and 69,000 KES (USD 678) for the household as a whole. Hence, these revenue statements reveal that women are also actively engaged in farming; although the median revenues of women are about half that of the men, in one third of the households the lady of the house earns more than the man[2].

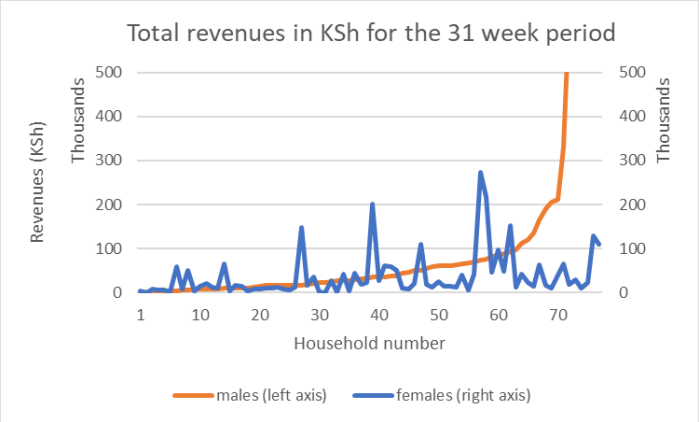

Figure 1. Total revenues (in KES) for the 31-week period, for female and male household members. 78 households included[2]. US$ 1 is approximately KES 100.

In the follow-up workshops in Kisumu and Kericho Counties farmers explained that men are the custodians of livestock. According to the cultures and traditions of the communities in the two counties, livestock is sold by men and milk by women. The main revenue source for men in Kisumu is from selling cattle, and this is supplemented with selling of maize, cereals and goats (in this order). In Kericho, men supplement their income with selling some products in addition to sugarcane. Milk and maize sales are the main sources of revenue for women.

Another striking feature is the skewed distribution of revenues. Ten percent of the households earn more than five times the median revenues and have a total share of 63% of the revenues at this point in the year. This suggests the existence of a segment of wealthier farmers, who might have different relations with commercial markets as compared to poorer smallholders.

Also, in the credit use, a substantially gendered division can be observed (Figure 2). The total credit amount newly taken up was 2.4 and 1.8 million KES, for female and male household members, respectively. In financing daily expenses, school fees and food is the main purpose for credit use (total 51% for the women and 36% for the men), while credit use for farm inputs (e.g. fertilizer, seed and feed) is relatively limited (5% of the total for the women, 20% for the men).

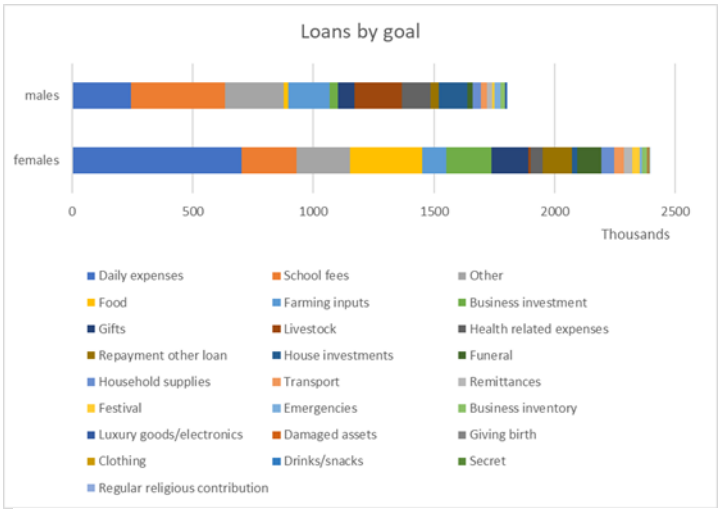

Figure 2. Total loan amounts taken out, by purpose, during a 31-week period (in KES), for female and male household members. US$ 1 is approximately KES 100.

The main credit sources (Figure 3) for the women are household members (32%), community-based savings groups (which are often organized by women) (28%), and

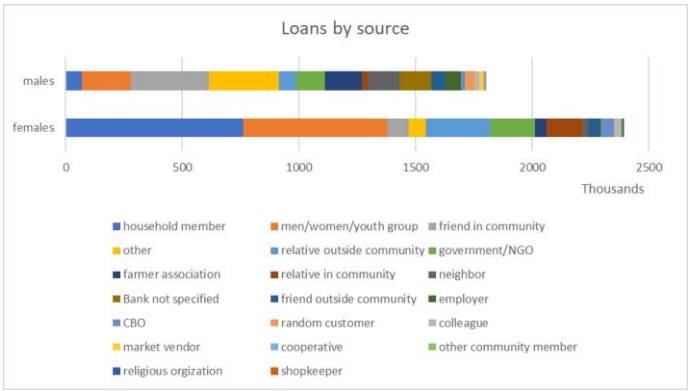

Figure 3. Total loan amounts taken out in KES by source, during a 31-week period, for female and male household members. US$ 1 is approximately KES 100.

[1] The scale of the y-axis has been manually maximized at 500,000 KES. In seven out of the 77 reported households the male has an income higher than 500,000 KES, in a range between 637,000 and 3.2 million KES.

[2] Note that in Figure 1, only households where both male and female household members receive revenues are included, and the households are ranked according to the male revenues. This provides a limited analysis of intra-household distribution. A more in-depth gender analysis, including single-headed households, was beyond the scope of this paper.

relatives (18%), particularly the relatives outside the community. The men show a more diversified network of loan sources, the most being the neighbours and friends in the community (27%), the groups (12%), farmer associations (9%), governments and NGOs (7%) and banks (7%). Processors, traders and input suppliers are hardly mentioned as sources of credit.

Input suppliers in Nyando

There are over 24 input suppliers (agrovet dealers) based in the Kisumu area and operating in Nyando. The dealers market both crop and livestock production inputs. Fertilizer is the most profitable business line. Although the margins per unit are low, the volumes transacted are usually high. Moreover, hybrid seeds are becoming more important as farmers are shifting from planting open pollinated varieties (OPVs) due to low productivity. Other relevant inputs include agrochemicals, veterinary medicines and small farm implements.

The input products are either from local manufacturers or importers (e.g., Bayer, Syngenta and Yara). For smaller dealers the key mode of delivery are retail sales (business to consumers), while larger dealers wholesale to other dealers (business to business) as well as retail. All dealers are members of the Kisumu County Agrovet Dealers Association (KCADA). Some dealers sell via community based organizations (CBOs), with bulk deliveries to CBOs especially in cropping seasons, while others sell to smallholders directly from local outlets (with occasional on-farm deliveries).

On seasonality, there are business peaks with high sales occurring during long rain seasons. Yet demand is becoming more volatile due to erratic rainfall disrupting normal business operations. During the short rains and dry seasons business slows downs. Climate change has not only affected the input market during the long rain season, but has also further reduced rainfed cropping activity during the short rain and dry seasons. This reduces cash flow and ties up working capital.

However, climate change has opened also new opportunities for agrovet dealers. Specific examples include new products such as starting or increasing sales of shade nets, greenhouses, solar pumps, drip irrigation equipment, and new agrochemicals for controlling emerging pest and diseases (for both crops and livestock).

Overview of the input business opportunities

The key climate-smart adaptation strategies from the interviews with the local agrovet dealers are based on a variety of rationales, such as increasing efficient production, irrigation during droughts, diversification of production and enabling a second crop season.

In Table 1 the key climate-smart adaptation strategies elicited from local agrovet dealers are depicted.

Table 1. Input climate-smart adaptation strategies.

STRATEGY	RATIONAL
Horticultural production (e.g. tomatoes, kale and watermelon)	Low gestation period of most seasonal horticultural crops
Changing animal breeds from many local animals to a few hybrid animals (cows, goats, sheep) with higher productivity	More efficient production due to depressed pasture production
Changing livestock species (e.g. more poultry)	Requiring fewer inputs
Water harvesting by using pans/boreholes	Irrigation during dry seasons
Fruit farming (e.g. mangoes)	Diversification
Irrigated rice production	Enabling second cropping season after rice
Growing Brachiaria grass	Fodder for dairy animals
Increasing agroforestry	Diversification, shade, erosion control, fodder, wood products
Organic farming	Soil nutrient addition through organic fertilizers and composting manure
Bee keeping	Diversification
Other crops (e.g. cotton, green grams, papaya, sorghum, soya)	Diversification

Overview of the output business opportunities

The majority of the agrovet dealers do not have a business model for outputs, but some have implemented or are testing specific output business models. For example, in the cassava business model – promoted by Self-Help Africa with EU grant funding - an agrovet dealer is encouraging farmers to produce cassava, as a business and for household food security. A cassava demo farm has been set up near Kisumu, and the agrovet plans to sell cassava cuttings and other inputs to the farmers. The initiative is in nascent stages and if it takes off, it can create bulk produce of cassava which farmers could commercialize through their CBO, through interlinked input-output contracts with the agrovet and cassava processing factories (chips, flour, starch).

Another emerging example is in the rice business model, where an agrovet dealer has facilitated an irrigation scheme for farmers in West Kano with plans to develop and package his own brand of rice and not only sell it locally but also in urban areas. This model will involve an app-based mobile business account (Agro-wallet), farmers, buyer (LBDA/Lake Basin Development Authority) and the agrovet dealer.

If the National Irrigation Board (NIB) could allow a second cropping season after rice, farmers could engage in commercial horticulture. In addition, the United States Agency for International Development (USAID) is planning to build a cold room for horticultural produce at the Kisumu airport, which provides opportunities for farmers to develop an output business model for horticulture.

Other services provided by agrovet dealers

Extension services

The agrovet dealers business model evolves with the seasons, concentrating during low cropping seasons on extension work with the farmers to prepare them for the long rainy season. The provided extension services differ among agrovet dealers and are used as a competitive advantage strategy to distinguish themselves. All dealers provide advice on best input options such as on fertilizer, agrochemicals and livestock drugs. Some employ agronomists who identify crop diseases and advice on control strategies. This boosts sales for the company's products, promotes the agrovet dealer and helps the farmer. Another, more comprehensive extension approach, is to organize field days and to support farm demos of crop varieties and practices. Few agrovet dealers also provide training on village savings and loans (e.g. table banking).

There are linkages between agrovet dealers and government extension agents. On the one hand the dealers at times connect farmers with government extension agents based on the cases they deal with. On the other hand, input products are also promoted by government extension agents who recommend farmers on where to buy specific inputs. Note that, past structural reforms downsized public extension services and agrovet dealers stepped in to fill in the void and promote private/demand-driven extension services.

Financial services

Most agrovet dealers do not sell on credit to individual farmers, although occasional short-term credit (a few weeks) is provided to those known to the dealer. Some agrovet dealers allow farmers to buy expensive implements in instalments usually over a period of three months. There are more opportunities for CBOs to buy on credit.

In general, agrovet dealers borrow in peak season when inputs are in high demand. Either supply companies provide bulk inputs to each other on credit or proforma invoices are financed by banks (e.g. Africa Banking Corporation, Equity Bank, Jamii Bora, Kenya Commercial Bank and Sidian Bank).

Proximity models in the input supply chain

In Figure 4 we depict the input supply chains and their actors. The diagram enables us to visualize distinct business models for input suppliers.

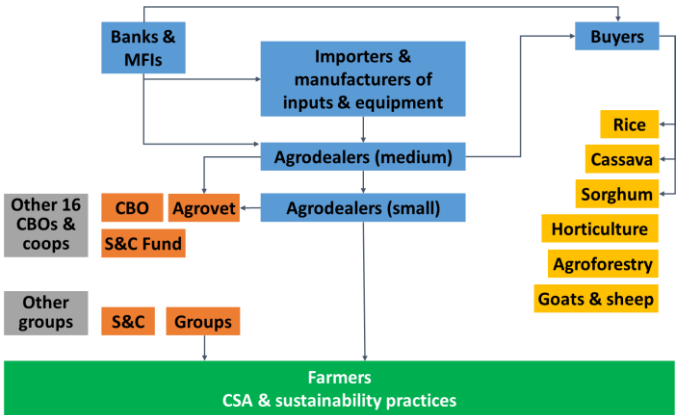

Figure 4. Input supply chains in the Nyando region

Color legend: CBO-related actors, commercial actors, farmers, crops

CBO = Community-Based Organization; MFI = Microfinance Institution; S&C = Savings & Credit. The crop sectors mentioned in yellow are related to specific CSA practices tested in the CCAFS project.

- Selling inputs through retail;
- Selling inputs through wholesale (and through smaller agrovets, or CBOs);
- Provision of inputs on (short-term) credit to trusted clients;
- Input provision combined with agronomic advice;
- Input provision combined with supply chain finance (purchase order, Agri-wallet, Digifarm@Safaricom);
- Input provision combined with product aggregation in the output chain (so-called contract farming or out-growers schemes).

Financial institutions in the Nyando area

There are multiple banks and microfinance banks active in Kisumu and Kericho Counties. All of these banks work nationwide and have branches in Kisumu city; some of them also have outlets in Kericho County. The commercial banks that are most active in agri-finance include Kenya Commercial Bank (KCB), Cooperative Bank, Equity Bank, Jami Bora Bank, and ABC Bank (African Banking Corporation). Microfinance banks with agri-finance programmes include Rafiki Microfinance

Bank (a subsidiary of Chase Bank), Kenya Women Finance Trust Bank (KWFT), Musoni Microfinance, and Faulu Microfinance Bank. These banks offer a wide range of services for agriculture, including agricultural loans, savings and deposit services, financing for agricultural SMEs, trade and export financing, insurance. These services however are not all easily applicable to – and accessible for – smallholder farmers.

The commercial banks largely offer their services to commercial farms, to agribusinesses, and to structured value chains (especially in coffee, tea, dairy). They are not inclined to serve smallholder farmers, nor CBOs. In Kisumu County, the number of commercial farmers is very limited, so the commercial banks are hardly working with farmers directly.

The microfinance banks are more inclined to offer their services to smallholder farmers, because it is part of their mission and mandate. However, they prefer to work through aggregators, to keep their risks and operating costs manageable. Examples of this model include i) working with agrovets, who work with small farmers; and ii) working with buyers of the agricultural products, who work with small farmers.

The microfinance banks also participate in combined input supply - output marketing models, where a value chain company provides the inputs and secures the market for the product. Such examples (in the wider region around Kisumu city) can be found in the rice sector, and in niche agroindustry markets of sorghum, cassava, soybeans, and yellow sweet potato. In these niche markets, often specific varieties of the crop are grown, which are suitable for the processing factory (sorghum and cassava for the beer brewery, cassava flour for porridge). In a few cases they see individual farmers emerge from these aggregation models and develop into regular clients of the bank, although such cases are very rare.

Banks prefer to lend to individuals, or to legally structured companies. Regarding relations with CBOs in the wider Kisumu region, banks do not find it attractive to lend to CBOs. They perceive that often CBOs are created by a few individuals to benefit from an opportunity and are not really solid organisations.

Rather than providing CBOs with credit, banks find it easier to offer accounts services to CBOs, to manage their transactions and savings. The banks can offer them bank accounts and savings accounts, as well as proximity services through their bank agents. Well-structured CBOs might even become bank agents and thus offer proximity service to their members. This can also bring more customers to the bank.

Proximity models in the finance chain

For the financial institutions, their proximity models with smallholder farmers can be summarized as follows:

- Financing input suppliers (agro-dealers), who do different kinds of business with smallholders;
- Financing buyers or processors, who are buying agricultural products from smallholders;
- Financing fintech operators, who are providing fintech services to farmers;
- Financing farmers via fintech operators (e.g. Agri-Wallet, Digifarm@Safaricom);
- Financing farmers directly, through individual or group loans.

Most of these models imply indirect financing of the banks and MFIs to the farmers, in very structured business environments. Only in very specific circumstances is direct lending for farmers feasible: the credit risk must then be under control in a very structured farming environment (e.g. irrigated farming, commercial farming).

Private sector perceptions about smallholder farmers

A few general remarks stand out from the interviews with input suppliers and banks:

- Climate change and the related new risks and uncertainties make farmers reluctant to invest in inputs, because of the risk of loss when the crop fails;
- Nyando is seen by some as somewhat traditionalist, not very innovative in terms of agricultural practices and choice of livestock breeds and crops;
- Nyando is seen by some as “used to hand-outs”, which makes commercial transactions more difficult;
- CBOs are seen as attractive clients; at the same time the fact that the CBOs’ volunteer staff applies rotating responsibilities for the agrovet shop and for the demo farm is seen as a limitation.

Proximity models from the farmers’ perspective

The farmers found it valuable to learn about the business models of the commercial parties, and also about their perceptions regarding smallholder farmers. The farmers agreed on some of the perceptions, but disagreed on others:

- Farmers could explain very clearly why some farming practices that seem innovative are not suitable for their conditions. For example, they do not consider greenhouses as suitable for hotter lowland areas, and they point at high investment costs for water tanks and water pans. Also, Kericho and Kisumu Counties

are quite different in agro-ecological and socio-economic characteristics: an innovative practice that is useful in Kericho is not necessarily useful in Kisumu.

- Promising crops brought forward by farmers seem close to their food production (more resistant varieties of food crops, traditional vegetables) and for local trading, rather than commercial crops for external markets suggested by the commercial parties.
- The suggested new animal breeds imply a more radical change in the animal farming system than only changing the breed.
- Farmers are very confident about their village groups, in terms of good collaboration and reliability. At the same time, there are challenges in how to link the groups to commercial parties, and what the role of the CBOs should be in that linkage process.

The farmers put forward different proximity models to create better linkages with commercial parties:

- New varieties of food crops (drought-resilient, fast-maturing) or animal breeds (drought-resilient).
- Crop and livestock diversification: (sorghum, sweet potato, beans in the short rainy season; tree fruits, pineapple, milk goats, kitchen gardening, cow peas, traditional vegetables, fodder management).
- Work the farm as a business: keeping track of revenues and costs, calculating profitability, and planning savings and loans.
- Group action: the farmer village groups could act as a platform to create more linkages with the commercial parties (opening bank accounts, joint savings, negotiating loans).
- Collective marketing: joint marketing to ensure that their farm produce reaches the market.
- Agricultural extension by input suppliers: farmers want input suppliers to play a more active role in providing knowledge and advice about the right inputs, drought-resistant and early maturing seeds, pest-tolerant varieties, modern farming practices.
- Upgrading the CBOs to cooperatives: CBOs could be upgraded to well-functioning cooperatives, to be a solid business partner for banks and value chain parties.
- Sharing capital: sharing capital goods that are too expensive to acquire as individual smallholder farmers (irrigation, equipment, greenhouses).
- Contract farming: participate in structured models of input supply and output marketing, as showcased in rice, sorghum for beer, cassava.
- Warehouse receipt financing (WRF): stocking cereals at village level, either as savings for the dry season, or as collateral for short-term loans.[3]

Concluding reflections

In general, the input suppliers seem to operate closer to the small-scale farmers than the banks. They are more integrated with the farming community. They are also more independent entrepreneurs, whereas the banks in Kisumu operate in nationwide structures and are more hierarchically organised.

Many farmers consider their village group as their most important ally in doing business. The CBO is already one layer more distant than the group and might not in all cases be the best intermediary between farmers' groups and commercial parties.

Fundamentally, market- and investor-oriented business models may prosper with segments of farmers that are closer to markets, physically and socioeconomically. This seems to be a minority of the farmers in the Nyando area, and maybe more prominent in Kericho than in Kisumu. The majority of smallholder farmers in Nyando seem to lean more towards subsistence farming to meet food security needs, with a larger diversity of crops and fragmented product volumes for the market. This evidently limits the potential for commercial linkages.

Next steps

The proximity models mentioned by input suppliers, banks and farmers show some overlaps and linkages, but do not automatically converge towards joint business models. The research project will apply and test a co-creation model to elaborate some examples of joint business models that could help scale CSA practices. The following co-creation steps are envisaged:

- Shortlisting and selecting 2-3 most promising business models and elaborating these further with the parties engaged, including some financial modelling of costs and benefits.
- Organising a multi-stakeholder co-creation workshop, to validate and discuss the 2-3 business models.
- Enriching the co-creation process around scaling CSA with the full results of the financial diaries, after a full year of data collection.

[3] The WRF option was not mentioned by any actor, but the research team thinks that it might be an interesting additional possibility, connected to existing excess production of food crops.

Further Reading

- Karlsson NPE et al. 2019. Business modelling in farm-based biogas production: towards network-level business models and stakeholder business cases for sustainability. Sustainability Science July 2019. 14:4, 1071-1090.
- Hilary RS et al. 2017. Partnership construction and value co-creation to address voids in rice production: The case of rice value chains in Uganda. Cogent Food & Agriculture. 3:1, 2017.

Cor Wattel *(cor.wattel@wur.nl) is a Researcher at Wageningen Economic Research.*

Marcel van Asseldonk *(marcel.vanasseldonk@wur.nl) is a Senior Scientist at Wageningen Economic Research.*

John Kamau Gathiaka *(gathiaka@uonbi.ac.ke) is a Senior Lecturer and a Development Economist at the School of Economics, University of Nairobi.*

Richard Mulwa *(richard.mulwa@uonbi.ac.ke) is a Professor at the Centre for Advanced Studies in Environmental Law and Policy (CASELAP) and School of Economics, University of Nairobi.*

Lia van Wesenbeeck *(c.f.a.van.wesenbeeck@vu.nl) is the Director of the Amsterdam Centre for World Food Studies*

Remco Oostendorp *(r.oostendorp@vu.nl) is Professor of International Economics at Vrije Universiteit Amsterdam.*

John Recha *(j.recha@cgiar.org) is a Climate Smart Agriculture and Policy Scientist, CCAFS East Africa.*

Maren Radeny *(m.radeny@cgiar.org) is a Science Officer, CCAFS East Africa.*

Jonne Bosselaar *(jonne.bosselaar@wur.nl) is a Junior Researcher at Wageningen Economic Research.*

About CCAFS Info Notes

The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) brings together some of the world's best researchers in agricultural science, development research, climate science and Earth system science, to identify and address the most important interactions, synergies and tradeoffs between climate change, agriculture and food security. Visit us online at **https://ccafs.cgiar.org**.

CCAFS is led by the International Center for Tropical Agriculture (CIAT) and supported by: