

# Info Note

## Financial landscape mapping for climate-smart agriculture in the Nyando Basin, Western Kenya

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### Key messages

- Smallholder farmers tend to limit their cash outlays for climate-smart agriculture investments.
- Financing needs can be resolved mainly within the village for most of the season. External sources are primarily used in the beginning of the rainfall season during planting.
- Financial institutions are hardly present in the farming areas. They tend to work through intermediaries. The most important intermediaries are value-chain actors and community-based organizations.

Upscaling climate-smart agriculture (CSA) practices requires, among others, an enabling financial system. When smallholders introduce CSA practices on their farms, this usually requires them to invest. Some of the farmers may need loans to finance such investments, while others prefer to use their savings or another source of funds. Climate change may also alter the farmers' cash flow patterns and volatility throughout the season. Together, these factors may trigger farmers to demand new services from the financial system around them.

Access to finance may influence the farmers' decisions to adopt CSA practices. This effect may work through at least four different pathways. The first pathway is the direct influence of access to finance lifting resource constraints to invest in CSA practices. The second pathway is indirect; where access to finance can enable farmers in general to invest and become more profitable (on-farm as well as off-farm), which in turn may generate expenditure effects including higher expenditures on CSA practices. The third pathway is also indirect; where access to finance may influence farmers' risk behavior, as

credit, savings and insurance may represent mechanism for coping with risks and variations of income. With risks better addressed, the farmer may be more willing to invest, rather than keeping capital buffers for adverse situations (Ruben et al. forthcoming 2018). A fourth pathway would be that access to finance could change the intra-household distribution of resources and thus the decision-making on CSA practices. The four pathways together are relevant for reaching scale in CSA adoption.

In the NWO-CCAFS research project on climate-smart financial diaries, the financial transactions of approximately 125 households will be monitored on a weekly basis for one year. The project will provide unparalleled granular data on all transactions, cash and in-kind. These data will be analyzed to assess how adoption and application of CSA practices affects the farmers' cash flow and investments throughout the year. Such high-frequency data are key for understanding the potential demand for CSA financial products by smallholder farmers and in turn its importance for scaling CSA.

The present case study analyses the financial environment within which the farmers in Nyando operate and within which they deploy their CSA practices. This initial financial mapping will help the project to identify relevant questions to be asked in the financial diaries surveys, including interpretation of the results. It will also be a point of departure for the second phase of the project, when the financial diaries will be discussed with financial institutions in the region to identify the potential of existing financial products and the possible need for new, innovative ones to enable upscaling.

## The Nyando area: climate challenges and CSA practices

The Nyando River Basin is located in Kisumu and Kericho Counties of Western Kenya (Figure 1). It is very densely populated, with about 400 inhabitants per km<sup>2</sup>. Average landholdings are very small, and the area suffers from serious land erosion (Ojango et al. 2013). Poverty rates are substantial, with 80% of the households suffering food shortages during 1 or 2 months per year, and 17% during 3 or 4 months per year.

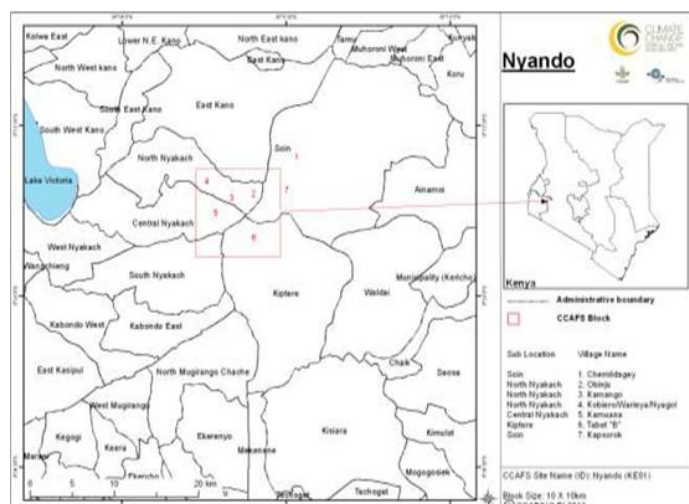


Figure 1. Climate-Smart Villages AR4D Sites in the Nyando River Basin in Western Kenya. Source: Bonilla-Findji et al. 2017.

Agriculture is mainly a mixed crop-livestock farming system and rain-fed. Cultivation of crops (cereals, legumes, horticulture, root crops, sugar cane) is the main livelihood but largely subsistence. Approximately 90% of the households have complementary cash income from off-farm activities, of which the most important are working on someone else's farm, operating a business and remittances or gifts. Challenges include soil erosion and declining soil fertility. Over the last decade, the start of the rainy season has been delayed on average by one month, which shortens the agricultural season. Also the variability of rains has increased, with long dry spells in some periods and flooding in the lower part of the basin during seasonal rainfall events.

Agro-processing is limited to sugar mills (in the more hilly parts of the basin), small-scale sugar jaggeries, rice mills and a new beer brewery in Kisumu City which is expected to process sorghum. Most crops and livestock are sold in informal markets, through traders and middlemen.

Since 2011, CCAFS, in collaboration with other partners, has been working in villages in rural parts of the Nyando Basin covering an area of 10x10 km by deploying a series of CSA research activities with local partners through its AR4D approach. These CSA practices are quite diverse and include the use of soil and water conservation practices, multiple stress tolerant crop varieties, improved

post-harvest storage of seeds on-farm, improved breeds of goat and sheep, smart farms with greenhouses for horticulture, beekeeping, and agroforestry (Ojango et al. 2015).

## Which CSA investments are being promoted?

CCAFS is currently working with at least 2,350 households implementing CSA practices on their farms in 23 administrative villages, out of the 103 administrative villages in Nyando. The most important CSA practices promoted by CCAFS in the Nyando area are listed in Table 1, which is based on the inventory of CSA practices for Nyando by CCAFS (Bonilla-Findji et al. 2017).

Table 1. Main CSA practices promoted in the Nyando Basin by CCAFS.

CSA practices	# households (2016)	Examples of investment costs <sup>1</sup>
Improved breeds <sup>2</sup> Galla goats Red Masai sheep	1,900	Per animal: Galla goats (< 1 year): KES 10,000 Red masai (< 1 year): KES 7,000 Local breed (<1 year): KES 3,500 + plus stabling + fodder + animal health.
Improved varieties Maize, Sorghum, Pigeon pea, Beans, Green grams	2,350	Per hectare: KES 27,000 for each crop. These include ploughing, purchase of seeds, pesticides, fertilizers for planting & topdressing and weeding.
Intercropping Sorghum+Pigeon pea, Beans+Maize	2,350	Per hectare: KES 27,000 for ploughing, seeds, weeding, pesticides and fertilizers.
Tree planting <sup>2</sup> Casuarina, Grevillea	800	Per hectare: ESh 15,000 for the purchase of seeds, nursery establishment, transplanting, and tree management.
Water harvesting	150	KES 70,000-100,000 for a water pan of 8'x4'x4.5' with polythene liner. Most of this cost is labor. Liner KES 7,000.

<sup>1</sup> US\$ 1 is approximately KES 100.

<sup>2</sup> Mitigation potential.

Source: Bonilla-Findji et al (2017) for the CSA practices and the number of participating households. The investments costs are estimates from field interviews conducted in March 2018, and are intended as approximate indications. Extensive investment analysis or cost-benefit analysis was beyond the scope of this report.

Improved breeds of goats and sheep are promoted with the goal of improving productivity and enhancing the livelihoods of communities living in these areas faced with climate variability (Ojango et al. 2015). Sheep and goats are better adapted to droughts, whereas cattle are more vulnerable. Households in Nyando tend to have small

flocks of sheep and/or goats, generally in the range of 4-6 goats and/or 3-5 sheep per household (Ojango et al. 2015). Traditionally sheep and goats tend to graze on the crop residues of harvested farms and suffer a scarcity of feed during the dry periods. This leads to slow growth rates of livestock and vulnerability to pests and diseases. The improvement promoted by CCAFS is to introduce more productive indigenous breeds (Galla goats and Red Masai sheep), to be reared under improved management, with better grazing, supplementary feeding, better livestock health services, and with controlled mating.

Use of improved seeds and intercropping are encouraged. Improved seeds of cereals (maize, sorghum, and finger millet), legumes (pigeon pea, cowpeas, beans, and green grams) are tested by farmers on their farms, and compared on traits such as yield, water stress tolerance, maturity period, grain size, market availability, as well as pest tolerance and disease resistance. Intercropping is integrated with agroforestry that integrates fruit trees between the food crops, and with combinations of food crops (sorghum+pigeon pea, beans+maize).

Agroforestry is promoted for several purposes. It can provide farming families with the 'five Fs': Food, Fuel, Fodder, Finance (cash) and Fertility. Trees help to reduce soil erosion, which creates deep gullies during the rainy season. Some species fix nitrogen and improve soil fertility. Others provide fodder for goats, and timber and shade CCAFS – with its partners – has supported 40 tree nurseries, with a capability of producing 140,000 high-quality tree seedlings in a season. Farmers are also trained, among others in the selection of seeds, raising seedlings in tree nurseries, and transplanting.

Soil and water conservation involving the construction of terraces and use of stone bunds is another practice promoted and helps with retention of topsoil on the landscape. The farmers have been trained to construct water harvesting pans on their farmland for water that can be used in drier periods. The pans can be used for watering livestock, or for manual irrigation by use of watering-cans for small vegetable plots.

## What is the average amount of CSA investments?

There are no rigorous cost-benefit data available for each of these practices. Still, in Table 1 we show some indicative data about the associated investment costs, originating from our field interviews. The investment in improved breeds of goats and sheep for a farmer consists in buying the better breeds, investing in improved

livestock housing structures, fodder and animal health, and adapting and intensifying their husbandry practices. For a farmer, it is relatively easy to accommodate improved seeds and intercropping into their usual cash flow since the additional investments are quite limited. The investment in tree planting consists of buying the seedlings, planting the trees, fencing against animals, and sacrificing some cropland for tree planting. While digging a water harvesting pan – apart from the polythene liner required - is largely a matter of hard work, often through pooling labor in order to reduce the cash requirement of the investment. Using the water harvesting pan would then imply an investment of (family) labor for watering the vegetables.

A small survey of 35 East African farmers by Groot et al. (2018) found that most farmers effectively invested up to USD 50 last year on one specific category of CSA practices<sup>1</sup>. Only a small minority (<10%) invest between USD 100 and 500 in a CSA practice. The survey did not reveal large gender differences. The amounts of funds invested are often quite modest, at least for each category of the CSA practices. This does not necessarily mean that CSA practices are cheap for the farmers. It might be the case that farmers only invest as much as they can afford to invest, but do not implement the practices fully – or not on all their land - because of lack of resources. Finding that out would require more in-depth research. One observation from the field work is that farmers tend to limit the cash outlays for their investments, by using mutual labor exchange (in-kind) where possible, a clear indication that farmers are cash constraint.

## Farmers and financial relations

### How do Kenyan farmers relate to financial services?

Finding from national surveys show that general access to financial services<sup>2</sup> in Kenya has improved over the last decade (FSD Kenya 2016a). Approximately 75% of the Kenyan population has now some kind of access to formal financial services, either through banks, insurance companies, mobile money, Micro Finance Institutions (MFIs) or Savings and Credit Cooperative Organisation (SACCOs). Ten years earlier this was approximately 25%. The largest growth stems from mobile money providers (M-Pesa and other similar services), but also banks, microfinance banks and insurance companies have grown in outreach.

The rural population has benefited from better access to financial services, but clearly less than the urban population. For the rural population, its access to formal

<sup>1</sup> In the survey, practices were group into categories, such as “soil conservation and land preparation”, “water use efficiency or water conservation”. For each category the survey asked how much farmers had invested, and from what source.

<sup>2</sup> Financial services include savings, credit, transfers & remittances and insurance.

financial services of any kind rose from 23.8% (2006) to 69.0% (2016). This includes having a mobile money account, being a member of a SACCO, or being client of an MFI, a bank or an insurance company (FSD Kenya 2016a).

In rural areas, about two-thirds of the population use mobile money, and 40% uses informal financial services. Banks (including microfinance banks) are the third most-used category of financial services in rural areas (27.3%).

The Global Findex surveys (World Bank 2017) for Kenya reveal that 64-79% of rural inhabitants borrowed money in the past year (Table 2). In most cases, they borrow from family or friends (45%-60%), and to a lesser extent from a savings club (21%) or a financial institution (bank, MFI or SACCO) (9-17%). The most common motives for rural borrowing are social expenses such as education, school fees or medical expenses<sup>3</sup>. Somewhat less frequent is borrowing to start, operate or expand a farm or a business. So it seems that rural inhabitants do take loans, but mostly from informal sources and not so often with the purpose of financing their farms.

*Table 2. Rural inhabitants in Kenya borrowing any money, by source and use. Source: World Bank Global Findex Database 2017, data processed by the authors.*

	% age 15+ rural		
	2011	2014	2017
Borrowed any money in the past year		79%	64%
Borrowed from:			
• From family or friends	59%	60%	45%
• From a savings club			21%
• From a financial institution	9%	15%	17%
• From a store or buy on credit	10%	9%	
Borrowed for:			
• For education or school fees		34%	
• For health or medical purposes		31%	15%
• to start, operate, or expand a farm or business		23%	9%

This is confirmed by data on how agriculture is financed (FSD Kenya 2016a). Most farmers (87.7%) self-finance their farms, with their savings or with the last harvest's surpluses. Much less frequent sources are the buyers of the crops (12%) and/or the farmers' relatives (11.5%). Only a limited number of farmers mention *chamas* (including table banking), SACCOs and cooperatives as sources of financing for agriculture.

<sup>3</sup> This seems to coincide with the FSD Kenya national survey which found that the most common motive to take a loan was day-to-day needs.

<sup>4</sup> Locations and sub-locations are administrative entities in Kenya. The country is divided into 47 counties, which are divided into 290 sub-counties, 2,427 locations and 6,612 sub-locations. The Nyando area where

The same pattern can be distinguished when we look at the main strategies to cope with shocks: these are often based on self-financing. In rural areas the most important coping strategies are the use of savings (39.9%), seeking help from social networks (26.8%) and selling assets (4.5%). Borrowing from the table banks or other financiers is much less frequent.

### How do farmers in Nyando relate to financial services?

The Nyando farmers' financial relations seem to mimic the patterns at the national level. According to the household baseline survey of CCAFS (2011), only 2% of the surveyed households received any credit for agricultural activities.

Nyando farmers use very diverse sources of financing throughout the agricultural season. This is visualized in Figure 2 which was constructed in a participatory manner during the field workshop. The diagram visualizes the agricultural year starting in January at the top and goes clockwise through the year. The concentric circles represent geographical spheres of influence, with the village in the centre, the sub-location as a middle layer, and the location<sup>4</sup> and higher geographical divisions (counties and sub-counties) in the outer layer.

Figure 2 shows that in the period of land preparation most of the financing needs are resolved within the village, through mutual labor assistance, selling stocks or animals, borrowing from the table banks, remittances and moneylenders. The only external source mentioned is remittances from outside the village and sub-location. For the sowing season, these internal sources are complemented by financing from outside, from agro-dealers (inputs on credit), sugar companies, tractor services of the County Department of Agriculture and NGOs (One Acre Fund, Innovations for Poverty Action). At the harvest, the cereal banks and animal stocks are replenished, and the debts of the household are paid. This includes not only agricultural debts, but also social expense debts such as school fees that normally should have been paid at the beginning of the school season. For the second sowing and harvest season the same cycle is repeated, generally with lower amounts because the areas sown are smaller<sup>5</sup>.

CCAFS is active lies partly in the county of Kisumu and partly in the county of Kericho.

<sup>5</sup> Financial relations during the dry season were not reported in the workshop. The financial diaries will shed light on these.

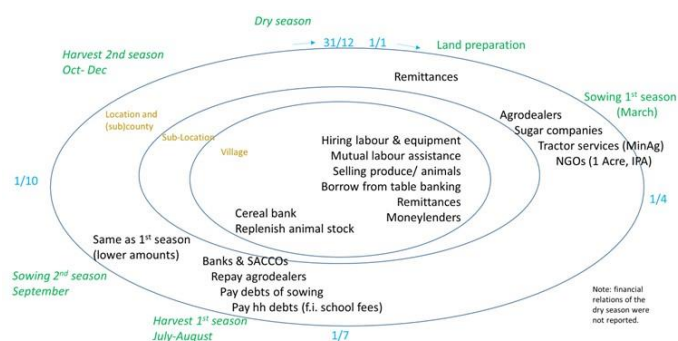


Figure 2. Financial relations throughout the agricultural season: What financial services does a farmer use throughout the agricultural season, to bridge ups and downs in his/her cash flow?

Specifically, for CSA investments, the small sample survey of Groot et al. (2018) showed that the merry-go-rounds – such as table banking – are the dominant source from where the farmers financed their CSA investments<sup>6</sup>. This predominance of table banking might be linked to the fact that CCAFS operates in close collaboration with the community-based organizations (CBOs), and that the CCAFS package contains some CSA subsidies combined with extension services of the county agricultural services. The second source is self-financing and remittance funds for most categories of CSA practices, or the input supplier (fertilizer) for the category of nutrient management.

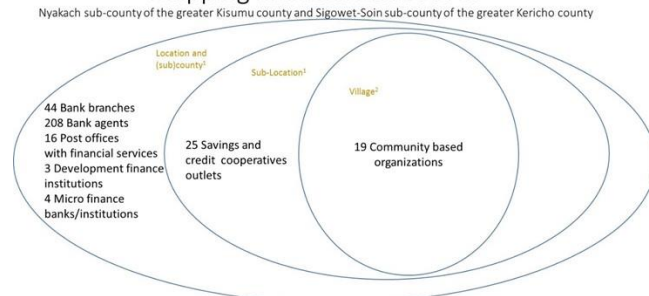
## Supply of finance in the Nyando region

### Mapping of financial supply landscape

The financial mapping uses data from recent inventories, a workshop and field interviews. The workshop in Kisumu assembled a series of stakeholders. During the field visit, a team of nine researchers visited the Nyando basin area (partly in the Kisumu county and partly in Kericho county), and discussed access and use of financial services by the communities.

The most relevant financial service providers available around the Climate Smart Villages AR4D project site in the wider Nyando region, which could support smallholder farmers to invest in CSA are mapped in Figure 3. The financial service providers present in Nyando Basin are classified according to their proximity, and indirectly as well as affinity and scale of operations, into village-, sub-location- and location- and county-based financial institutions.

## Mapping financial institutions



<sup>1</sup> Source: Finclusion Lab.  
<sup>2</sup> Source: Social Service Department.

Figure 3. Mapping supply of finance in the Nyakach sub-county of the greater Kisumu county and Sigowet-Soin sub-county of the greater Kericho county, Nyando region.

In Kisumu and Kericho Counties together, there are 44 bank branches, 208 bank agents and 16 post offices with financial services (based on geodata financial inclusion status derived from the Finclusion Lab). The mainstream banks include Barclays Bank of Kenya, Commercial Bank of Africa, Cooperative Bank of Kenya, Ecobank Kenya, Equity Bank, Family Bank, Housing Finance Company of Kenya, Kenya Commercial Bank, and National Bank of Kenya. Clients of these mainstream banks range from consumers to SMEs and corporate clients. They offer a wide range of financial services, from bank accounts, debit cards/credit cards, savings accounts, loans, transfers, bank services, and sometimes insurance. As Meyer (2015) describes for Sub-Saharan Africa, “many [private] banks are interested agricultural trade and export financing but agricultural loans made by banks usually represent less than 5–10% of their total portfolios. They normally limit agricultural lending to large farmers, estates, plantations, agribusinesses, out-grower schemes and export crop value-chains. Some lend to well-managed cooperatives, farmer associations, MFIs and rural businesses for on-lending in cash or kind to producers. A few attempt to downscale and make microfinance loans.”

Equity Bank, KCB and Cooperative Bank are known for their agent banking networks, where particular shopkeepers offer basic banking services such as deposits, withdrawals and savings on behalf of a commercial bank. These shops are usually branded in the colours of the bank.

Mobile banking is very strong and still growing in Kenya. Over 70% of Kenyans have a mobile money account nowadays. Mobile wallets used to be for transfers and payments only but are increasingly used for savings and also for consumer credit. Also, the number of bank accounts has increased since linkages between bank

<sup>6</sup> The sample for this survey may be biased towards members of the CBOs, who are – among other functions – also umbrella organisations for the table banks.

accounts and mobile money have been made possible (MShwari by CBA and KCB MPesa).

Models such as agent banking and mobile banking make basic banking services more accessible for larger numbers of small-scale clients, facilitating their financial lives. Still, their impact in the real economy (agriculture, small and medium enterprise) seems limited (FSD Kenya 2016b). Some banks are specifically known for their involvement with agriculture: Equity Bank, Family Bank, Cooperative Bank, KCB Bank. They usually have specific loan products tailored to farmers and agribusinesses (Wattel and Savelkouls 2018). There are three development finance institutions in Kisumu —Agricultural Finance Corporation, Women Enterprise Fund, Youth Enterprise Development Fund— and these institutions cover Kericho from Nakuru.

Kericho county has three microfinance banks (Kenya Women Finance Trust Bank (KWFT), Sidian Bank (formerly KREP) and Faulu Microfinance Bank) and one microfinance institution (ECLOF), while at least one microfinance bank has a branch office in Kisumu (Rafiki Microfinance Bank). These development finance institutions and microfinance institutions offer credit and savings services generally with a social objective. Clients are mostly low-income or lower-middle-income categories. In addition, they sometimes act as agents for other services, such as transfers. Some microfinance banks are known for their relative affinity to agriculture, namely Faulu Microfinance Bank, KWFT and Rafiki Microfinance Bank.

Financial institutions not only finance farmers directly but also indirectly, through value-chain actors or other aggregators (agro-dealers, traders, processors). Many smallholder farmers do not have easy access to financial institutions, and value-chain partners are crucial as intermediaries in order to channel credit processing services to a vast number of smallholders that are otherwise too difficult to reach individually. Value-chain actors have a vested interest to provide bundled credit in order to promote their business sales. They allow scale in outreach and transactions (since they have a well-ramified distribution network in the countryside). Value-chain connections with credit supply seem to be scarce in the pilot area except with for at least three agro-dealers, although also their credit exposure is limited as well. For example, one agro-dealer sells 95% on a cash basis and only a maximum of 5% on credit (with Local Purchase Order which is legally enforceable). There are some indications that these agro-dealers also buy some of the crops, and thus perform a traders role. Farmers who have received inputs—on-credit from the agro-dealers must at least deliver sufficient produce to pay off their debts.

In Kisumu and Kericho Counties, there are 5 and 20 outlets of SACCOs respectively. These SACCO's are

member-based and savings-based organizations. They collect the savings of their members, and make loans to them. Many SACCOs are urban in nature. The larger cooperatives also offer other financial services, like transfers. SACCO's usually have a limited agricultural loan portfolio, because they need to diversify their risks. But the more farmers are members, the more agricultural lending tends to take place.

### **Community-based organizations as interfaces between farmers and other actors**

In this segmented market CBO's target non-commercial farmers at a village level. CCAFS supports 3 CBO group platforms (FOKO, KAPSOKALE and NECODEP) in its project site in the Nyando region. These platforms comprise 58 affiliated groups: FOKO has 14 women groups, 5 youth groups and 12 mixed groups; KAPSOKALE has 4 women groups, 3 youth groups and 6 mixed groups; and NECODEP has 9 women groups, 2 youth groups and 3 mixed groups. The group size ranges from 15 up to 30 members (i.e., smallholder). Since its inception, these three platforms enrolled more than 1,675 members by 2015 (Kinyangi et al. 2015). The CBOs are not legal entities, although they are registered with the county government, for which they cannot be clients of financial institutions. Apart from savings groups, they also have other activities such as trial and promotion of agricultural (and CSA) practices. Some CBOs have a cereal bank or a community agrovet shop.

The groups apply table banking which is a very simple concept similar to the merry-go-round. The only difference is that the money contributed by the members is not given to one person to take home. Instead, money collected is provided as loans to members who need it. Every group can have its own by-laws (e.g., taking a loan is mandatory if participating, collateral not only cash deposits but could include, in theory, assets like livestock or dwellings). Typically, groups start with a membership fee (e.g., KES 500 per member) to generate initial capital. Those who need money can take a loan at a 10% interest rate per month. The loans are used to buy farm inputs (e.g., seeds and fertilizers), stocking animals and for buying household goods. The maximum loan amount can be two times the size of the member's savings. For example, in some groups loans range between KES 1,000-5,000. The average duration of the loan is approximately 13 weeks (3 months). In the weekly meetings, each member can buy new shares of KES 50 each (minimum 1 and maximum 10). This means that each member saves KES 50-500 per week in the group, during 52 weeks. After 52 weeks, when all loans have been repaid, a share-out is done. The total savings capital of the group (except social fund and any debts), as well as the interest income gained, is redistributed to the members, in accordance with the number of shares of each member. At the moment of share-out, the share

value has increased substantially, because of the interest income, from an initial value of KES 50 per share to (for example) KES 80. In case of emergency (e.g., illness) loans can be provided without interest (i.e., social fund). Moreover, each CBO also has a small fund which it can lend with interest to other groups. This fund stems from membership fees of the groups, which ranges from KES 2,500 to 3,500, and from contributions of CCAFS.

## Financing gaps and opportunities

The current study seeks to understand how farmers in the Nyando Basin make use of financial services and to what extent the supply of finance matches with the needs of farmers to invest in CSA practices.

The mapping reveals that a range of financial service providers are present in the Nyando Basin, that could be relevant for CSA scaling. Yet formal institutions have limited outreach and mostly work through agro-dealers in the value-chain which bundle supply of inputs and short-term credit. For investments as in CSA practices, self-financing and exchange of labor prevails.

With formal financial institutions having a limited appetite to finance agriculture and smallholders, and farmers seeking credit to finance CSA investments, CBOs are a natural vehicle to facilitate financing of CSA practices. This can be done through the table banks within the CBOs, or in other types of financial structuring with CBOs (e.g., the agrovet shops). Moreover, the close interaction between CBO members fosters an exchange of knowledge and skills in regards to making investments in CSA.

The CBO platform approach is a business model that creates value by facilitating funding between two or more interdependent groups. A next step would be to expand this approach to a broader geographical area since the approach is in principle replicable. Furthermore, there is potential to crowd-in formal financial institutions and value-chain actors. A multi-actor layered financing approach increases the funding capacity of CBO's platforms and affiliated groups. Aggregating smallholders through CBOs enables the efficiency of scale (i.e., minimize transaction costs related to credit processing). Moreover, a group lending strategy transfers monitoring to borrowers, where joint liability ensures strong incentives to members to help their peers succeed. The existing CBOs have a documented credit history of the borrower's responsible repayment of their debts.

Establishing CBO's platforms and affiliated groups requires efforts. Groups need to be mobilized and sensitized on their engagement. Subsequently, a series of trainings need to be conducted including modules on, among others, group constitution, leadership and elections, depositing of savings, disbursement and

repayment of credit, and record-keeping. In the first year, the association meetings are regularly supervised and checked that the group can run without any outside help. Most of the CBOs were established by other development programs and partners before CCAFS initiated the Climate-Smart Villages in the Nyando project site. Currently, CCAFS contributes by providing, among others, research capacity, for example, to support uptake and finance of CSA activities by the CBO's. As such, the CBO model fills a gap in financing CSA activities, but initiating scaling-up depends on collaboration with development partners.

Building on the existing financial landscape, and the financial lives of climate-smart farmers, several questions for follow-up research emerge:

- How do the different CSA practices work out in terms of the households' cash flows, investment needs and return on investment?
- Is the CBO model – including but not limited to the table banks - capable of facilitating the variety of CSA practices, with adapted savings and loans services? What about CSA practices with larger investment amounts and longer durations? Or practices that are implemented by many members at the same moment?
- Can the financial volume of the CBOs be increased, through linkages with financial institutions and value-chain actors? Through which business models (bundling of services, blending finance)?
- What is the potential of public funding to increase the financial volume of the CBOs? And what are its boundaries?
- Can the CBO model - as tested with three CBOs - be replicated towards the other 16 CBOs in the Nyando area who are not affiliated to CCAFS? Through which replication models? With what kind of partnerships?
- Could new business models be created with value-chain actors and financial institutions who have a stake in sustainable farming practices (e.g., as a sales strategy for their equipment and inputs, as a sourcing strategy for their trade and processing, or as a risk management strategy)?

## Further readings

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*This note presents the financial landscape in which the climate-smart agricultural activities in Nyando take place. 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 CCAFS East Africa, Wageningen Economic Research and the University of Nairobi.*

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