DIGITIZING VALUE CHAIN PAYMENTS

for Smallholder Farmers in Ethiopia

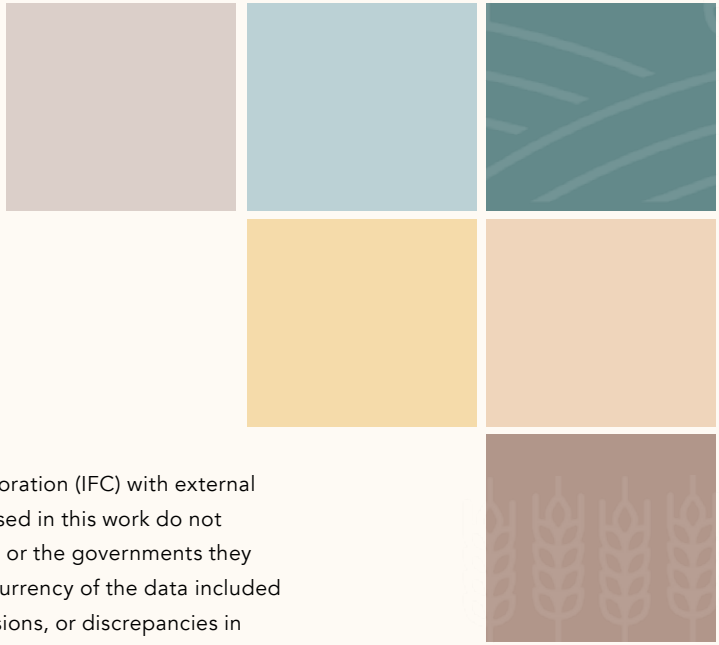
photo: ICARDA

GAFSP
global agriculture & food security program

L-IFT

IFC International Finance Corporation
WORLD BANK GROUP

Creating Markets, Creating Opportunities



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Acronyms

AKF	Alema Koudijs Farm
AMF	Asella Malt Factory
ATM	Automated Teller Machine
CBE	Commercial Bank of Ethiopia
CBO	Commercial Bank of Oromia
CSA	Central Statistical Agency
Coop	Cooperative
DF	Digital Finance
DFS	Digital Financial Services
DFP	Digital Financial Products
EC	Ethio Chicken
ECX	Ethiopia Commodity Exchange
EPRDF	Ethiopian People's Revolutionary Democratic Front
FSP	Financial Service Provider
GOE	Government of Ethiopia
Ha	Hectare
HHH	Household Head
IFC	International Finance Corporation
KII	Key Informant Interview
Kgs	Kilograms
MFI	Microfinance Institution
Obs	Observations
SHFs	Small Holder Farmers
SC	Supply Chain (the chain related to the individual buyer)
TC	Technology Company
USAID	United States Agency for International Development
VC	Value Chain (the generic chain)
VSLA	Village Savings and Loan Association

Foreword

This report presents the findings, conclusions and suggestions resulting from an analysis of "Digitalizing Value Chain Payments for SHFs" in Ethiopia. The objective of this study/analysis was to achieve a comprehensive understanding of the financial flows, behaviour and other economic aspects of SHFs and value chain actors, their digital payment needs and pain points as well as the capabilities of financial services providers to utilize technology as a basis for expanding access to finance. In order to do so, it was first necessary to identify a number of products ideas and discuss these with the actors, prior to designing and testing different product features.

The study investigated three value chains, namely barley, chicken feed and vegetables.
The assignment consisted of three main components according to three types of actors:

- **SHFs and their direct value chain environment** (including model farmers, traders and kebele situation)
- **Value Chain Actors**, consisting of the larger actors such as buyers, processors, (larger) traders and other actors supporting the value chains
- **Financial Service Providers and related organizations**, which included several banks, technology companies (TCs) and digital (payment) firms

The study kicked-off in August 2021 and last data collection took place in April 2022. During this period, significant data (including diaries data over a period of four months) and findings were collected, analysed, discussed and further explored with a range of actors. The reader should keep in mind that this period coincided with Ethiopia experiencing three destabilizing factors, namely the Covid pandemic, shortages of inputs as well as price increases and instability due to civil conflict, which saw its most violent months while the study was ongoing. However, the approach of the study, particularly the diaries methodology, made it possible to successfully implement the study and the team could ensure that the data, findings and conclusions were not compromised.

How to use this report

The main report describes the data analysis and recommendations for FSPs on the opportunities and the challenges of introducing digital financial services. It is organized in seven chapters and an annex. After the Executive Summary and Introduction, which give a brief summary of the overall survey findings and recommendations, the survey methodology, parameters, and timespan, Chapter 1 introduces the Vegetable Value Chain findings. Following in form and context, Chapter 2 reviews the Chicken feed Value Chain, and Chapter 3 reviews the Malt Barley Value Chain. Chapter 4 analyzes the financial behavior of the various stakeholders across value chains, Chapter 5 focuses on Financial Service Providers, and Chapter 6 describes product ideas and product development. Finally, Chapter7 offers conclusions and implications for next steps.

The annexes provide rich data for readers with an interest in agricultural value chains and SHF behavior in Ethiopia.

Finally, the data portal, delivered through FINBIT technology, contains all the data collected through the diaries. The portal is available long-term and provides all data collected in graphic and table form, according to any segmentation including value chain, geographical zone, age, gender, type of farmer, account holder, etc. The portal allows exportation of its graphs enabling authorized users to include these in documents such as proposals, report, internal memos. The portal presents the data for the entire diaries group as well as for (anonymized) individual SHFs in the sample. The latter feature makes it possible for any users to identify personas that represent customer segments, and these personas will enable the users to build targeted products.

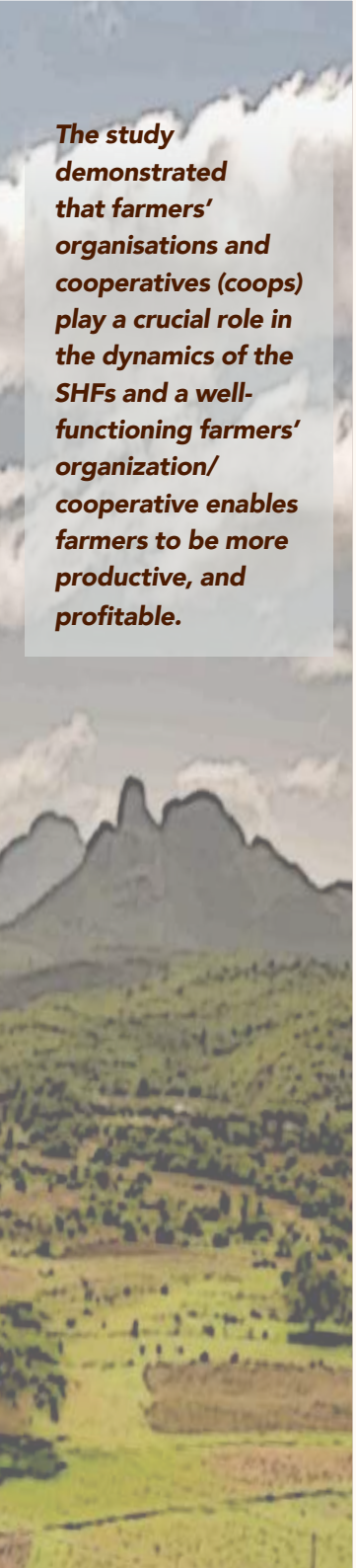
Executive Summary

The study, 'Digitalizing Value Chain Payments for Small Holder Farmers in Ethiopia' aimed to develop a comprehensive understanding of financial flows and digital payment needs of small holder farmers (SHFs) and other value chain actors. It also aimed to assess the ability of financial services providers to utilize technology to expand access to finance to value chain actors.

The study focuses on three value chains: malt barley, chicken feed and vegetables. Malt barley and chicken feed value chains operate in a sellers' market, that is, a market where the demand for the crop exceeds its supply. In these markets, it is easy for SHFs to find buyers willing to offer high market prices. The vegetable value chain, in contrast, is a 'buyers' market' due to its short shelf life and the fact that it focuses on high-end markets (including the export market). In these markets SHFs face more challenges in finding buyers. Financial Service Providers (FSPs) providing credit to both sellers' markets and buyers' market value chains, need to properly weigh the risk of non-repayment due to side-selling, while in buyers' markets SHFs could struggle with not being able to sell on time and at a good price and might face challenges in servicing their debt.

SHFs interviewed for the study typically have bank accounts but receive and make all payments in cash. They are not familiar with digital financial services (DFS) preferring to make transactions in cash and as a distant second alternative, using bank accounts. SHFs also report facing challenges when accessing credit to purchase high quality inputs.

Most SHFs interviewed are members of organizations and cooperatives (coops) that when managed successfully, enable farmers to be more productive. While few successful coops do exist, the majority are poorly managed. To truly improve each value chain, the quality of the farmers' organizations and cooperatives needs to improve by providing them with technical assistance, management systems and technology.



The study demonstrated that farmers' organisations and cooperatives (coops) play a crucial role in the dynamics of the SHFs and a well-functioning farmers' organization/ cooperative enables farmers to be more productive, and profitable.

The study investigates three stakeholder groups in each value chain: small holder farmers (SHFs), larger value chain actors, such as buyers, processors and (larger) traders and finally Financial Service Providers (FSPs) and related organizations, including several banks, technology companies (TCs) and digital (payment) firms. All three groups of stakeholders agree that value chains need to have easier access to credit.

<table>
<tr><th colspan="2">DEMAND SIDE</th><th>SUPPLY SIDE</th></tr>
<tr><td colspan="2">SHFs and Value chain actors express a clear need for credit, while complaining that interest rates are high and pose a problem.</td><td>FSPs are committed to increasing financial services to the agricultural sector.</td></tr>
<tr><td colspan="3">Interests and priorities of each stakeholder:</td></tr>
<tr><td>SHFs: Access to affordable credit, at a timely moment in combination with access to inputs, technical assistance and markets.</td><td>Value chain actors: Faster payment methods that allow bulk payments to make it easier to buy on the spot.</td><td>FSPs: Support in accessing farmers, assessing farmers and guarantees in repayment.</td></tr>
<tr><td colspan="3">Barriers to adoption of new digital payment for each stakeholder:</td></tr>
<tr><td>SHFs will adopt digital payments if the value chain actor (trader, processor) demands it or if high-quality inputs and appropriate credit is offered. SHFs may need training, particularly if they are using a feature phone.</td><td>Traders are in a good position to quickly adopt digital payments because they have transactions year-round, they deal with multiple buyers and already manage a dozen of bank accounts each to accommodate buyers. They may need awareness of actual credit costs and of the impact of inflation. The main bottleneck for traders is to have sufficient liquidity to pay the farmers. They are interested in digital payments if that solves their liquidity problems.</td><td>FSPs are motivated to roll out agricultural digital services, this is also a priority for the government and they have to meet a minimum quota serving the agricultural sector. If they receive support in building bank agent networks and get help with managing agricultural risks, they are expected to actively enter this market, although need more experience and knowledge about each value chain and related, such as those providing technical assistance and inputs.</td></tr>
</table>

FSPs have learned from past experiences that digital payments alone cannot be profitable and additional services need to be bundled to make them financially feasible. The study found that uncollateralized credit products tend to be profitable, using alternative collateral as repayment assurance. The most common credit options are inputs on credit, warehouse finance, and leasing.

However, the study also makes clear that to achieve good repayment rates for any credit product, farmers need access to tailored, high-quality and timely inputs to increase good yields and reduce the risk of crop failure as well as well-designed and well-delivered technical assistance without which the farmers may not be able to benefit from the high-quality inputs.

Recommendations

The main recommendation of the study is to support FSPs in building in-house product development expertise. Detailing how exactly financial products should be offered and for which value chain is beyond the scope of the study, but it acknowledges that **only through intensive interaction with specific client groups can successful products be developed.**

There are three financial product ideas that are good candidates to successfully serve SHFs and/or traders/buyers: inputs on credit (including the service of an input package), warehouse (receipt) finance, leasing or hire-purchase mainly for machines.[1] FSPs will need to tailor and pilot these services in each value chain and this requires in-house skills in product development and product piloting. FSPs need the ability to collect and interpret data about their customers on a continuous basis and adjust services to meet the customers' (changing) needs. FSPs also need to develop or hire in-house agricultural expertise.

In support of product development skills, **improvement in the agricultural sector could come through collecting and pooling more and better data on the financial lives of agricultural actors (SHFs, model farmers and traders/buyers) and generally build a data-driven financial ecosystem.**

In addition, **support for farmers' organizations and cooperatives with technical assistance and management training will strengthen the agricultural sector and will also enable FSPs to better and more efficiently serve SHFs.** They need training in effective management, in offering services to their members that address the members' core challenges, in keeping a better administration and charging appropriately for services and to build partnerships with others.[2] In addition, it would be useful to provide training on value chain (VC) finance - what is VC finance, how should VC finance be used, where to get VC finance and how can the association strengthen its members with knowledge as well as being a guarantor or endorsing services, businesses, members.

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1 For the technical differences between the versions of the leasing product group, refer to 'Leasing, hire purchase and similar financial constructions' on page 90.
2 These ideas for training are based on experiences that predate this study.

photo: ICARDA

Methodology and Research Design

This assignment followed a combination of methodologies and approaches, specific to each component of the study.

Key Informant Interviews (KII)

- **KII with the larger actors in the three value chains:** These included buyers, processors, aggregators and (larger) traders. In total, 20 KII took place with two traders (one large), six model farmers, seven processors/buyers and five others (such as unions and coops).
- **KII with Financial Service Providers (FSPs):** Sixteen financial service providers and technology companies were contacted, as well as some people with high level understanding of the eco-system. The team managed to interview a total of nine institutions, where most of the institutions attended their video conference meeting with three to five staff members.

Kebele Survey: It was important to identify the most useful Kebeles where the diaries could take place (and identify Kebele guides for assistance). From the information gathered in the KII, 26 Kebeles (from which the KII buyers were sourcing) were identified as candidates. Out of these, six were selected for the final sampling process based on the kebele survey outcome. Sampling criteria for the kebeles were:

- **Population size**
- **Percentage share of farmers**
- **Large (known) value chain actor**
- **Presence of coop/union**
- **Number of model farmers**
- **Number of female HHHs**
- **Status of phone connectivity**
- **Status of internet connectivity**
- **Presence of financial institutions**
- **Availability of mobile banking users**
- **Easiness to reach the area**

In each Kebele, a local guide with good standing and access to local leaders and households was hired. These Kebele guides were an important element that enabled successfull operations in an adverse environment. The guides helped to quickly access potential kebeles and SHFs in the sample and also provided key context for the study.

Trader survey: a survey with 21 traders (small and large) in the neighbourhood of the kebeles

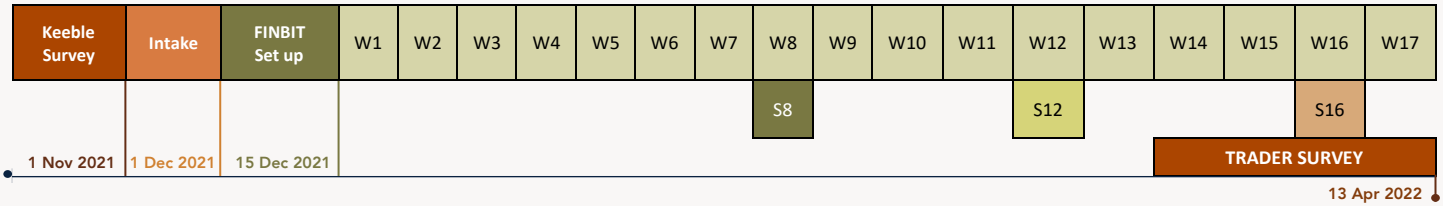
Intake survey: A survey conducted with a larger sample from which the Diaries respondents were sampled

Financial Diaries and deep-dive surveys

The Diaries methodology means that a group of people are continuously interviewed over an extended period to capture the dynamics and fluctuations of their financial lives and other aspects of their lives (Fig.1). Over a period of 17 weeks SHFs weekly reported on their financial behaviour. In parallel, three surveys with Diaries respondents were conducted. These surveys gave in-depth information on the themes of loans and supply chain finance, livelihoods and (appetite for) digital financial services.

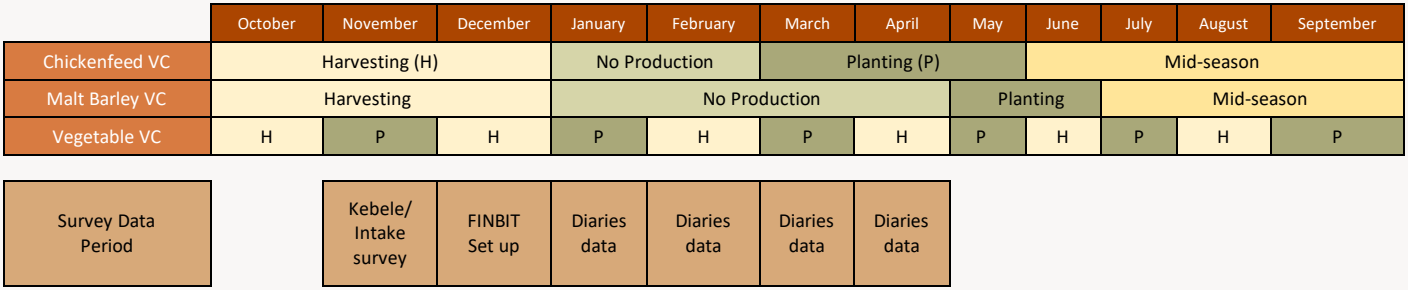
Timeline for the Diaries

Figure 1: Diaries Process timeline



The collection of Diaries in relation to the seasonal calendar of each value chains is displayed in Figure 2.

Figure 2: Timing of the financial diaries versus seasonal agricultural cycles



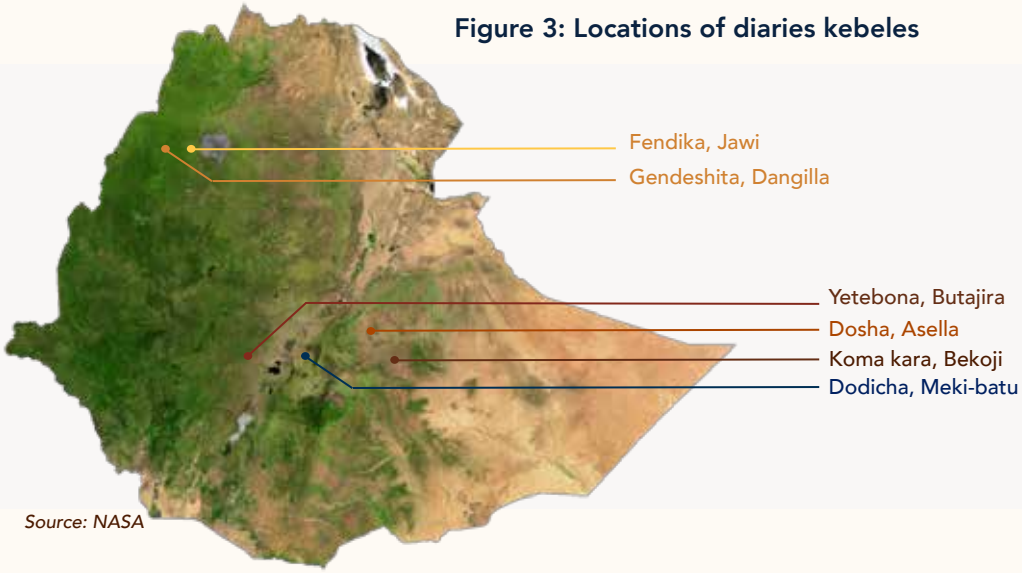
The team used FINBIT® technology to collect the Diaries, in combination with *SurveyToGo* software for the deep-dive surveys.

Diaries show the dynamics, trends and fluctuations of people's behavior and make clear which situations people experience and how they react to different events and experiences. Diaries compare to surveys the way video compares to photography. They are a rich source of information that recognizes the time dimension in people's lives.

Diaries data collection is an intensive process, where respondents and interviewer work closely together to build the confidence and trust that make it possible to capture complex and sensitive issues. Fortunately, the collection of diaries started just before the worst period of violence in the country, meaning that relationships had already been established before that particularly difficult period. The areas where diaries were collected are shown in Figure 3.

Diaries process: The process started with an Intake survey, with 434 people interviewed. From these 434, 150 people were purposely sampled for the diaries' components. Sampling criteria were based on willingness to participate in the intensive, weekly interviews, sufficient representation of members of a cooperative, sufficient people with bank-accounts, sufficient proportion of women, some representation of model farmers and (smaller) traders, and sufficient representation of people with digital payment methods experience. This resulted in the over-sampling of women and model farmers and traders.

Figure 3: Locations of diaries kebeles

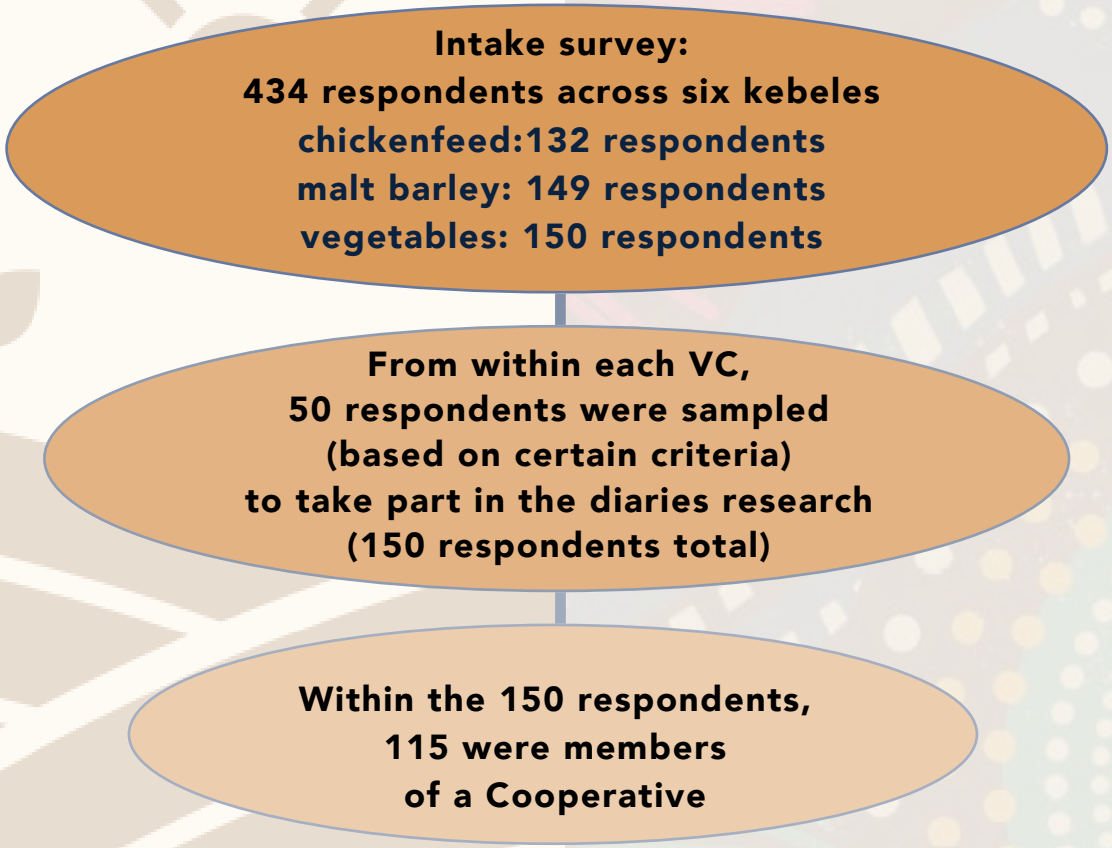


Source: NASA

Amhara region
Oromia
Gendeshita kebele (maize)
Dosha kebele, (barley)
Fendika kebele (maize)
Koma kara kebele (barley)
SNNP
Yetabona kebele (vegetable)
Dodicha kebele (vegetable)

Confidentiality: To enable all interviewed people to speak freely, the team always guaranteed that the information they shared was kept confidential and that any comment made could not be traced to the individual.[3]

Figure 4: Survey profile



3 Author experience showed people willing to participate in diaries tend to be people with more time, less likely to travel, more willing to share about their lives, and curious and willing to experiment. In other projects, this has resulted in samples with relatively more women, poorer individuals and those more interested in change. Individuals that refuse to participate tend to be more mistrusting, or better off. Annex 8.5 reports more details of the SHF respondents in the intake and diaries samples. The differences between these samples were marginal apart from any purposely oversampling. For example, in the vegetable value chain, we oversampled women, to ensure that overall, we had a sufficient sample of women SHFs in the sample.

Transcripts of the Key Informant Interviews and interviews with FSPs are not part of the annexes to this document. Likewise, data in the portal is fully anonymized.

INTRODUCTION

Value chains of chicken feed, malt barley, vegetables, and traders

The following chapters describe individual value chains and main actors, as well as the sourcing process, coordination and payment systems involved.

Comparisons between VCs and details are sourced from the trader survey, while details from the financial time series data are relegated to the Annexes.

The study covered three value chains: chicken feed (focusing on soybeans and maize as major raw materials), malt barley and vegetables. All these crops are predominantly produced by smallholder farmers (SHFs) and sold in local markets, characterized by transactions at prevailing prices with limited coordination among supply chain actors.

Recently, however, organized supply chains have been emerging slowly with coordination between upstream and downstream actors. Upstream actors are involved in a range of activities, from the supply of inputs (seeds, irrigation, pesticides, fertilizers, machinery, etc.) to production. Downstream actors are involved in activities related to processing, packaging, trading, distribution, and sales.

Source: ICARDA

Source: donnetiopi-mercatodafrica

Chains transactions are increasingly characterized by repeated interactions not only for the exchange of final products, but also the provision of inputs and extension services. These relationships can serve as an entry point for the introduction of digital financial services. For instance, big traders in the chicken feed chain are an important intermediate actor between small traders and processors who expressed interest in warehouse financing/ mechanize loans to increase their purchasing and supplying capacity. Their relationship with small traders (in collection centers in local markets) enables them to achieve rapid turnover of commodities and timely repayment of merchandize loans. This in turn, minimizes liquidity problems for all actors (including small traders and SHFs) since the large traders will be able to buy in larger volume with immediate payment.

Similar opportunities exist between model farmers and SHFs, between inputs or service providers and SHFs, and between model farmers and processors.

Each supply chain shares features, such as the types of actors involved and the payment systems used with the other supply chains. The major intermediary actors between SHFs and buyers are model farmers and traders. Farmers' organizations, such as SHFs cooperatives and cooperative unions, play a modest role, but some show potential.

Source: donnetiopi-mercatodafrica

Vegetable Value Chain

1. Desk research vegetable value chain

Approximately 17.7 million small-scale producers are engaged in the production of fruits, vegetables, and cultivation of root crops in Ethiopia. These activities are spread over a total area of 0.55 million hectares, and return a combined harvest of 60.8 million tons.

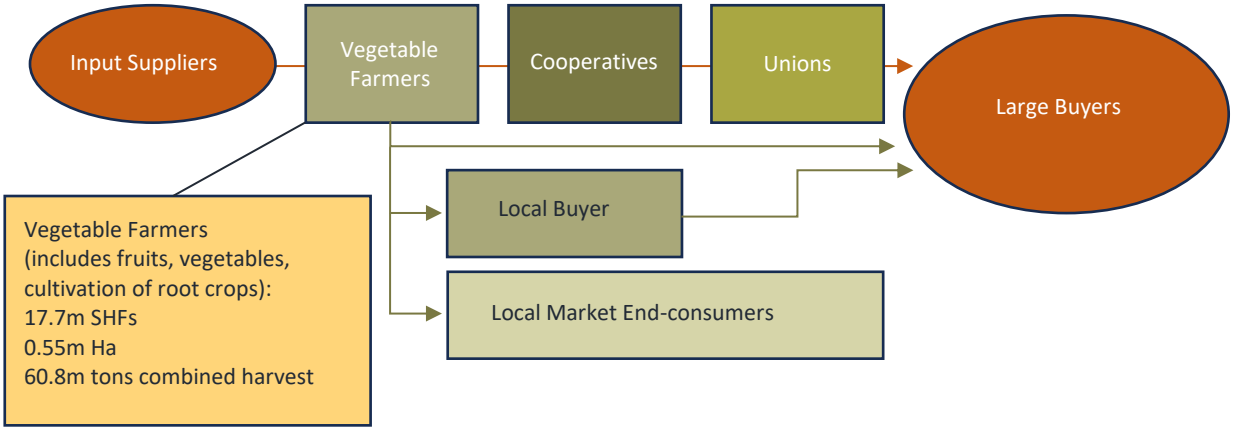
Ethiopia has only recently discovered its untapped potential to produce vegetables, and horticulture in general. Promotion of horticultural cultivation is now taking place in several parts of the country, particularly alongside the rift valley lakes and basins.
(Joosten, et al 2011; CSA 2018)

Ethiopia has strong cereal-based food and production traditions. While most SHF produce cereals, many also produce certain vegetables (such as cabbage, pepper, shallot, and ensete) as a side activity. As a result, land surface used for vegetable cultivation is relatively small when compared to land surface used for cereals.

Vegetable production is expected to attract more SHFs in the future, as it enables up to three production cycles per year and provides a much higher return per unit area. Several SHFs have begun to cultivate new and different vegetables (including avocado and lemon grass), which they supply via local cooperatives and unions to local processors and/or exporters. Besides exporting, the growing middle class in urban centers in Ethiopia are increasingly interested in consuming new and different vegetables in restaurants, hotels, and catering services. The emergence of these distinct 'end buyers' allows for the potential development of more coordinated value chains.

The vegetable value chain (based on the KII) is visualized as follows:

Figure 5: Vegetable value chain



Source: Based on KII (not representative for the whole country)

2. Key informant interview findings: Vegetable value chain

Two coordinated vegetable supply chain buyers were interviewed, Meki-Batu Union and Greenpath, a vegetable exporting company. While the vegetable value chain is relatively well coordinated upstream (with SHFs linked to cooperatives and unions collectively buying inputs), downstream the purchase of produce typically involves different brokers in a poorly developed market. Our two buyers are the exception, and vegetable growers linked to them are better off as their market is organized.

Meki Batu: About 8,000 SHFs producing tomatoes, green beans, onions, etc. are organized under the Meki-Batu vegetable and fruit cooperative union. 30% of Meki Batu production is supplied to Ethiopian Airlines while the rest is sold via local brokers and traders who come to the farm gate. The Union has so far been unable to identify other off-takers for the produce due to limited skills finding buyers for the more advanced vegetables, such as high-quality avocados and lemon grass.

The Union indicated a keen interest in developing market linkages. Digitization of payment streams would be appealing to the Union if it led to increased relations with corporate off-takers. As vegetables are highly perishable, its value chain development is necessarily linked with the development of cold chain management and appropriate infrastructure that can enable proper post-harvest care, storage and transportation to the market. In the absence of this, SHFs often have very low bargaining power and are forced to accept any price from buyers.

Brokers typically pay SHFs immediately through bank transfer. In the rare cases where SHFs directly supply the Union, they are paid in cash.

Greenpath Food: Its supply chain is tightly coordinated and driven by the exporting firm which supplies all the necessary inputs to SHFs. It provides extension services, and it collects outputs with its own transportation system. All SHFs (around 250) are required to open bank accounts for payments, and they received their payment via bank transfer. Unfortunately, Greenpath Food stopped its activities while the diaries data collection was taking place in one location. SHFs who previously sold to Greenpath might have faced challenges selling their produce elsewhere given their complete dependence on a single buyer for their organic inputs and agriculture practices, not to mention the low chance of finding an attractive local market that could pay for their export standard products.

3. Diaries findings: The typical vegetable value chain

As mentioned in the Methodology and Research Design section, 50 active SHFs in the vegetable value chain participated in the study for a period of four months. The seasonal calendar for SHFs in the vegetable VC and the survey timespan, was as follows:

Figure 6: Calendar for SHFs in Vegetable Value Chain

	October	November	December	January	February	March	April	May	June	July	August	September
Vegetable VC	H	P	H	P	H	P	H	P	H	P	H	P
Survey Data Period		Kebele/ Intake survey	FINBIT Set up	Diaries data	Diaries data	Diaries data	Diaries data					

Source: World Bank, Sambrian Mbaabu

Source: iStock

The typical SHFs that participated in the diaries research has the following characteristics:

SHFs respondents' characteristics

Farmer Characteristics - Vegetables (mean)	Intake SHFs in the sample	Diary SHFs in the sample
Age (years, average)	38.4	32.7
Education		
No schooling (100=Yes)	25	28
Elementary school (100 =Yes)	34	34
High school (100%=Yes)	20	22
Married (100=Yes)	79	70
Gender (100=Male)	70	38
Respondent is Household head (100=Yes)	83	60
Has a mobile phone (100=Yes)	88	96
Is part of a cooperative union (100= Yes)	93	86
Membership of more than one farmer organizations (100=Yes)	96	96
Has a bank account (100=Yes)	87	84

Source: Intake and Diaries SHFs in the sample

The Intake survey already oversampled on phone ownership, cooperative membership, and having a bank account, as it was decided that those SHFs were possibly receptive to using digital payments. Vegetable SHFs that participated in the diary sample have a comparable rate of bank-accounts, and membership in farmer organizations. Since mobile money usage was a sampling criterion, all respondents that had used mobile money were included in the diaries sample.

- **Women:** When sampling for the diaries, the vegetable value chain was one of the few that had a significant proportion of women and they were oversampled to ensure sufficient women SHFs.
- **Age:** The average age of the vegetable SHFs in the diaries sample is a bit lower (early 30s) than those for malt barley and chicken feed SHFs in the sample as those are in their mid-forties.

Production demographics

Production - Vegetables (mean)	Intake SHFs in the sample	Diary SHFs in the sample
Land owned (under the prevailing land tenure system) (Ha)	0.8	0.8
Land cultivated (Ha)	0.4	0.4
Share of land devoted to value chain crop	43%	41%
Average yearly harvest of the value chain crop (in Kgs)	8,336	6,829
Farmer purchased (improved) inputs (seeds, fertilizer, etc.) (100=Yes)*	94	88
Inputs purchased on credit (used voucher, loan, etc.) (100=Yes)	3	0
Payment of inputs in cash (100=Yes)	91	88
Farmer hired workers (100=Yes)	94	88
Farmer used cash to pay workers (100=Yes)	94	88

Source: Intake and Diaries SHFs in the sample

** The question was: Did you purchase or obtain from a third party (someone else) any of the following inputs during this past season?*

- **Land:** The vegetable SHFs in the sample own the least land of the three value chains at 0.8Ha. They also use the smallest share of land for the value chain (of the study), only 41%. Many vegetable SHFs also grew khat (a stimulant drug) as well as food barley or maize on the rest of their land.

- **Improved seeds:** A large number of vegetable SHFs use improved seeds as they receive improved inputs from the Meki Batu Union and Greenpath.

- **Input on credit:** None of the vegetable SHFs in the diary sample reported buying input on credit. However, during informal talks, they mentioned that in one of the two kebeles the buyer provided inputs directly to the SHFs on credit. The costs of the inputs (given in kind) were deducted from the harvest payment when sold to the buyer. It thus appears that accessing inputs on credit is more common than previously reported, perhaps because SHFs fail to recognize receiving inputs in kind to be repaid at harvest as a loan.

- **Type of payments:** Almost all payments are made in cash. Previously, a buyer in one of the two kebeles introduced a bank account for all the SHFs suppliers through which they used to be paid. During the collection of diaries, the buyer left the area and the payments through bank-accounts were stopped.[4] The SHFs turned to selling at the local market and to using cash for their sales.

4 The reason for the buyer stopping operations in the kebele and not returning is not known.

Storage

Storage - Vegetables (mean)	Intake SHFs in the sample	Diary SHFs in the sample
Farmer has/uses storage after harvest for the VC crop researched (100=Yes)	2	2
Average time elapsed from harvest to sale of all crops, including non-VC research crops (in months)		
At home	6	6
Warehouse	3	6
Other	9	8

Source: Intake and Diaries SHFs in the sample

Storage: The vegetable SHFs hardly use storage as their produce is perishable. However, all SHFs also grow other crops some of which are stored. For the "at home category" people mainly store the harvest in 100Kg bags. Some mentioned having improved bags that are sturdier against pests, which they received from a buyer. In addition, maize is stored in or around the house in a traditional manner, using traditional storage. They also mentioned using a warehouse owned by the Union, but for crops other than vegetables.

Marketing

Marketing questions were asked both in the Intake survey and during the diaries collection period in the Digital Finance Survey (DF Survey). Due to recent conflict, the marketing of vegetables changed during the data collection of diaries. In one kebele, the main buyer did not return to buy resulting in a shift in the number of buyers. Before the conflict, 50% of SHFs sold to one buyer but after the conflict nobody did, all selling at the market.

Photo: Pol Cucala Bergadà

Marketing - Vegetables (mean)	Intake SHFs in the sample	Diary SHFs in the sample
Produce is sold to whom (multiple answers possible)		
Produce sold at the market directly (100=Yes)	66	66
Sold to a trader (100=Yes)	67	70
Sold to the farmer's organization/Coop (100=Yes)	19	14
Number of times produce is sold		
Always sell all at once	43%	48%
Always sell some at different times	49%	38%
Sometimes sell some at different times	1%	2%
Number of buyers (traders) the farmer sold the produce to		
1 buyer	51%	50%
2 buyers	0%	0%
3 or more buyers	43%	38%*
SHF gets paid in cash (100=Yes)	93	88

Source: Intake and Diaries SHFs in the sample

**One of the main buyers, was still with the farmers at Intake Survey but had withdrawn from the farmers during the other surveys, leaving the SHF to sell at the local market. Hence a large percentage of people selling to 3 or more buyers.*

Number of times sold: Depending on the type of vegetable produce it is sold all at once or at different times. Some vegetables can be stored a bit longer and allows the SHFs to sell gradually.

Marketing of harvest - Vegetable SHFs in the sample	Vegetable SHFs in the sample
Number of buyers the harvest is sold to	
Harvest is sold to one buyer (100=Yes)	0
Harvest is sold to a few buyers (100=Yes)	42
Harvest is sold to many buyers (100=Yes)	56
Sold to the same or different buyers	
Always sells to the same buyer(s) each year (100=Yes)	0
Different buyers, but I always know them already (100=Yes)	18
Different buyers, some I may not know from before (100=Yes)	80
Payment Type	
SHF gets paid in cash (100=Yes)	98
Payment Received	
Immediately I deliver	94%
Before I deliver	12%
After I deliver	16%
If so, number of days between payment and delivery of produce	11

Source: Digital Finance Survey

- **Number of buyers and whether selling to the same or different buyer(s):** After the main buyer ceased operations in one kebele, SHFs sold crops to multiple buyers. They also started to sell "to buyers they might not know". In reality, they were desperate to sell their produce as vegetables are not normally sold in the local market. For example, SHFs in the sample were forced to sell lemongrass and grade A export avocados at the local market. Lemongrass is not used in Ethiopia and the 'grade A' avocados are too expensive for local buyers. For both of these products, it was difficult to get buyers. Besides these high-end products, the SHFs cultivate a range of vegetables and produce (including Khat), which they sell to many buyers.
- **Payment type:** The buyer that ceased operations in one kebele used to deposit the amounts purchased into the SHFs' bank-accounts. Afterwards, all payments reverted to cash as transactions are done at the local market.

Input purchases

Input purchases - Vegetable Diary SHFs in the sample*	Vegetable Diary SHFs in the sample
Number of input providers	
inputs from one provider	0%
From many different input providers	2%
I don't buy inputs	6%
one input provider per type	14%
Other (specify)	2%
Two or three input providers per type	74%
Same input provider(s)	
Different input providers, some I may not know from before	43%
I don't buy inputs	2%
Other (specify)	8%
Year by year different input providers, but I always know them already	45%
Year in year out the same input providers	2%
Payment is made	
When inputs are delivered	72%
Before inputs are delivered	12%
If so, number of days between payment and delivery of produce	5
Payment is made after inputs are delivered	2%
If so, number of days between payment and delivery of inputs	28

Source: Digital Finance Survey

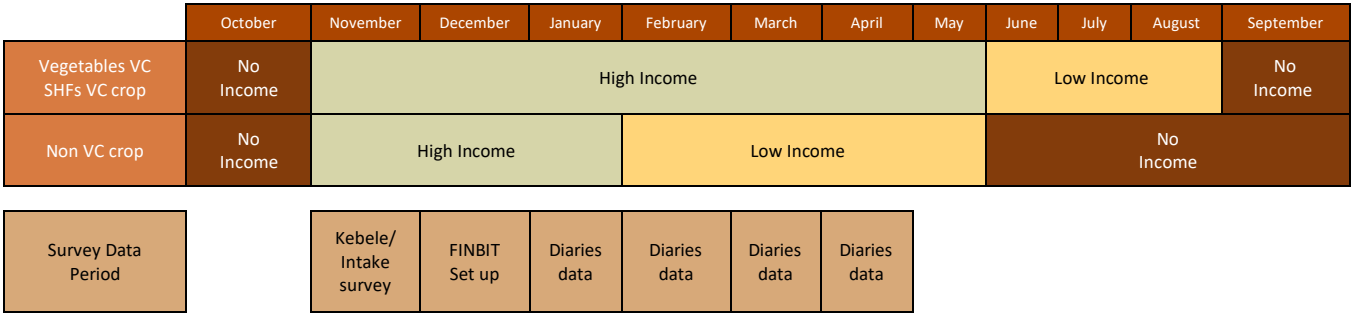
**The percentages do not add up to 100%, as certain question and answers (that correlate) have been put together in the table for easy viewing. The remainder of the answers are non-response and those who selected 'other' and have been left out of the table. This applies for many of the following tables.*

- **Input providers:** Vegetable SHFs tend to buy from two to three input providers per type of crop. They also buy from different providers year on year, some they know and others they might not know.

- **Payment for input:** Two-thirds of SHFs pay for inputs on delivery. One buyer provided inputs and payment for the inputs were deducted from the payment for the harvest being sold to them. A small proportion (12% of the SHFs) pre-paid for inputs, which they received five days later, on average. The SHFs mentioned informally that they particularly liked the provision of inputs instead of having to purchase and transport them.

Income

Figure 7: Financial diaries in the Vegetable Value Chain



Income: The months of the financial diaries covered the highest VC vegetable income but also covered part of the highest income for the non-VC income (December and January). For VC vegetables, there are only two months that SHFs do not get any income (September and October) and a few months when their income is low (May – August).

Vegetables (n=49) - Income	Percentage of SHFs in sample that have this as an income	If so, how many months do you receive such income?	If so, farmer received income in cash (100=Yes)	In the months receiving income, how many times a month is income received?
Farming income for the value chain crop	65%	10	100	3
Other Farming income (not from the VC crop)	84%	10	100	2
Farming production for self-consumption	27%	12.5	100	1.7
Non-farm business activities or income generation	29%	12.8	100	8.8
Labor income (work on others' farms, for a small business, etc.)	8%	9.3	100	11.6
Remittances or gifts	4%	9.5	50	1.5
Receive rent (from houses, vehicles, machines, etc.)	0%	0	0	0
Government payments/subsidies	8%	13.0	50	1.0

Source: Livelihood Survey

- **Farming income streams:** The vegetable SHFs in the sample were asked about the different income categories they received during the year. The numbers add up to more than 100% as SHFs receive income from several income sources. Most of the vegetable SHFs in the sample received income from the VC vegetables (65%). An even larger proportion also received farming income from Khat and other crops such as food barley, head cabbage, chilies, and from livestock (84%). The SHFs also cultivate for self-production although they may sell part of it if they have excess production (27% get income from that).

- **Non-farm business activities:** SHFs are typically own non-farm business for 3.9 months a year and in those months, they receive on average 8.8 payments. Some SHFs are active in carpentry and every now and then have a carpentry sale. Others make mats from fiber and sell that in specific months.

- **Labor income:** not many SHFs in the vegetable sample (8%) work as farm laborers, but if they do they receive 11.6 payments per month, probably as daily payments.

- **Remittances:** a very small number (4%) of vegetable SHFs receive remittances. In Ethiopia a range of digital remittances solutions exist and they would be an entry point to include the vegetable SHFs into digital payments. However, the percentage of remittance recipients in this sample is small.

- **Government payments:** in the vegetable SHFs sample the number of Government payments recipients is also small. Otherwise, this would be another candidate for increasing the uptake of mobile money faster, as the Ethiopian government increasingly sends its payments digitally.

- **Type of payment:** Almost all payments were in cash except remittance and government payments received electronically half of the times. Both could have been done with mobile banking (government uses electronic transfers for certain payments in Ethiopia) and even mobile money for remittance.

- Vegetable SHFs have a large variety of income sources and therefore there are many different entry points to introduce digital payment systems.

Source: Ethiopia_WebCrop

Expenses

Vegetables (n=49) – Expenses	Percentage of SHFs in sample that have this as an expense	If so, how many months do you have such an expense?	If so, does farmer pay in cash (100=Yes)	In the months making the expense, how many times a month?
Farming inputs (seeds, fertilizer, pesticides)	90%	10.3	100	1.5
Farm labor	76%	12.8	100	3.1
Non-farm supplies/inputs	4%	8.5	100	2.0
Non-farm workers	6%	12.3	100	5.2
Transport	78%	12.8	100	3.1
Fuel (e.g., for a vehicle/machine)	55%	10.6	100	2.6
Rent (e.g., for using others' land, building)	0%	0	0	0
Taxes, licenses	51%	2.0	100	0.1
Training, advice	0%	0	0	0

Source: Livelihood Survey

Expenditure farming input: For vegetable SHFs almost all indicated spending on seeds, fertilizer and pesticides (90%), which the SHFs in the sample all considered very expensive. Expenses for this happen ten months of the year with only 1.5 transactions per month on average.

Expenditure farm labor: Expenses for farm labor are the next most mentioned expenditure (76%) and payments for this happen more frequently per month (3.1 expense transactions per month) than spending on farming inputs (1.5 transactions).

Transport and Fuel: Many vegetable farmers spend on these two cost categories - transport 78% and fuel 55%. They travel to the market using their own transport or by renting it. In one of the vegetables kebeles in the sample, the SHFs' transport costs had gone up after the buyer ceased operations. When the buyer was active, it would purchase at farm-game saving on transports costs for SHFs. Once the buyer ceased operations, SHFs had to travel to the market to find buyers.

Taxes and Licenses: Half of the SHFs have expenses on taxes and/or licenses (it is not known which types).

Cash: All expenses were paid in cash.

4. Diaries findings: Access to credit for the vegetable value chain

Access to credit was asked in the Intake survey and an in-depth survey during the diaries data collection.[5]

Took credit from financial institution in the last growing season - Vegetables (mean)	Intake SHFs in the sample	Diary SHFs in the sample
Took credit this growing / buying season, from a financial institution (100=Yes)	33	30

Source: Livelihood Survey

Was 'any' loan taken in the past 12 months?	Vegetable SHFs in the sample
No loans taken	38%
Yes, took a loan	63%

Source: Loans & Supply Chain Survey

Access to credit - Vegetables SHFs in the sample *(if a loan had been taken, which loan types (in the past 12 months)*	Loan taken % and mean amount (in the past 12 months) (US$)*
Took informal loan from family/friends/neighbor/employer	54% (US$ 143.4)
Took loan from local store	0%
Took loan from moneylender	2% (US$ 39.5)
Took loan from savings group/Coop/MFI	10% (US$ 1,083.7)
Took loan from bank and amount (100=Yes)	0

Source: Loans & Supply Chain Survey (ex-rate 0.0192555)

** SHFs could choose multiple different loans and there are overlapping loans, so the numbers do not add up to 100%*

- **Access to credit:** The data is not directly comparable across sources because there were a few months in between the Intake and the in-depth survey. In the 'Loan and supply chain survey' we asked more specifically for any loans, from different people and organizations, while in the Intake survey we merely asked if credit had been taken during the growing/buying season for a financial institution. The loan and supply chain survey seems the most accurate and one can use diaries data to corroborate the responses.

- Most loans were taken from family/friends/neighbors (54%). The loan amounts taken were on average (US$ 143) which is higher than chicken feed SHFs average loans from this category lender. From other projects we know that in Ethiopia loans are taken more often from friends than from family.

5 In the intake survey access to credit was asked with the following question: 'Do you normally take out a loan, from a financial institution, during the growing/buying season of …?'. In the Loan and supply chain finance survey in-depth survey, the question used was: 'Which loan types have you used in the past 12 months?'.

- Loans from saving group/MFI/coop make up a small percentage of the loans (10%) but the average amount is considerably higher at US$ 1,084. In the chicken feed VC the average amount from this category is much lower - US$ 279.
- No questions were asked about the loan tenure in these surveys, nor the reason for taking the loans.

Savings

Savings - Vegetable Diary SHFs in the sample	Savings tool used
At home or on body (1=Yes)	90
With savings group (1=Yes)	29
With MFI (1=Yes)	4
With credit coop (1=Yes)	0
With Bank (1=Yes)	38
With mobile money (1=Yes)	0

Source: Loans & Supply Chain Survey

Savings: Almost all SHFs save at home (or on the body because it is easier to access and few are worried about theft or other risks. Saving in the bank is the second most common form of saving because it is out of reach, and they cannot be tempted to use that. However, since bank branches are typically far from home, saving at a bank is not very convenient in case of an emergency.[6]

6 "Informally it was mentioned that due to needing a bank account to receive payment from a buyer for sold produce (the dedicated buyers for particular vegetables interviewed in the KII), these SHFs had started to save in their bank accounts as well. In one kebele the bank was an MFI bank (commonly described as 'the bank'). It was mentioned by a SHF during a field visit, that having a bank or MFI account merely depends on the distance to the branch." In some areas the differentiation between a bank or MFI is not made, and both are called banks.

Source: Ethiopia Hero

Supply chain finance

SHFs were asked about their preferences for different types of supply chain finance arrangements and received a quick explanation before answering.

Supply Chain Finance - Vegetable Diary SHFs in the sample*	Farmer has heard of… (has had and can explain/ has heard not sure)	Farmer has used in the past…	Farmer finds it useful/ very useful, a little useful**
Inputs on credit	98%	42%	98%
Pre-paid inputs	91%	65%	71%
Buyer gives advance before harvest	89%	29%	75%
Buyers only pay after delivery	100%	38%	94%
Buyers give a loan before harvest	94%	19%	79%

Source: Loans & Supply Chain Survey

** **Inputs on credit:** SHF receive inputs in kind without paying and pay back later. The repayment is often paid from the harvest income (between SHF and input provider).*

***Pre-paid inputs**: SHF pays the input provider to place the order. Input provider delivers the ordered inputs later (between SHF and input provider).*

***Buyer gives advance before harvest:** Buyer gives the SHF an advance (in money) on the produce the SHF commits to sell to the buyer. The SHF typically uses the advance to purchase inputs or pay for labour costs. The advance is settled when harvest is sold to the buyer (between SHF and buyer).*

***Buyers only pay after delivery:** No finance from buyers in advance. Payment only upon delivery of the produce (between SHF and buyer).*

***Buyers give a loan before harvest:** SHF receives a loan to buy input from the buyer, the repayment can be anytime. The buyer would expect to buy the harvest as well, but in principle the SHF has no obligation to sell to the buyer if the loan has been repaid (between SHF and buyer).*

*** Not useful' and 'not at all useful' were also categories but not displayed, hence it does not add up to 100%*

Supply chain finance: Most SHFs have heard of the different supply chain finance arrangements, but only few had experience with them. Interestingly, the two most common supply chain finance forms were 'pre-paying inputs' and 'buying inputs on credit'. The enthusiasm for 'inputs on credit (98%) and 'buyers give a loan before harvest' is understandable because these help SHFs' cash flow. It is remarkable that a high percentage of SHFs find supply chain finance useful where they provide liquidity, such as 'buyer only pays after delivery' (94%) and 'pre-paid inputs' (71%). Altogether the awareness of these forms of finance is high and the high percentage of finding it useful indicates a definite interest in these options.

Mobile money

On two occasions SHFs were asked if they 'know and use' mobile money or mobile banking, and specifically if they do 'cash in and out and buying airtime' by using mobile money or mobile phone.

Farmer uses mobile money or mobile phone for cash-in/cash-out or transfers (100=Yes)	Intake SHFs in the sample	Diary SHFs in the sample
Cash-in	1	2
Cash-out	5	10
Airtime purchase	32	50
Transfers	6	12
Farmer makes mobile bill payments (100=Yes)	2	2

Source: Intake and Diaries SHFs in the sample

SHFs use their mobile phone to buy airtime and to a very limited extend do cash in/out. They are not fully aware whether this is with a mobile money wallet or a mobile banking app, when they are doing it on their phone.

Mobile Money - Vegetable SHFs in the sample	Vegetable Diary SHFs in the sample
Has heard about mobile money (100=Yes)	34
Uses mobile money (100=Yes)	4

Source: Digital Finance Survey

Using mobile money features such as buying airtime and cash in/out: Based on survey data, half of the vegetable SHFs have used mobile money or their mobile phone to buy airtime. However, from informal clarifications, it appears that they meant using their mobile phone to activate airtime, rather than using mobile money to buy the airtime. If this usage is removed only a few people have in fact used mobile money (10% for cash out and 12% for transfers). When discussed during a field-visit more people turned out to have used mobile money, but they had not recognized it as such. Nevertheless, it is still only a large minority.

Financial services used	Vegetable Diary SHFs in the sample
MFI account (conventional)	0%*
Edir (funeral associations)	92%
Mobile money/wallet	0%
Credit cooperative	8%
Bank-account (conventional)	86%
Equb (traditional revolving saving groups)	54%
Other savings group (VSLA, etc.)	2%
Agent banking (bank or MFI account but accessed through an agent, not a branch)	2%
Mobile banking (bank or MFI account but operated through phone)	2%

Source: Digital Finance Survey

**Although the data seemingly indicate that MFI accounts are not used, bank and MFI accounts are often both called bank account by respondents and hence the bank data might include MFI data.*

Financial services used: As mentioned earlier, the large majority have a bank-account. In addition, the large majority of the SHFs also use Edir (92%), a type of burial group usually between neighbors, and Equb (a savings group using a range of Rotating Savings and Credit Associations' methodologies) (54%). Anecdotally we found that people did not distinguish between a bank or MFI account.

Source: Farm Africa

photo: ICARDA

During a field visit (where SHFs in the study sample were given gifts for their participation), focus group discussions were held with three male and three female participating vegetable SHFs. The results of the discussion can be summarized as follows:

Vegetable SHFs would like increased market access by linking to a buyer who could provide inputs, since getting high quality inputs on time is difficult. Seeds and fertilizer are provided by the government through cooperatives, and they purchase pesticides from private sellers outside of the kebele. Due to liquidity constraints, they never buy enough for the season, and they often cannot afford the highest quality pesticides. SHFs appear to describe parts of a 'contract farming' arrangement. Besides agricultural inputs, vegetable SHFs also need fuel and pumps to pump up water for irrigation. They also want extension services, as they lack knowledge on the best inputs and how to use them.

When asked about a hypothetical loan or voucher program to purchase farming inputs, vegetable SHFs would want an official contract with the voucher provider, which would preferably be an MFI because they are close by rather than a union/coop.

If the 'voucher' contract would interlink the loan and buying the harvest:

Vegetable SHFs asked about the ***pricing of the produce - whether it would be fixed or spot price paid on the day of sale.*** They also wondered what would happen to the loan in the event of a natural disaster.

Size of the voucher loans: Female vegetable SHFs wanted lower amounts than men, because they would be easier to reimburse. The men wanted a larger loan/ voucher that also included funds for petrol and a water pump.

Repaying the loan/voucher: Female vegetable SHFs want to pay back in several small amounts and the male vegetable SHFs wanted to pay back at once immediately after selling their crops.

Vegetable SHFs prefer a voucher instead of cash. Better yet, the inputs should be provided by the buyer. The reason is that they would need information about what inputs to purchase if given cash. They would also like the buyer to buy a variety of crops, not just three types because it is easier to deal with one buyer.

Vegetable SHFs were opposed to paying interest and that instead the buyer should try to use the price paid to get interest back. There could be a problem is the price paid is below the market price.

They all want to be paid into their MFI account because it arrives instantly. SHFs have been using MFI account for more than one year as their previous buyer only paid through a account and they are used to it.

IN THE FIELD

Vegetable SHFs

Half of the vegetable SHFs in the focus group use the ATM to withdraw money located near the market. The other half visit the branch.

Only one young man of the six participants had used his phone to transfer money; he had been testing how it worked, and he mentioned he wanted to be modern. Most did not use smartphones but keypad touch phones, and a few did not have a phone. Women in particular did not know how to use mobile money or mobile banking and did not see the need, given that they managed small amounts; they were also afraid of using mobile money for fear of losing the money.

All save money in their bank account. Their saving aims are to better their life, buy a house, buy land, and invest in a business. They also have money for emergencies but saved at home.

They complained about the buyer ceasing operations. ***They preferred selling to a company that provided them with seeds and organic pesticide, rather than having to sell in the market*** because they lack storage facilities, and many crops are perishable. As a result, they had to sell immediately at the going price.

Source: Farm Africa

Vegetable Value Chain Summary

Vegetable SHFs cultivate many different crops, with a significant proportion for high-end markets, including the export market. Most also grow other crops, thus diversifying their livelihood.

Vegetable SHFs appear more resilient because they have a diversified production and engage in different activities in different seasons, but the **production for the high-end market is vulnerable as they rely on a single buyer.** If it ceases operations (which happened), SHFs are forced to undersell in the local market.

Perishable Vegetable produce has some unique features due to its short shelf life. Even with a functioning cold chain, the sale period is limited. Transport/logistics are essential, too.

Vegetable SHFs are more integrated with the cooperative which provides some inputs. For some specific crops, particularly for the export market, the buyers provide the inputs (seeds). **Receiving inputs from buyers is very attractive for the SHFs.**

Some SHFs have received technical assistance from their main buyer and appreciate its importance for successful production and the ability to sell at high prices.

The vegetable value chain is the only one of the three chains studied, where farmers have a problem selling the produce. This constitutes an opportunity for a financial service provider, who will be able to negotiate and who can expect these SHFs to adopt digital finance and other services as long as their needs for inputs and technical assistance and a market are met. Moreover, the SHFs are relatively more experienced with mobile money and there are demonstrated cases where SHFs accepted payments in digital form.

A financial service provider could successfully and profitably serve this sector if, but only if, they are collaborating with a buyer or another organization that can provide timely, quality inputs, and appropriate, cutting-edge technical assistance on appropriate farming techniques that maximize yield and make maximum use of the quality inputs. For instance, when to plant, how to plant, how to transplant seedlings, spacing, timing and quantity of pesticides, moments to irrigation, etc. **If these partnerships with others are not guaranteed, the vegetable sector may be too risky for the FSP.**

The opportunity for financial service providers is to provide digital loans, both to the smallholder farmers and to the buyers and traders, since that will enable them to provide inputs on credit or pre-pay the harvest which will solve some of the SHFs cash-flow challenges. The larger opportunity may be leasing (or hire-purchase/ rent-to-own) irrigation equipment, including machinery.

2 Chicken feed Value Chain

1. Desk research chicken feed value chain

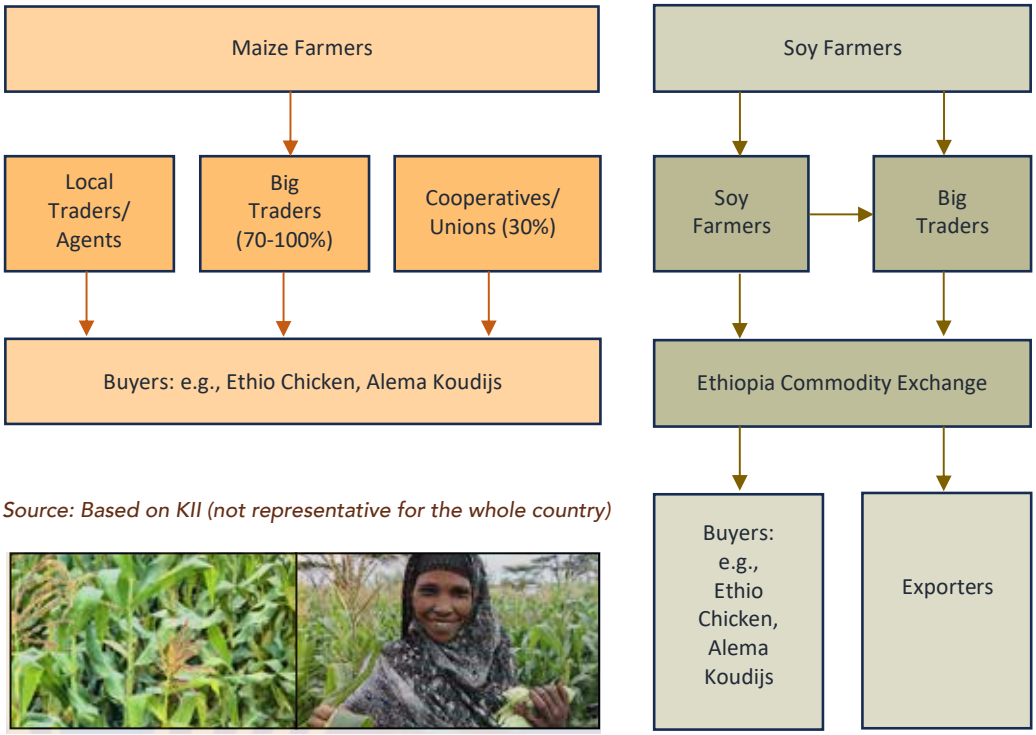
Following the uptake of commercial poultry production in Ethiopia, the chicken feed value chain has been expanding, with many SHFs joining as suppliers of raw materials such as maize and soybeans. While current domestic consumption of chicken feed is considered relatively low, the trend shows an increase (USAID and GOE 2017). Consumption growth is expected to continue given macroeconomic trends such as population growth, urbanization, and per capita income growth all of which are expected to stimulate demand for chicken meat and eggs and therefore chicken feed.

Both vertically integrated and small-scale commercial poultry breeding systems use almost exclusively specialized poultry feed, which is supplied by feed processors like Alema Koudijs Farm (AKF), Ethio-chicken feed (EC), or by their own subsidiaries within their supply chain (in case of vertically integrated ones). These latter feed processors source their raw materials from SHFs in semi-organized value chains that only have loose links with cooperatives/unions and source more directly from SHFs.

In 2017, there were 12 commercial animal feed plants, and 13 vertically integrated cooperative unions processing animal feed in Ethiopia. Ninety members of the Ethiopian Animal Feed Industry Association reported producing 62,000 metric tons of concentrated feed for the market. However, there were still insufficient supplies of high-quality, affordable, specialized poultry feed. An additional 50,000 hectares of maize and 45,000 hectares of soybean are required to support the projected increase in poultry production in Ethiopia. Maize production is dominated by 8 million SHFs. They could fulfill the needs of the country if they were included in more coordinated chains. Soy production is sold through the Ethiopia Commodity Exchange (ECX).

The chicken feed value chain (based on the KII) is visualized as follows:

Figure 8: Chicken feed Value Chain



Source: Based on KII (not representative for the whole country)

2. Key informant interview findings: Chicken feed value chain

KIIs conducted with AKF and EC and with some of their suppliers show that each of the two feed processor companies purchase at least 30,000-40,000 metric tons of maize and 15,000-35,000 metric tons of soybean and soy cake annually. Soy cake is sourced from local food processors located around Addis Ababa. The rest is bought in rural areas for maize, and from the soy exchange. Both maize and soybeans are predominantly produced in Wellega, Gojjam and Asossa areas. Current security issues seriously affect the supply of both maize and soy and processors have difficulties finding adequate supplies.[7] According to key informants, the shortage of soybean worsened due to the recent government policy which allowed the exports of soybean and processed soy cake to tackle the foreign currency shortage, without meeting the internal demand.

7 The displacement of SHFs from the Wellega and Asossa area, infrastructural damage and roadblocks affected the production and supply of maize and soybeans.

Maize is sourced mainly from Wellega and to a lesser extent from Gojjam.

- The Wellega area usually supplies year-round to central Ethiopia where Addis Ababa is the main market.
- The Gojjam production starts in February selling mainly to Shire, Adwa and Mekelle (under normal conditions) and then begins selling southward around the rainy season (June till August).
- Traders are the major buyers of maize. The two processors interviewed indicated that traders supply from 70 to 100% (but sometimes Unions supply up to 30%). SHFs supply both the traders and the unions (but not directly the processors). There is limited coordination between traders and SHFs and transactions typically take one of two forms:
    - SHFs bring their crop in various amounts to the market using any available transport (often carts and donkeys) where the traders have a purchasing or collection center. Traders check the quality, weigh, pack, and store. Payment is made immediately in cash.
    - Local small traders go from farm to farm with their own truck and purchase at farm-gate with direct cash payments and sell the produce to a bigger trader at the collection center in the local market. Payment to local traders is usually done immediately via bank transfer or cheque. Depending on the relationship between the two parties, payment can be delayed for a few days. The big traders usually send the supply to traders in Addis Ababa market using their own or rented trucks. These traders usually provide legal receipts to their buyers.[8]

The aggregation process of soybean is similar to that of maize except when done by model farmers with a trade license who tend to have close relation with SHFs (for more detail about model farmers, see the discussion under malt barley below, which also applies to soybean model farmers).[9] Once aggregated, model farmers/traders sell the soybeans via the Ethiopian Commodity Exchange (ECX) only. To be able to sell to the ECX, suppliers need to have the appropriate license and they need to be a member of ECX.

Payment to SHFs will be conducted the same day via bank transfer. "… most SHFs moved to bank transfers, when the government imposed limits on cash withdrawals and traders could hence not pay the SHFs the full amount in cash anymore, because of the cash withdrawal limit by the government. There were no restrictions on bank transfers. Otherwise, their preference is direct cash payment. When we do bank transfers for farmers, they don't give us their account number and let us do it (they are largely illiterate). Rather, they walk with us to the bank and give us their bank book and collect the receipt at the end. They need more awareness creation, education, building trust, technical support, and good service on how to use the different financial products appropriately. The farmers tend to be timid when it comes to entering and dealing with the banks, the service providers should treat farmers well, with respect and encourage them to raise their doubts, so that the service provider can take away their worries."

8 According to key informants, there are traders who only operate shipments and trucks but have no appropriate license to trade and provide the legally required receipts. In such an event, those traders would opt to informally sell it to other traders with appropriate licenses to sell to buyers who require legal receipts such as feed processors.
9 For instance, a model farmer from Jawi, Gojjam indicated that he works with hundreds of SHFs with whom he shares advice on agriculture practices and provides inputs on credit or payment. The model farmer also buys SHFs' output by sending trucks or carts to collect soy from their farm gates or SHFs themselves bring the soy to the collection center of the model farmer.

Although November-December is peak season, SHFs in the study areas continue supplying until the start of the rainy season in end May, because the road is untraversable during the rainy season.

Relation between feed processors and suppliers

The interviewed feed processors largely rely on traders for their supply of maize and on the ECX for soybean, but they also have some indirect relations with SHFs, for instance, through cooperative unions.

Feed processors enter contracts with traders specifying minimum quality standards, quantity, transportation and delivery.[10] Price is determined by market forces, and since supply often lags behind demand, there are frequent price hikes. Apart from working with traders, one of the processors (EC) has some experience with sourcing from cooperative unions. They plan to expand this as unions are found to be (relatively) more reliable and stable suppliers compared to traders, and with the capacity to provide proper warehouse facilities. The latter is very important to EC as it does not own sufficient storage capacity to secure adequate stock of supplies for its operation.

EC acknowledged that most unions have weak management with a poor understanding of the business and failing to make decisions in a timely manner. To address this, EC appears ready to provide support to unions. Similarly, AKF, which relies 100% on traders, indicated its interest in opportunities that enable a direct link with SHFs or other forms of production especially soybean and expressed willingness to take part in initiatives that increase supply.

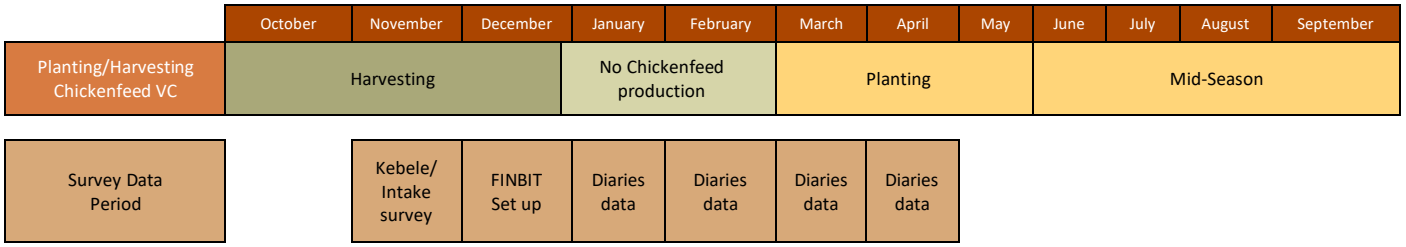
Payment to traders and unions is done via bank transfer or cheques, depending on suppliers' interest. Usually, bank transfers are preferred since suppliers thus avoid having to collect cheques from buyers' offices. Immediate payment is common but after buyers and suppliers have developed a certain level of trust, a few days delay is tolerated.

Source: S.Samuel CCAFS

3. Diaries findings: The typical chicken feed value chain

Fifty active SHFs in the chicken feed value chain participated in the study for a period of four months. The seasonal calendar for SHFs in the vegetable VC and the survey timespan, was as follows:

Figure 9: Calendar for SHFs in the Chicken feed Value Chain



SHFs respondents' characteristics

The typical maize and soybean SHFs that participated in the diaries research has the following characteristics:

Farmer Characteristics - Chicken feed (mean)	Intake SHFs in the sample	Diary SHFs in the sample
Age	48	46.8
Education		
No schooling (100=Yes)	44	28
Elementary school (100=Yes)	24	26
High school (100=Yes)	9	12
Married (100=Yes)	90	80
Gender (100=Male)	93	84
Respondent is Household head (100=Yes)	97	98
Has a mobile phone (100=Yes)	89	96
Is part of a cooperative union (100= Yes)	79	76
Number of other farmer organizations that farmer is member of	87%	87%
Has a bank account (100=Yes)	84	90

Source: Intake and Diaries SHFs in the sample

Member of a cooperative Union: While the large majority of SHF is a member of a cooperative, chicken feed SHFs in this sample are somewhat less likely to be a member (76%) compared to vegetable SHFs (86%). Those who are not a member have less access to fertilizer and credit, provided by the cooperatives.[11]

Bank account: The proportion of chicken feed SHFs with a bank account (90%) is higher than that of vegetable SHFs (84%). The study oversampled respondents with bank account as they were deemed more open towards digital payments. The percentage of SHFs with a bank account went up from 84% in the intake sample to 90% in diaries sample.

Production demographics

Production - Chicken feed (mean)	Intake SHFs in the sample	Diary SHFs in the sample
Land owned (under the prevailing land tenure system) (Ha)	1.4	1.6
Land cultivated (Ha)	0.9	1.1
Share of land devoted to value chain crop	70%	68%
Average yearly harvest of the value chain crop (in Kgs)	3,183	3,502
Farmer purchased (improved) inputs (seeds, fertilizer, etc.) (100%=Yes)*	84	76
Inputs purchased on credit (used voucher, loan, etc.) (100=Yes)	2	2
Payment of inputs in cash (100=Yes)	38	40
Farmer hired workers (100=Yes)	74	80
Farmer used cash to pay workers (100=Yes)	74	78

Source: Intake and Diaries SHFs in the sample

**The question was: Did you purchase or obtain from a third party (someone else) any of the following inputs during this past season?*

Land: The chicken feed (average land size for VC crop 1.6Ha) and barley SHFs (average land size for VC crop 1.8Ha) own (under the prevailing land tenure system) almost double the amount of land compared to vegetable SHFs (average land size for VC crop 0.8Ha).

Share of land devoted to value chain crop: While vegetable SHFs only used around 43% of their land for the value chain vegetables (leafy greens, tomatoes), the chicken feed SHFs in the sample, use 68% of their land for soybean and maize production.

11 Among the reasons for not joining a Cooperative Union, 48% of the Intake survey respondents mentioned that they did not see the benefit of joining, 25% mentioned the coop was not managed properly and 18% mentioned there was no cooperative in their neighborhood.

Improved inputs: A significant proportion of chicken feed SHFs purchase improved inputs from a third party (76%). Membership in a cooperative does not appear to increase access to improved inputs although it should be easier for a cooperative member particularly fertilizer which is state controlled and distributed through the cooperatives. Chicken feed SHFs in the sample, receive inputs from traders and unions, and only pay 40% of their purchased inputs in direct cash. The rest is deducted from the sale of produce. This is a very different arrangement from the malt barley and vegetable VCs).

Storage

Storage - Chicken feed (mean)	Intake SHFs in the sample	Diary SHFs in the sample
Farmer has/uses storage after harvest for the VC crop in the research (100=Yes)	25	24
Average time elapsed from harvest to sale of all crops (months) (incl. non research crops)		
At home… months	5.7	5.7
Warehouse… months	5.4	6.5
Other… months	5.2	5.5

Source: Intake and Diaries SHFs in the sample

Storage: About 24% of the chicken feed SHFs use storage. Maize SHFs store 'at home' and it's sold whenever money is needed. Soybeans are sometimes stored at the traders' home before it is sold to the Ethiopia Commodity Exchange (ECX) until the SHFs want to sell, but most soybeans are sold immediately. Traders offer storage to SHFs for free as they are guaranteed to be able to buy the stored produce. The chicken feed and the malt barley are sellers' markets and storage can be a good way for a trader to incentivize SHFs to sell to them.[12] Chicken feed SHFs also grow other crops like wheat.

12 During field-visits SHFs mentioned storage as: 'bring to a professional warehouse which gives me a receipt and produce becomes part of what is stored there' although 'my bags stored

Marketing

Marketing questions were asked both in the Intake survey and during the diaries collection period in the Digital Finance Survey (DF Survey).

Marketing - Chicken feed (mean)	Intake SHFs in the sample	Diary SHFs in the sample
Produce is sold to whom		
Produce sold at the market directly (100=Yes)	36	34
Sold to a trader (100=Yes)	40	40
Sold to the farmer's organization/coop (100=Yes)	61	56
Number of times produce is sold		
Always sell all at once	27%	24%
Always sell some at different times	57%	54%
Sometimes sell some at different times	13%	16%
Number of traders farmer sold produce to		
1 buyer	49%	48%
2 buyers	27%	30%
3 or more buyers	21%	16%
Farmer gets paid in cash (100=Yes)	95	90

Marketing of harvest - Chicken Feed SHFs in the sample	Chicken Feed SHFs in the sample
Number of buyers the harvest is sold to	
Harvest is sold to one buyer (100=Yes)	30
Harvest is sold to a few buyers (100=Yes)	36
Harvest is sold to many buyers (100=Yes)	28
Sold to the same or different buyers	
Always sells to the same buyer(s) each year (100=Yes)	34
Different buyers, but I always know them already (100=Yes)	50
Different buyers, some I may not know from before (100=Yes)	10
Payment Type	
Farmer gets paid in cash (100=Yes)	94
Payment Received	
Immediately I deliver	76%
Before I deliver	8%
After I deliver	36%
If so, number of days between payment and delivery of produce	9.7

Source: Intake and Diaries SHFs in the sample

To whom is produce sold: Chicken feed SHFs mainly sell to the cooperative (56%). Chicken feed SHFs have a stronger link with the cooperative than other value chains. The cooperatives or cooperative unions are a good entry point for any contact, experiment or intervention with chicken feed SHFs, different from vegetables and malt barley SHFs.

The timing of selling: Maize and soy are sold at the time that chicken feed SHFs need money and hence are sold at different times of the year, for instance when school fees are due, or fertilizer or pesticide needs to be paid.

Number of buyers: During the Intake survey, almost half of the chicken feed SHFs reported selling to one (48%) or two (30%) buyers, while during the DF Survey (a few months later) fewer chicken feed SHFs reported to sell to one buyer (30%) and a few more reported to sell to two buyers (36%) and to many buyers (28%). Political turmoil in Ethiopia might have caused this increase in the number of buyers, but the even higher demand might also have impacted this behavior. The fact that SHFs sell to different buyers prevents buyers/traders from offering improved input on credit since SHFs could take the input but side sell their harvest.

Input purchases	Chicken Feeds Diary SHFs in the sample
The number of input providers	
Inputs from one provider	16%
From many different input providers	18%
I do not buy inputs	6%
One input provider per type	36%
Other (specify)	2%
Two or three input providers per type	16%
Always buys from the same input provider (100%=yes)	
Different input providers, some I may not know from before	6%
I don't buy inputs	0%
Other (specify)	0%
Year by year different input providers, but I always know them already	14%
Year in year out the same input providers	68%
Payment is made when	
Payment is made when inputs are delivered	30%
Payment is made before inputs are delivered	8%
If so, number of days between payment and delivery of produce	7.6
Payment is made after inputs are delivered	48%
If so, number of days between payment and delivery of inputs	1

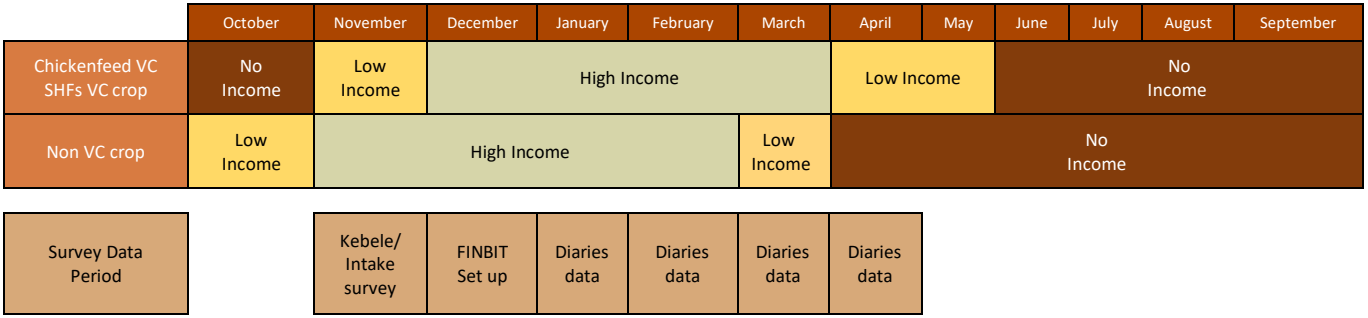
Source: Digital Finance

Sold to the same buyer: Chicken feed SHFs in the sample sell to different buyers that they know already (50%) or sell to the same buyer each year (34%). From informal discussions we know that SHFs have alternative buyers, indicating a sellers' market. Traders mentioned that fulfilling their quota is one of their biggest issues for chicken feed and for malt barley, as explained by not having a steady number of sellers.

Payment type: Most chicken feed SHFs are paid in cash (94%).

Input purchases

Figure 10: Financial diaries in the Chicken feed Value Chain



Source: Digital Finance

Input providers: Unlike the other two value chains, chicken feed SHFs do not seem to buy inputs from any preferred input provider. Vegetable SHFs typically have 'two to three input providers per type' (74%); malt barley SHFs are more linked to 'one input provider per type of input' (60%). However, chicken feed SHFs use the same providers (68%) year on year. Given the number of input providers chicken feed SHFs purchase from (the ones outside of the coops), it appears difficult to offer a financial package with links to a specific input provider.

Income

Income: The highest income for chicken feed SHFs was made during the months of the financial diaries data collection, for both chicken feed VC and non-VC crops. Vegetable VCs have two months of no income, chickenfeed VCs have four.

Chicken Feed (n=50) - Income	The number of SHFs in sample that have this as an income	If so, how many months do you receive such income?	If so, farmer received income in cash (100=Yes)	In the months receiving income, how many times a month is income received?
Farming income for the value chain crop	94%	7.4	100	0.7
Other Farming income (not from VC crop)	20%	7.3	100	2.1
Farming production for self-consumption	2%	12	100	3
Non-farm business activities or income generation	22%	12.7	73	5
Labor income (working on others' farms, working for a small business, etc.)	6%	8.7	100	28
Remittances or gifts	0%	-	0	-
Receive rent (from houses, vehicles, machines, etc.)	8%	10.3	100	0.8
Government payments/subsidies	6%	8.7	67	0.7

Source: Livelihood survey

Income: Most chicken feed SHFs (94%) received income from chicken feed value chain produce (soy and maize). They devote a larger share of their land to VC crops than SHFs in the vegetable VC. Chicken feed SHFs are also involved in livestock rearing, and grow and sell teff, nuts, sesame, and rice, etc., and have fewer non-farm activities (22%) compared to the vegetable value chain SHFs in the sample. Non-farm business typically involves renting out a donkey and cart. Soy and maize value chain crops give 6.9 months of income. SHFs receive this income infrequently during these income months, 0.6 times per income month. This is very different from vegetables SHFs who receive income 3.1 times per month with income from this VC. The number of times they receive income is an important indicator for digital finance services.

Payment type: Most of the chicken feed SHFs income sources are paid in cash, except for government payments (only 63% cash) probably is paid in mobile money.

Expenses

Chicken feed SHFs were asked what expenses they have for their VC production:

Chicken Feed(n=50) - Expenses	The number of SHFs in sample that have this as an expense	If so, how many months do you have such expense?	If so, does farmer pay in cash (100=Yes)	In the months making the expense, how many times a month?
Farming inputs (seeds, fertilizer, pesticides)	92%	4.5	100	0.9
Farm labor	86%	5.8	100	11.6
Non-farm supplies/inputs	10%	7.8	100	0.8
Non-farm workers	2%	6	100	0.1
Transport	40%	8	100	4.4
Fuel (e.g. for a vehicle/machine)	2%	13	100	12
Rent (e.g., for using others' land, building)	0%	-	0	-
Taxes, licenses	0%	-	0	-
Training, advice	0%	-	0	-

Source: Livelihood survey

Expenses on farming inputs and farm labor: Almost all chicken feed SHFs mention spending on farming inputs (92%), farm labor (86%), and transport (40%) is the third category mentioned, but few of them spend on fuel (2%).

Training: While chicken feed SHFs do not spend on training, they do receive it (4.4 times per month) from the cooperative.

4 Diaries findings: Access to credit for the chicken feed value chain

Access to credit was asked in the Intake survey and an in-depth survey during the diaries data collection (see discussion in Vegetable VC).

Took credit from financial institution in the last growing season - Chicken feed (mean)	Intake SHFs in the sample	Diary SHFs in the sample
Took credit this season, from a financial institution (100=Yes)	48	44

Source: Intake and Diaries SHFs in the sample
Source: Loans & Supply Chain Survey (ex-rate 0.0192555)

Was 'any' loan taken in the past 12 months	Chicken Feed
No loans taken	66%
Yes, took a loan	34%

Source: Loans & Supply Chain Survey (ex-rate 0.0192555)

Access to credit – Chicken Feed SHFs in the sample *(if a loan had been taken, which loan types (in the past 12 months)*	Loan taken % and mean amount (in the past 12 months) (US$)*
Took informal loan from family/friends/neighbor/employer	15% (US$ 93.4)
Took loan from local store	0%
Took loan from moneylender	0%
Took loan from savings group/coop/MFI	17% (US$ 279)
Took loan from bank	0%

SHFs could choose multiple different loans and there are overlapping loans, so the numbers do not add up to 100%

While 44% of chicken feed SHFs mentioned in the Intake survey having taken a loan from a financial institution during this growing season, in the Loans and Supply chain survey the number of loans taken was only 34% for the past 12 months, perhaps because the question in the Intake survey was understood as 'Ever taking a loan'.

Most loans were taken from 'family/friends/neighbors' and 'saving group/MFI', and the amounts were small, US$ 93.4 and US$ 279, respectively.

Savings

Savings	Savings tool used
At home or on body (1=Yes)	21
With savings group (1=Yes)	2
With MFI (1=Yes)	38
With credit coop (1=Yes)	9
With Bank (1=Yes)	76
With mobile money (1=Yes)	0

Source: Loans & Supply Chain Survey

Saving: All chicken feed SHFs report saving. The largest share saves at a bank (76%) and in their MFI account, (both Kebeles have bank and MFI branches in the kebele, which may not represent all the chicken feed SHFs due to how the kebeles were selected). Banks and MFIs are either in the Kebele or within 10km reach, for all the sampled SHFs. Farmers farther away from a branch use these services less. Formal providers are not common in more remote kebeles. Anecdotally, farmers reported that saving in the bank or MFI account was not deliberate but a result of leaving a balance after a payment via direct transfer.

Supply Chain Finance

SHFs were asked about their preferences for different types of supply chain finance arrangements and received a quick explanation before answering.

Supply Chain Finance - Chicken Feed Diary SHFs in sample	Farmer has heard of… (has had, can explain/ has heard not sure)	Farmer has used in the past…	Farmer finds useful (very useful, a little useful)
Inputs on credit	93%	6%	78%
Pre-paid inputs	97%	70%	94%
Buyer gives advance before harvest	100%	11%	66%
Buyers only pays after delivery	100%	19%	89%
Buyers gives a loan before harvest	95%	9%	70%

Source: Loans & Supply Chain Survey

Supply chain finance: Most SHFs have heard of the different supply chain finance arrangements but have only significantly used pre-paid inputs which was also found most useful, perhaps because they lacked knowledge and experience in the other types of financing.

Mobile Money

On two occasions SHFs were asked if they 'know and use' mobile money or mobile banking, and specifically if they do 'cash in and out and buying airtime' by using mobile money or mobile phone.

Farmer uses mobile money or mobile phone for cash-in/cash-out or transfers (100=Yes)	Intake SHFs in the sample	Diary SHFs in the sample
Cash-in	5	12
Cash-out	5	14
Airtime purchase	13	24
Transfers	5	12
Farmer makes mobile bill payments (100=Yes)	0	0

Source: Intake and Diaries SHFs in the sample

Using mobile phone features (such as buying airtime and cash in/out): A limited number of chicken feed SHFs have used any of these. Only 24% bought airtime with a phone, a lower share than vegetable SHFs.

Mobile Money – chicken feed SHFs from the sample	Chicken Feed Diary SHFs in the sample
Has heard about mobile money (100=Yes)	36
Uses mobile money (100=Yes)	0

Source: Digital Finance Survey

Financial services used	Chicken Feed SHFs in the sample
MFI account (conventional)	38%
Edir (funeral associations)	90%
Mobile money/wallet	0%
Credit cooperative	0%
Bank-account (conventional)	72%
Equb (traditional revolving saving groups)	36%
Other savings group (VSLA…)	22%
Agent banking (bank or MFI account through an agent, not a branch)	0%
Mobile banking (bank or MFI account but operated through phone)	8%

Source: Digital Finance Survey

Financial services used: Many chicken feed SHFs use an MFI account (90%) and a credit cooperative account (72%).

Interestingly, half of the sample say they have used 'mobile banking' (50%). This may include some mobile money services which are offered by formal financial service providers in Ethiopia.

Chicken feed Chain Summary

Chicken feed SHFs are not as diversified as vegetable SHFs, with 75% of their income derived from maize or soy production. As a result, these **SHFs have very seasonal work and specific harvest times.**

Income from maize and soy is concentrated in some months but they can be stored. Maize is typically stored on the farm using traditional storage methods with some loss. Some storage takes place in warehouses. Altogether **SHFs get their income from these crops across six months, December to May with a peak in income in January.**

Most SHFs use improved inputs, including seeds and fertilizer (both for maize and soy). The **improved inputs come from the farmer organizations and cooperatives. However, per acre productivity remains low.**

For these SHFs to become more productive **significant technical assistance is needed** and farmers have indicated their desire for it.

While **SHFs currently face a very attractive market, with higher demand than the available supply, they are also vulnerable, because they strongly focus on one crop** and are therefore susceptible to weather, insects/pests and market fluctuations. Particularly for soy where all produce is traded on the Ethiopian Crops Exchange (ECX).

There are several parties attempting to increase production through 'out grower' schemes, locking in farmers and encouraging traders to stimulate SHF production. However, for the time being, the **demand for chicken feed is expected to increase and any attempt to increase production will easily be absorbed by the large demand.**

In the chicken-feed value chain, **FSPs could also lend to traders and provide liquidity to end-buyers** for an outgrowing scheme that includes quality inputs.

To successfully serve this sector, **FSPs could partner with (large) buyers, who have production knowledge and awareness of the market channels.** FSPs could also explore entering this market through farmer associations or cooperatives, to have easier access to the SHFs and achieve more volume. Like other value chains, sourcing good quality inputs in a timely manner is very important and FSPs should take this aspect into account when choosing (a) partner(s).

FSPs could also invest in relationships with actors who can provide technical assistance since this will significantly increase production and therefore the SHFs' ability to repay any loans.

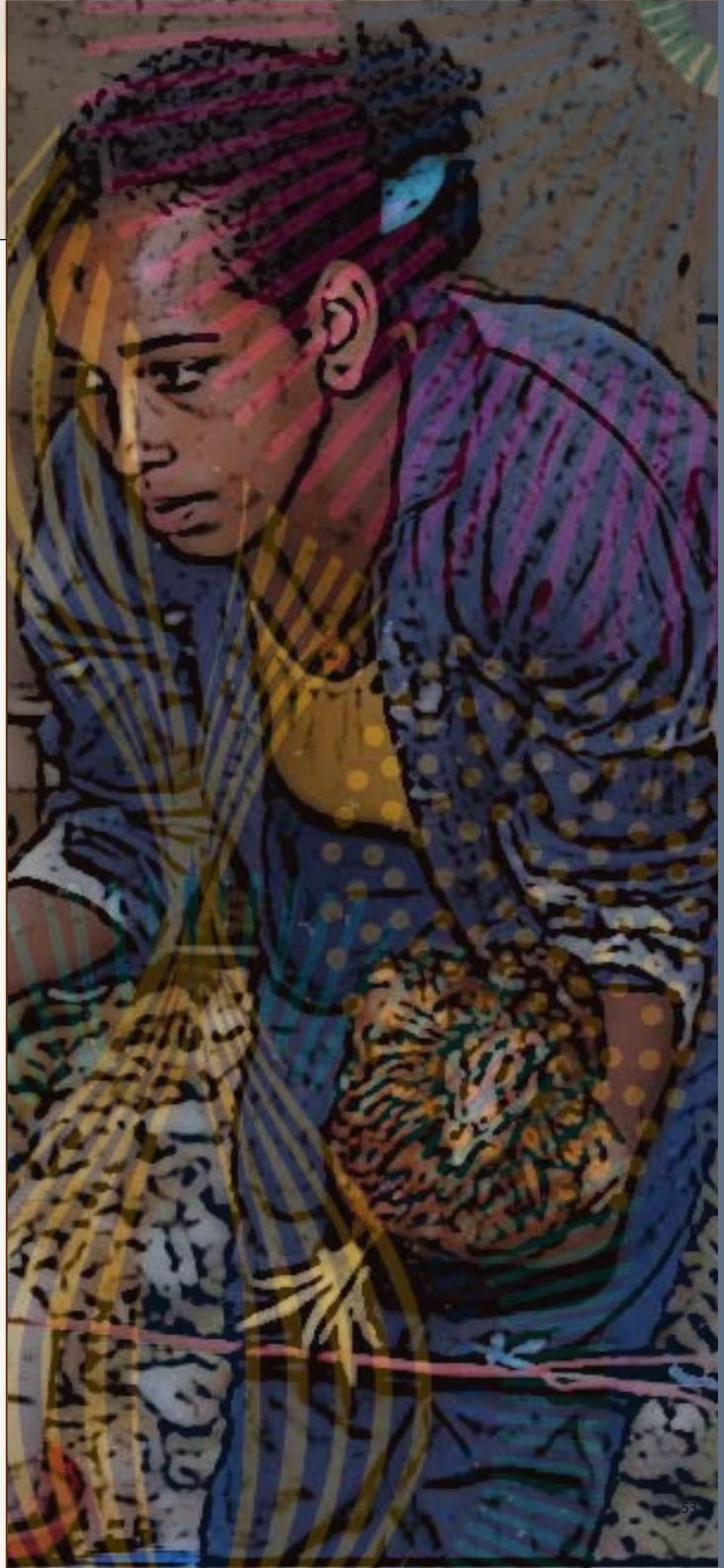
FSPs will face significant challenges to introduce digital finance in this value chain because it is a sellers' market, and it may be hard to convince the farmers. However, if the FSP can offer access

to improved inputs at a reasonable price, and particularly inputs on credit, SHFs will certainly accept payments and repayment through digital channels. Considering that all these inputs come from war-affected areas, prices have hugely increased and the chances of next season foregoing fertilizer inputs are real.

FSPs could focus on assisting farmers' access to irrigation, by leasing (or hire-purchase/rent-to-own) irrigation equipment. This may be less risky than financing inputs since the pumps form the collateral and irrigation may stabilize farmer's production.

FSPs could investigate warehouse financing. This is an opportunity since the shortage of production makes it lucrative to reduce any storage losses. Such **warehouses, set up by traders or (larger) buyers could also open additional financing opportunities,** such as warehouse receipt finance.

FSPs may investigate financing the production of organic fertilizer, since this is already on the Ethiopian government's radar. There may be a party who wants to initiate an organic fertilizer factory, and this will require significant investments and is a medium term project.



3 Malt Barley Value Chain

1. Desk research malt barley value chain

Barley is one of the staple food crops in Ethiopia constituting 6% of the per capita calorie consumption. Most of barley production in Ethiopia is food barley (90%) but the demand for malt barley (used in beer) is rapidly increasing as several multinational beer breweries and malt processors have recently entered the domestic market. The beer market in Ethiopia has high potential given its population and per capita income growth. Breweries and malt processors (e.g., Heineken, Diageo, Soufflet, Boortmalt) have increasingly sourced from SHFs who are the major producers of malt barley.

2. Key informant interview findings – Malt barley value chain

Although barley is produced in several parts of Ethiopia, Arsi zone of Oromia region is the largest producer of malt barley. In this zone, the value chain is also relatively better coordinated compared to that of other parts in East, West and North Shewa. In Arsi the value chain splits up into basically 2 chains, one using traders and wholesalers, while the other uses cooperatives and unions.

Malt Barley has one production cycle, with harvest in December-January. In December the base price is determined by stakeholders (government, buyers, farmers, traders) and coordinated by the government.[13] In practice, however, the market price is usually far above the base price.

Although production of malt barley is raising, it always falls behind demand. Each of the major buyers (Heineken - Soufflet, Boortmalt and Asella Malt Factory or AMF) source 36,000-50,000 metric tons of malt barley annually, but none of them were able to source enough supply to fully utilize their processing capacity.[14]

13 In December the government invites stakeholders to set a base price based on the production cost of the year till harvesting. According to buyers, government favours farmers and their organisations and the voice of the rest is not heard. The invitation of other actors is just nominal.

14 Heineken has played a major role in the development of the supply chain but has recently handed over its activities to Soufflet. In the last years, they sourced between 50%-90% of full capacity.

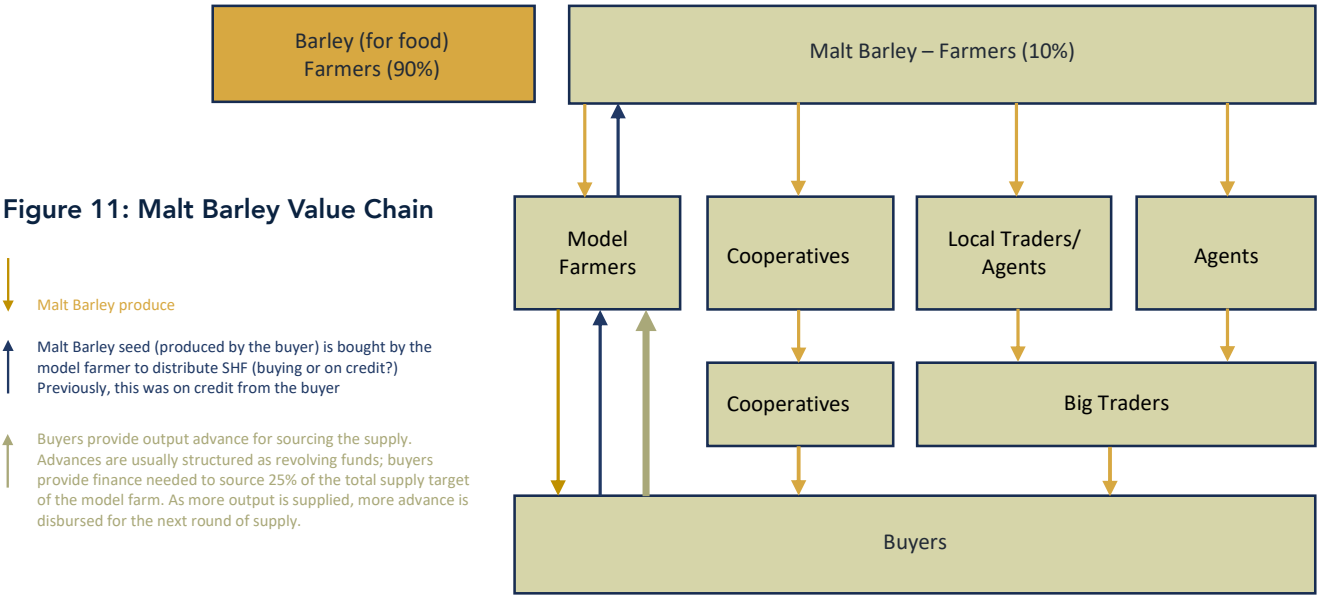


Figure 11: Malt Barley Value Chain

Source: Based on KII (not representative for the whole country)

The ongoing supply shortage compelled some of the major buyers to invest in developing the value chain through setting up 'outgrower' schemes, whereby buyers work with model farms (instead of traders), who can disseminate technology to SHFs around them and aggregate their produce during harvest. This contributes to the emergence of a more coordinated malt barley value chain, whereby model farmers play an important role in coordination and production due to increasing supply chain shortages.

Relation of model farmers and the SHFs

The 'model farmer' is a concept promoted by the 'developmentalist' government and it often represents successful SHF who uses best agricultural practices, understands the business and politics and is part of the community.[15] Model farmers are usually literate, and understand quality standards and measurements. Besides their own production, model farmers can organize a significant number of SHFs (e.g. from 400 to a 1000 SHFs) and collect their produce. They might also have small storage facilities, trucks, weighing stations, packaging facilities, and easy access to inputs and finance from their suppliers. Some model farmers have a trader license. They can often serve as an entry point for the government or buyers to introduce new technologies on their plots before dissemination to other farmers. Although model farmers are assumed to be present for all the value chain crops studied here, the following table mainly focuses on the malt barley and soy value chains. The main difference between both VCs is that soy model farmers are not provided with advance financing for inputs. In addition, the use of storage for 'joint hoarding' was not mentioned by soy model farmers.

15 The EPRDF government used to call itself 'developmental government' and used many such terminologies in promoting its economic policy

From the KII, the differences are:

Features	Barley	Soy	Remark to explain the comparison
Getting financing from buyers	YES	NO	
Getting input from buyers	YES	NO	A soy model farmer mostly uses seed from his/her own soy farm to supply for SHFs and sometimes buy from government
Sourcing from SHFs outside peak season	YES	NO	For soy SHF - due to lack of proper road during rainy season, supply stops in May before the rainy season starts
Close relation with SHFs	YES	YES	
Contract between Model farmers and SHFs	NO	NO	
Model farmers have collection center and storage	YES	YES	
Storage jointly used with SHFs to hoard	YES	NO	Some model farmers in barley chain mentioned this practice
ECX sales channel	NO	YES	Because soy is traded via the ECX, there is a limited chance of developing close relationships between suppliers and buyers
Unstable price and lack of supply	YES	YES	
Bank transfer major payment channel	YES	YES	
Mobile bank users	YES	NO	Mainly for personal use

As the malt barley value chain became more organized and better coordinated, model farmers began playing a significant role as intermediaries between SHFs and buyers such as Soufflet, Boortmalt, and others. They often play the role of a small trader closely linked to the SHFs community; as their patron and 'gateway' to the market. Most model farmers engage in farming and trading, but their involvement in farming diminishes as trading activity increases. Model farmers source inputs from their major buyers or private dealers not only for their own use but also SHFs in their network. These inputs are mostly paid in cash, but they can sometimes be received by SHFs on credit from model farmers. Model farmers also provide advice to SHFs in their network.

Although SHFs are not required to sell to model farmers, after harvest most SHFs bring their harvest to local aggregation centers owned by model farmers where weighing, packing and storage facilities are available. Usually, SHFs are paid immediately based on market price but occasionally the two parties reach an agreement for an immediate payment for a share of the harvest, while the rest is stored in the hopes of fetching a higher price. This is how a model farmer described the arrangement with SHFs:

'…we collect from SHFs in the surrounding rural kebeles via agents and at the collection centres. Out of the many SHFs in the area, 416 SHFs take seeds on credit or with [instant] pay depending on their situation and [they] supply their output to me. For example, most of the time SHFs bring their output in the peak season (December-Feb) to me [model farmer] and store it in my storage, they [the SHF] collect payment for small portion based on the prevailing market price, the rest might stay until August when the price reaches its peak and then the SHFs sell remaining output to me in August/September (e.g., this year December price was 1,923birr/quintal and in Aug-Sept it reached around 4,400). This arrangement is not good for me [model farmer] but if I refuse, the SHFs would go to another trader or model farmer who will be willing to do so' [storage fee cannot be charged].

These services are provided by model farmers and traders to SHFs because it is a 'sellers' market', and they need to provide incentives for a 'good' relationship with the SHF. There is considerable supply outside peak season coinciding when SHFs need cash, such as when school opens, during major holidays or during the application agro-chemicals. SHFs usually use their own carts and donkeys to transport their product but, when necessary, model farmers provide trucks. In addition, model farmers hire local aggregating agents who collect malt barley from distant locations. The transactions between SHFs and local agents all made in cash, but between SHFs and model farmers both direct cash and bank transfer are used. However, payment via bank transfer has been increasing due to the push by some model farmers following a government directive which temporarily limited cash withdrawal.[16] Although some SHFs successfully started using bank transfers, others could not because of lack of service providers in nearby locations. SHFs need to travel far to reach a bank branch, where a long queue awaits them to get service or withdraw money from ATM machines, which sometimes do not work. Therefore, model farmers use all the means possible to withdraw as much cash as possible to conduct transactions with SHFs.

Relation between model farmers and buyers

The advantage to buyers from working with model farmers in the malt barley value chain is the assured access to supply produced with high quality inputs.

16 In May 2020, the Ethiopian government imposed a restriction on cash withdrawal for individuals and businesses to be Birr 200,000 and Birr 300,000 per day respectively. In addition, In January 2021, it has limited cash transfers using all means to the maximum of 5 times a week. The latter restriction was lifted as of January 2022.

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Seed: Some buyers are engaged in the production of their own seeds and use model farmers as part of their retail systems through which they disseminate their preferred variety to SHFs. Seeds used to be supplied by buyers to model farmers on credit, but this changed as the latter's financial capability increased and the overall interest in planting malt barley increased, now model farmers purchase seeds from buyers with immediate payment, while buyers provide output advance for sourcing the supply.

Advances are usually structured as revolving funds: Buyers provide finance needed to source 25% of the total supply target of the model farm. As more output is supplied, more advance is disbursed for the next season.

Advances are sometimes given against bank guarantee letters or signed cheques by model farmers.

Contracts: Buyers sometimes enter contracts with model farmers that specify volume, quality, transport arrangement and destination. However, due to the supply shortages, buyers can not strictly follow their own requirements.

…As one of the main buyers stated 'we can put whatever specifications we want on the contract, but at the end of the day, we do what we must do to meet our supply quota including relaxing our standards'.

Although buyers do not have direct sourcing relations with SHFs, they provide extension service and other technical support to SHFs to improve production. Side selling is common, but buyers seem to accept it as unavoidable given the lack of contract enforcement and continuous price increases. Buyers are trying other ways to minimize side selling, for example by increasing production and productivity via extension services, input provision; building business relations and trust with traders/model farmers, controlling the capacity of traders/model farmers for hoarding, as well as building relationship with Unions which are found to be more reliable. Extension services are well received and have been used as an entrance for bank account opening (in the vegetable chain).

Some buyers mentioned that there is an increasing interest in direct purchases from SHFs, to curb the number of intermediaries and the challenge of supply instability by starting its own transportation that goes to SHFs and collect supply directly.

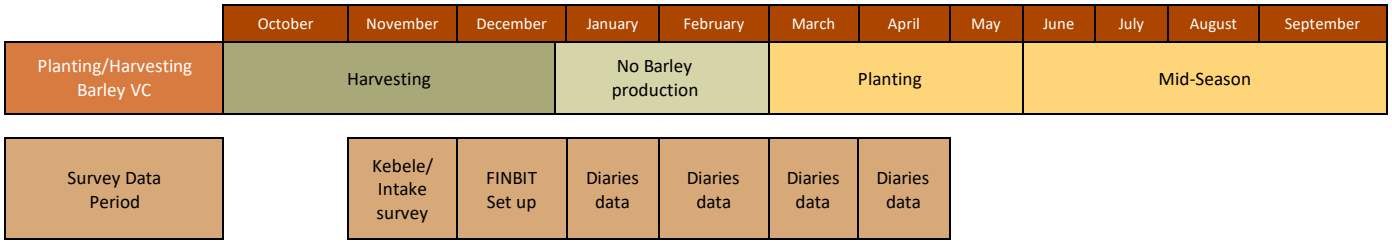
'We are trying to find a way to get payments directly to SHFs; not just transfer, but a system that allows immediate and easy access to/withdrawal of cash. Due to withdrawal limits we are forced to work with traders/model farmers who not only aggregate but are also able to organize more withdrawals by asking family members and friends to open accounts and pay SHFs.'

3. Diaries findings - The typical malt barley value chain

As explained in the methodology chapter, 50 SHFs active in the chicken feed value chain participated in the study for a period of more than four months. The seasonal calendar for malt barley VC is as follows:

The seasonal calendar for SHFs in the malt barley VC and the survey timespan:

Figure 12: Financial diaries in the Malt Barley Value Chain



SHFs respondents' characteristics

Farmer Characteristics - Malt barley (mean)	Intake SHFs in the sample	Diary SHFs in the sample
Age	45.5	45.7
Education		
No schooling (100=Yes)	15	8
Elementary school (100=Yes)	45	46
High school (100=Yes)	27	36
Married (100=Yes)	90	82
Gender (100=Male)	89	78
Respondent is Household head (100=Yes)	100	100
Has a mobile phone (100=Yes)	87	96
Is part of a cooperative union (100= Yes)	69	68
Membership in other farmer organizations (100= Yes)	81	81
Has a bank account (100=Yes)	82	92

Source: Intake and Diaries SHFs in the sample

Age: The SHFs in the malt barley diaries sample are relatively older, with an average age of 45.7. This will negatively impact the speed of uptake of 'new' digital payment systems. Young people are more open to digital payments.

Cooperative member: Malt barley SHFs are less likely to be members of a cooperative although members were oversampled from the kebele.

Bank accounts: Most malt barley SHFs have bank accounts, as part of the sampling criteria.

Production Demographics

Production - Malt barley (mean)	Intake SHFs in the sample	Diary SHFs in the sample
Land owned (under the prevailing land tenure system) (Ha)	1.6	1.8
Land cultivated (Ha)	1.2	1.2
Share of land devoted to value chain crop	71%	73%
Average yearly harvest (in Kgs)	5,916	6,550
Farmer purchased (improved) inputs (seeds, fertilizer, etc.) (100=Yes)*	99	100
Inputs purchased on credit (used voucher, loan, etc.) (100=Yes)	1	2
Payment of inputs in cash (100=Yes)	97	96
Farmer hired workers (100=Yes)	63	72
Farmer used cash to pay workers (100=Yes)	63	72

Source: Intake and Diaries SHFs in the sample

** The question was: Did you purchase or obtain from a third party (someone else) any of the following inputs during this past season?*

Land owned: The sampled malt barley SHFs own most land of the three value chains.

Share of land devoted to value chain: The malt barley SHFs also devote the largest share of their land to the value chain crop chosen (malt barley), as compared to the other two value chains.

Inputs: All malt barley SHFs use improved inputs (the highest among all three value chains), hardly any of these inputs are purchased on credit and almost all are paid in cash.

Workers: Three-quarter of the malt barley SHFs (72%) hire workers and pay them in cash.

Storage

Storage - Malt barley (mean)	Intake SHFs in the sample	Diary SHFs in the sample
Farmer has/uses storage after harvest for the VC crop in the research (100=Yes)	0	0
Average time elapsed from harvest to sale of all crops (months) (incl. non research crops)		
At home… months	4.9	4.8
Warehouse… months	4.6	4.2
Other… months	0	0

Source: Intake and Diaries SHFs in the sample

Storage: In the Intake survey, malt barley SHFs mentioned that they do not typically use formal storage facilities for malt barley. Many people, however, do store malt barley at home in bags for a duration of five months. Sometimes they store it in the warehouses owned by traders.

Marketing

Marketing - Malt barley (mean)	Intake SHFs in the sample	Diary SHFs in the sample
Produce is sold to whom		
Produce sold at the market directly (100=Yes)	23	16
Sold to a trader (100=Yes)	87	86
Sold to the farmer's organization/coop (100=Yes)	28	28
Number of times produce is sold		
Always sell all at once	6%	8%
Always sell some at different times	53%	60%
Sometimes sell some at different times	40%	32%
Number of traders farmer sold produce to		
1 buyer	22%	24%
2 buyers	17%	24%
3 or more buyers	61%	52%
Farmer gets paid in cash (100=Yes)	97	94

Source: Intake and Diaries SHFs in the sample

Sales: Malt barley is mainly sold to traders and to a lesser extent to farmers' organizations and even the (local) market.[17] The crop is sold at different times; hence it is stored somewhere (either in bags at the farm, or at the trader's house).

The number of buyers: for about half the SHFs in the sample, the crop is sold to different buyers, three or even more. It is a sellers' market, where an SHF has a choice of buyers.

Marketing of harvest - Malt Barley Diary participants	Malt Barley Diary participants
Number of buyers the harvest is sold to	
Harvest is sold to one buyer (100=Yes)	26
Harvest is sold to a few buyers (100=Yes)	62
Harvest is sold to many buyers (100=Yes)	12
Sold to the same or different buyers	
Always sells to the same buyer(s) each year (100=Yes)	24
Different buyers, but I always know them already (100=Yes)	74
Different buyers, some I may not know from before (100=Yes)	2
Payment Type	
Farmer gets paid in cash (100=Yes)	100
Payment Received	
Immediately at time of delivery	92%
Before I deliver	12%
After I deliver	24%
If so, number of days between payment and delivery of produce	7.17

Source: Digital Finance Survey

Sold to the same buyer: The harvest is sold to several buyers (62%) but the buyers are always known (74%).

Payments are made generally immediately when the produce is delivered (76%). Many of the produce is already in a traders' warehouse, so can easily be traded.

17 This question was a multiple selection question, so the totals add up to more than 100% and SHFs in the sample who sell at the market also sell to traders or their farmers' organisation.

Input purchases

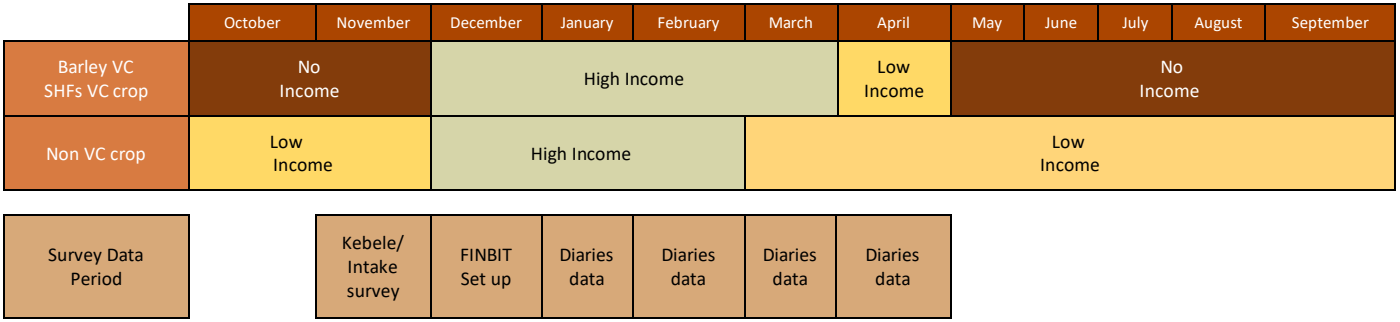
Input purchases - Malt Barley Diary SHFs in the sample	Malt Barley Diary SHFs in the sample
One or more input providers	
Inputs from one provider	18%
One input provider per type	60%
From many different input providers	6%
Two or three input providers per type	16%
I do not buy inputs	0%
Other (specify)	0%
The same input provider	
Different input providers, some I may not know from before	10%
I don't buy inputs	0%
Other (specify)	0%
Year by year different input providers, but I always know them already	64%
Year in year out the same input providers	26%
Payment is made when	
Payment is made when inputs are delivered	92%
Payment is made before inputs are delivered	0%
If so, number of days between payment and delivery of produce	2.6
Payment is made after inputs are delivered	0%
If so, number of days between payment and delivery of inputs	180

Source: Digital Finance Survey

Input providers: Malt barley SHFs in the sample mostly buy inputs from one input provider per type of input (60%). Every year they buy from different input providers, but they always know them (64%). Payment is typically (92%) made when the input is delivered.

Income

Figure 13: Income in the Malt Barley Value Chain



Income: The highest income for malt barley SHFs was during the months of the financial diaries, for both their chicken feed VC and non-VC crops. While vegetable VCs have only two months of no income, and chicken feed five, malt barley have six months of no income. From the malt barley, but they have low income form the other non-VC income.

Malt barley (n=50) - Income	The number of SHFs in sample that have this as an income	If so, how many months do you receive such income?	If so, farmer received income in cash (100=Yes)	In the months receiving income, how many times a month?
Farming income for the value chain crop	98%	8.5	100	3.5
Other Farming income (not from the VC crop)	68%	10	100	3.7
Farming production for self-consumption	12%	8.2	100	3.1
Non-farm business activities or income generation	24%	11.7	91	12.6
Labor income (working on others' farms, working for a small business, etc.)	2%	13	0	1
Remittances or gifts	0%	-	0	-
Receive rent (from houses, vehicles, machines, etc.)	6%	12.7	100	1
Government payments/subsidies	10%	12.8	60	6.8

Source: Livelihood Survey = This question was a multiple selection question, so the totals add up to more than 100% since almost all have several income sources.

Income: Unsurprisingly, most malt barley SHFs received income from malt barley (98%) and from another farming source(s) (68%). This makes malt barley the value chain with the highest share of income earned from agriculture. A few (24%) also have non-farm income (such as mat making), while 10% receive a monthly government income as well.

Number of times per month: Farm income from malt barley is received over 8.3 months per year and for the other crops 6.8 months per year. Both provide income several times per month, indicating that malt barley is stored in bags at the farm.

"we store it [malt barley] at home and sell when we need the money, like at the beginning of the school year or when we need cash during festival and holiday times." (Farmer Koma Kara)

Expenses

Malt barley (n=50) - Expenses	The number of SHFs in sample that have this as an expense	If so, how many months do you made such expense?	If so, does farmer pay in cash (100=Yes)	In the months making the expense, how many times a month?
Farming inputs (seeds, fertilizer, pesticides)	100%	8.3	100	5.9
Farm labor	40%	11.3	95	8.3
Non-farm supplies/inputs	22%	10.7	100	9.4
Non-farm workers	10%	9.6	100	6.6
Transport	60%	9.3	100	9.1
Fuel (e.g. for a vehicle/machine)	2%	3.0	100	0.5
Rent (e.g. for using others' land, building)	16%	5.1	100	3.2
Taxes, licenses	94%	6.9	100	0.9
Training, advice	0%	-	0	-

Source: Livelihood Survey

Expenses: All malt barley SHFs purchased inputs during 8.3 months of the year and more than 5 times per month. This suggests that they buy many small quantities. Taxes and Licenses are another type of expense that most SHFs reported (94%) which other studied value chains do not report as often (chicken feed 0% and vegetables 51%). Taxes and Licenses are paid over 6.5 months and less than one transaction per month. Other expenses reported were transport 60% and farm labor 40%.

4. Diaries findings - Access to credit for the malt barley value chain

Access to credit was asked in the Intake survey and an in-depth survey during the diaries data collection.

Took credit from financial institution in the last growing season - Malt barley (mean)	Intake SHFs in the sample	Diary SHFs in the sample
Took credit this season, from a financial institution (100=Yes)	32	36

Source: Intake and Diaries SHFs in the sample

Was 'any' loan taken in the past 12 months	Malt Barley
No loans taken	18%
Yes, took a loan	82%

Source: Loans & Supply Chain Survey

Access to credit - Malt Barley SHFs in the sample (if a loan had been taken, which loan types (in the past 12 months)	Loan taken % and mean amount (in the past 12 months) (US$)*
Took informal loan from family/friends/neighbor/employer	74% (US$ 381)
Took loan from local store	2%
Took loan from moneylender	0%
Took loan from savings group/coop/MFI	32% (US$ 1,258)
Took loan from bank (100=Yes) and amount	7 (US$ 41,640)

Source: Loans & Supply Chain Survey (ex-rate 0.0192555)

Almost a third (36%) of the malt barley SHFs mentioned in the intake survey having taken a loan from a financial institution during this growing season, while in the Loans and Supply chain survey 82% of the SHFs in the malt barley VC reported having taken `any' loan.

Most loans were taken from 'family/friends/neighbors' (74%) and 'saving group/MFI' (32%), the amounts were small, US$ 381.4 and US$ 1,258.4 respectively. Both in percentages and in amounts these two groups are the highest for all the value chains.

Savings

Savings - Malt Barley Diary SHFs in the sample	Savings tool used
At home or on body (100=Yes)	50
With savings group (100=Yes)	13
With MFI (100=Yes)	17
With credit coop (100=Yes)	0
With Bank (100=Yes)	83
With mobile money (100=Yes)	0

Source: Loans & Supply Chain Survey

Saving: The large majority of malt barley SHFs save at the bank (83%). Considering that 92% of the SHFs have a bank account, these SHFs also use their bank-account for saving.

The percentage of SHFs that save at home is relatively low (50%). In practically all previous studies and in the other value chains saving at home is usually the most wide-spread form of saving.

Supply chain Finance

SHFs were asked about their preferences for different types of supply chain finance arrangements and received a quick explanation before answering.

Supply Chain Finance - Malt Barley Diary SHFs in the sample	Farmer has heard of… (has had and can explain/ has heard not sure)	Farmer has used in the past…	Farmer finds useful… (very useful, a little useful)
Inputs on credit	72%	26%	80%
Pre-paid inputs	69%	28%	67%
Buyer gives advance before harvest	76%	11%	74%
Buyers only pays after delivery	72%	19%	75%
Buyers gives a loan before harvest	70%	11%	63%

Source: Loans & Supply Chain Survey

Supply chain finance: Similarly to SHFs in other VCs, most have heard of the different supply chain finance arrangements, but only few had experience with them. Prepaid inputs (28%) and 'inputs on credit' (26%) are the two most common forms. 'Buying inputs on credit' is seen as the most useful.

In general, SHFs are looking for supply chain finance that can improve their liquidity situation.

Mobile money

In two occasions SHFs were asked if they 'know and use' mobile money or mobile banking, and specifically if they do 'cash in and out and buying airtime' by using mobile money or mobile phone.

Farmer uses mobile money or mobile phone for cash-in/cash-out or transfers (100=Yes)	Intake SHFs in the sample	Diary SHFs in the sample
Cash-in	5	14
Cash-out	3	8
Airtime purchase	1	4
Transfers	3	10
Farmer makes mobile bill payments (100=Yes)	1	2

Source: Intake and Diaries SHFs in the sample

Mobile Money - Malt Barley Diary SHFs in the sample	Malt Barley Diary SHFs in the sample
Has heard about mobile money (100=Yes)	42
Uses mobile money (100=Yes)	46

Source: Digital Finance Survey

Using mobile phone: A very limited number of malt barley SHFs reported in the intake having used mobile money, but when asked in the digital finance survey a couple of months later, 46% reported having used mobile money.[18]

18 It is unclear what accounts for the difference. People might have had a marketing surge in their kebele or they may not have understood the question in the first survey.

Financial services used Malt barley	Malt Barley Diary SHFs in the sample
MFI account (conventional)	34%
Edir (funeral associations)	64%
Mobile money/wallet	2%
Credit cooperative	6%
Bank-account (conventional)	98%
Equb (traditional revolving saving groups	52%
Other savings group (VSLA, etc.)	4%
Agent banking (bank or MFI account but accessed through an agent, not a branch)	2%
Mobile banking (bank or MFI account but operated through phone)	16%

Source: Digital Finance Survey

Financial services used: There is a high level of financial services usage amongst malt barley SHFs. Almost all malt barley SHFs use a bank account (98%), Edir (64%) and Equb (54%).

Malt Barley Chain Summary

Malt barley, (like chicken feed crops) is rain-fed with a single season resulting in **strong seasonality**.

While seeds are supplied by buyers and model farmers, **improved inputs (fertilizers, pesticides, etc) are typically obtained from farmers' organizations and cooperatives** as many barley farmers are member of a farmers' organization. Some SHFs claim that access to fertilizers is an issue.

Malt barley value chain has a more developed supply chain finance, where buyers provide model farmers (who act as local traders) with 25% of the value of their target to purchase in their area. As more produce is supplied, more advance funds are disbursed for the next round of supplying.

The market for malt barley (like that of chicken feed) is a sellers' market, where **it is easy for SHFs to find a buyer.**

Malt barley SHFs are relatively loyal to their traders. They often sell to one trader only and year on year they only sell to the traders they know.

Income from malt barley is high for three months – December to February. However, March to August some barley is still sold, from storage. Sales typically take place at the moment that SHFs need cash, such as back to school, major holidays or the time to purchase agro-chemicals.

None of the SHFs interviewed stored the malt barley professionally but rather **store it at home using traditional methods.**

Malt barley producers are less diversified than vegetable SHFs but a lower amount of their total income comes from malt barley (total 58%) and from other farming activities (22%).

There are a number of parties attempting to increase production through 'out grower' schemes, locking in farmers and encouraging traders to stimulate SHF production. However, for the time being, **the demand for malt barley (like that of chicken feed) is expected to increase and any attempt to increase production will easily be absorbed by the large demand.**

To successfully serve this VC, **FSPs could partner with (large) buyers, who have production knowledge and awareness of the market channels.** FSPs could also explore entering this market through farmer associations or cooperatives, to have easier access to the SHFs and achieve more volume.

When entering this VC, FSPs should take into account that **model farmers and traders are already accessing funding,** including from the end buyers and banks, and **this may not be a value chain that requires much additional liquidity.**

As with other value chains, however, **leasing (or hire-purchase, rent-to-own) of irrigation equipment may be considered, as the financing of warehouse construction or the set-up warehouse receipt financing for the existing professional warehouses.**

4

Analyzing financial behavior across value chains

Source: Farm Africa

1. Smallholder farmers

While the number of SHFs in the sampler that were not members of cooperatives or farmers organizations is very small, they appear to be worse-off compared to members, spending less on farming inputs, having smaller harvests and producing mostly for self-consumption.

All SHFs tend to buy from different input providers and sell to different buyers and unlike vegetable SHFs, chicken feed (51%) and malt barley SHFs (94%) spend on taxes and licenses. This increased level of 'formality' could be used by FSPs when expanding digital financial services (DFS).

Access to credit

Malt barley SHFs have the highest number of loans (82%) mostly from friends/family/neighbors (74%) while chicken feed SHFs took out the least number of loans (and also the smallest amounts), perhaps because a larger number of chicken feed SHFs receive their inputs from the buyer thus requiring less liquidity. Most loans were taken out for working capital, and across all VCs, SHFs that are not members of cooperatives or farmer organizations borrow the least.

Source: Shutterstock

Was 'any' loan taken in the past 12 months	chicken feed	malt barley	vegetables
No loans taken	66%	18%	38%
Yes, took a loan	34%	82%	63%
Access to credit 'if a loan had been taken, which loan types (in the past 12 months)'	Loan taken % and mean amount (in the past 12 months) (average amount per category, in USD)		
	chicken feed	malt barley	vegetables
Took informal loan from family/friends/neighbor/employer	15% (average US$ 93)	74% (average US$ 381)	54% (average US$ 143)
Took loan from local store	0%	2%	0%
Took loan from moneylender	0%	0%	2% (1 loan of US$ 40)
Took loan from savings group/coop/MFI	17% (average US$ 279)	32% (average US$ 1,258)	10% (average US$ 1,084)
Took loan from bank (100=Yes) and amount	0	7 (1 loan of US$ 41,640)	0

Source: Loans & Supply Chain Survey

Loan features

Chicken feed	Malt Barley	Vegetables
Quick loan decisions (91%)	No collateral (69%) No group guarantee (63%) Quick decision (56%)	Quick loan decisions (98%) Application close to home/ Disbursement close to home/ Repayment close to home all score 78%

All SHFs (comparing the VCs) indicated that a quick turnaround time, no collateral and application/disbursement/ repayment close to home are very important.

Chicken feed	Malt Barley	Vegetables
A shop is least preferred (94%) A bank agent is the most preferred location (ideal 47%)	A bank branch is least acceptable (93%) for one group, ideal for another (76%), A cooperative office is an acceptable location (75%). A shop is not acceptable (89%).	Ideal is a bank branch (78%), A coop office (69%) A bank agent is not a good location (63%).

The type of location where credit could be obtained, besides being close to home was also important. A shop was not seen as acceptable because it is seen as too public.

When asked about how loans should be disbursed, SHFs prefer cash because all their payments are still in cash. Digital payment needs to be promoted within the kebele and throughout the value chain to create more opportunities for SHFs to actually use digital payments to pay for transactions, within their personal and business lives. At present they hardly get an opportunity to use digital payment other than for "top up" time.

Demand for credit is seasonal, coinciding with the planting season. Chicken feed SHFs access loans from friends, malt barley SHFs took loans from MFIs while vegetable SHFs took loans from their neighbors. Interestingly, even traders did not use any formal FSP, but took loans from friends and neighbors as well.

Savings

A large part of the SHFs have a bank account, and almost all mention that they use it to save. Saving in the bank account is stimulated by regular payment into it and then by not withdrawing the full balance. Distance to the bank also plays a role in whether money is kept at the bank. Vegetable SHFs reported 'buying assets to sell later' (for example, goats bought small and sold during religious holidays) as an alternative savings mechanism.

Linkages to Farmer Associations

Very few SHFs in the sample have storage, they mainly store in bags at home or in rudimentary shacks. Malt barley and soy are being stored at traders' warehouses or at Union warehouses, but to a limited extend. Increasing storage options available to SHFs would increase the 'selling power of SHFs particularly for chicken feed and malt barley. For perishable crops a cold chain storage could increase the time for SHFs to find a buyer. In a few cases, farmers organizations support their members with normal storage.

While malt barley and chicken feed SHFs only use the 'buying input and selling produce' service from cooperatives, vegetable SHFs also use 'sell farm production in bulk, receive credit, and get information and consulting services from the cooperative. Collaborating with well-functioning farmers organizations could increase trust in digital payments, particularly for vegetable SHFs.

Supply chain finance

Only 'inputs on credit and prepaid inputs', are well known to the SHFs, but they find the rest of financing arrangements useful.

Supply chain finance options usefulness	Chicken feed	Barley	Vegetables
Inputs on credit	78%	80%	98%
Pre-paid inputs	94%	67%	71%
Buyer gives advance before harvest	66%	74%	75%
Buyers only pays after delivery	89%	75%	94%
Buyers gives a loan before harvest	70%	63%	79%

Perceptions about Payments

Many SHFs do not know the difference between mobile banking and mobile money. If SHFs have used 'mobile' services, it is generally mobile banking. Between the intake survey and the end of the diaries, however, there was an increase in respondents using mobile money, particularly among younger respondents. Vegetable SHFs seem adopt mobile money more often, perhaps because they have far more transactions by having multiple harvests throughout the year immediately sold to different buyers.

Almost all SHFs in the sample use banking services, and Edir and Equb are used slightly more by females than males. Women have not used any of the mobile banking options and men seem to be more enthusiastic to move to digital than women.

Incentives to use digital payment

Table 58 reports different digital finance scenarios under which farmers could choose to pay inputs in cash versus digital payment. (Light grey is preference for cash, dark grey is preference for digital.) The scenario where SHFs in the vegetable VC would choose digital payment services was when it also offered the possibility to order in advance good quality inputs for the next year (fertilizer, seeds, pesticides) that are guaranteed to arrive on time. In all the other scenarios presented, farmers preferred to be paid in cash. Overall, vegetable SHFs seem more open to adopt digital payments.

Value chain	Chicken feed			Malt barley		Vegetables		
Scenario: which input provider would you prefer to buy from, one that needs to be paid in cash or another that needs to be paid in digital money?	No preference	Prefer buying from cash **input provider**	Prefer buying from digital input provider	Prefer buying from cash **input provider**	Prefer buying from digital input provider	No preference	Prefer buying from cash **input provider**	Prefer buying from digital input provider
1. Inputs are paid at same time	13%	**68%**	19%	**83%**	17%	2%	**61%**	37%
2. Inputs are paid at same time but digital input provider gives you access to credit where the digital transactions are used for your credit assessment	23%	32%	45%	47%	53%	29%	14%	**57%**
3. Inputs are paid at same time but digital input provider charges you 5% less for the same inputs	15%	34%	51%	49%	51%	8%	41%	**51%**
4. Purchase from input provider that needs to be paid in cash must be made one week before input delivery	23%	**49%**	28%	**53%**	47%	12%	33%	**55%**
5. Inputs are paid at same time, but digital input provider gives you the possibility to order good quality inputs for next year (fertilizer, seeds, pesticides) that are guaranteed to arrive on time	15%	34%	**51%**	49%	**51%**	6%	22%	**71%**
Grand Total	**18%**	**43%**	**39%**	**56%**	**44%**	**11%**	**34%**	**54%**

Education and Literacy levels

Coop members are more educated, especially barley SHFs. There are more women involved in the vegetable value chain, and women have lower levels of education. Financial, digital and general literacy is low, particularly also among women. Finally, trust in mobile money or mobile banking is low, but also trust in the people.

The digital ecosystem

The digital infrastructure and environment is far from developed in rural areas. Many SHFs have USSD phones that are limited in what they can do, internet connectivity is limited, and there are few branches, agent or ATMs. There are virtually no businesses where transactions can be done using digital payments.

Some mentioned that the fees charged for digital payments are visible and high.

2. Traders

The trader survey was conducted in April 2022 with 21 traders. Respondents trade with SHFs and model farmers in the six kebeles included in the research. The research team identified these traders by asking the participant SHFs for names of traders. The trader survey was standard with mostly closed-ended questions and only a few open-ended questions (see Annex for instrument and data).

VC coverage	Malt barley (1), Maize (5), Soy (5), Vegetables (10), altogether 21 traders
Type of trader	Three were employees, while eighteen were owners
Truck Ownership	Two owned their own trucks
Storage space	Eleven had their own storage space
N. Employees	Eleven work alone (no agents or other staff)

Type of payments to suppliers: Most traders still pay their suppliers in cash, although the larger the supplier, the more non- cash payment types are used, such as cheques and bank account transfers (within the same bank). Electronic transfers or mobile money are hardly used.

Trader advance payment to suppliers: About half of the traders (10/21) give advance payments to SHFs in return for purchasing their produce. The advance is settled with the first delivery of produce (60%), with 10% of the times settled in kind and 30% in cash at an agreed time.

Trader advance inputs to suppliers: Most traders (18/21) do not provide advance inputs, only three do, of which two settle the payment at an agreed time and one with the first delivery of the harvest.

Traders receive an advance from their buyer: Most traders (18/21) do not receive an advance from their buyer. Only two traders in soy (each receiving US$ 19,000 per season) and one in malt barley (receiving a monthly advance of US$ 2,850) received advance payments made to the buyer using all available means: direct cash, bank transfer, and cheque (depending on in which payment type they have the money and whether there are limitations on transfers).

Payment type used when the trader sells the produce to buyer and the speed of payment between trader and buyer: Most traders receive their buyers' payments in their bank accounts, (except those in vegetable VC, which is still a cash-based VC). Only one soy traders receive payments once a month, the rest of the traders (twenty) receive the payment immediately or on the same day, several times per month.

The number of buyers that the trader deals with: Many traders sell to many end consumers particularly when selling maize and vegetables for human consumption.

Buyer contracts: none of the traders has a contract with a buyer

Access to credit

Loans in the past year: Eight traders took at least a loan.

Type of loan need: Nineteen traders (out of the 21 traders) mention that they would need loans, two for investment and the rest (17) for working capital. Two mentioned no need of loans.

Type of loan available: Only six traders (out of the 19 traders who need a loan), can obtain this type of loan. Among the reasons for not being able to obtain such loans are the lack of collateral, reasonable interest rates and reasonable repayment terms.

"I wish I could get working capital loan using as collateral the crops I have in storage." (Malt barley trader)

Insurance: Almost none of the traders has an insurance (19/21). Of the two that took out an insurance, only one is satisfied with the coverage against accidents, theft, loss, fire, etc.

The biggest risks traders' face: The top three of risks are theft, price movements and not meeting quota/political instability.

According to traders, financial products should be accessible to all, be fast, reliable, secure, modern, and comfortable.

Description	Percentage
Theft	38%
Price movements	32%
Not meeting the quota	11%
Political instability and government intervention	11%
Fire	4%
Lack of storage	2%
SHFs have inflation	2%

Perceptions about Payments

Among the challenges of payment types, traders mentioned:

- Delays due to not having time to go to the bank (19/21 times) - all payment types require going to the bank; to get cash, to move cash between banks etc. It takes traders a lot of time, effort, and distance to get to the bank to conduct the transactions.
- Delays due to connectivity (even if some transfers could be done electronically, there is a lack of connectivity between the trader and buyer's banks that delays transfers by a few days).
- Limits on the value of the transfers per day, which is often binding given the amounts traders moving.
- Limit on number of transfers per day were also mentioned, but less often than other challenges.

Since 19 of the 21 traders mentioned the time cost of going to the bank, digital transfers could solve the payment challenges if connectivity was not an issue.

Use of digital payment: About one third of traders (6/21) used digital payments, mostly mobile banking. Most users operate in the soy and vegetable VCs. The reasons for not using digital payments were varied, but most traders mentioned lack of 'trust in the system and no knowledge to use it'. This suggests that if knowledge were provided (and there was infrastructure for cash in/out nearby) traders could be persuaded to use digital payments.

Perceived advantages of digital payment over cash: Traders mentioned that they thought that digital payments is more secure than cash (74% or 14/21), has more privacy (12/21) and is faster (10/21).

Trader's willingness to use digital payment: If their buyer used digital payments for their transactions, most would be willing to use it (76% or 16/21). Traders mentioned the need for training and support to set up and use the technology.

Trader's thoughts on the willingness to accept digital payments among their suppliers: More than half of the traders (12/21) think that suppliers would be willing to use digital payments if provided with proper training.

SHF/Trader profile summary

Traders and anyone that works as an intermediary between suppliers and buyers would benefit from a faster, timely, less bureaucratic, easily accessible, and reliable payment system.

Time costs going to the bank are a huge impediment, as well as regular limits to the number and value of transactions.

Traders seem ready to use digital payments with proper training. They also expect 50% of their suppliers to be able to work with digital payments.

Traders have a large, unmet demand for credit and insurance services. Addressing this demand using a digital payment system to deliver it, could be an incentive to transition to digital systems.

SHFs (particularly in the vegetable VC) change to different payment types if the buyer (trader) recommends it.

3. Payment channels

Direct cash

Direct cash and bank transfers are the dominant payment channels in all three VCs. Upstream the importance of direct cash payment is high, while further downstream other means such as bank transfers can also be used. It is common for local agents and traders to go with bags of cash to pay SHFs for their produce in remote areas. Buyers, traders, and model farmers find it difficult to estimate the number of cash transactions per day, but they are many, especially on market days (1 or 2 days a week; specific dates vary by localities). The value of each transaction, however, is usually smaller compared to bank transfers. Most transactions with SHFs and smaller traders are still in cash, while transactions with larger traders are done via bank transfers.

The cash withdrawal limit recently imposed reduces the amount that can be purchased in cash thus forcing SHFs to move into the banking system where no limits exist. It remains unclear whether this move will be sustained after the legal limit is lifted unless cash-out facilities become more accessible for SHFs.

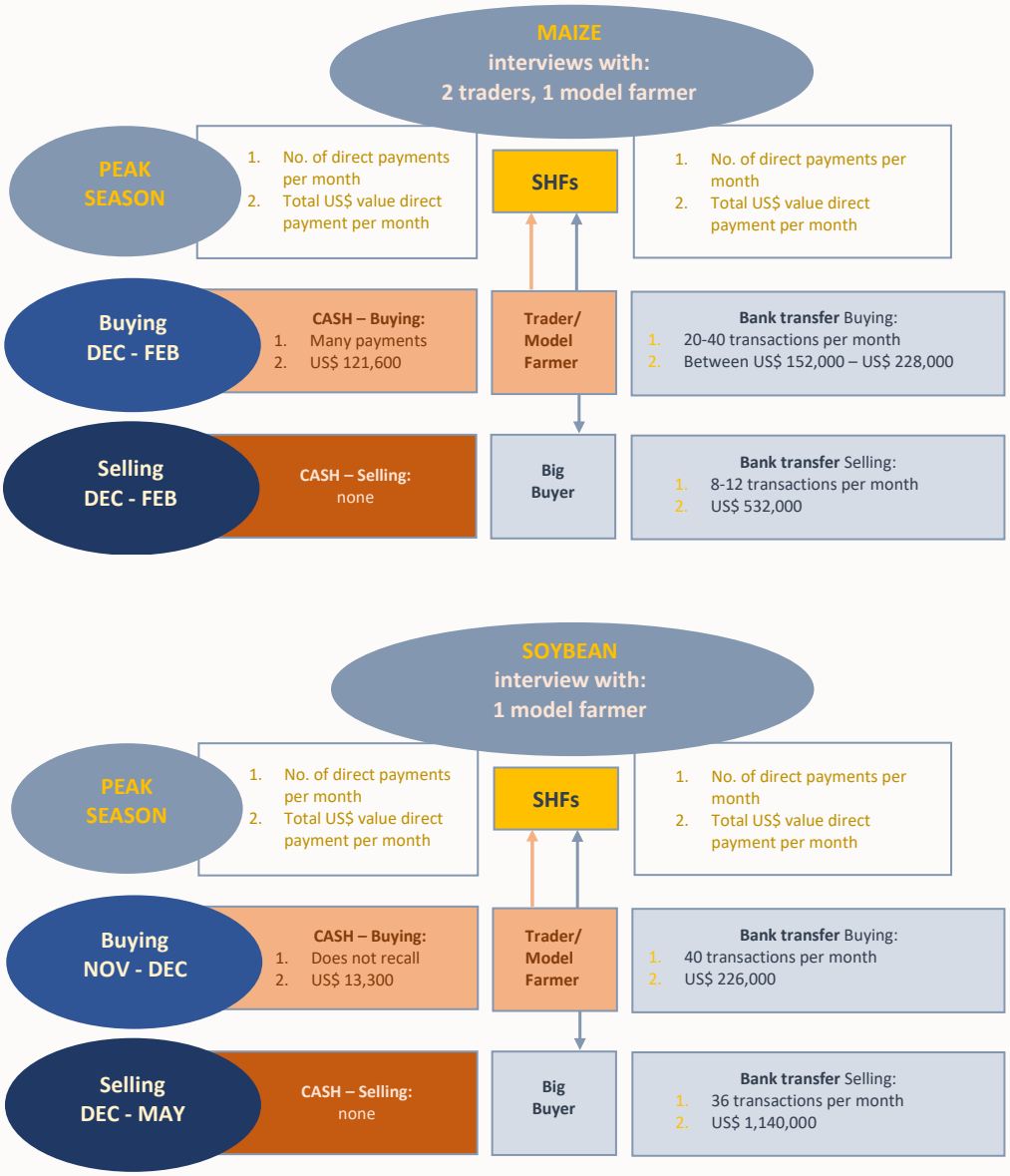
In addition, some buyers are interested in reducing the number of intermediaries and/or in directly engaging with SHFs to source their supply, thus eliminating one level of cash payments. To do so, buyers need to overcome:

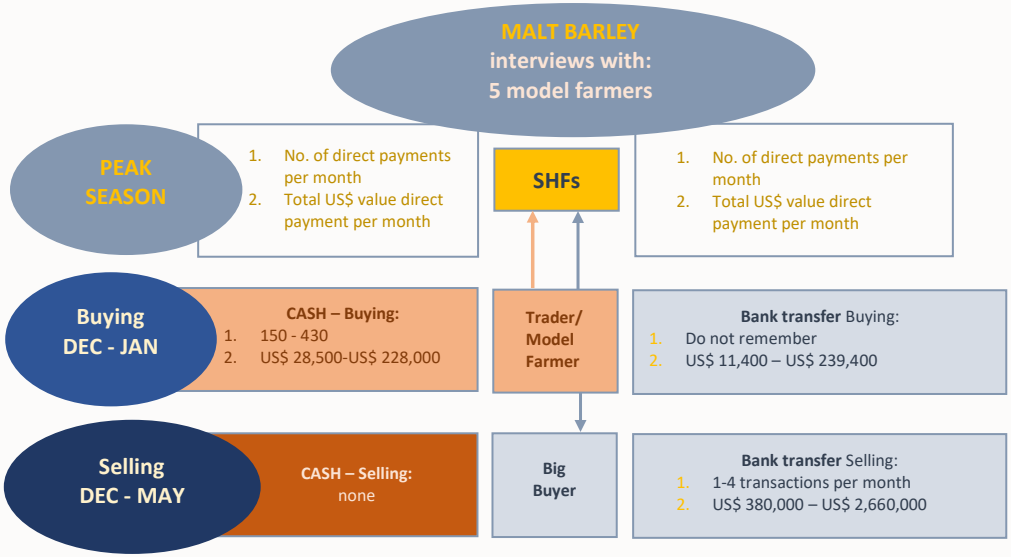
1. The inability, at present, to make payments to SHFs or actors close to them (e.g., model farmers) in a timely and accessible manner.
2. The time it takes for a transfer to be deposited into the SHF account. It takes sometimes between 2 days to 5 days for transfers to be verified and done.

Buyers like Soufflet plan to start direct sourcing from SHFs next season if they can remove some of these obstacles. Payment trends of interviewed Key Informants based on 2020-2021 season:

The following shows, for each VC, that inputs are purchased from suppliers in cash and via bank transfers, but produce is sold to end buyers only via bank transfers.

Figure 14: Value Chain Inputs & Sales





Bank Transfer

Bank transfer is another important payment channel used in direct transactions with SHFs.

SHFs: SHFs that transact via bank transfers supply a relatively large share of the output to model farmers or traders have better access to transport and sell their harvest in markets with the presence of FSPs with cash-out facilities. The number of transactions conducted via bank transfers are relatively small compared to direct cash payment, but the value of each transaction is much larger.

Similarly, when SHFs supply to their cooperatives, payment is usually done using direct cash while payments for transactions between cooperatives and their unions are usually conducted using bank transfer.

The Commercial Bank of Ethiopia (CBE) is the most used bank, followed by Cooperative Bank of Oromia (CBO), Dashen, Awash and Abyssinia banks. CBE is preferred because of its wide network of branches and agents throughout Ethiopia but in the malt barley value chain CBO is also widely used for the same reason.

Model Farmers: Some model farmers reported using a mobile bank app to make payments, but as there was a restriction at the time from the government limiting the electronic money transfers to not more than 5 per week, they did not find the tool satisfactory.

Businesses: The mobile bank app was found unsuitable because in Ethiopia businesses that use a proper accounting system require more than one signatory when doing a transfer and bank apps could not accommodate double signatories. In addition, the maximum transfer limit per transaction and day is too small. Similar views were voiced by buyers, and hence bank transfers or cheque remains the common payment channel. While bank transfers are common, they are delayed due to various reasons such as:

- A long verification and approval process especially if the client goes to a 'new' bank branch where it is not a frequent visitor, but that is closer to where he is.
- Network failure, no paperwork done and/or no transfers
- Absence of signatories
- If it happens on the week when they close their monthly balance as they wish to show a high deposit balance.
- Lack of interoperability if buyers and suppliers have accounts in different banks.

Nevertheless, buyers and traders/model farmers with bigger businesses did not find bank transfer a pressing challenge compared to their own internal payment approval system which is slow and long. The internal process is found more responsible for payment delay than the external one linked to bank transfer or cheque. Therefore, a digital system that improves the internal payment approval process is more interesting and a priority for several interviewed larger actors. Therefore, digital payments that can tackle these constraints can be appealing for the value chain actors.

According to the KII, buyers are interested in digital Apps providing extension services and a traceability system that connects aggregators, warehouses, and buyers.

Source: Hero

5 Financial service providers and related actors

Source: Thrive

1. Assumptions before interviewing the FSPs

At the time of the study, agricultural prices were increasing worldwide, due to Covid-19 and the resulting supply chain disruptions.[19] The government prioritizes agriculture since it is a feasible way for Ethiopia to obtain foreign currency. While digital finance is on the agenda at all FSPs, adoption at scale has not yet happened in Ethiopia. When taking stock of the financial sector's interest to serve agricultural value chains, we assume that:

- ***Most FSPs may not prioritize the agricultural sector and may be reluctant to enter, although resistance may be lower than in the past decades.***
- ***Most FSPs are reluctant to offer DFS as they would rather other digital payments. Once payment services are in place, other services could be overlaid on the payment infrastructure.***

2. Product ideas tested during the FSP interviews

During FSP interviews, the team presented and discussed five levels of digital payment services, from a basic payment service to one that included several additional features.

19 The national conflict in Ethiopia intensifying towards the end of 2021 and the war in Ukraine that started in February 2022 (with Russia being the main fertilizer exporter and Ethiopia being a net importer), all contributed to the rise in agricultural prices. These trends have remained the same at the time of data collection.

Product basics	Product description
Digital payments in value chain	Along one entire value chain, one digital payment provider is the accepted means of payment.
Digital payments in value chain + using the payment records to assess creditworthiness for loan applications	Product 1 plus access to credit for all actors in the VC based on the volume of their digital payments.*
Digital payments in value chain + tracking of quantity and quality produced, and use of other administrative data	Product 1 plus use of administration data given by measurements on the quality and quantity of goods produced. The system should facilitate a record of sales, issue (digital) receipts, pre-ordering inputs, etc.
Digital payments in value chain + admin data and access to finance	Combination of products 2 and 3 above. All value chain actors use the same digital payment provider, which is combined with an app that collects admin data on production.
Digital payments in value chain + detailed financial recordings that in combination with payment records can assess creditworthiness for loan applications	Product 2 plus detailed records from their accounts to allow FSP assess creditworthiness and make better credit decisions and products that tailor payments to cash inflows.

**The product was explained to FSPs by focusing on the ability of financial track record in the digital payment platform to assess creditworthiness and replace collateral requirements.*

While these products were discussed with most of the interviewees, in some interviews the research team ended up focusing on the product ideas that had arisen during the interview. For instance, two VC actors were providing quality input packages on credit. One of these had conducted two pilots with microfinance institutions. They had put together an input package with quality seeds, key pesticide/insecticide and technical assistance instructing SHFs what to apply when and what aspects of the spacing, timing and crop husbandry were important for yields. This actor plans to roll out this approach on at larger scale. The other actor was still in the design phase putting together an input package and exploring which technical assistance to include (if any).

Another actor was developing warehousing financing with warehouse transactions being digital and including characteristics of the produce sold in the digital administrative platform. Two other parties were also interested in warehouse – and receipt finance. Another party was focused on leasing agricultural machines.[20] In this product, the machine lessee would use a digital booking system and use digital payments to transact. The record of transactions could in turn be used by FSPs to finetune their credit score models. Several others were also interested in leasing, but the DFS aspects were not clear. Other FSPs were interested in invoice discounting (or factoring) but this was still in early stages of development.

20 Whether the financial construction would be purely leasing or some variation on leasing such as hire-purchase was not discussed.

FSPs and TCs - Commitment to agricultural VCs

The majority of the FSPs were interested and committed to serving the agricultural sector. Many had already started some intervention in the agricultural sector, such as providing quality input packages, trying to offer non-collateralized loans, etc. All FSPs consulted are working on expanding their network and outreach in rural areas. Part of the reason they are all committed to agriculture is a government regulation that requires that 5% of their portfolio be lent to the agricultural sector. However, many of the FSPs interviewed were committed to agriculture for other reasons as they expected the sector to be more profitable for lenders in the future.

Initiative	Stage	Comment
Providing quality input packages on credit (two actors)	Not yet a digital loan service but will be. Beyond trial, ready for expansion	Well-received by farmers, possibly hard to implement due to input shortages
Barley traders using digital payments	Experiment completed, ready for expansion	Complicated VC dominated by large end-buyers
Digital payments to bank-accounts of vegetable SHFs	In roll-out phase, but VC actor had stopped operations.	Farmers accepted the payment system because buyer was reliable and helped with inputs and technical assistance
Digital payments to farmers in various value chains (also outside the three chains of this study)	Several FSPs offered this to value chains.	All payment services made losses and did not automatically lead to additional volumes (and profits) from farmers.
Warehouse finance	Early stages; no field-experience yet, but several warehouses sufficiently sophisticated to make warehouse finance and receipt finance possible.	Part of a comprehensive VC initiative
Technical assistance to ensure that farmers apply the inputs correctly and maximize their produce	Usually offered in combination with other interventions.	Seen as critical by FSPs but they need to partner with actors that can deliver it.

Interestingly, the more experience FSPs and other organizations have in the agricultural sector, the less rosy their view is on its opportunity and profitability. Those with experience in agriculture all mentioned that just providing financing is not sufficient for successfully serving this sector. The agricultural sector has a number of production challenges that may make lending unfeasible if left unattended. The challenges are (i) access to appropriate inputs including fertilizer, seeds, and pesticides, (ii) expert advice of how to and when to apply fertilizer, quality seeds and pesticides and (iii) proper storage which enables farmers to sell when prices are high (for non-perishable crops). During the interviews, FSPs specializing in finance thought these issues would be resolved by other VC actors. But in practice this is not the case. For example in Oromia region, fertilizer supply is controlled by the regional government and distributed by cooperative unions making it complicated to ensure sufficient supply for specific VC farmers. FSPs lacked knowledge on locally produced (organic) fertilizer like that used by GreenPath but the research team confirmed that these are outside of government control and may provide an opportunity.[21]

While FSPs with less experience in agriculture are expected to partner with other actors to solve these challenges, FSPs with more experience have taken in-house more and more functions, including hiring credit officers with agricultural background. They have started to provide technical assistance themselves, presumably thinking that without technical assistance farmers would face too much risk.

As an alternative, a technology company (TC) provided a platform onto which farmers were onboarded to receive information (expert advice, etc) SMSs. FSPs and TC that want to offer DFS need to build an agent network that is reliable, easy to use and convenient, that is, near the SHFs. One technology company had such challenges with one type of agents that they decided to build a network of employed agents instead of the usual model of turning existing businesses into agents. FSPs and TCs interviewed for this study were working on their agent network and a few reported to have a functioning model in agents hosting a wide range of services so agents achieve sufficient earnings.

There were three FSPs who already had experiences with providing agricultural inputs: Lersha, Wasasa and Kifiya. All three were enthusiastic and believe that it is the way to successful lending in agriculture. FSPs have all embraced a value chain approach by supporting different value chain actors at the various production stages of the value chain.[22] There were several FSPs who believed that lack of storage creates an opportunity to enter the market and offer financial services. FSPs also mentioned the potential of leasing agricultural machinery, although the government is already active in such leasing market through the Development Bank.

21 Based on discussions in the kebeles and various agricultural actors as well as the talks with technology companies. However, for scaling locally produced fertilizers, significant investment will be required for building a factory and acquiring machines as well as advanced know-how. The small-scale locally produced (mostly) organic fertilizers would not be able to solve the structural problem of fertilizer shortage.
22 Malt barley was mentioned as a complex value chain, and Kifiya expressed reluctancy to restart activities in it, although the reasons were unclear. It appears that the barley VC has few actors, and these are quite powerful engaging directly with buyers.

Digital finance current activities and plans

FSPs are active in digital finance, and it is their top priority to expand as soon as possible. They have their own digital services with many banks both offering a mobile money service (also named 'mobile wallet') and mobile banking, although it is unclear why they are providing these competing services simultaneously.[23] It appears that no institution needs support developing a new digital channel because they have either built them already or have enough options for partnering with existing channels. Instead, they need support in achieving higher volumes on their digital services because at present none is profitable.[24] The issue is not one of building new digital finance channels but of consolidating them so they share the same infrastructure. FSPs realize that simply providing digital payments is not profitable. Digital payments are costly to offer, and fees that can be charged are negligible, particularly now that CBE offers payments entirely for free.[25, 26] FSPs interviewed agreed that prospective clients were resistant to replace cash with digital payments, and that something was "need to sweeten the deal" such as input packages, access to other financial services (like loans, e.g., by using data) and faster payments, higher payments, access to training, access to information (e.g. market prices, where to sell which products).

They acknowledge that developing the appropriate packages of inputs at scale is challenging because they have only had experience with pilots below 1,000 farmers each. The most important add-on is 'access to finance', particularly access to non-collateralized loans. FSPs repeatedly mentioned that it is complicated for farmers to provide collateral, since many lack land titles, but most of all, because SHFs are fearful of losing it in case they cannot repay the SHFs on time. Almost all the interviewed FSPs and TCs spontaneously mentioned that they need new mechanisms to serve as alternative collateral.

The types mentioned included warehouse finance, where the interviewed said that allowing people to use receipts from a registered and certified warehouse could enable them to offer credit, but the FSP had not yet started to provide this. Others mentioned the option of leasing where the leased machine would effectively be the collateral for the loan. Here again, no direct experience had yet emerged. A few FSPs knew about invoice discounting or named it 'factoring', but again, no direct experience was reported.

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23 There is now one mobile money service, Telebirr by EthioTelecom, that is unlinked to a bank-account, and this is already quite scaled. It is yet unclear whether all these separate mobile money services will ever reach sufficient scale. Some may disappear, some may merge, and others may continue lose money.
24 It is not easy to get an estimate of the number of mobile money users. Several FSPs reported having more than one million and some even 5 million people signed up for their mobile wallet. These numbers could be inflated since other studies in Ethiopia suggest that small firms and individuals often have multiple bank accounts.
25 Reportedly, M-Birr has gone out of business because they were dedicated to provide the World Bank electronic cash transfers, e-PSNP (Productive Safety Net Programme, a World Bank cash-transfer reaching several million of Ethiopia's rural households during the lean season), for a large number of woredas but in a recent tender by the World Bank , they were out bidden by Commercial Bank Ethiopia who offered to provide this payment for free.
26 In Ethiopia, differently from Kenya or Uganda, the people really expect basic financial services to be free (because they have had credit unions and regional based microfinance which are deposit taking. The services of these are nearly at zero cost. Probably because of this the customers in Ethiopia are not willing to pay any transaction fees or fees for maintaining an account. This makes the profitability of digital and mobile services much more fragile than in other East-African countries.

While much of the discussions during the interviews focused on non-collateralized lending, FSPs also had concerns about developing such products.

FSPs also brought up the value of data and the for better credit scoring models. Digital payment records could of course provide useful data to improve credit scoring that would not require physical collateral, but they expressed concerns about such data being sufficient.

Leasing, financial lease, hire purchase, buy-now pay later and other terms

Leasing, financial lease, hire purchase, buy-now-pay-later are all similar financial services where an FSP (often referred to as the "lessor") finances a machine or other durable, movable good, and the machine user pays fixed instalments until the good is paid off. At that moment the good's ownership is transferred from the FSP to the person or business who has paid the instalments, often referred to as the "lessee". This is akin to renting a good for a certain period, after which rented item becomes property of the person or entity renting it.

The advantage of this financial service is that it is relatively straightforward for the lessor to reclaim the good in case of non-payment of the instalments, even in case of late payments. In all the forms of leasing, the good remains the property of the lessor, which means that it can be easily repossessed, without court proceedings or the involvement of registered bailiffs.

Each country has its own regulation regarding leasing, hire-purchase, and other constructions. In some countries a lessee has more protection, and the lessor cannot repossess the good easily after a number of instalments have been paid.

The Digital Payment Services tested in the study and how the FSPs and Technology Companies reacted to them:

Product basics		Reactions FSPs and TCs	Implications for Product Development
1. Digital payments in value chain	-	All FSPs and technology companies are already offering this, and do not consider this sufficient for attracting large numbers of clients. Additional benefits are needed to get scaled uptake.	The experience is that it is not possible to charge realistic fees to users for digital payments as a pure payment channel. Considering the significant cost for agents, such payment channels remain loss-making, or uptake will be very limited. If only payment channels are offered, it is also a challenge for agents to have sufficient volume. A payment channel needs to be combined with other services from the start and the other services should provide the FSP and/or the technology platform as well as the agents with sufficient revenue to become profitable once scaled.
2. Digital payments in value chain **plus using the payment records as credit worthiness proof for loan applications**	+	All FSPs and technology companies are aware of the options to use the data in value chains as one element in credit assessment or credit scoring. However, they do not expect to purely base credit decisions on this data for a while.	While the regulations are changing, FSPs particularly hesitate to focus on this approach, because they worry it will take a long time before truly uncollateralized loans are allowed. FSPs are more optimistic that receipt-based collateral becomes eligible to base a loan decision on, so this option would best be combined with warehouse receipts, purchase order financing and invoice-discounting.
3. Digital payments in value chain **plus other non-financial tracking, e.g., for quality control, and other administration elements**	-	For the FSPs the additional attraction of a product that can make the value chain more efficient was not convincing enough. Considering the complexity of providing digital financial services, this option is not a priority. Technology companies will be more willing to trial such approaches but likely they will not focus on this due to the priorities of end users, who are focused on getting inputs and loans.	This option would be most valuable for the value chain actors, such as the buyers, processors and/or exporters. It will be worthwhile for technology companies to explore options with those actors if they (or a development agency) are willing and able to pay for developing the necessary technology and if the value chain actor(s) are willing to pay for using the technology. All the same, the technology companies mentioned that other types of services (such as inputs on credit, warehouse finance, leasing) should be a priority over this non-financial value chain technology.
4. Digital payments in value chain, admin services, and access to finance	-	This product was not much discussed, it was considered relatively complex during the first few interviews and then dropped from the discussions.	Based on the interviews, it is recommended to first focus on option 2 and after that explore whether adding non-financial administrative technology (option 3) is desirable and makes business sense.

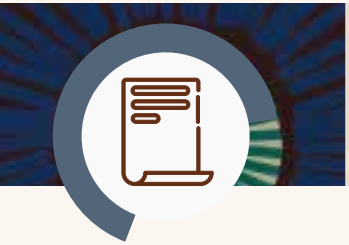
(continued on the following pages)

Product basics		Reactions FSPs and TCs	Implications for Product Development
5. Digital payments in value chain, plus detailed financial recordings that in combination with the payment records will more comprehensively serve as proof of credit worthiness	+	This product was understood and desirable from the point of view of the FSPs. Their worry is about the feasibility for the farmers to fill all that data.	Several FSPs were doubtful whether the digital payments' data would suffice and be reliable to inform a loan decision. They shared their fears about the large numbers of default on digital loans in Kenya and worried about farmers realizing soon enough what the algorithm would be for loans based purely on digital payments records. The technology companies were more convinced that they could find a way to design an algorithm that would work. When offered an additional dimension with farmers reporting repeatedly over time and reporting a wider range of data*, the FSPs were very interested since this would provide them a more solid basis for a loan decision. However, another organization should be responsible to help the farmers to adopt such technology and consistently report on this technology. The technology companies were also keen on adding this technology and they expected to be able to integrate it into their own applications.
NEW: Leasing	+	Mentioned by several as a good option, but not yet any experience with it or expertise available in house. Moreover, there is a large actor (Ethiopia Development Bank) who is already providing this.	To develop leasing properly an FSP requires significant expertise. It may be feasible to find collaborations with companies that specialize in leasing, probably from other African countries or even further away. A crucial element in successful leasing is to ensure that a second-hand market exists or develops for those machines or vehicles offered through leasing. Otherwise repossessing the leased item is not very useful because it would be hard to sell the used item without a second-hand market. Another crucial element in leasing is that the leased items are truly durable and require little or at least simple maintenance that normal farmers can perform. If someone leases a machine, they will only pay off the machine fully if the machine keeps functioning. When the machine breaks down, technically the lessor is responsible for repairs or replacements and even if break down is due to negligence of the lessee, it is always hard to prove. Due to these factors of success, it is recommended to only start on leasing if it is planned to become a major business line. This is not something to offer as a small extra service.
NEW: Warehouse receipt finance	+	This was mentioned by several actors, potentially because IFC has given training in this too. There is already infrastructure for this, and this option should be explored further.	It was beyond the scope of this assignment to explore this form of financial services profoundly. As with leasing, this is a specialized form of financial services and requires technical skills about storage as well as a complex administrative system and legal set up. However, if indeed there are already such warehouses that have the right building, the ability to keep the goods dry and free from vermin and insects, it could be a very interesting option for both FSPs and technology companies. As for leasing, this will require a significant investment in terms of time and effort and should only be considered if it will become a major service. It is not something to offer on the side.

Product basics		Reactions FSPs and TCs	Implications for Product Development
NEW: Invoice discounting or factoring	+	Mentioned by several FSPs and according to them feasible and feasible to be integrated with digital finance options.	While FSPs were keen on this form of financial services, the field research did not demonstrate that farmers are often paid later than they deliver the goods. In fact, most farmers reported that they only release the goods the moment they receive the payment ** In case other value chains have significant numbers of farmers paid later than the transfer of the goods, which receiving an invoice to be claimed later, it could be worthwhile to support FSPs and technology companies to develop this type of finance. The delay in payment should be at least one month, probably on average two months. This type of service is like leasing and warehouse finance, a specialized type of service which requires advanced expertise.

** For full disclosure, the authors/consultant group offer such a technology. To avoid a conflict of interest, we destressed this product in this report.*

*** In the traders' survey it became clear that there are a number of supply chain a-synchronous payments. For instance, buyers give advances to traders for buying their quota of produce. Some traders are paying SHFs in advance, before delivering the produce. However, these forms of payments where the larger party is paying an advance to the smaller party, is not suitable for invoice-discounting. Only in cases such as the traders delivering to the buyer first and getting paid later, would constitute an invoice discounting opportunity. Situations where farmers deliver to the traders and get paid several weeks (or months) later would provide opportunities for invoice discounting. However, in a 'sellers' market' such payment delays are unlikely.*



FSPs and TCs profile summary

FSPs are already committed to (further) building and expanding digital channels. They agree, however, that only focusing on payments is not the right approach. Instead, they want to focus on bundling digital payments with other services (inputs, credit, expert advice, storage, marketing). Several recommendations follow from the FSPs' and TCs' surveys:

It is important to support FSPs in developing comprehensive services that not only address financing but also access to quality inputs on time and the right technical skills.

Services should go beyond simple, collateral based loans and should make use of value chains mechanisms and embedded financial mechanisms, such as inputs on credit that are automatically repaid from sales to buyers.

FSPs will not be able to provide all of these services in-house: they should form partnerships with other organizations who can take care of inputs and technical assistance.

Value chain oriented financial services, including warehouse receipt finance, leasing/hire-purchase, and inputs on credit, are sophisticated services that: benefit from advanced IT systems, need to be informed by data, and require more advanced technology than what most FSPs currently use.

6

Product Ideas and Suggestions for Product Development

Important factors to remember for product development:

Farming practices and culture vary from value chain to value chain

One of the key findings in this study is that each VC has very specific characteristics. This means that a financial product that works well for one value chain may not work for another.

Limited knowledge of farmers and agriculture amongst most of the FSP staff

FSPs showed great interest in serving the agricultural sector and working using the value chain approach. However, their understanding of agriculture is limited which means that they need more exposure and gradually build experience before they can effectively and profitably serve this sector.

The agricultural sector needs a bundle of different services, not only financial services

In agriculture, even more than other sectors, it is not enough to provide loans or other financial products. The sector also needs access to quality inputs, technical assistance for production, improved storage, and accessible, more efficient markets. If a financial service provider only offers access to finance, there is a significant risk that loans will not be repaid and that other services, such as the digital payments, value chain administration or financial history tracking that the FSP may offer, may go underused. This means that FSPs and technology companies need to partner with actors that can provide services related to the agricultural production.

Small scale experiments, intensive analysis and learning, iterative process:

Facilitate FSPs to experiment fast and repeatedly

Recognizing the three factors above, FSPs should get hands-on experience in the sector without risking significant losses. They can best be supported with methodologies for hands-on human centric methods through which they can design simple, feasible experiments and after learning build on it and launch a new wave of experiments.

Support FSPs and technology companies with data on their specific value chain in the specific region

FSPs can use the results of this study to get in-depth knowledge of farming practices and SHFs' behavior and preferences. Training and workshops and sometimes individual coaching may be needed for staff to actively engage with the available data and learn to identify the implications for their FSP/technology company and the value chain to focus on.

Explore a range of loan products with alternative collateral FSPs (with exception of microfinance institutions) only have experience with secured lending secured (with physical collateral)

There is great potential in exploring alternative credit contracts that do not rely on physical collateral, including data-based credit assessment, leasing, and receipt-based collateral including warehouse finance and other inventory-based lending, invoice discounting and buyer/purchase order guarantees. All these options are worth exploring and each FSP may have their own preferences.

Products and services to be explored:

FSPs and technology companies have some preferences for certain products:

Alternative collateral financial products		FSP arguments in favor
1. Digital value chain payments	-	Not financially feasible immediately, but it is a tool to mobilize resources (savings) form the public.
2. Combination digital value chain payments and administrative data credit assessment	+	Digital payments will provide data that can make credit assessment faster and better.
3.Combination digital value chain payments plus detailed self-reported financial transaction records for advanced credit assessment based on both administrative data and self-reported data	+	Full financial picture of clients, including all cash-based payments, will better predict repayment abilities and decide loan size/moment.
4.Leasing	+	Addresses priority from farmers and one of the most secure alternative collaterals. (The leased machines or vehicles serve as collateral)
5.Warehouse receipt finance	+	In several value chains produce is stored and administered well, and this will be a secure alternative collateral.
6.Invoice discounting or factoring*	+	In some value chains, farmers are paid late, which results in farmers lack of liquidity. The opportunity is that the farmer holds a receipt from a buyer, usually a larger entity than the farmer and based on the receipt that can be claimed from the buyer, the FSP or technology company can securely provide short-term credit.

**While this product appeared attractive to the FSPs, there is no confirmation from the traders/buyers or the SHFs themselves that invoice discounting or factoring is a priority financial service. Instead 'merchandize credit' (short term loans using inventory stored as collateral) and inputs on credit would be more desirable supply finance products for the agricultural value chains.*

Product development support mechanism

There is a need for a certificate program on agricultural product development.

Option for the content of a product development certificate program

Training content

The following presents suggestions for the training content of such a certificate program:

Training content	Source
Human Centric Product Development	Ideo human centric product development Kit Project partner product development manual (see Annex)
Data analysis and interpretation for understanding customer desires and fears	Online data course by Acumen Various options in for instance Coursera, MOOC and Udemy
Principles of Leasing	ELFA course, or project partner in-house training materials
Principles of Invoice discounting	Redcliffe course, or project partner in-house training materials Supply chain finance reader by FSD Kenya
Principles of Warehouse receipting	A range of resources on FinDev Gateway and World Bank websites.
Agricultural value chains and how to optimize them	Courses by Rural Finance & Investment Learning Centre. FAO material.

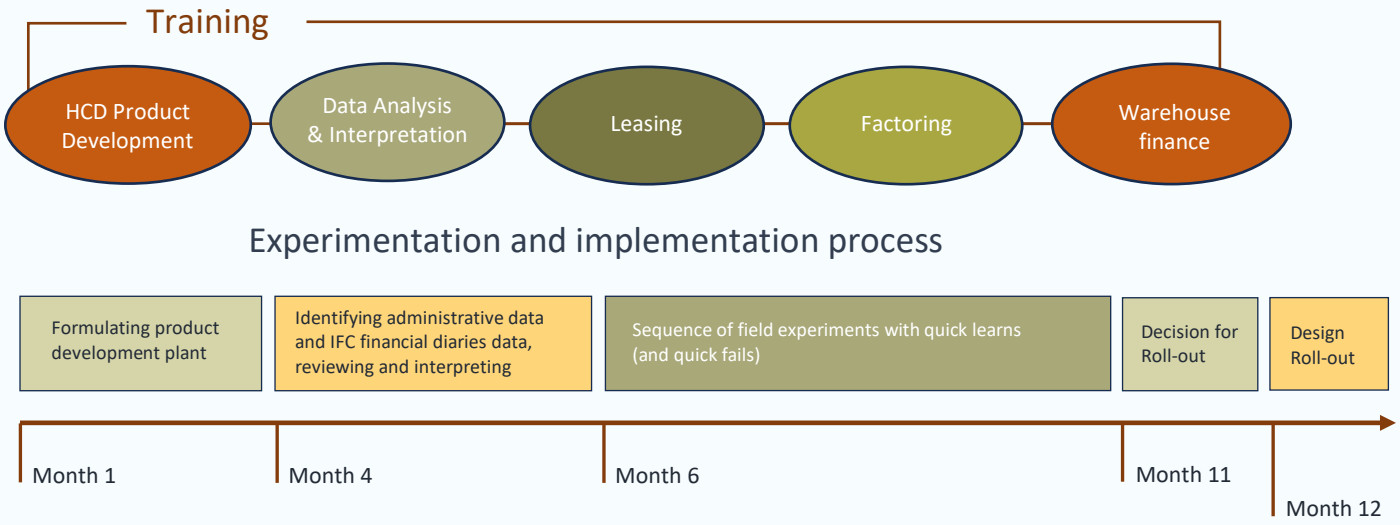
Each training component needs to have a range of practical exercises through which the FSP teams will immediately start on their first cycles of product development.

Coaching process

While the hard skills for product development, delivered through training, are important, the component that will be essential to help FSPs be successful in product design and testing, is coaching their staff in the process of product development. Teams will need coaching in writing an implementation plan, writing up findings, analyzing their findings, finding data, using the data, communicating what the data indicates, etc.

A training of one hour a week for a year where the coach also reviews the training progress of the FSP team would be adequate.

Figure 15: Training components



7 Conclusions and Implications

Buyers, Large traders and Model Farmers

There have been successful experiences piloting digital payments in value chains. The significant conclusion is that SHFs and traders accepted the system, and it brought satisfactory results for those who were near to cash-out infrastructure.

All interviewed actors see the potential of DFS to speed up transactions and facilitate their business. However, traders and model farmers also expressed their fear about security, reliability, and the ease of use, addressing these issues is critical for all levels of users.

FSP

FSPs can be assured that value chain actors will accept DFS as long as there is nearby cash-in/out infrastructure and timely payments take place.

Appropriate loans services are needed to address the different value chains

Model farmers and traders reported to have working capital, overdraft or merchandise loans amounting from Birr 2.5 million to 98 million (US$ 48,000 – US$ 1,800,000) with repayment periods of 3 to 6 months. Interest rates are considered high and not always can the full amount of requested loan be obtained, nor the type of loan such as overdraft or merchandize loans.[27] Traders indicated their interest in merchants loans without additional collateral and lower interest rate loans. Warehouse receipt loans would be equally feasible, where professional warehouses exist. High interest rate loans are also acceptable if repayments are once or twice a year, instead of monthly instalments. Further, they propose an increase of cash-flow based loans that consider business's track record and evidence such as purchase order books, instead of physical collateral only. They also plead for a fairer assessment of the value of collateral.

27 "Merchandise loan is a loan with fixed month tenure provided to finance businesses by taking into collateral merchandise that is readily available, marketable, insurable and with stable price. These loans are advanced while keeping the goods under sole custody of the Bank." (from Zemen Bank website, visited on 23rd August 2022

FSP

FSPs can successfully service the larger value chain actors with loans by using alternative collateral, such as purchase orders (confirmed buyers' quota) and merchandize and if the FSP offers bullet repayments or at least less frequent repayments, the current interest rates can be acceptable. These loans will be for significant amounts of US$ 50,000 upwards.

Increase Insurance products

Traders and model farmers have insurance for their properties because they use the property as collateral for their loans and banks require collaterals to be insured. Otherwise, crop insurance or warehouse insurance are not widely used yet. Several value chain actors mentioned their need for these forms of insurance products.

FSP

FSPs should consider exploring agricultural insurance products as part of their services for the agricultural value chain actors. Particularly warehouse/merchandize insurance could be complementary to warehouse receipt finance and merchandise loans. Such insurance would reduce the risks of loan default.

SHFs

For each value chain, distinct services need to be designed taking into account the specifics of the value chain.

The diaries study demonstrated that SHFs from the three value chains showed a wide range of behavior. Particularly their attitude to digital financial services and their preferences for loans and support was about as different as it can be. Throughout the SHFs data, the most significant segmentation factor is which value chain the respondent belongs to. The differences are larger than the authors have seen in any previous agricultural study.[28]

FSP

FSPs should consider that (digital) financial services rolled out successfully in one value chain, may not be appropriate in another value chain. For each value chain, they should go back to the product development stage and conduct market research and testing phases.

28 The diaries study demonstrated that SHFs from the three value chains showed a wide range of behavior. Particularly their attitude to digital financial services and their preferences for loans and support was about as different as it can be. Throughout the SHFs data, the most significant segmentation factor is which value chain the respondent belongs to. Some examples of the differences across the value chains are that loans sizes in the malt barley value chain access currently are more than ten-fold higher in value than chicken feed SHFs. The focus on the value chain crop or specialization was much lower in the vegetable value chain. The willingness to adopt digital services was much higher for the vegetable value chains.

SHFs that are part of a successful cooperative or farmer association show distinct traits and are more likely adopters of DFS and more attractive potential clients. However, only some cooperatives and farmer associations are successful.

In the study sample, members of these farmer organizations are larger producers, more likely to buy inputs, and more active sellers. It is of course not clear whether there is a causal correlation between membership and performance of the SHFs. There is an indication that there is a significant difference between members of a well-functioning cooperative and those part of a low-performing cooperative.

FSP

FSPs could use cooperatives and farmer associations as channel for serving SHFs. This will help them reach relatively successful and larger SHFs as well as help achieve larger volumes at lower costs. Strengthening lower performing cooperatives and farmer associations will be necessary, particularly technical assistance and management training. Ideally a larger, experienced organization would step into this.

Younger[29] SHFs aged 25-34 are more open-minded and also need more loans and other financial services[30] than older SHFs. Once experiments have been successful with the young SHFs, the other age groups will likely follow.

There are also significant differences in behavior according to age, where younger farmers are having less access to resources, and lower income but more flexibility to take up digital payments and other novel approaches. The differences according to gender in this sample we found to be mild.

FSP

FSPs could use younger SHFs as their entry point into SHF groups. These are more likely early adopters.

SHFs are following a 'mixed livelihood' strategy.

SHFs active in a specific value chain have a range of other income sources, including other agricultural products. This particularly goes for vegetable farmers who had more income from crops like barley and maize than from their vegetables. While this may reduce their professionalism in the specific cash crop, this approach supports SHFs' resilience and helps spread income and risks.

29 This study segments the SHFs by age into four groups: 18-24, 25-34, 35-44 and 45+. The youngest age group, 18-24, is not displaying the same features as the 25-34 group. This may be due to the youngest having little economic options and not yet adopting technology or simply several may still be in education and not yet focusing on farming.
30 The data analysis according to segmentations has not been included due to space constraints. When comparing the data by age segments, there were clear differences with higher willingness to adopt DFS and desire for certain financial services amongst the age group 25-34. The younger age group also show to have less assets, while being more ambitious and interested in investing in their farming.

FSP

When providing loans or other financial services, FSPs should consider their full range of economic activities and recognize the dynamics of their mixed livelihoods.

Few SHFs have access to loans, particularly from formal sources.

The lack of access is a huge impediment to production and if access to loans is linked to using digital finance, adopting digital finance is a major incentive. Ideally, loans will be based on alternative collateral. The most feasible loan products are inputs on credit, leasing of machines and warehouse receipt finance.

FSP

Financial service providers should focus on loans for serving the SHFs, rather than payment services only. These loans need to use alternative collateral as a repayment guarantee mechanism.

SHFs are able and willing to adopt financial services, including DFS.

A significant number of SHFs have a bank-account. However, many are using the account in a limited way, primarily for receiving payments and some for holding part of their savings. They are not using their accounts for bill payments or paying suppliers. SHFs have experience receiving a bank-account if a buyer or another actor chooses that as a payment channel. However, apart from malt barley farmers leaving some of their payments on their account (as passive savings) the farmers do not themselves use these accounts for their financial strategy, not making payments or applying for loans.

While financial service providers experience that SHFs are resistant to using digital payments and are very price sensitive, SHFs prove to be flexible in adopting and using digital payments if there are benefits, such as access to a reliable buyer (GreenPath producers all agreed to use the imposed bank-account), access to loans but particularly access to quality inputs.

FSP

It is insufficient to offer a digital payment method only. FSPs need to offer additional attractions to get SHFs to actively use the channel, for instance basing loan decisions on active DFS usage.

Financial Service Providers

There are several findings which indicate that FSPs are ready for and committed to developing digital financial services. These are:

1. Practically all FSPs have their own digital payment channels and a surprising number of them have more than one channel, typically both a mobile money and mobile banking channel. These investments demonstrate that the FSPs are keen to expand offering DFS.
2. The FSPs and other organizations interviewed mentioned they are highly motivated to start working through digital channels and any engagement with them is likely to fall into fertile soils.
3. The recent regulatory changes have also built confidence amongst FSPs that the future lies in more DFS. Nevertheless, the FSPs are also holding back acting on the new regulations, because they are not yet clear how much of the original regulations will be maintained or dropped, particularly around collateral for loans.

FSP

The right conditions exist for FSPs to now significantly grow their DFS.

While the willingness for new services exists and there is also an awareness that users' needs and preferences should be leading in the product design, the organizations lack skills to develop and pilot new digital products on their own. They need support on the following:

1. These organizations want to listen to clients, but they do not know how to go about this independently. Even if they would have data, they do not have skills in-house to interpret data.
2. It appears that the FSPs do not have experience piloting new products fast and cost-effectively. In the interviews they appear to take a more conventional stance on market research, product development, and product roll-out instead of a faster feedback loop with a sequence of less costly small-scale experiments.

FSP

Financial Service Providers need direct and intensive support developing financial services, ideally in the form of coaching over a period of time rather than short training courses.

Ethiopia has insufficient data available about SHFs and their financial lives

1. There is little to no financial inclusion or financial behavior data available beyond existing administrative data. As compared to countries in the region [31], Ethiopia is poor on financial inclusion data in general and probably even more lacking data on rural areas and farmers. The fact that Ethiopia consists of so many distinct agricultural zones with specific cultures, languages, and farming methods as well as the wide range of crops grown, means that Ethiopia need a huge amount of data before it can serve the various agricultural value chains in an appropriate way.
2. Since (most) banks so far have rarely served SHFs, they do not have access to their own data about SHFs, neither do they have expertise and understanding about their behavior nor about preferred financial products.

F
S
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It is recommended that IFC together with other organizations create a sharing, data driven environment which offers both quality data and segmented data, for all different farming zones, value chains and farming systems. To speed up the access to data on SHFs' financial behavior, it is important that FSPs pool their resources and share findings. Moreover, international organizations could be encouraged to work with a number of FSPs together to centrally offer them data on financial behavior serving multiple needs within one budget. The financial diaries data from this study can be a start for this data sharing.

FSPs have limited skills in product development and at present cannot independently design, test, and pilot appropriate DFS for agricultural value chains.

1. The culture in FSPs towards product development is conventional and few FSPs are able to use either the human centric design or the 'fail-fast' approaches to introducing new products and services. Typically, a product is developed, rolled out and its appropriateness measured after a first loan cycle. This sequence of steps typically takes two years.
2. FSPs currently tend to offer standard products, primarily loans with monthly repayments guaranteed with physical collateral. While FSPs are enthusiastic about starting loan products that use alternative collateral as repayment guarantees, they have limited knowledge on alternative collateral and also lack the expertise to trial such products. Likewise, the FSPs have had little exposure to designing repayment schedules that better match the seasonality and cash-flow situation of SHFs.

31 We refer here to countries like Kenya, Uganda and for instance Rwanda and Tanzania. These countries have Finscope data and in general have more statistical information and research on financial inclusion.

3. While ideally, each value chain would get tailor-made services, many FSPs are not equipped to design products that closely match the specifics of a value chain. Few FSPs have experience in the farming sector and few of their staff have agricultural expertise.

FSPs need technical assistance for building human centric design skills and skills in interpreting and acting on data. They need coaching in conducting innovative, simple, incremental experiments on a continuous basis.

Rather than supporting FSPs in developing specific products that match exactly clients' needs, the FSPs will be best served by gaining in-house skills on human centric design and fast experimentation. This way they will themselves be able to repeatedly go through entire loops of data – interpreting – product ideation – product idea testing – product idea improvement – product trial – further improvement – product piloting – final improvement – product roll-out. If the FSPs are supported light-touch but over an extended period of time, they will be able to start becoming far more responsive to the market and independently be able to manage a continuous flow of consultation with farmers, learning, design, discussions, reflections, redesign, retesting, etc.

FSPs likewise need continuous coaching by data experts before they can become fully data driven. All FSPs expressed in interviews their interest in using data for credit assessment and product development. They also felt that basing decisions on such data would be more efficient and effective than the current collateral-based systems. They all have the desire to get more data and use data in all processes. However, it does not appear that the current staff at FSPs have this level of expertise. It is usually not feasible to get organizations to acquire the data skills they need by simply hiring one or more data experts. To be successful at data, it is necessary for the entire organization to embrace and understand data and to create a data-driven culture.

ANNEXES

1. Kebele survey results
2. Questionnaire_Trader survey
3. Analysis of FINBIT weekly financial data
4. Analysis of FINBIT data, Graphs
5. Insights from Focus Group Discussions with SHFs, model farmers and traders
6. Survey Data Portal

Source: ICARDA

Source: NASA

Annex 1: Kebele survey results - *Chosen kebeles are highlighted in yellow*

Woreda	Kebele	Population	% Share of farmers	Value chain actor	Presence of Coop/union	Availability: Model farmer	Availability: Female HHH	Phone connectivity status	Internet connectivity status	Financial institution presence	Mobile banking user availability	Easiness in reaching area
1. Meki Batu	Dodicha	7717	85.0%	GreenPath & Ethiopian Airlines	Available	50	205	Very good	Good	bank & MFI within 7-9 Km	Available	Very good
	Golba Aluto	4500	26.9%	GreenPath & Ethiopian Airlines	Available	100	220	Very good	Good	bank & MFI within 8 Km	Available	Good
	Haleku	6000	90.0%	GreenPath & Ethiopian Airlines	Available	30		Very good	Good	bank & MFI within 7 Km	Available	Good
	Bekele Girissa	4960	90.0%	GreenPath & Ethiopian Airlines	Available	200	136	Very good	Good	bank & MFI within 3 Km	Available	Good
	Tepho Corroqe	4000	85.0%	GreenPath & Ethiopian Airlines	Available	100		Very good	Good	bank & MFI within 2 Km	Available	Good
	Shubi Gamo			GreenPath & Ethiopian Airlines	Available	30		Very good	Good	bank & MFI within 3 Km	Available	Good
2. Jawi	Work Meda	7620	10.6%	No, sold for ECX	Available	300	63	Bad	Bad	MFI	Available	Bad
	SewaTap	4874	13.1%	No, sold for ECX	Available	260	37	Bad	Bad	MFI	Not Available	Bad
	Deq	5234	13.8%	No, sold for ECX	Available	240	51	Bad	Bad	MFI	Not Available	Bad
	Fendika	12536	22.0%	No, sold for ECX	Available	1300	68	Very good	Good	Banks & MFIs	Available	Very good
	Wenbelase	3674	14.4%	No, sold for ECX	Available	195	19	Bad	Bad	MFI	Not Available	Bad
	Jahimala	4894	15.6%	No, sold for ECX	Available	360	41	Bad	Bad	MFI	Available	Bad
3. Butajira	Misrak Mesqan	5037	11.0%	GreenPath	Available	68	130	Medium	Medium	MFI	Not Available	Bad
	Gidan Borat	8400	13.0%	GreenPath	Not available	34	332	Very bad	Very bad	MFI	Not Available	Bad
	Yetebor	6500	35.0%	GreenPath	Available	50	1000	Good	Good	bank & MFI within 10-13 Km	Available	Very good
	Mihrab Embor	2015	41.0%	GreenPath	Available	10	200	Bad	Bad	MFI	Available	Bad

Annex 1: Kebele survey results *continued*

Woreda	Kebele	Population	% Share of farmers	Value chain actor	Presence of Coop/union	Availability: Model farmer	Availability: Female HHH	Phone connectivity status	Internet connectivity status	Financial institution presence	Mobile banking user availability	Easiness in reaching area
4. Bekoji	KomaKara	8200	95.0%	Heineken, Soufflet & Booltmart	Available	1	70	Very good	Very good	MFI	Not Available	Very good
	Farechu	870	99.0%	Heineken, Soufflet & Booltmart	Available	5	9	Very good	Good	MFI	Not Available	Good
5. Tiyo	Shalla Chabetti	1600	50.0%	Soufflet, Asella Malt Factory & Booltmart	Available	100	150	Very good	Very good	bank & MFI within 10-12 Km	Available	Good
	Bori Chilalo	8900	8.2%	Soufflet, Asella Malt Factory & Booltmart	Available	80	60	Good	Good	bank & MFI within 17 Km	Available	Good
	Dosha	1720	55.2%	Soufflet	Available	206	50	Very good	Very good	bank & MFI within 5 Km	Available	Very good
	Waji Chilalo	5000	16.6%	Soufflet, Asella Malt Factory & Booltmart	Available	190	300	Good	Good	bank & MFI within 17 Km	Available	Good
6. Dangila	Zugda	3500	100.0%	No, sold for ECX	Available	2000	200	Good	Good	MFI	Not Available	Good
	Gedeshita	6000	33.3%	No, sold for ECX	Available	50	30	Good	Good	MFI	Not Available	Good
	Abadira	7337	50.7%	No, sold for ECX	Available	15	105	Bad	Bad	MFI	Not Available	Good

Annex 2: Questionnaire Trader Survey

Question ID	Question	Answer
1	[Q_1] IFC-TRD-010 Name of respondent:	
2	[Q_2] IFC-TRD-020 Mobile no.	
3	[Q_3] IFC-TRD-030 What type of trader are you?	<1> Employee <2> Owner
4	[Q_4] IFC-TRD-040 Who is your employer?	
5	[Q_5] IFC-TRD-050 Name of company/organization:	
6	[Q_6] IFC-TRD-060 Business type:	<1> Sole trader <2> Company
7	[Q_7] IFC-TRD-070 Does your business own trucks?	<1> Yes <2> No
8	[Q_8] IFC-TRD-080 How many trucks?	
9	[Q_9] IFC-TRD-090 How many fulltime drivers as employees?	
10	[Q_10] IFC-TRD-100 Does your business have Storage space?	<1> Yes <2> No
11	[Q_11] IFC-TRD-110 How big is the storage?	
12	[Q_12] IFC-TRD-120 Where is the storage?	
13	IFC-TRD-130 What products do you trade in?	[A_Q_13_1] <1/0> maize [A_Q_13_2] <1/0> soy [A_Q_13_3] <1/0> barley [A_Q_13_4] <1/0> vegetables [A_Q_13_5] <1/0> grains [A_Q_13_6] <1/0> pulses [A_Q_13_7] <1/0> other

Buying crops - Loop 1 crop

Question ID	Question	Answer
14	[cropQ_14] IFC-TRD-140 Where do you buy {0}? (location)	
15	IFC-TRD-150 From what type of seller do you buy {0}?	[crop] <1/0> SHF [crop] <1/0> Model farmers [crop] <1/0> Aggregators [crop] <1/0> Other traders [crop] <1/0> Coop
16	IFC-TRD-160 Do you buy {0} at the farm gate, a market, a collection point?	[crop] <1/0> Farm gate [crop] <1/0> Market [crop] <1/0> Collection point [crop] <1/0> Other (specify)
17	[cropQ_17] IFC-TRD-170 What are the high season months to buy {0} from your suppliers?	<1> መስከረም (September) <2> ጥቅምት (October) <3> ህዳር (November) <4> ታህሳስ (December) <5> ጥር (January) <6> የካቲት (February) <7> መጋቢት (March) <8> ሚያዚያ (April) <9> ግንቦት (May) <10> ሰኔ (June) <11> ሀምሌ (July) <12> ነሐሴ (August) <13> ጳጉሜ

Loop 2 crop

18	[Q_18/Q_18_S] IFC-TRD-180 In high season, do you work on your own or do you work with others within your business?	<1> works alone <2> has employees <3> works with agents <4> Other (specify)
19	IFC-TRD-190 In high season how many suppliers do you buy from per day/week?	
	[T_Q_19_1] per day	
	[T_Q_19_2] per week	

Annex 2: Questionnaire Trader Survey - *continued*

Question ID	Question	Answer
20	IFC-TRD-200 What portion (%) do you buy from what type of suppliers?	
	[T_Q_20_1] Small holder farmer (individual)	
	[T_Q_20_2] Model farmer (who also aggregates)	
	[T_Q_20_3] Aggregator	
	[T_Q_20_4] Medium trader	
	[T_Q_20_5] Coop/Union	
	[T_Q_20_6] other	
21	[Q_21] IFC-TRD-210 Please specify what you mean by "other" in the previous question	
22	[cropQ_22] IFC-TRD-220 In high season: per week how many quintals do you buy {0}?	
23	[cropQ_23] IFC-TRD-230 In mid-season: per week how many quintals do you buy {0}?	
24	[cropQ_24] IFC-TRD-240 In low season: per week how many quintals do you buy {0}?	
25	IFC-TRD-250 What portion (%) of what you buy, do you pay 'when' to your supplier?	
	[T_Q_25_1] immediately	
	[T_Q_25_2] once a day	
	[T_Q_25_3] once a week	
	[T_Q_25_4] once a month	
	[T_Q_25_5] Other	
26	[Q_26] IFC-TRD-260 Please specify what you mean by "other" in the previous question	

Loop 3 crop

Question ID	Question	Answer
27	[cropQ_27] IFC-TRD-270 In high season: per week, how many payments do you make on average, to buy {0}?	
28	[cropQ_28] IFC-TRD-280 In middle season: per week how many payments do you on average make for buying {0}?	
29	[cropQ_29] IFC-TRD-290 In low season: per week how many payments do you on average make for buying {0}?	
30	IFC-TRD-300 In high season; per week, how many payments do you make per type of supplier, per week?	
	[T_Q_30_1] Small holder farmer (individual)	
	[T_Q_30_2] Model farmer (who also aggregates)	
	[T_Q_30_3] Aggregator	
	[T_Q_30_4] Medium trader	
	[T_Q_30_5] Coop/Union	
	[T_Q_30_6] other (specify)	
31	[Q_31] IFC-TRD-310 Please specify what you mean by "other" in the previous question	

Loop 4 crop

Question ID	Question	Answer
32	[cropQ_32] IFC-TRD-320 In high season: per week, what would the value of your payments be, for buying {0}?	
33	[cropQ_33] IFC-TRD-330 In middle season: per week, what would the value of your payments be, for buying {0}?	
34	[cropQ_34] IFC-TRD-340 In low season: per week, what would the value of your payments be, for buying {0}?	

Annex 2: Questionnaire Trader Survey - *continued*

35	IFC-TRD-350 In high season: what is the share of produce that you buy from the different types of suppliers? How many quintals from SHF compared to aggregator compared to medium traders, etc.	
	[T_Q_35_1] Small holder farmer (individual)	
	[T_Q_35_2] Model farmer (who also aggregates)	
	[T_Q_35_3] Aggregator	
	[T_Q_35_4] Medium trader	
	[T_Q_35_5] Coop/Union	
	[T_Q_35_6] other (specify)	
36	[Q_36] IFC-TRD-360 Please specify what you mean by "other" in the previous question	
37	IFC-TRD-370 In what form do you pay these suppliers?	
	[T_Q_37_1] Small holder farmer (individual)	<1> No connection with the supplier <2> Direct cash <3> Cheques <4> Bank account classical (with bank book) <5> Bank account (electronic bank transfer) <6> MFI account <7> Mobile money wallet (not linked to a bank) <8> Mobile money account (linked to bank) <9> In kind <10> Other (specify)
	[T_Q_37_2] Model farmer (who also aggregates)	<1> No connection with the supplier <2> Direct cash <3> Cheques <4> Bank account classical (with bank book) <5> Bank account (electronic bank transfer) <6> MFI account <7> Mobile money wallet (not linked to a bank) <8> Mobile money account (linked to bank) <9> In kind <10> Other (specify)

	[T_Q_37_3] Aggregator	<1> No connection with the supplier <2> Direct cash <3> Cheques <4> Bank account classical (with bank book) <5> Bank account (electronic bank transfer) <6> MFI account <7> Mobile money wallet (not linked to a bank) <8> Mobile money account (linked to bank) <9> In kind <10> Other (specify)
	[T_Q_37_4] Medium trader	<1> No connection with the supplier <2> Direct cash <3> Cheques <4> Bank account classical (with bank book) <5> Bank account (electronic bank transfer) <6> MFI account <7> Mobile money wallet (not linked to a bank) <8> Mobile money account (linked to bank) <9> In kind <10> Other (specify)
	[T_Q_37_5] Coop/Union	<1> No connection with the supplier <2> Direct cash <3> Cheques <4> Bank account classical (with bank book) <5> Bank account (electronic bank transfer) <6> MFI account <7> Mobile money wallet (not linked to a bank) <8> Mobile money account (linked to bank) <9> In kind <10> Other (specify)
	[T_Q_37_6] other (specify)	<1> No connection with the supplier <2> Direct cash <3> Cheques <4> Bank account classical (with bank book) <5> Bank account (electronic bank transfer) <6> MFI account <7> Mobile money wallet (not linked to a bank) <8> Mobile money account (linked to bank) <9> In kind <10> Other (specify)

Annex 2: Questionnaire Trader Survey - *continued*

38	[Q_38] IFC-TRD-380 Please specify what you mean by "other" in the previous question	
39	IFC-TRD-390 What % of all your payments (not value) do you make in which form?	
	[T_Q_39_1] Direct cash	
	[T_Q_39_2] Cheques	
	[T_Q_39_3] Bank account classical (with bank book)	
	[T_Q_39_4] Bank account (electronic bank transfer)	
	[T_Q_39_5] MFI account	
	[T_Q_39_6] Mobile money wallet (not linked to a bank)	
	[T_Q_39_7] Mobile money account (linked to bank)	
	[T_Q_39_8] In kind	
	[T_Q_39_9] Other (specify)	
40	[Q_40] IFC-TRD-400 Please specify what you mean by "other" in the previous question	
41	[Q_41] IFC-TRD-410 What is the approximate value of your purchases in a year?	
42	[Q_42] IFC-TRD-420 Which financial provider/bank does the business use mostly? (Name)	
43	IFC-TRD-430 Do you provide your suppliers with advance payments - linked to you buying their produce?	[A_Q_43_1] <1/0> No [A_Q_43_2] <1/0> Yes, the small farmers [A_Q_43_3] <1/0> Yes, the smaller traders [A_Q_43_4] <1/0> Other (specify)

Loop 5 crop

Question ID	Question	Answer
44	IFC-TRD-440 How much in total per year for {0} - separate per type of supplier?	
	[cropT_Q_44_1] The small farmers	
	[cropT_Q_44_2] The smaller traders	
	[cropT_Q_44_3] {0}	

Question ID	Question	Answer
45	[Q_45/Q_45_S] IFC-TRD-450 How do your suppliers repay the advance you give?	<1> The advance is settled with the first delivery of goods <2> The advance is settled in cash, at an agreed time <3> Other (specify)
46	[Q_46] IFC-TRD-460 Do you provide your suppliers with advanced inputs (in kind) - linked to you buying their produce?	<1> Yes <2> No
47	[Q_47] IFC-TRD-470 How much is it worth, in total per year?	
48	[Q_48/Q_48_S] IFC-TRD-480 How do your suppliers repay the value of the advanced inputs that you give them?	<1> The value of the advanced inputs, is settled with the first delivery of goods <2> The value of the advanced inputs, is settled at an agreed time <3> Other (specify)
49	[Q_49] IFC-TRD-490 You mentioned that you have storage, does the produce you store in there always belong to you? (You have paid for it)?	<1> Yes <2> No
50	IFC-TRD-500 Who else stores produce in your storage? (that is owned by others)?	[A_Q_50_1] <1/0> Suppliers [A_Q_50_2] <1/0> Other traders [A_Q_50_3] <1/0> Other (specify)
51	[Q_51/Q_51_S] IFC-TRD-510 How do these 'others' pay for using your storage?	<1> They pay a fee <2> Other (specify)
52	[Q_52] IFC-TRD-520 Do suppliers store produce in your storage (and it remains their produce)?	<1> Yes <2> No
53	[Q_53/Q_53_S] IFC-TRD-530 How do they pay for the storage?	<1> they only sell to me (they od not pay for storage) <2> they pay a fixed fee for storage <3> Other (specify)

Loop 6 crop

Question ID	Question	Answer
54	[cropQ_54/cropQ_54_S] IFC-TRD-540 You mentioned that you have trucks, what do you use the trucks for {0}?	<1> Transport gets produce from my supplier and brings to my storage (supplier has no transport; I pay for transport) <2> Transport of the produce to my buyers (transport price is included in the selling price) <3> My trucks are not used for this VC crops <4> Other (specify)

Annex 2: Questionnaire Trader Survey - *continued*

Question ID	Question	Answer
55	IFC-TRD-550 How many buyers are you selling to?	
	[T_Q_55_1] bigger trader(s)	
	[T_Q_55_2] agent(s) on behalf of a large trader	
	[T_Q_55_3] employees of a processor(s)	
	[T_Q_55_4] other (specify)	
56	[Q_56] IFC-TRD-560 Please specify what you mean by "other" in the previous question	
57	IFC-TRD-570 What is the share of your total product bought by your main buyers?	
	[T_Q_57_1] {1}	
	[T_Q_57_2] {2}	
	[T_Q_57_3] {3}	
	[T_Q_57_4] {4}	
58	[Q_58] IFC-TRD-580 Do you have contracts with buyers?	<1> Yes <2> No
59	[Q_59] IFC-TRD-590 What is described in the contract?	
60	[Q_60] IFC-TRD-600 Is price mentioned in the contract?	<1> Yes <2> No
61	[Q_61] IFC-TRD-610 How is the price set?	
62	[Q_62] IFC-TRD-620 Is there a minimum quantity fixed in the contract?	<1> Yes <2> No
63	[Q_63] IFC-TRD-630 How much is it?	
64	[Q_64] IFC-TRD-640 Is the selling season the same as the buying season?	<1> Yes <2> No
65	[Q_65] IFC-TRD-650 What other months are high selling months?	<1> መስከረም (September) <2> ጥቅምት (October) <3> ህዳር (November) <4> ታህሳስ (December) <5> ጥር (January) <6> የካቲት (February) <7> መጋቢት (March) <8> ሚያዚያ (April) <9> ግንቦት (May) <10> ሰኔ (June) <11> ሀምሌ (July) <12> ነሐሴ (August) <13> ጳጉሜ

66	[Q_66] IFC-TRD-660 How long do you store the produce in your storage, in general before reselling?	
67	[Q_67] IFC-TRD-670 Do you get advance(s) from buyers?	<1> Yes <2> No
68	[Q_68] IFC-TRD-680 How much per year?	
69	[Q_69/Q_69_S] IFC-TRD-690 How often is it disbursed?	<1> all at once at planting time of season <2> weekly <3> monthly <4> other (specify)
70	IFC-TRD-700 How do you receive advance payments made by buyers? (cash/bank transfer/cheque etc) and what is the % per payment form?	
	[T_Q_70_1] Direct cash	
	[T_Q_70_2] Cheques	
	[T_Q_70_3] Bank account classical (with bank book)	
	[T_Q_70_4] Bank account (electronic bank transfer)	
	[T_Q_70_5] MFI account	
	[T_Q_70_6] Mobile money wallet (not linked to a bank)	
	[T_Q_70_7] Mobile money account (linked to bank)	
	[T_Q_70_8] In kind	
	[T_Q_70_9] Other (specify)	
71	[Q_71] IFC-TRD-710 Please specify what you mean by "other" in the previous question	
72	[Q_72] IFC-TRD-720 Which financial provider does the buyer use for the advance payment? (Name)	
73	IFC-TRD-730 How do you receive payments from your buyers when you sell the produce? (cash/bank transfer/cheque, etc.) and what is the % per payment form?	
	[T_Q_73_1] Direct cash	
	[T_Q_73_2] Cheques	
	[T_Q_73_3] Bank account classical (with bank book)	
	[T_Q_73_4] Bank account (electronic bank transfer)	
	[T_Q_73_5] MFI account	

Annex 2: Questionnaire Trader Survey - *continued*

73	IFC-TRD-730 How do you receive payments from your buyers when you sell the produce? (cash/bank transfer/cheque, etc.) and what is the % per payment form?	
	[T_Q_73_1] Direct cash	
	[T_Q_73_2] Cheques	
	[T_Q_73_3] Bank account classical (with bank book)	
	[T_Q_73_4] Bank account (electronic bank transfer)	
	[T_Q_73_5] MFI account	
	[T_Q_73_6] Mobile money wallet (not linked to a bank)	
	[T_Q_73_7] Mobile money account (linked to bank)	
	[T_Q_73_8] In kind	
	[T_Q_73_9] Other (specify)	
74	[Q_74] IFC-TRD-740 Please specify what you mean by "other" in the previous question	
75	[Q_75] IFC-TRD-750 Which financial provider/bank the business use mostly? (Name)	
76	IFC-TRD-760 How fast do you receive payments from a buyer when you sell the produce? And what is the % that you receive it this way	
	[T_Q_76_1] immediately	
	[T_Q_76_2] once a day	
	[T_Q_76_3] once a week	
	[T_Q_76_4] once a month	
	[T_Q_76_5] Other (specify)	
77	[Q_77] IFC-TRD-770 Please specify what you mean by "other" in the previous question	

Loop 7 crop

Question ID	Question	Answer
78	[cropQ_78] IFC-TRD-780 In high season: per week how many payments do you on average receive for selling {0}?	
79	[cropQ_79] IFC-TRD-790 In middle season: per week how many payments do you on average receive for selling {0}?	

80	[cropQ_80] IFC-TRD-800 In low season: per week how many payments do you on average receive for selling {0}?	
81	[cropQ_81] IFC-TRD-810 In high season: per week what would the value be of the payments you receive approximately, for selling {0}?	
82	[cropQ_82] IFC-TRD-820 In middle season: per week what would the value be of the payments you receive approximately, for selling {0}?	
83	[cropQ_83] IFC-TRD-830 In low season: per week what would the value be of the payments you receive approximately, for selling {0}?	
84	IFC-TRD-840 Where is the produce sold?	[A_Q_84_1] <1/0> at your premisses (or your storage) [A_Q_84_2] <1/0> at the buyers premisses [A_Q_84_3] <1/0> market [A_Q_84_4] <1/0> Other (specify)

Challenges and DPS

Question ID	Question	Answer
85	IFC-TRD-850 What are the challenges that you face using different payment channels that you use? For each payment channel	
	[T_Q_85_1] Direct cash	<1> limit on number of transfers per day <2> limit on value of transfers per day <3> delay in transfers due to FSP <4> delay in transfers due to connectivity <5> delay due to not having time to go to the bank <6> I do not use this channel
	[T_Q_85_2] Cheques	<1> limit on number of transfers per day <2> limit on value of transfers per day <3> delay in transfers due to FSP <4> delay in transfers due to connectivity <5> delay due to not having time to go to the bank <6> I do not use this channel
	[T_Q_85_3] Bank account classical (with bank book)	<1> limit on number of transfers per day <2> limit on value of transfers per day <3> delay in transfers due to FSP <4> delay in transfers due to connectivity <5> delay due to not having time to go to the bank <6> I do not use this channel
	[T_Q_85_4] Bank account (electronic bank transfer)	<1> limit on number of transfers per day <2> limit on value of transfers per day <3> delay in transfers due to FSP <4> delay in transfers due to connectivity <5> delay due to not having time to go to the bank <6> I do not use this channel

Annex 2: Questionnaire Trader Survey - *continued*

	[T_Q_85_5] MFI account	<1> limit on number of transfers per day <2> limit on value of transfers per day <3> delay in transfers due to FSP <4> delay in transfers due to connectivity <5> delay due to not having time to go to the bank <6> I do not use this channel
	[T_Q_85_6] Mobile money wallet (not linked to a bank)	<1> limit on number of transfers per day <2> limit on value of transfers per day <3> delay in transfers due to FSP <4> delay in transfers due to connectivity <5> delay due to not having time to go to the bank <6> I do not use this channel
	[T_Q_85_7] Mobile money account (linked to bank)	<1> limit on number of transfers per day <2> limit on value of transfers per day <3> delay in transfers due to FSP <4> delay in transfers due to connectivity <5> delay due to not having time to go to the bank <6> I do not use this channel
	[T_Q_85_8] In kind	<1> limit on number of transfers per day <2> limit on value of transfers per day <3> delay in transfers due to FSP <4> delay in transfers due to connectivity <5> delay due to not having time to go to the bank <6> I do not use this channel
86	[Q_86] IFC-TRD-860 Do you use digital payment services (DPS)?	<1> Yes <2> No
87	[Q_87] IFC-TRD-870 Which one?	
88	[Q_88/Q_88_S] IFC-TRD-880 Why not	<1> Not sure about security, <2> It is costly <3> No trust in the system <4> Internet is not stable <5> Phone problems <6> No knowledge to use it <7> No (or far away) cash in/out centre <8> Other (specify)
89	[Q_89] IFC-TRD-890 If your buyers would be using DPS, would you be interested to use it as well?	<1> Yes <2> No

90	[Q_90] IFC-TRD-900 What support would you need to make the transition easier for you?	
91	[Q_91] IFC-TRD-910 Would your suppliers be interested in using DPS, if you would use it?	<1> Yes <2> No
92	[Q_92] IFC-TRD-920 What support would you need to make the transition easier for your suppliers?	
93	[Q_93/Q_93_S] IFC-TRD-930 What could be the advantage of using DPS over cash?	<1> Security <2> Privacy, <3> Speed when making or receiving payments <4> Other (specify)

Loan and Insurance

Question ID	Question	Answer
94	[Q_94] IFC-TRD-940 Have you taken loan(s) in the past year?	<1> Yes <2> No
95	[Q_95] IFC-TRD-950 How many loans, in the past year?	
96	[Q_96] IFC-TRD-960 From which FSP?	
97	[Q_97] IFC-TRD-970 How much, in the past year?	
98	[Q_98] IFC-TRD-980 What is the Repayment schedule?	
99	[Q_99/Q_99_S] IFC-TRD-990 What type of loan does your business need?	<1> working capital <2> investment <3> Other (specify)
100	[Q_100] IFC-TRD-1000 Are you able to get such types of loans?	<1> Yes <2> No
101	[Q_101/Q_101_S] IFC-TRD-1010 What are the challenges to get a loan?	<1> lacking the right types of business loans <2> lacking collateral <3> lacking the right paperwork <4> lacking reasonable interest % <5> lacking reasonable repayment terms <6> Other (specify)
102	[Q_102] IFC-TRD-1020 What types of insurance does your business need?	
103	[Q_103] IFC-TRD-1030 Have you taken insurance for your business in the past year?	<1> Yes <2> No

Annex 2: Questionnaire Trader Survey - *continued*

104	[Q_104] IFC-TRD-1040 Do you as a business get the insurance(s) that meet your needs? What are the challenges?	
105	[Q_105] IFC-TRD-1050 In general what financial product features you wish to see in relation to payment, loan and insurance?	
106	[Q_106/Q_106_S] IFC-TRD-1060 What are the biggest risks that they face?	<1> Theft <2> Not meeting the quota, <3> Price movements <4> Other (specify)

GPS

Question ID	Question	Answer
107	Next you will capture the location of the place you are completing this survey. Please turn your GPS ON!!	
108	GPS captured until now: {0}	
109	GPS coordinates were recorded: Long: {0} Lat: {1} You can now safely finish the survey.	

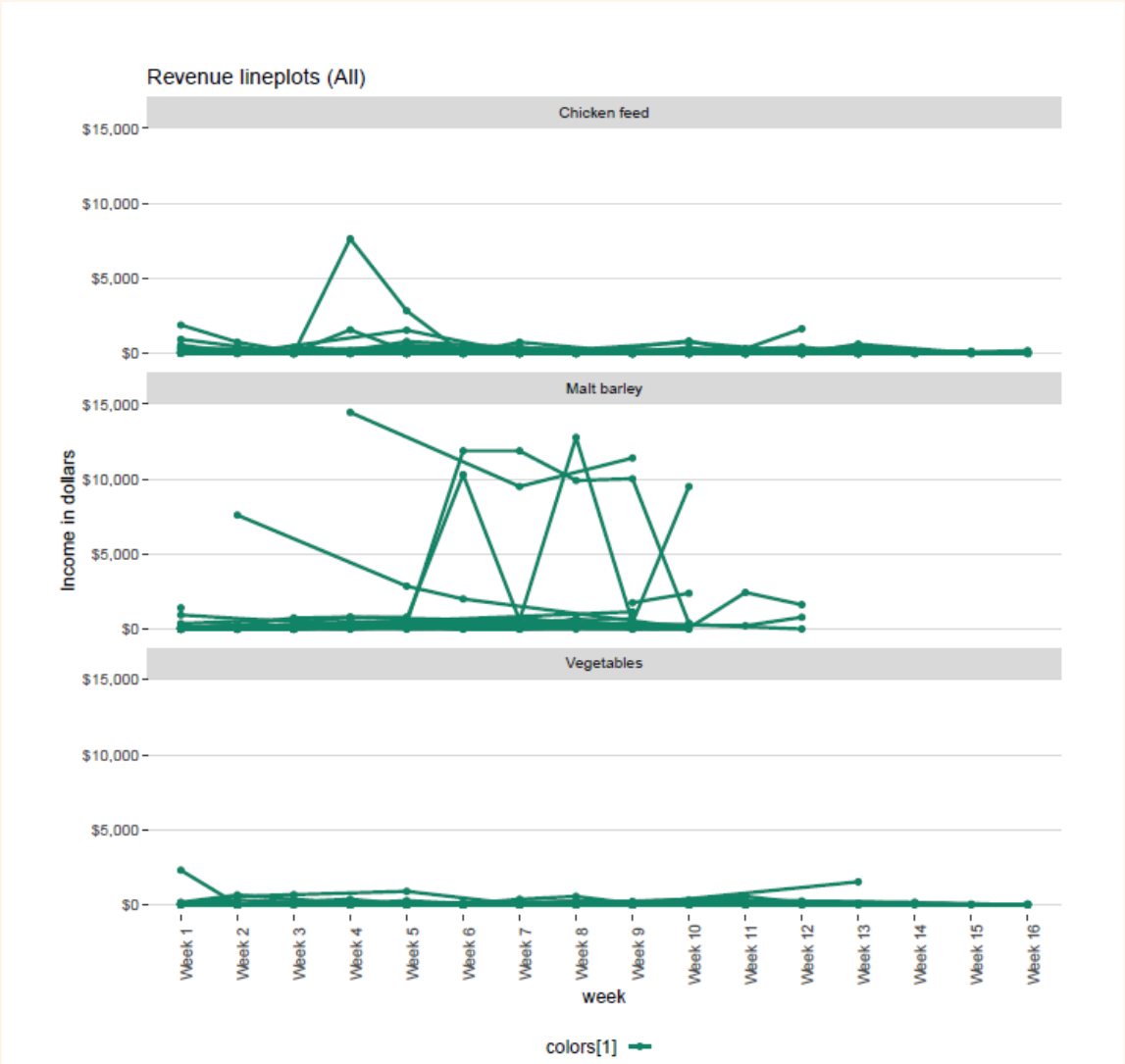
Source: ICARDA

Annex 3: Analysis of FINBIT weekly financial data

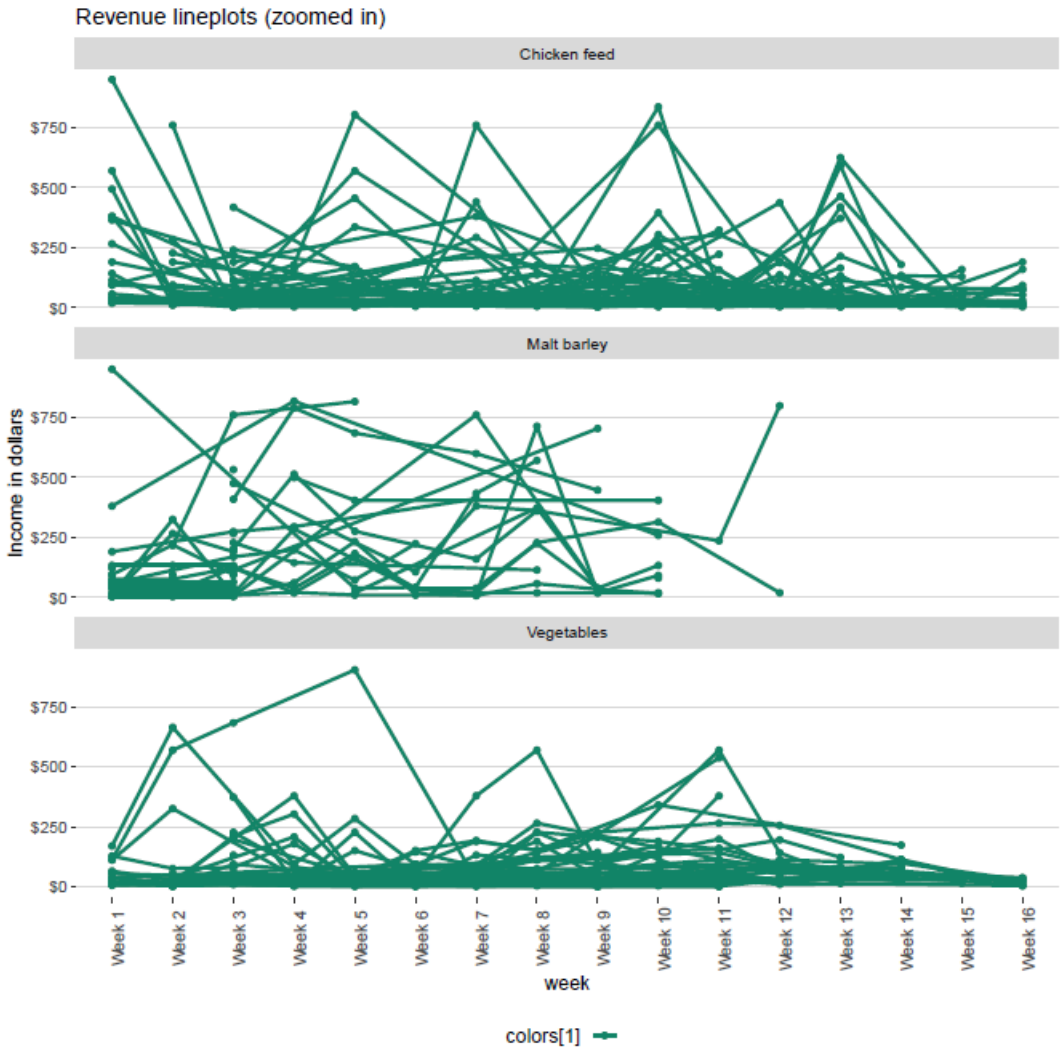
1. Income

There were some variations in income particularly for the vegetable and chicken value chains but less from the Malt value chain. Most of the firms for each value chain have similar behavior with very few standing out.

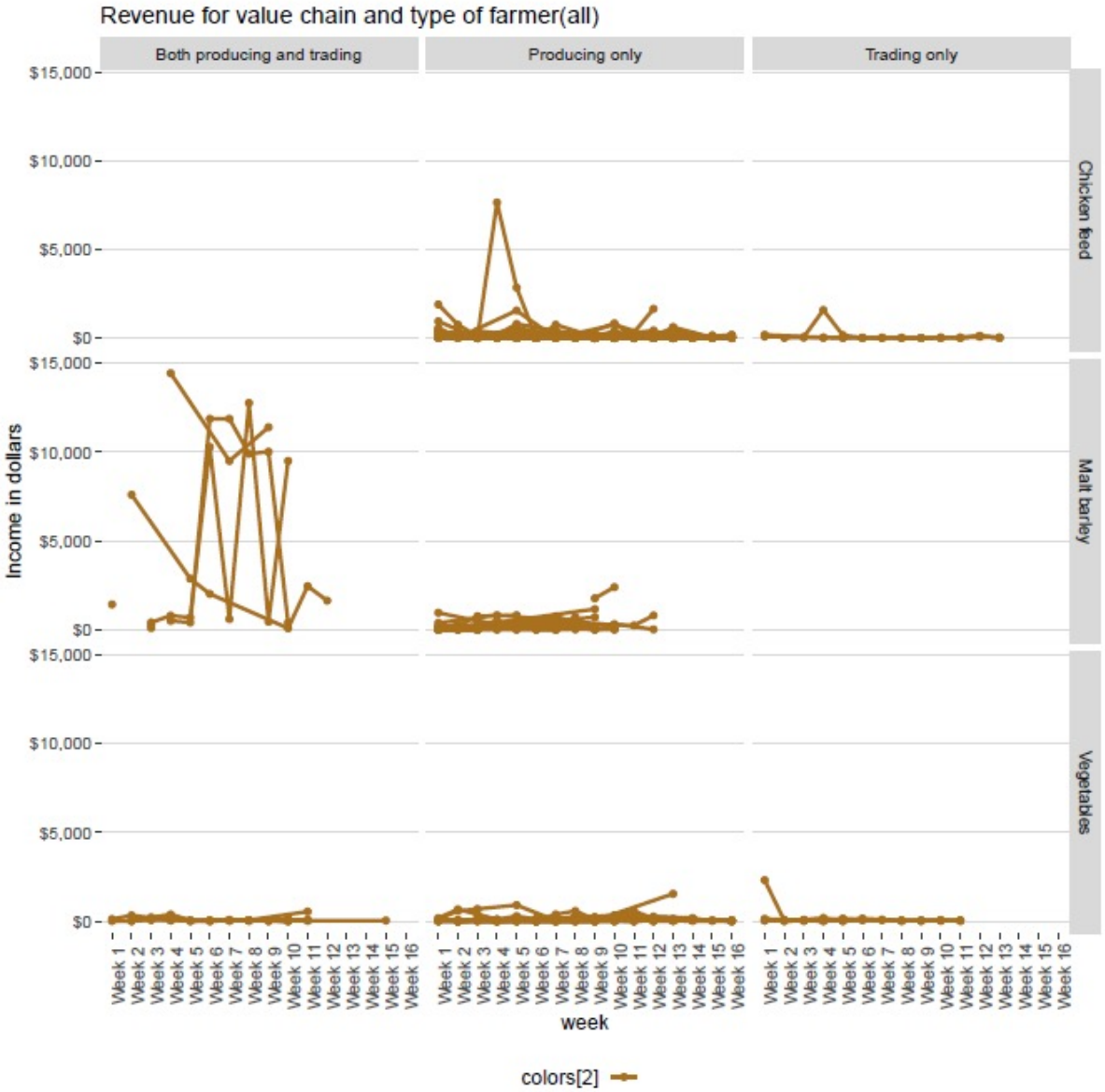
1.1 Revenue



Annex 3: Analysis of FINBIT weekly financial data - *continued*



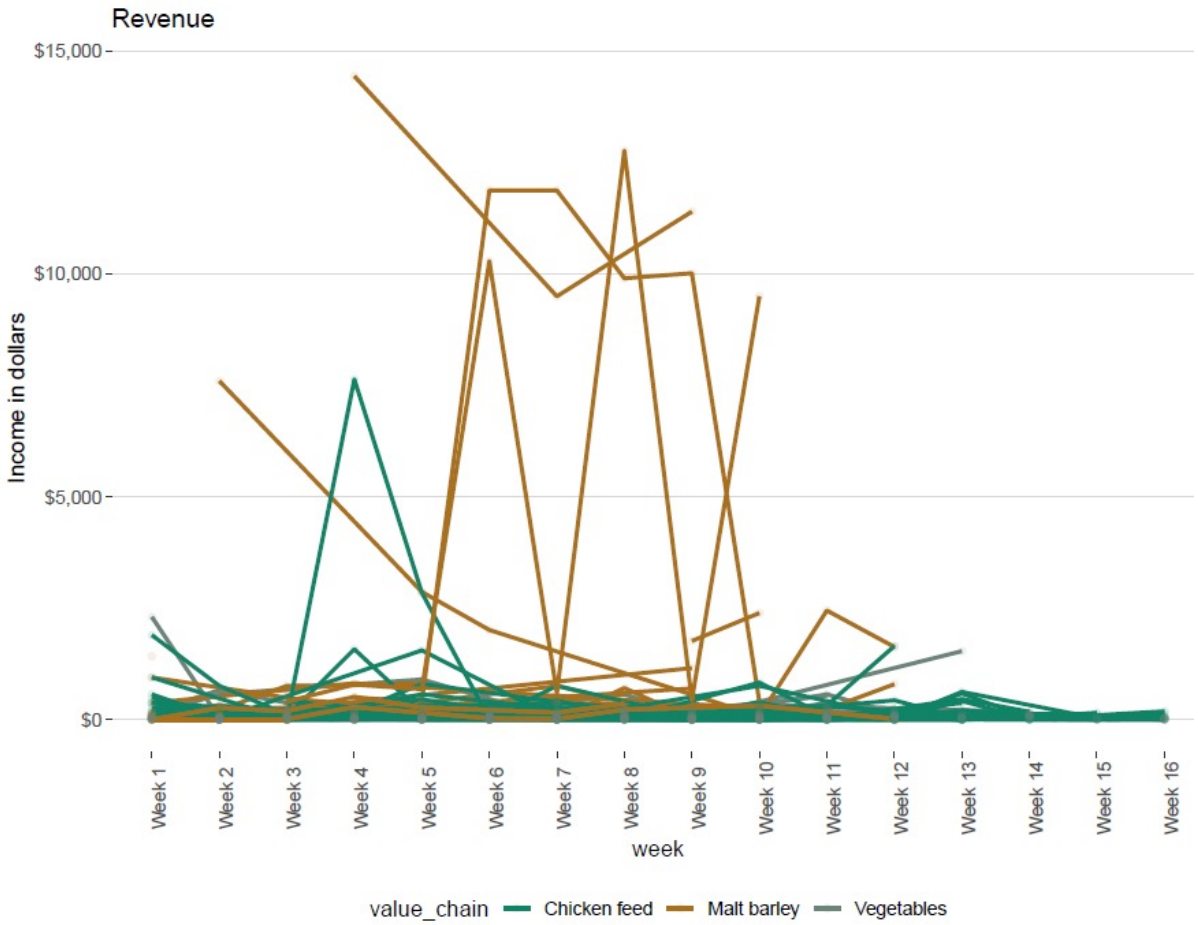
1.2 Revenue per value chain and type of respondents



Annex 3: Analysis of FINBIT weekly financial data - *continued*

At the beginning of the study, there was high income from the malt value chain, but this subsided over time. The graphs below suggest also high costs that went with the high incomes as well.

1.3 Revenue per week



2. Income sources

Agriculture and livestock were the main income sources for all the value chains

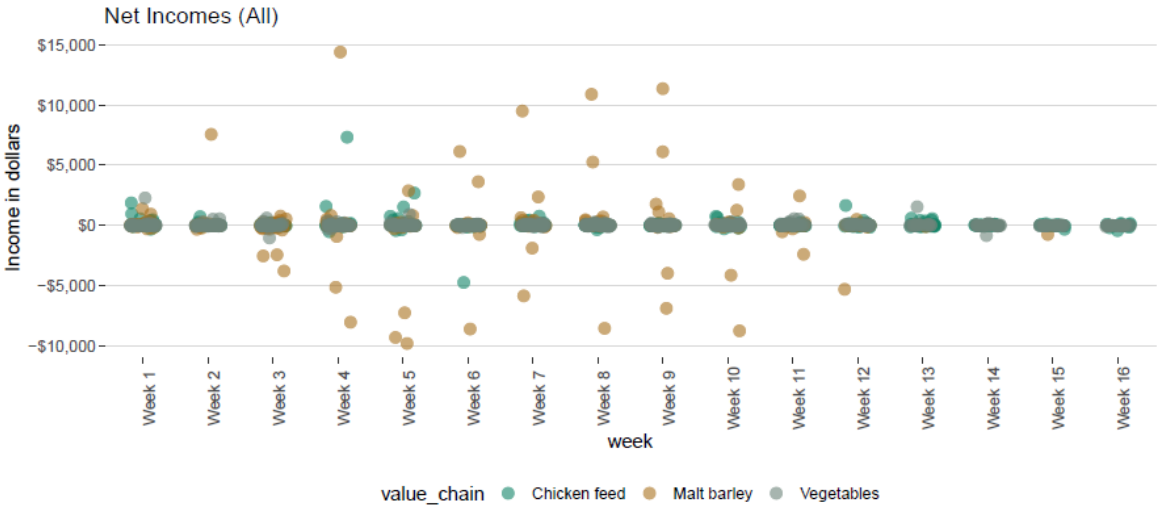
Income source sub-type	Chicken feed	Malt barley	Vegetables
Agriculture	33.3%	40.3%	30.2%
Cash crop sales	-	0.8%	5.6%
Casual Labour	4.3%	-	4.0%
Employment at small business (not formal)	0.7%	-	-
Formal employment (registered official company)	2.2%	1.6%	3.2%
From other family members	4.3%	0.8%	1.6%
From Spouse	2.2%	-	1.6%
Horticulture	-	3.2%	15.1%
Livestock	27.5%	28.2%	22.2%
Livestock/meat animal products sales	-	0.8%	0.8%
Manufacturing	0.7%	-	-
Other business	0.7%	2.4%	2.4%
Other employment	1.4%	1.6%	4.0%
Other non-work Income	10.1%	1.6%	0.8%
Receive gifts (e.g. church, aid organisation, family, inheritance, etc)	-	-	0.8%
Renting out rooms, vehicles, machines, etc	-	3.2%	-
Restaurant/bar/coffee place/bakery	-	0.8%	-
Retail Sales	-	0.8%	-
Selling valuable items	0.7%	-	0.8%
Service business	2.2%	6.5%	3.2%
Trading	7.2%	7.3%	3.2%
Work on other people's farms (Farm labour)	2.2%	-	0.8%
Total	100.0%	100.0%	100.0%

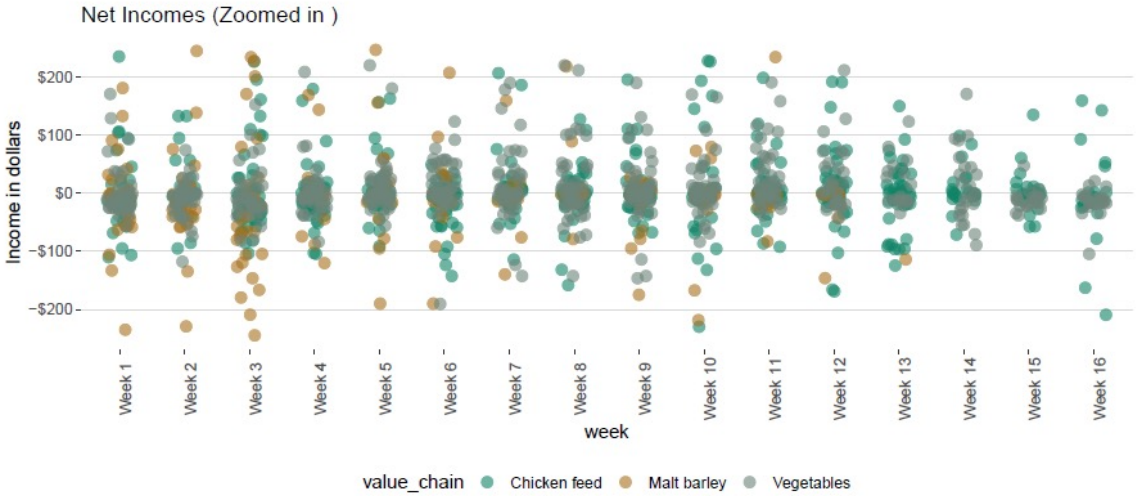
Annex 3: Analysis of FINBIT weekly financial data - *continued*

Income source sub-type	Both producing and trading	Producing only	Trading only
Agriculture	31.0%	36.5%	5.9%
Cash crop sales	9.5%	0.3%	17.6%
Casual Labour	-	3.3%	-
Employment at small business (not formal)	-	0.3%	-
Formal employment (registered official company)	-	2.7%	-
From other family members	-	2.7%	-
From Spouse	-	1.5%	-
Horticulture	9.5%	4.9%	17.6%
Livestock	26.2%	26.7%	11.8%
Livestock/meat animal products sales	-	0.3%	5.9%
Manufacturing	-	0.3%	-
Other business	-	1.8%	5.9%
Other employment	-	2.7%	-
Other non-work Income	-	5.2%	-
Receive gifts (e.g. church, aid organisation, family, inheritance, etc)	-	0.3%	-
Renting out rooms, vehicles, machines, etc	2.4%	0.9%	-
Restaurant/bar/coffee place/bakery	-	0.3%	-
Retail Sales	-	0.3%	-
Selling valuable items	-	0.6%	-
Service business	4.8%	3.6%	5.9%
Trading	16.7%	3.3%	29.4%
Work on other people's farms (Farm labour)	-	1.2%	-
Total	100.0%	100.0%	100.0%

2.1 Net Income

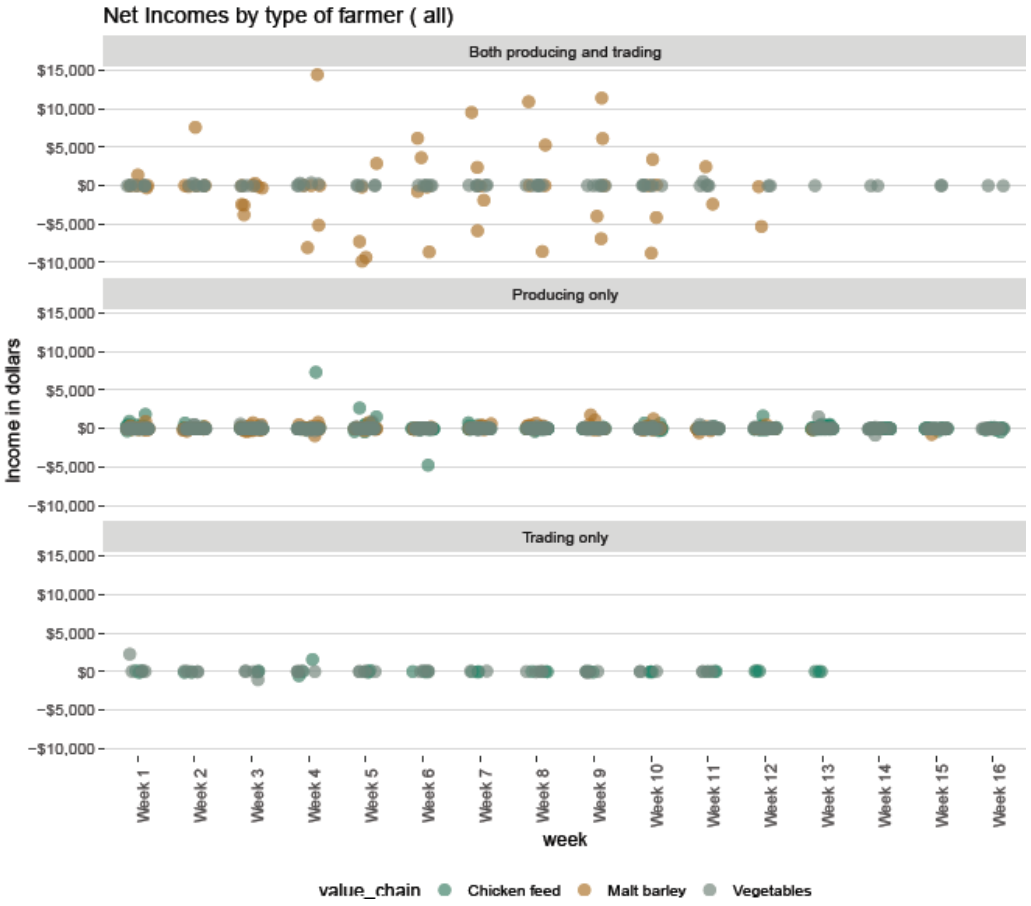
The average behavior is that the majority of firms have a stable net income that lies between $100 and -$100,malt barley seem more spread out than chicken feed and vegetables (their income is more uncertain) particularly week 1 - 3. Chicken feeds and vegetable have more stable income week to week.

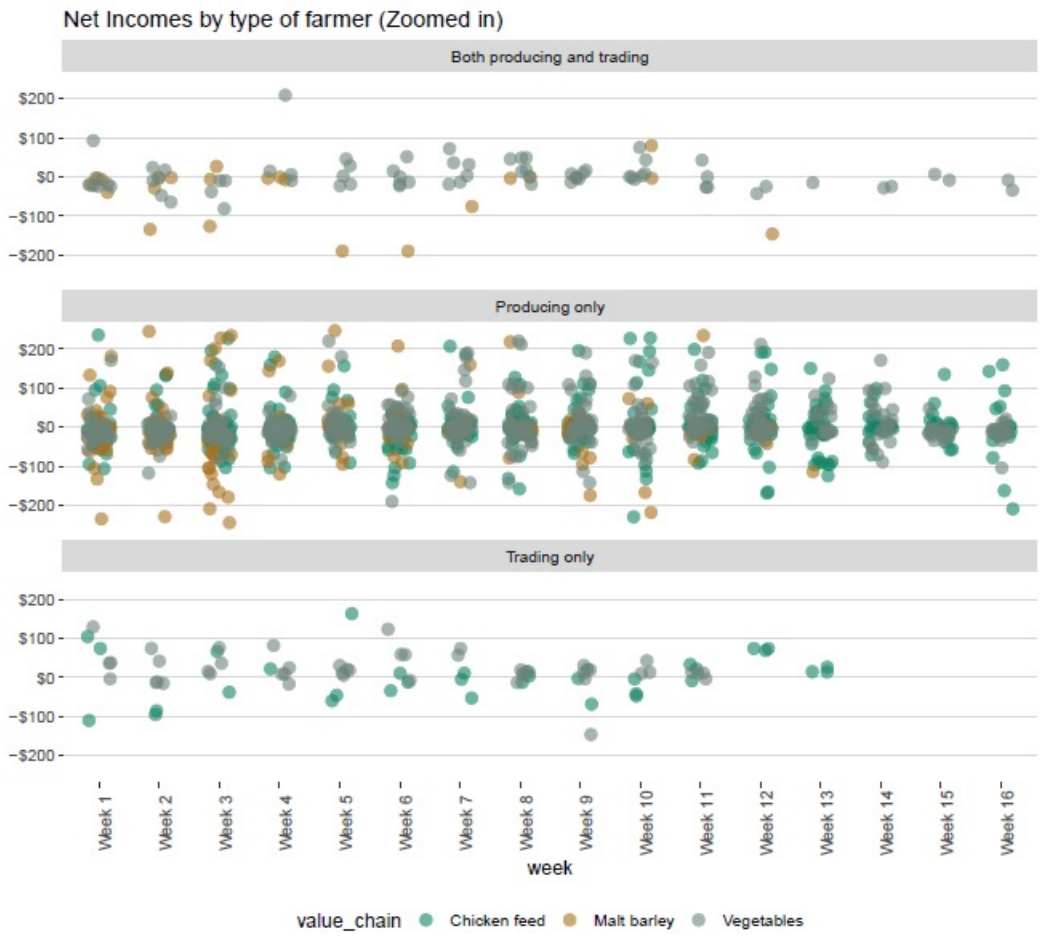

Net Incomes (All)
$15,000
$10,000
$5,000
$0
−$5,000
−$10,000
Income in dollars
Week 1
Week 2
Week 3
Week 4
Week 5
Week 6
Week 7
Week 8
Week 9
Week 10
Week 11
Week 12
Week 13
Week 14
Week 15
Week 16
week
value_chain
Chicken feed
Malt barley
Vegetables


Net Incomes (Zoomed in)
$200
$100
$0
−$100
−$200
Income in dollars
Week 1
Week 2
Week 3
Week 4
Week 5
Week 6
Week 7
Week 8
Week 9
Week 10
Week 11
Week 12
Week 13
Week 14
Week 15
Week 16
week
value_chain
Chicken feed
Malt barley
Vegetables

Annex 3: Analysis of FINBIT weekly financial data - *continued*

2.2 Net Income per type of resident

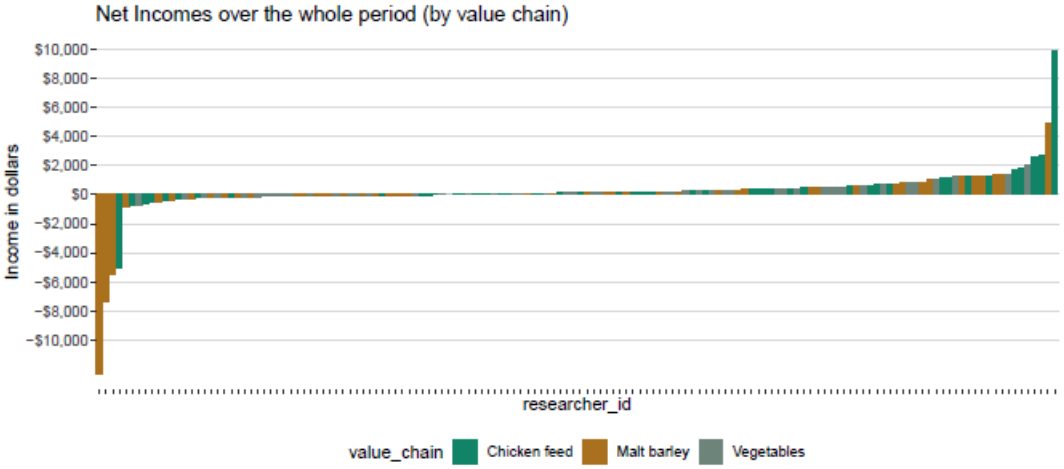


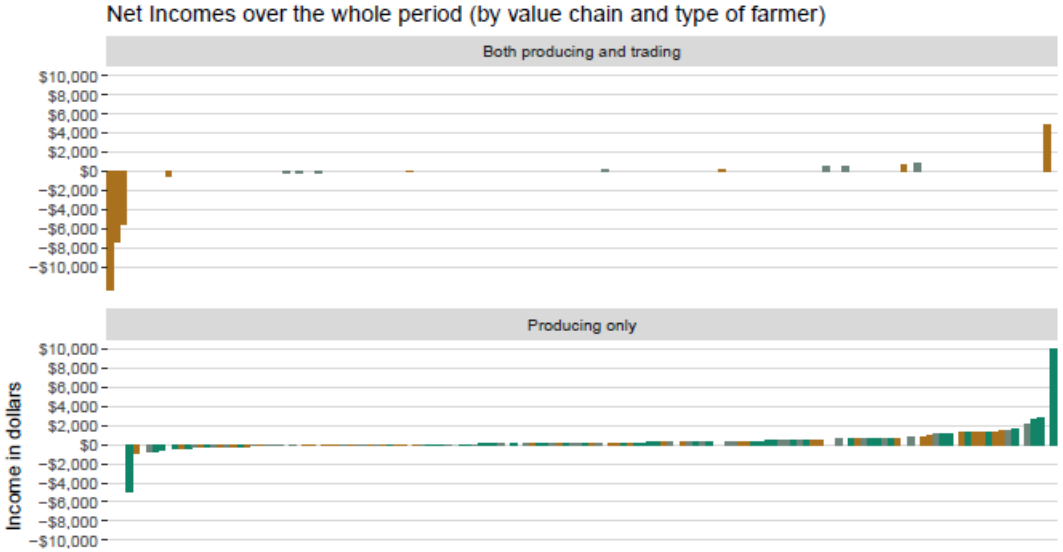


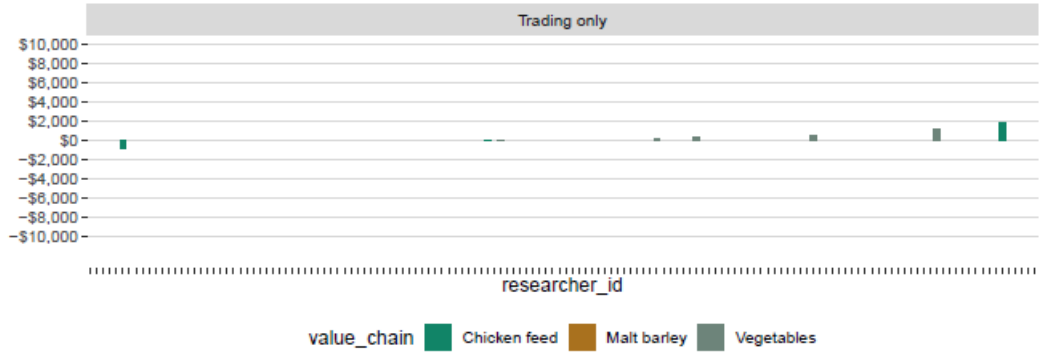
There is a spread between firms that make profit from those that made a net losses. This could be due to the study period being short so it may not have captured all the incomes particularly for Malt barley. That's why there are more malt farmers with negative net incomes, but the positive net incomes have all value chains evenly spread. Another observation is that most respondents broke even during the period of study.

Annex 3: Analysis of FINBIT weekly financial data - *continued*

2.3 Net income over 12 weeks



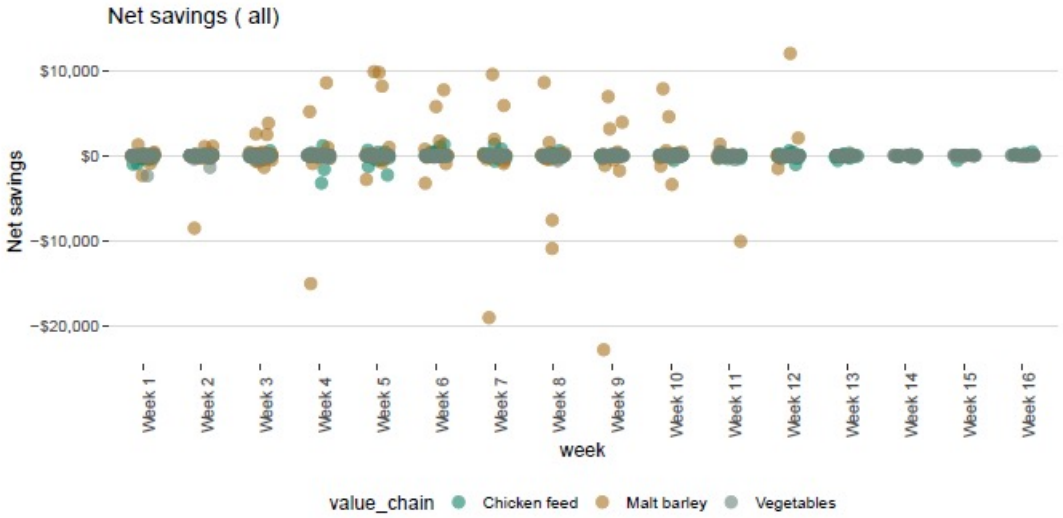




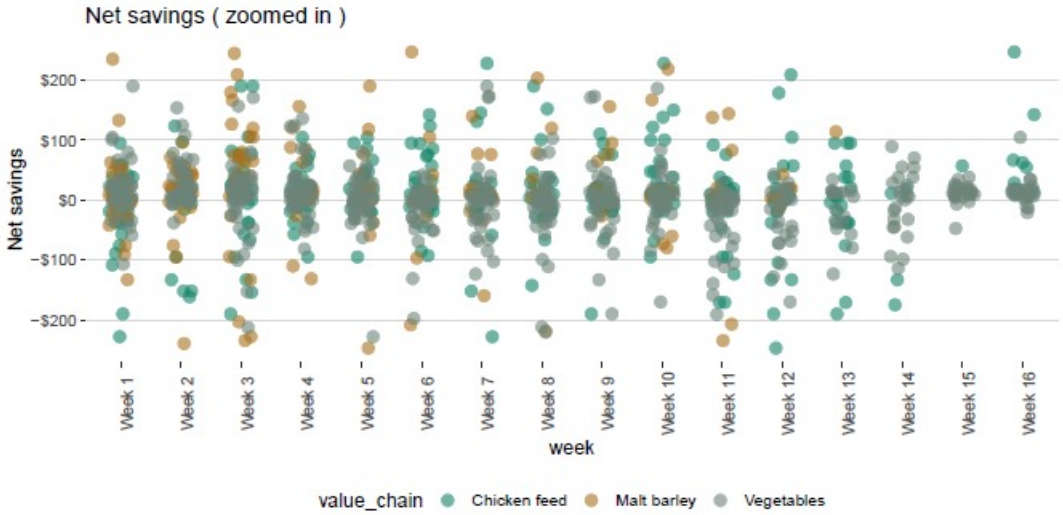
Savings patterns

Most net savings as expected fall close to zero showing that the various value chains deposit and withdraw the money quite often. At the beginning of the study, the malt value chain seems to be depositing more than they are withdrawing, having positive net savings than the other value chains.

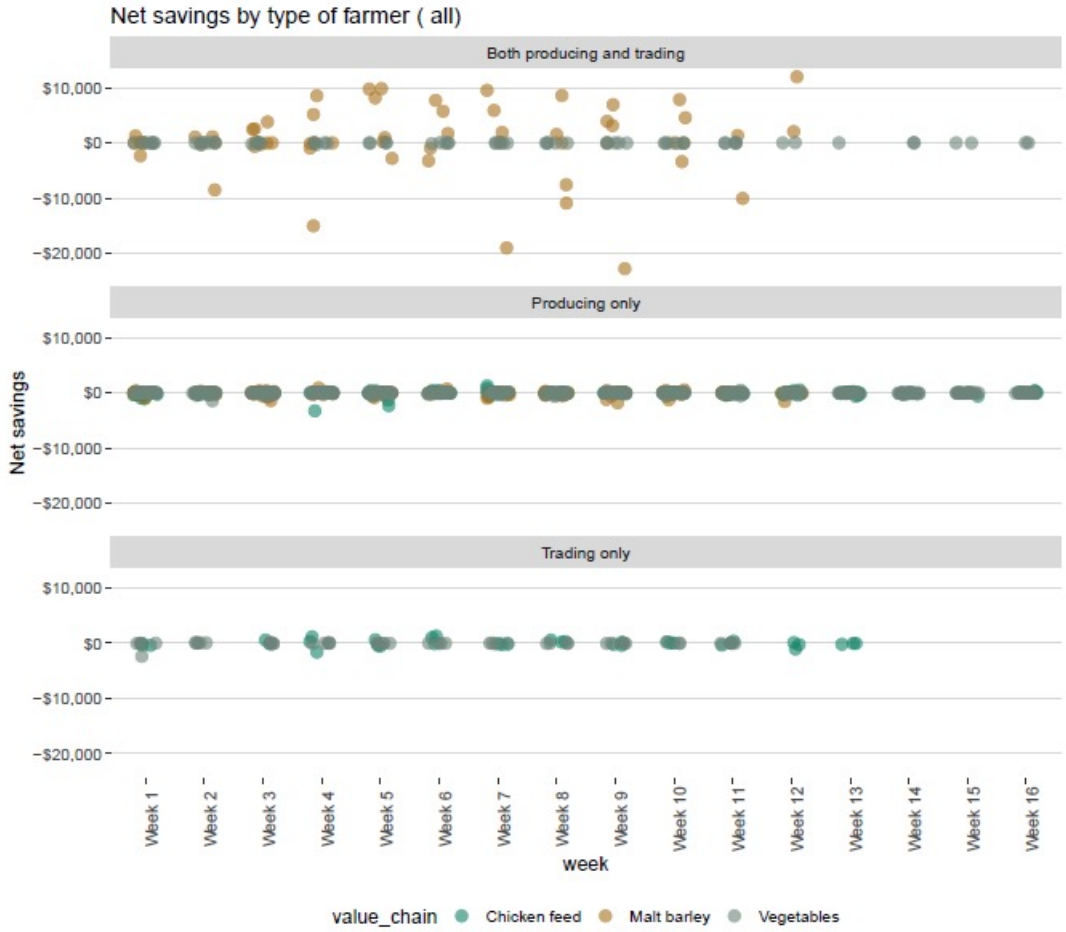
3.1 Net savings



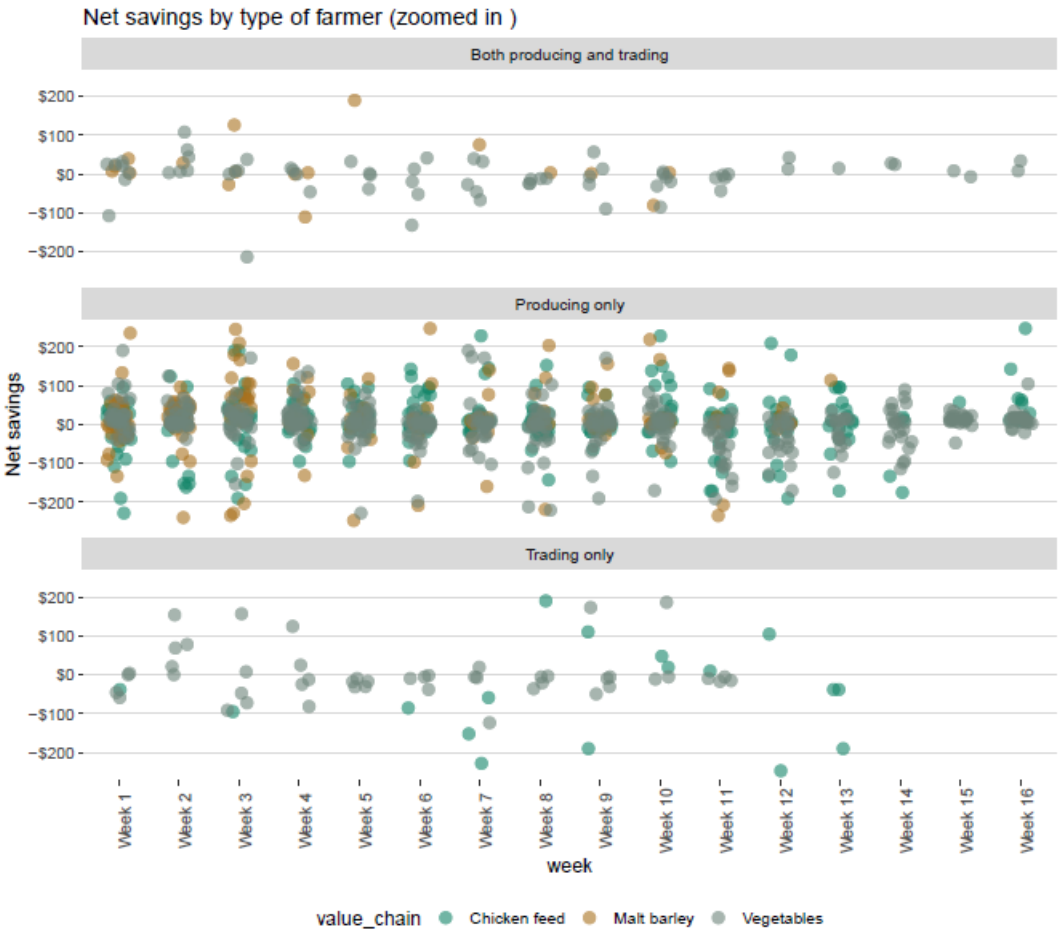
Annex 3: Analysis of FINBIT weekly financial data - *continued*



3.2 Net savings per type of respondent



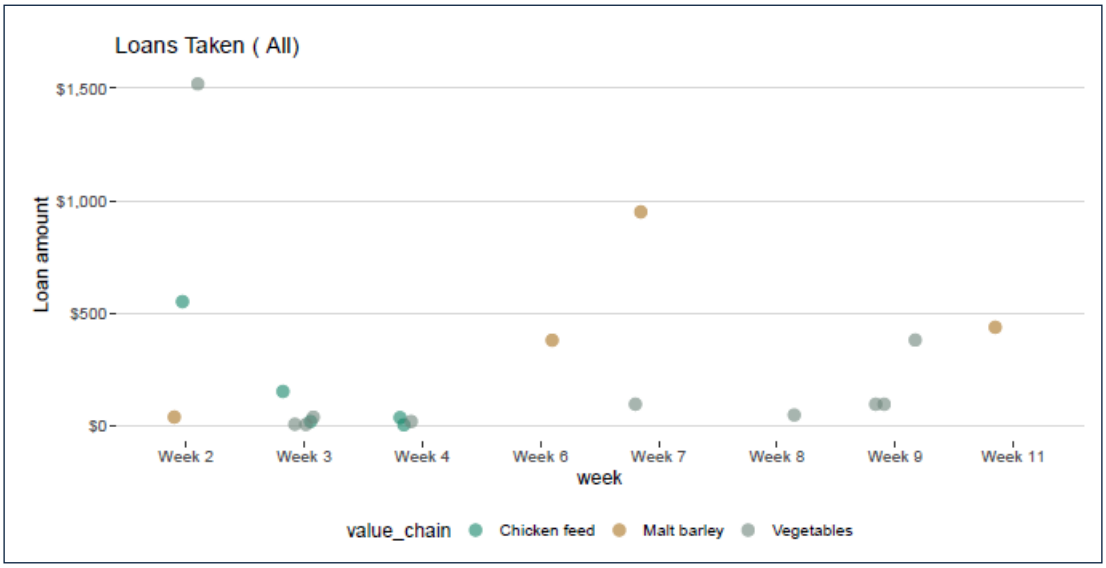
Annex 3: Analysis of FINBIT weekly financial data - *continued*



4 Loans

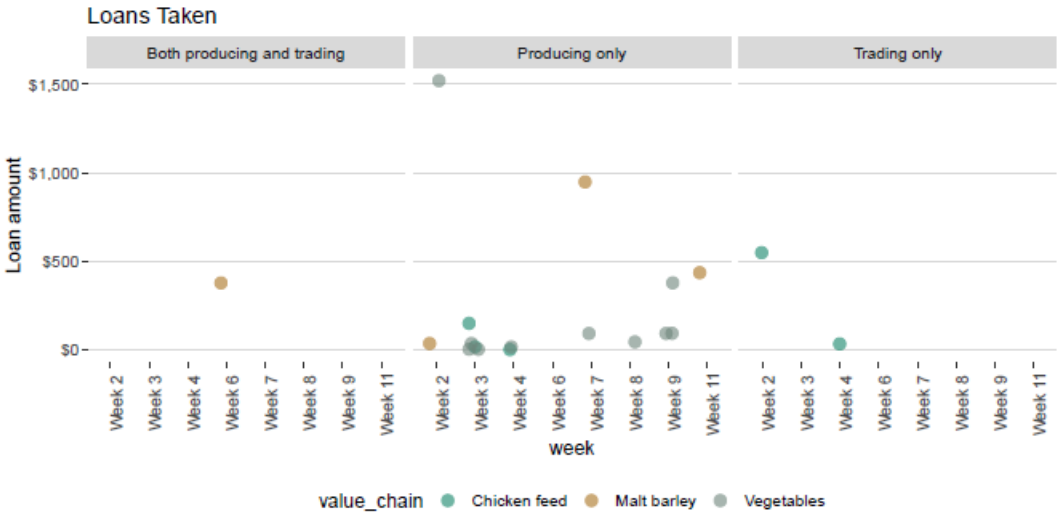
There were very few loans that were taken during the period mostly from the vegetable farmers.

4.1 Loans taken



Annex 3: Analysis of FINBIT weekly financial data - *continued*

4.2 Loans Taken per respondent type



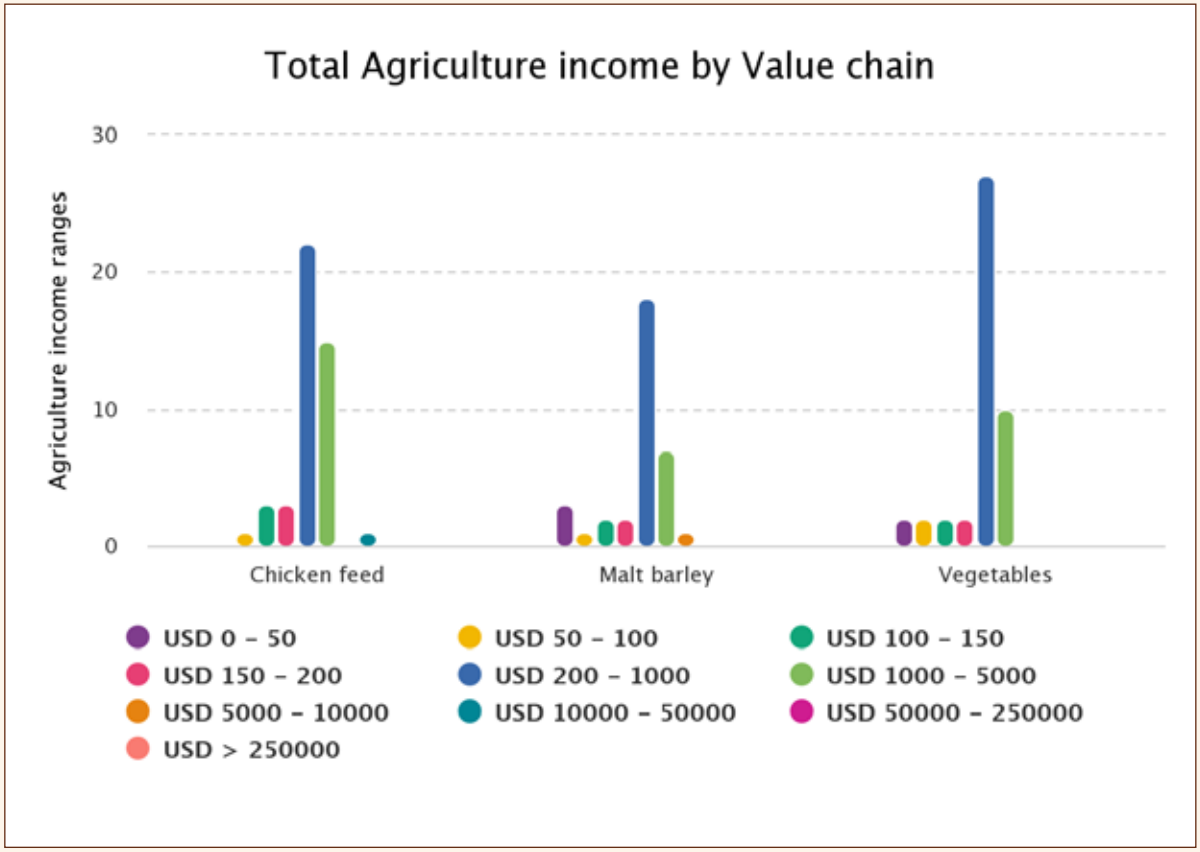
5 Sources/Loan tools used

Although there were few loans taken, chicken farmers seem to access loans from friends but Malt farmers took more loans from MFI while vegetable from neighbours.

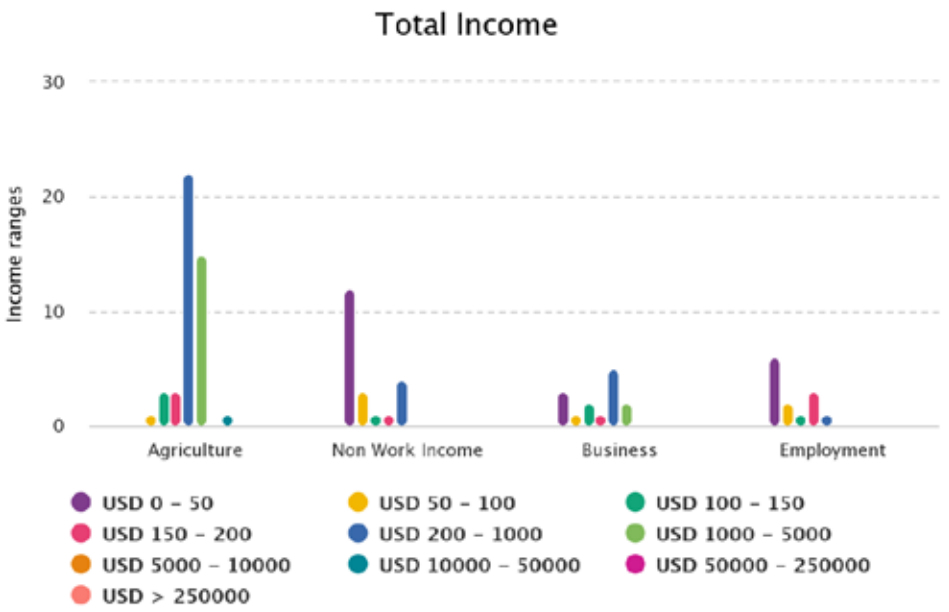
Loan taken loan tool	Chicken feed	Malt barley	Vegetables
Commercial bank	-	4.8%	-
Deposit taking microfinance	-	4.8%	-
Family	25.0%	9.5%	16.7%
Friends	55.0%	14.3%	16.7%
Informal Saving group/VSLA	5.0%	-	-
MFI	5.0%	52.4%	16.7%
Money lender	5.0%	-	5.6%
Neighbour	5.0%	4.8%	44.4%
Vendor	-	9.5%	-
Total	100.0%	100.0%	100.0%

Loan taken loan tool	Both producing and trading	Producing only	Trading only
Commercial bank	20.0%	-	-
Deposit taking microfinance	-	2.1%	-
Family	20.0%	18.8%	-
Friends	20.0%	25.0%	66.7%
Informal Saving group/VSLA	-	2.1%	-
MFI	20.0%	29.2%	-
Money lender	20.0%	2.1%	-
Neighbour	-	16.7%	33.3%
Vendor	-	4.2%	-
Total	100.0%	100.0%	100.0%

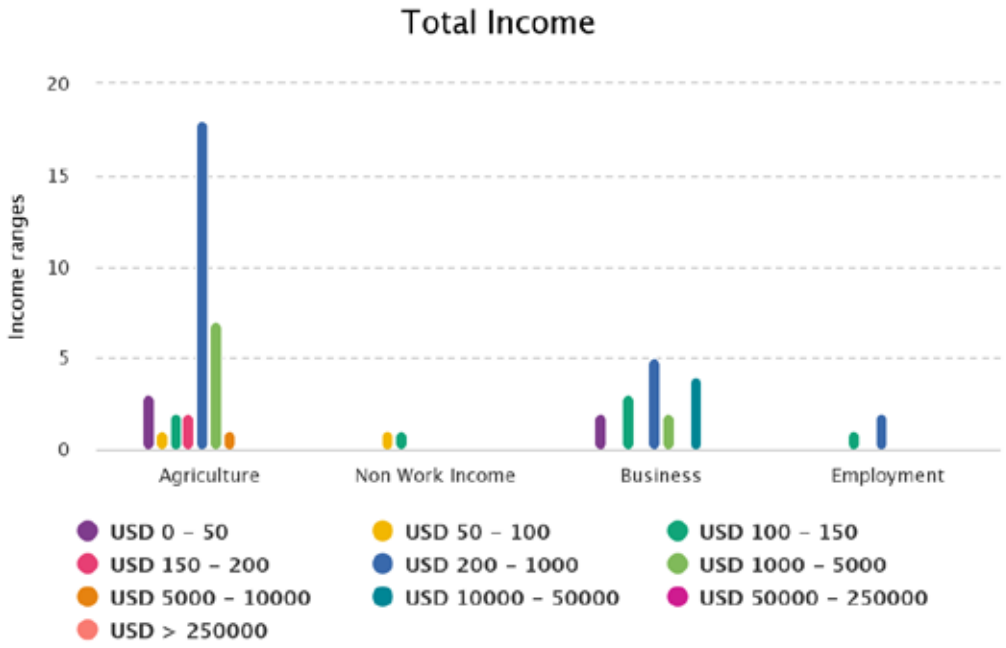
Annex 4: Analysis of FINBIT data. Graphs



Chickenfeed

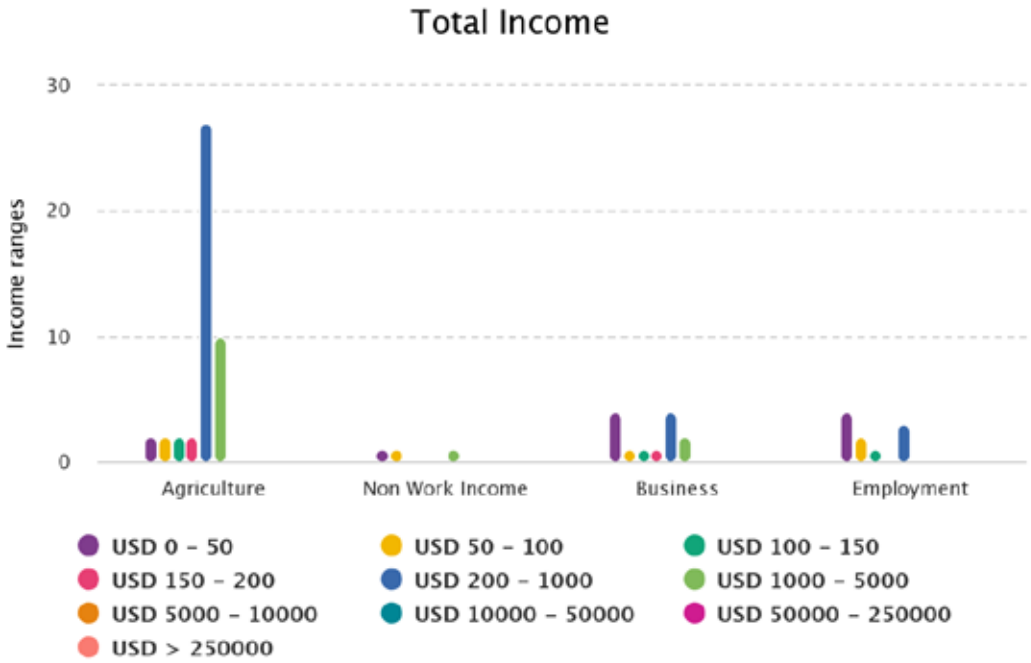


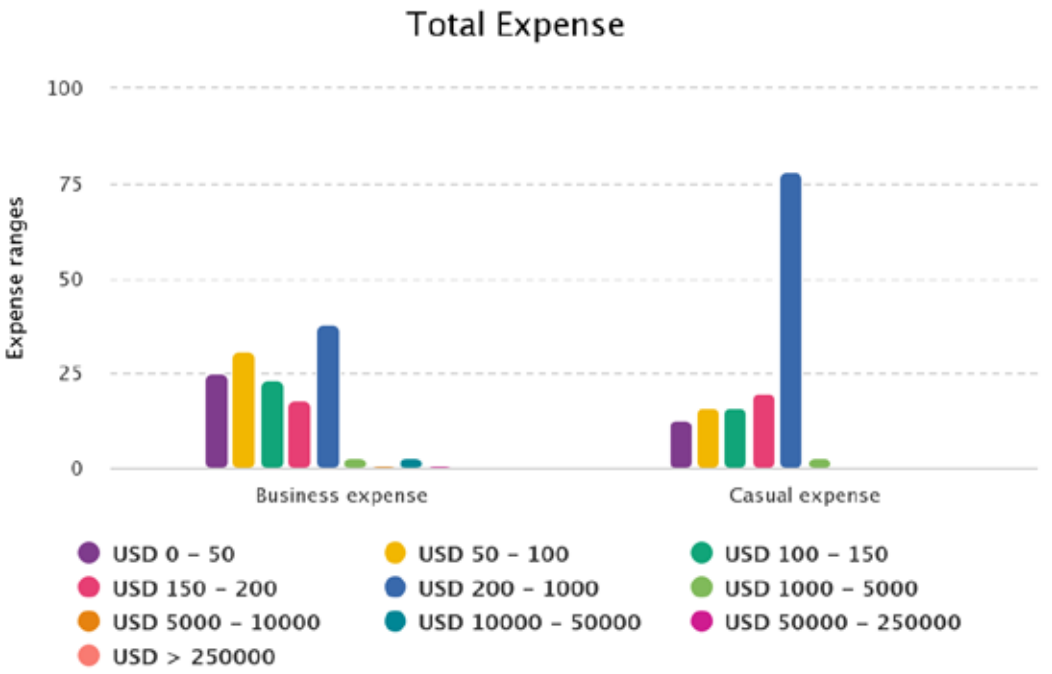
Barley

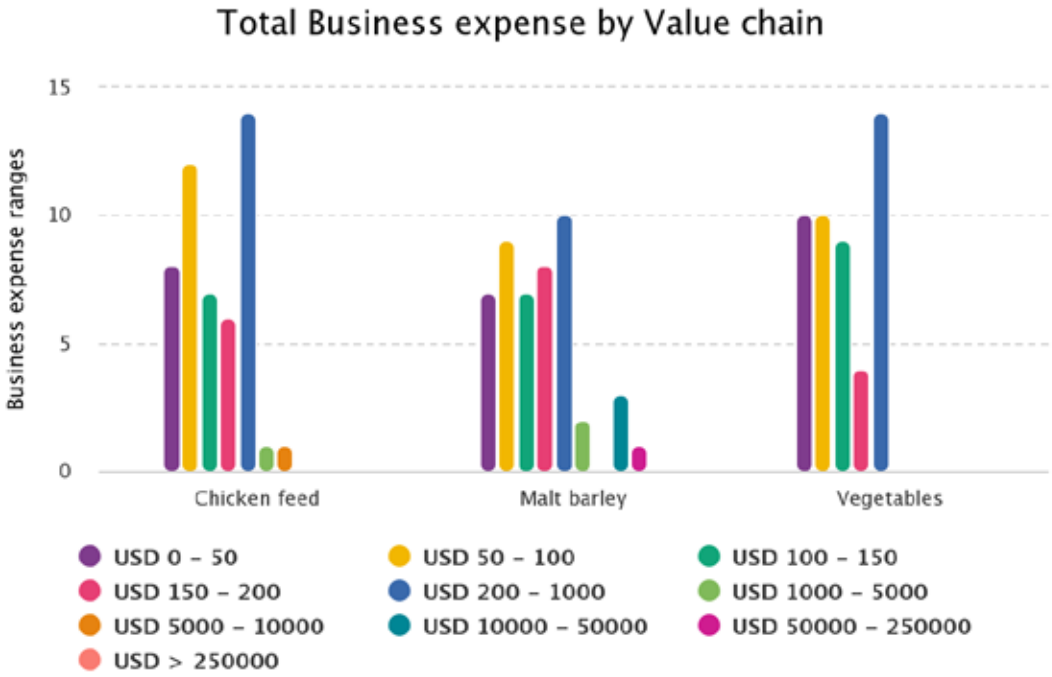


Annex 4: Analysis of FINBIT data. Graphs - *continued*

Vegetables

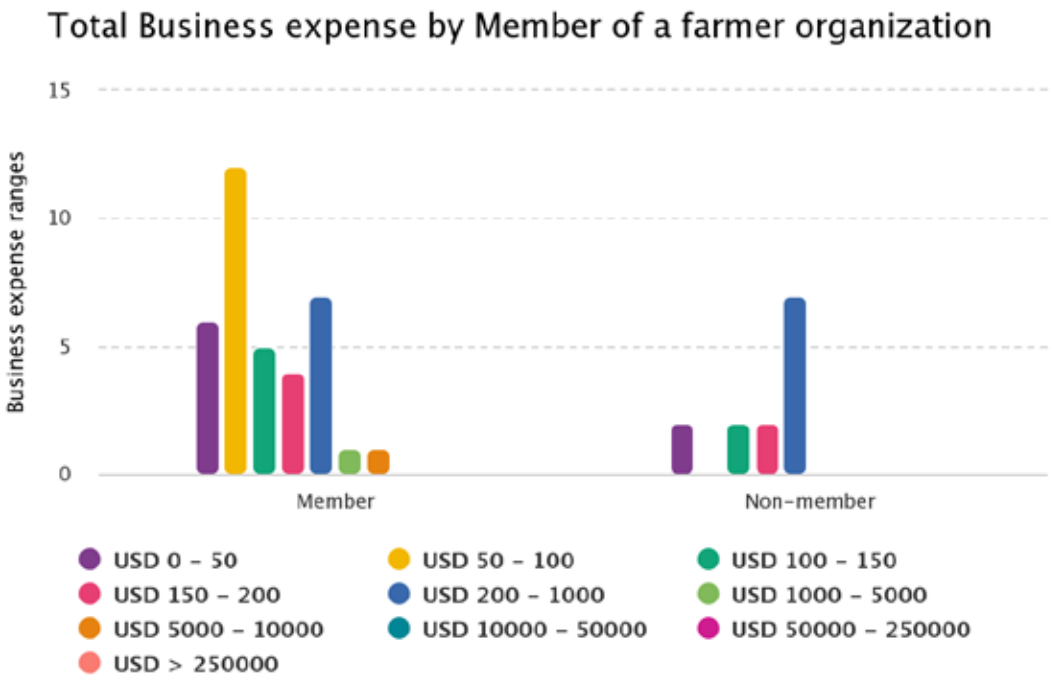



Total Expense
Expense ranges
100
75
50
25
0
Business expense
Casual expense
USD 0 – 50
USD 50 – 100
USD 100 – 150
USD 150 – 200
USD 200 – 1000
USD 1000 – 5000
USD 5000 – 10000
USD 10000 – 50000
USD 50000 – 250000
USD > 250000

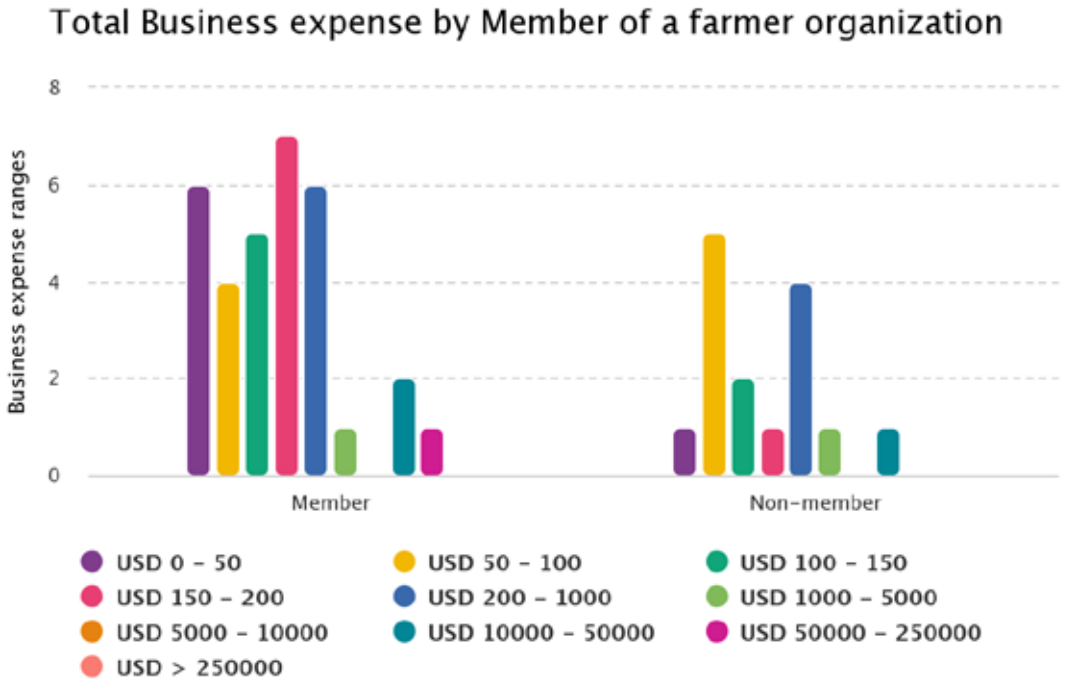

Total Business expense by Value chain
Business expense ranges
15
10
5
0
Chicken feed
Malt barley
Vegetables
USD 0 – 50
USD 50 – 100
USD 100 – 150
USD 150 – 200
USD 200 – 1000
USD 1000 – 5000
USD 5000 – 10000
USD 10000 – 50000
USD 50000 – 250000
USD > 250000

Annex 4: Analysis of FINBIT data. Graphs - *continued*

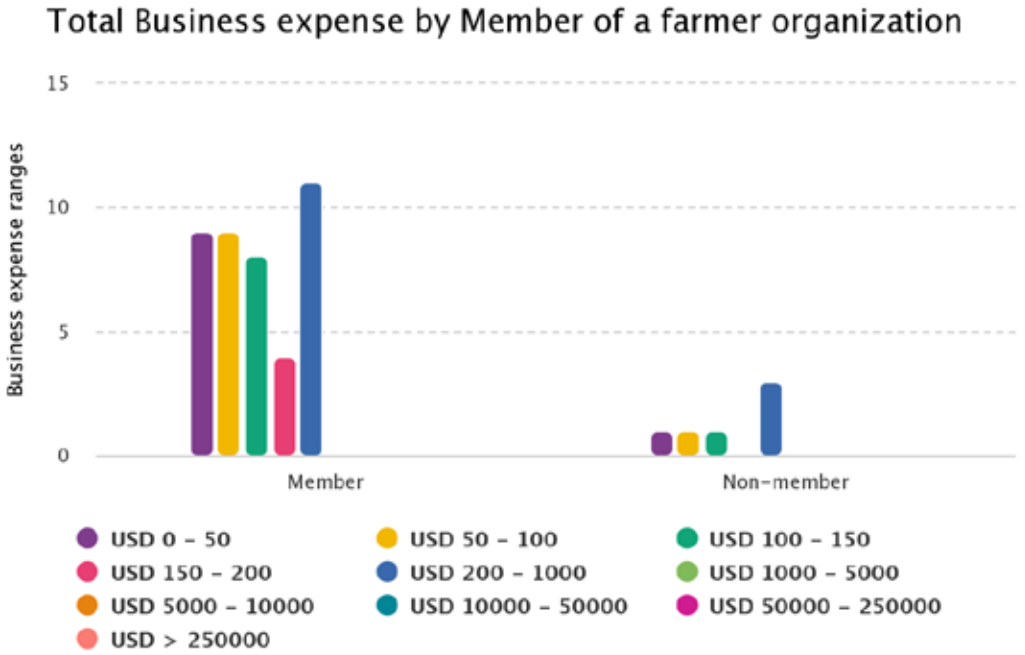
Chickenfeed



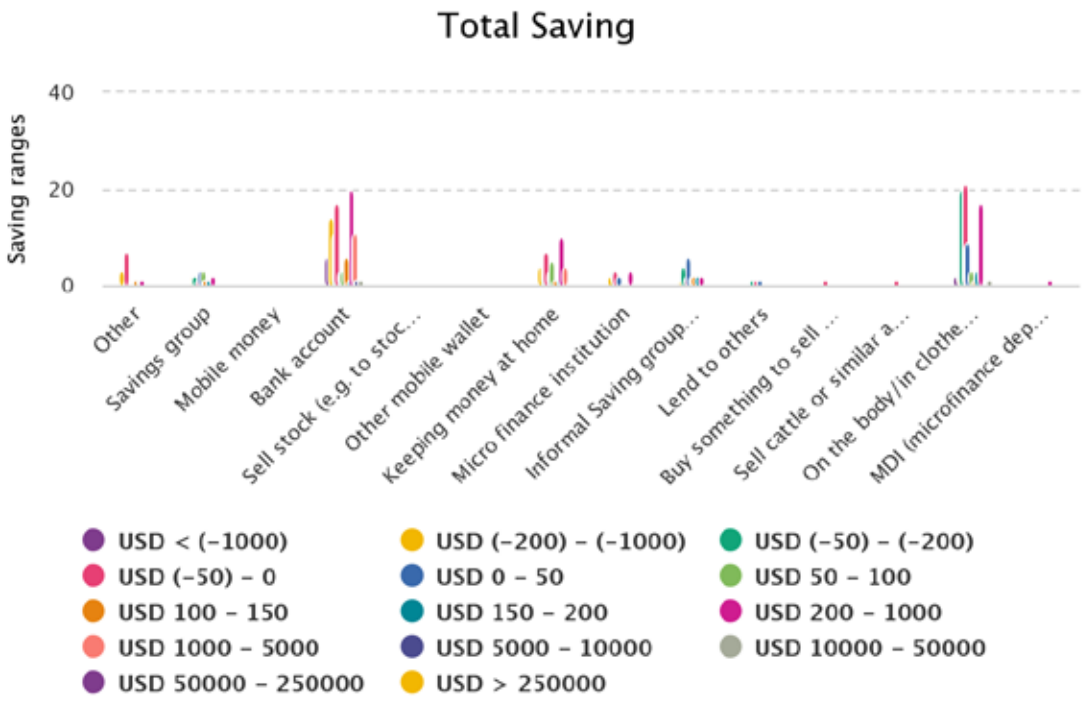
Barley



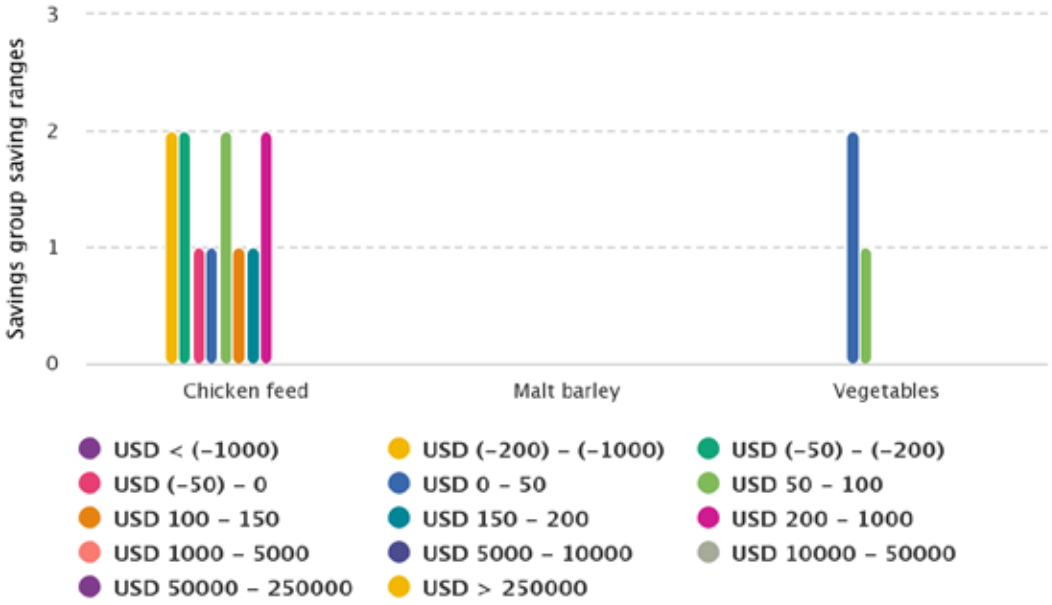
Vegetables



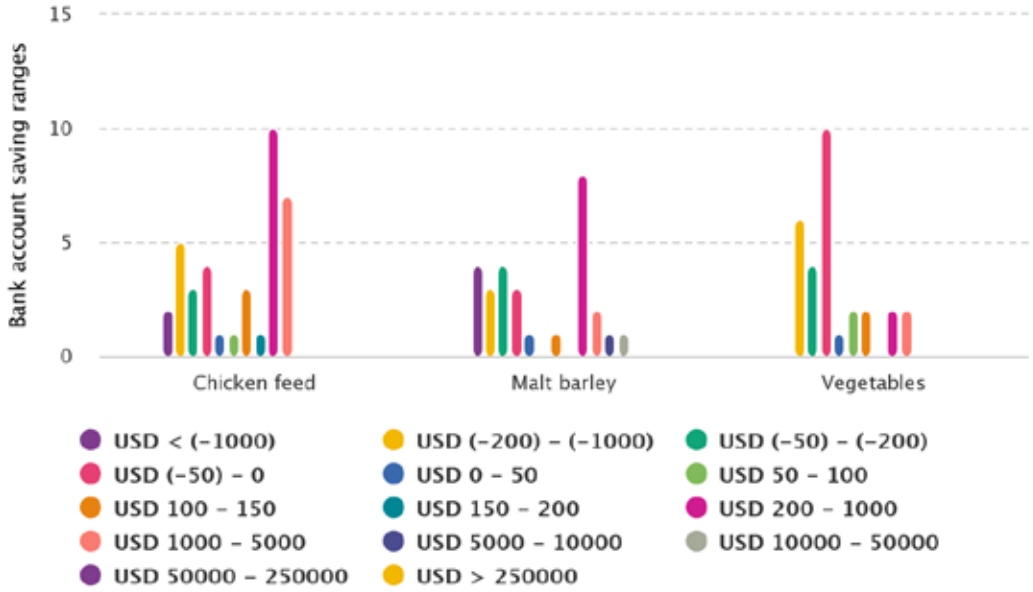
Annex 4: Analysis of FINBIT data. Graphs - *continued*



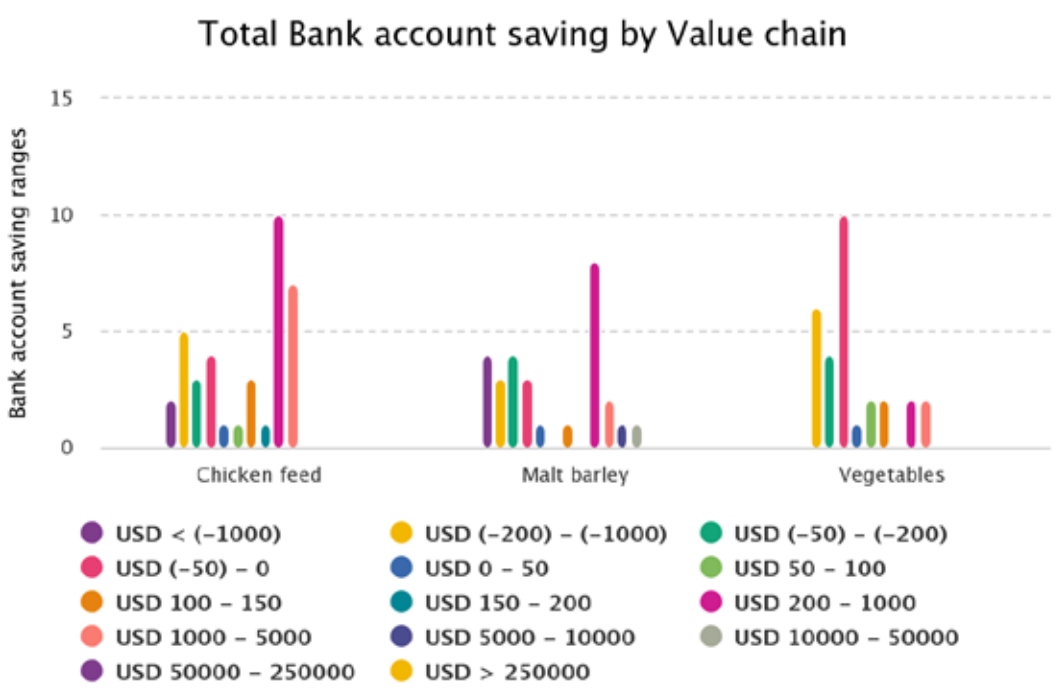
Total Savings group saving by Value chain

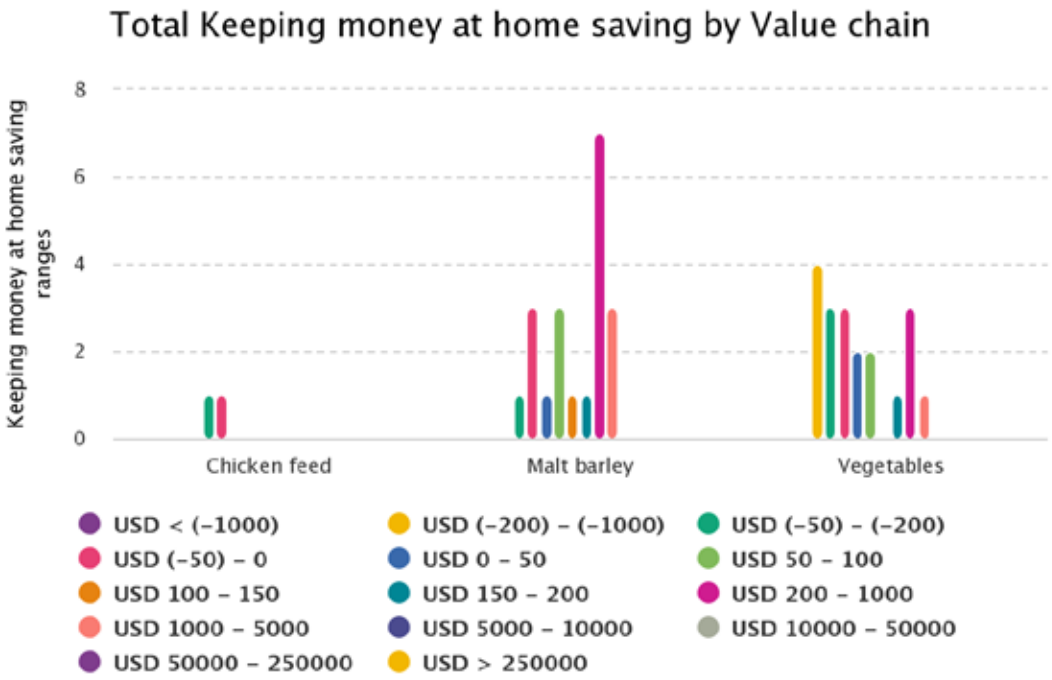


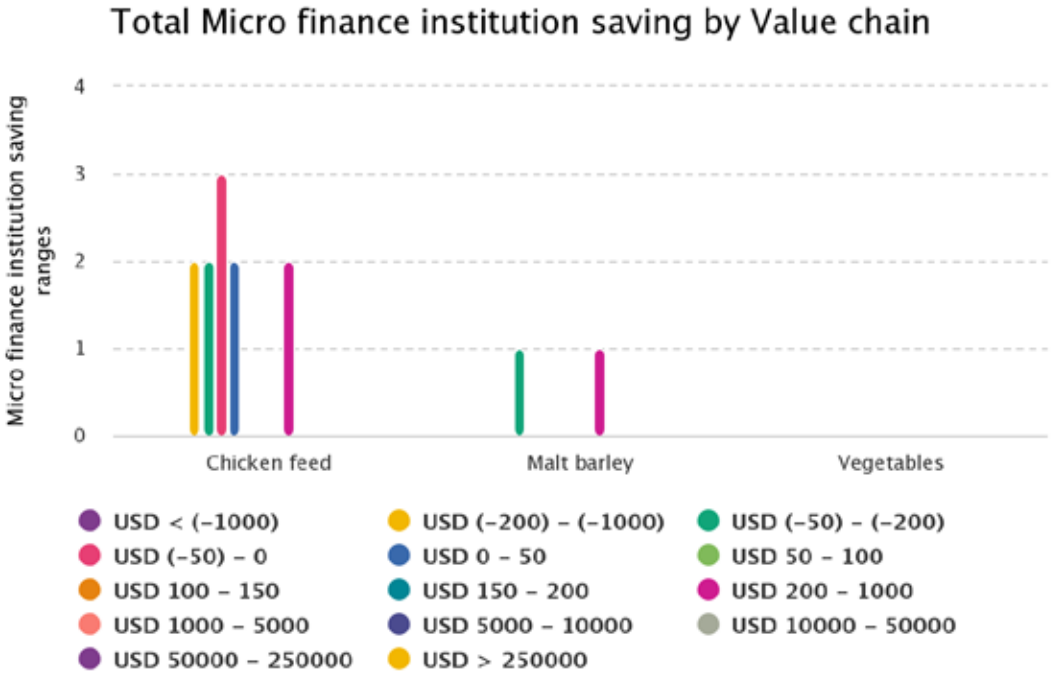
Total Bank account saving by Value chain



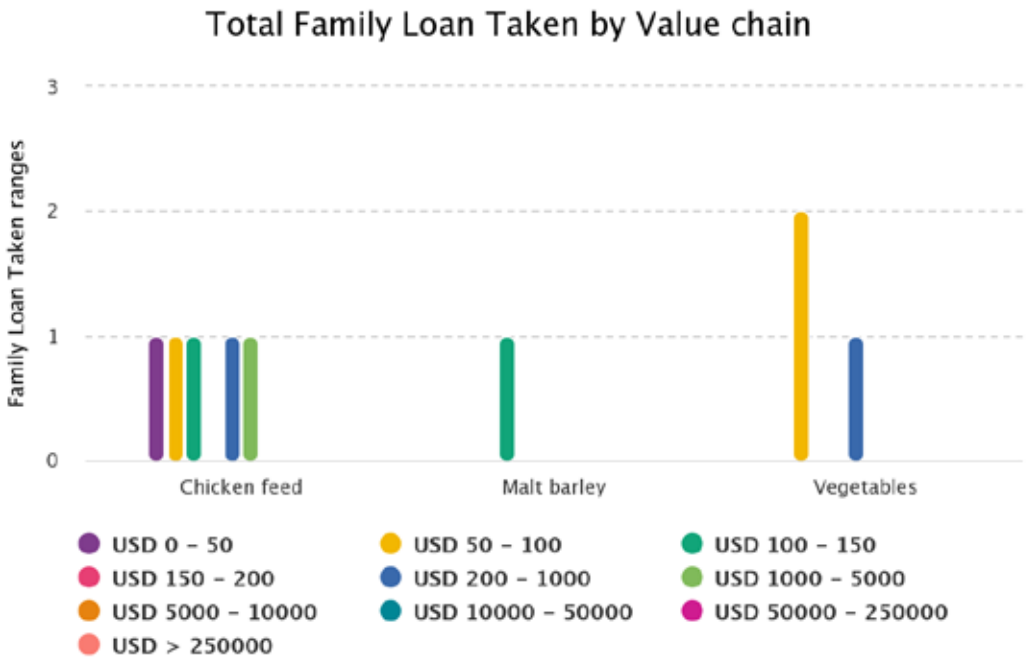
Annex 4: Analysis of FINBIT data. Graphs - *continued*



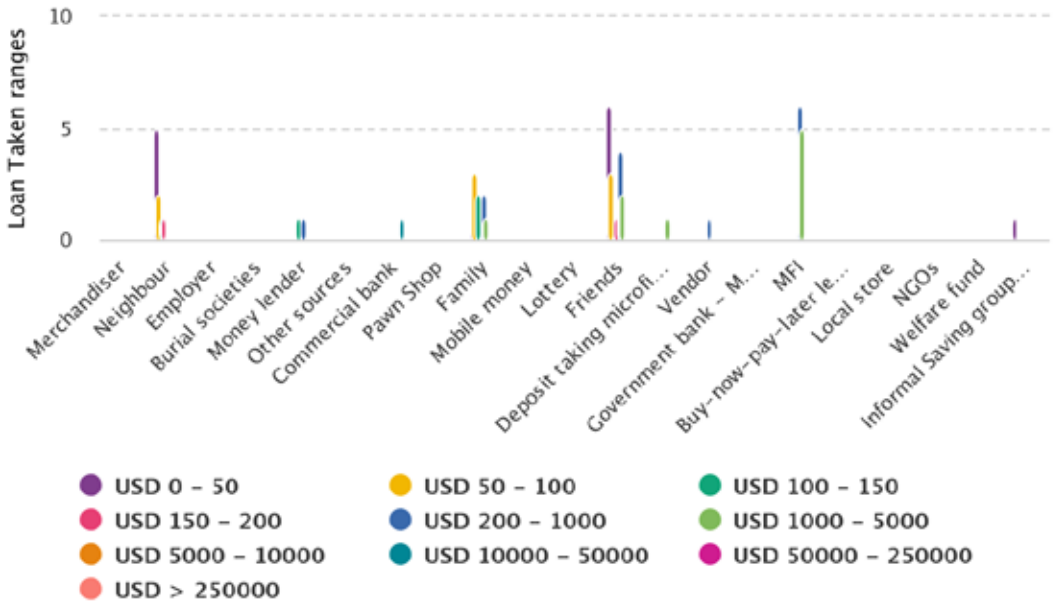

Total Keeping money at home saving by Value chain
Keeping money at home saving ranges
8
6
4
2
0
Chicken feed
Malt barley
Vegetables
USD < (-1000)
USD (-200) - (-1000)
USD (-50) - (-200)
USD (-50) - 0
USD 0 - 50
USD 50 - 100
USD 100 - 150
USD 150 - 200
USD 200 - 1000
USD 1000 - 5000
USD 5000 - 10000
USD 10000 - 50000
USD 50000 - 250000
USD > 250000


Total Micro finance institution saving by Value chain
Micro finance institution saving ranges
4
3
2
1
0
Chicken feed
Malt barley
Vegetables
USD < (-1000)
USD (-200) - (-1000)
USD (-50) - (-200)
USD (-50) - 0
USD 0 - 50
USD 50 - 100
USD 100 - 150
USD 150 - 200
USD 200 - 1000
USD 1000 - 5000
USD 5000 - 10000
USD 10000 - 50000
USD 50000 - 250000
USD > 250000

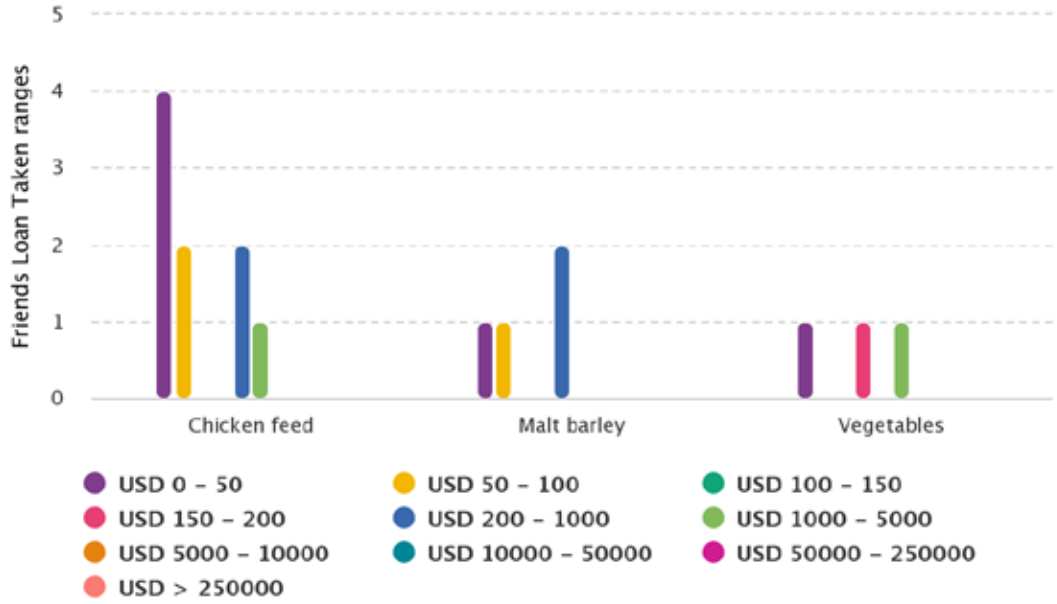
Annex 4: Analysis of FINBIT data. Graphs - *continued*



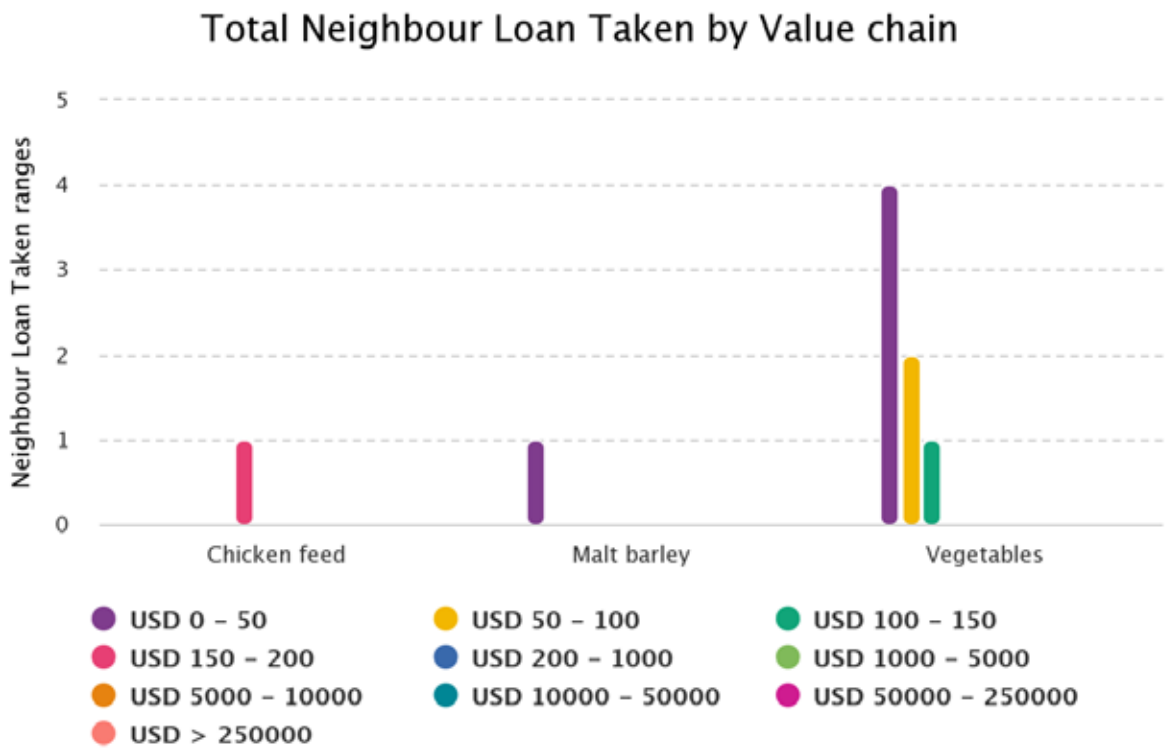
Total Loan Taken



Total Friends Loan Taken by Value chain



Annex 4: Analysis of FINBIT data. Graphs - *continued*



Annex 5: Insights from Focus Group Discussions with SHFs, model farmers and traders

Following the financial diaries work commissioned to L-IFT, IFC conducted eight Focus Group Discussions (FGD) with a sample of SHFs, model farmers and traders that had participated in the study from the Barley and Vegetable value chains during the months of November and December 2022. The FGDs aimed to gather sufficient insights for digital product designs. Using a Human-Centered Design (HCD) approach to extract needs, challenges, and goals of the respondents, the FGDs had the following objectives:

- Understand financial activities and any challenges or gaps faced,
- Determine the role which financial service providers are playing,
- Identifying what would attract value chain actors to deal with financial service providers and to adopt digital financial products and services,
- Capture the overall awareness, understanding and attitude towards digital financial products and services,
- Understand reasons for current financial behaviors and what needs to change or improve from the user perspective,
- Learn about inputs and production challenges and find out how digital financial services can offer solutions these.

In each of the two value chains, there were four categories of FGDs: i) women only SHFs, ii) mix of men and women SHFs, iii) model farmers and iv) traders. The FGDs for the Vegetable value chain were conducted in the Yetabon Kebele Meskan Woreda, Gurage Zone, SNNP Region and for the Barley value chain in the Dosha Kebele, Assela Town, Arsi Zone, Oromia Region. The number and activities of participants in each category in both value chains is shown in the table below.

Value Chain	Participant Group	Activities engaged in	Participant Count
Vegetable in SNNPR	Women only	Small Holder Farmers	9 Women
	Mixed (Women and Men)	Small Holder Farmers	9 (3 Women)
	Mixed (Women and Men)	Model Farmers	11 (5 Women)
	Mixed (Women and Men)	Traders	8 (4 Women)
Barley in Oromia	Women only	Small Holder Farmers	7 Women
	Mixed (Women and Men)	Small Holder Farmers	9 (2 Women)
	Mixed (Women and Men)	Model Farmers	8 (1 Women)
	Mixed (Women and Men)	Traders	10 Men

Annex 5: Insights from Focus Group Discussions with SHFs, model farmers and traders - *continued*

There are more women SHF respondents due to the women only FGDs in the SHFs category. The majority of women are in the vegetable value chain. As one moves more towards model farmers and traders, there appears to be more men, there is higher financial literacy and higher use of mobile banking services amongst men. This is especially the case for young men in the vegetable value chain and both young and some older men in the barley value chain.

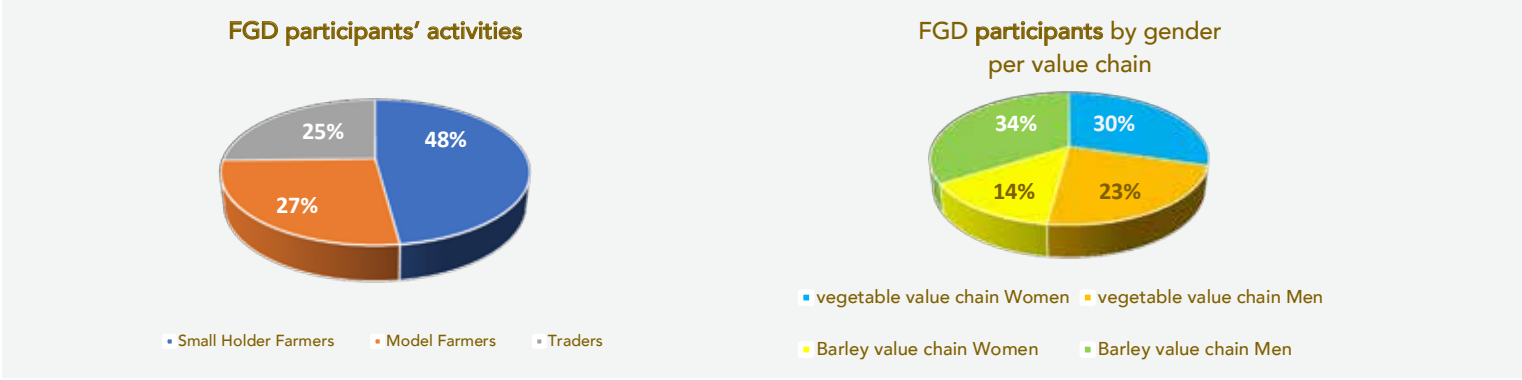


Figure 1: FGD participants by activities and value chain profiles

A peculiarity for both male and female SHFs is that subsistence agriculture is a way of life and not seen as a business, let alone a profitable one.

Traders in the barley value chain deal with larger value transactions compared to traders in the vegetable chains. Hence, traders in the value chain are economically stronger than their peers in the vegetable value chain. Accordingly, the financial needs and behaviors of traders in the barley value chain can be considered an outlier when designing financial products.

Model farmers in both value chains are engaged in additional activities like production of Kat (chat) and cattle fattening activities, earning them additional income.

Experience with Financial Institutions (FIs)

Saving Experiences: The savings experiences with FIs amongst the participants/ respondents is very similar in both value chains.

Except for some female SHFs, who are operating at a very small level in a sort of subsistence farming, all the other FGD participants have a bank account with commercial banks, which they use for demand saving. Most of the FGD participants in both value chains save with commercial banks for consumption smoothening. A significant number of the participants bank with the Commercial bank of Ethiopia (CBE). Few model farmers bank with two to three private banks in addition to CBE, while all traders use multiple accounts. The SHFs usually make deposit into these accounts at the time of harvest sale and withdraw money when needed in a disciplined and thrifty manner.

Traditional saving groups are popular with female SHFs in both value chains with similar characteristics in terms of purpose and structure. Equb a Rotating or Accumulating Saving and Credit Association (ROSCA/ ASCA) is mostly used by the female SHFs for holiday festivities, children school payments and for emergencies. The money collected from the group is saved in a dedicated bank account administered by a person they elect to be their representative. The members of the Equb at times even borrow from this fund when they are in urgent need for cash. Hence, Equb serves the SHF as a savings, credit, and insurance vehicle.

Loan Experiences and Perceptions

There is little appetite for loans amongst SHF, while some model farmers in both value chains borrow from MFIs and Traders in Barley borrow from banks. SHFs shy away from loans due to (i) high interest rates, (ii) unsuitable terms, and (iii) exploitative loan recovery practices. In fact taking out a loan is perceived as very risky. Some farmers, who had failed to repay their loans, had their land taken by the MFI until the loan was fully repaid. This caused an embarrassment and a stigma in the community. As a result, farmers seek alternatives to meet their finance needs, such as friends and family or buyer/supplier finance. Borrowing from a bank is not considered an option for SHFs due to stringent requirements including the need for: (i) physical collateral; (ii) a business license; (iii) a tax registration. Only some traders in the Barley value chain meet the bank's loan requirements and have the experience of borrowing from banks.

Traders in both Vegetable and Barley provide access to micro credit for very small traders and SHFs, respectively. Traders in the Vegetable value chain usually supply goods to very small traders on a daily basis on credit and the credit is typically settled post sales at the end of the day. Traders take the price risk or even face a loss, if as a result of changing prices, small traders are unable to sell and pay for the goods. Similarly, Barley Traders provide credit to SHFs during the production period to help SHFs to overcome liquidity challenges and smooth consumption. SHFs in the barely value chain, who borrow from Traders, are implicitly expected to sell their harvest to the lending Traders at a lower than market price induced by distress sales.

Payment Experiences

Even though farmers typically have and use a bank account, almost all payment transactions are in cash, because:

- Bank transactions are unfamiliar to them and uncommon especially in agricultural transactions.
- Bank branches are not close by. The SHFs incur transportation cost to access banks and then faces long queues.
- SHFs consider cash more convenient for small value transactions, whereas, for high value transaction they prefer using bank transfers (mainly because of the withdrawal limit set by the regulator),
- SHFs have trust issue when it comes to bank-based payments, particularly digital payments,
- Most SHFs have a habit of keeping some amount of money at home to meet emergency needs and purchase consumption goods.

SHFs use their bank accounts mainly for larger value transactions, saving for future needs, withdrawal and transferring money for their children school payments and similar expenses. A small portion of SHFs have experience using mobile banking services to transfer money mostly for children school expenses. They confirmed that mobile banking services are more convenient and less costly than in branch transactions.

SHFs in the vegetable value chain, who had partnered with Greenpath, expressed their satisfaction to receive bank payments for goods sold. This was also due to the SMS notification received once funds were credited to the account. Similarly, Traders and some SHFs in the barley value chain are happy to receive payments through banks from buyers like Soufflet. Such bank payment is directly deposited into their saving account and a notification via SMS is sent confirming the payment. Participants mentioned that direct payments save transportation costs to travel to and from the Kebele to the a nearby city where the bank branch is located. Below, is a summary of the needs, challenges, goals and fears as expressed by the FGD participants along with some of their voices followed by a table with a summary of their experiences.

Voices from FGD Participants

1. "I have a bank account, but I don't have any money in my account. My income is small, and I can only use it for daily expenses" Vegetable SHF
2. "My neighbors and family will not ask me for money if I told them, it's in the bank". Vegetable SHF
3. "I pay to my workers through mobile banking. I have 8 employees per week. All have bank account. They didn't ask me yet to make it in cash. When I buy low value items, I use cash. If it is a high amount, I will use mobile banking. Once or twice a month I withdraw money from the bank. Using mobile banking has many benefits. It keeps costs down, helps prevent thieves from stealing, and is great for security" Vegetable Model Farmer
4. "I have a bank account, but I don't use mobile banking. I buy and sell in cash. I deposit the proceeds from sales in the bank. When I want money for any expenses, I withdraw money from the bank" Barley Model Farmer
5. "Petty traders pay us in cash. They've never asked us to send the payment through bank account" Vegetable Trader
6. "Some of our loyal customers in Addis Ababa usually pay us through bank transfers and trust is crucially important in selling our produce because they pay after delivery" Barley Trader
7. "I don't deposit all my money at the bank I keep some cash at my home, I may need it for emergency purpose" Barley SHF
8. "There are some farmers who accept payments by a bank transfer but most of them prefer cash payment upon delivery of their produce" Barley Trader
9. "… if the farmer is selling a produce in larger quantities making a bank payment is necessary and more convenient. We usually do this when we buy whole harvest from the farmer. Barley Trader
10. "Most farmers are less aware of the benefits of mobile banking. When you ask them to make a transaction via mobile banking, they don't trust it and are afraid of being cheated. Therefore, it is good to create awareness for farmers on its benefit." Barley Trader

Needs

Financial

- Finance for input to grow the farming enterprise,
- Equipment finance (machinery, tools etc.),
- Loan repayment tenure that is longer than harvest time,
- Credit terms that farmers can afford,
- Funding to bridge the gap during harvest (to smooth consumption),
- Better health cover/insurance to enable access to better health services at private health facilities,
- Convenient payment services for school fees,
- Quick turnaround time from application to loan disbursement,
- Simplified requirements to qualify for credit (alterative collateral & credit scoring), and
- Borrow faster via mobile banking.

Non-Financial

- Linkage to agro dealers to supply quality seeds and chemicals/pesticides especially in both the vegetable and barley value chains,
- Access to markets at good prices (and on time/timely? → perishable goods),
- Access to mechanization services (combine harvesters, tractors etc..), and
- Financial literacy (across digital and non-digital financial services).

Challenges

- Stringent loan requirements by banks,
- MFI loans are easier to obtain due to lower formal requirements, but amount is small and comes with short repayment timelines and high interest rates,
- Liquidity shortages during production for SHF, while traders have fund shortages from lending to SHF,
- Pressure of short repayment cycle for funds borrowed from traders leading to losses due to distress sale at low price,
- Water shortages and shortages of water pump motors and water pump houses for vegetable value chain SHFs,
- High cost of inputs from profit-oriented agro dealers
- Lack of financial literacy inhibits ability to explore digital financial solutions,
- Little awareness/knowledge of digital financial services (DFS) – especially among Women and older men,
- Long bank queues that are time consuming,
- High cost of access to machinery (combine harvesters) using brokers, yield shrinkage by machine operators,
- No buyers/value-chain actors for vegetable value chain SHFs,
- Religious constraints of paying/receiving interest (for Muslims),
- Theft of cash becoming a huge risk, and
- Regulatory limit on cash withdrawal and cash holding (cash in transit included).

Goals

- Expand and grow their farming activities.
- Conduct profitable farming.
- Access to aggregators who can link to profitable markets for produce.
- Save costs and time of handling money and transacting (but need education on digital to enable trust in this).

Fears

- Loss of money held in cash.
- Loss of land due to failure to repay FI/MFI loans.
- Fear of losing money moved through mobile transaction. channels – lack of trust and understanding of mobile and digital channels and products.
- Afraid of taking loans.

Annex 5: Insights from Focus Group Discussions with SHFs, model farmers and traders - *continued*

Summary of Financial Behavior and experience with financial institutions

Value Chain Actors	General Observations	Experiences	
		Positive	Negative
SHFs	▪ Some women SHF do not have a bank account, neither do they save, borrow, or transact with banks ▪ Few women SHF obtain input loans from MFIs ▪ Majority of SHF save at home and/ or through Equb a form of Accumulating Saving and Credit Association (ROSCA/ASCA) – for festivities, school fees and emergencies ▪ SHF borrow from Equb when needed, some Equb funds are banked in an elected representative's personal saving account at the bank ▪ Most have no experience with, and don't trust DFS ▪ Lack financial literacy and understanding of digital payments (mobile banking, internet banking etc.) ▪ Keep cash at hand for emergencies (death, funeral, other expenses) ▪ Limited knowledge and appetite for insurance – its perceived to be for traders & aggregators only ▪ Edir[1] is used to save for funerals–contribute monthly ▪ Contribute annually to health insurance and access health services at public hospitals	▪ Find it easier to borrow from MFIs compared to banks ▪ Good relationship with MFI loan officers ▪ Saving in the bank provides ease of transfers / payments to others ▪ Like notifications for deposits and withdrawals on mobile ▪ Liked when aggregators (Greenpath) paid proceeds of produce sales in SHFs bank accounts ▪ Some women participants were happy with sending money to their kids in schools through bank transfers.	▪ Lenders do not bring loan and other financial services closer to farmers in the countryside ▪ Too many requirements by FIs – makes it difficult for farmers to borrow from FIs ▪ Not provided enough information and therefore lack knowledge about credit/loan access ▪ No knowledge, awareness, or education about mobile payments and other financial services ▪ Loan amounts granted by MFIs do not meet farming needs ▪ MFIs require farmers to deposit some money as security prior to granting loans, thereby reducing the amount available to the SHF for productive activities. ▪ Transport costs to the bank are high & discouraging ▪ Loss of land if unable to repay the loan
Model Farmers	▪ Older male and female model farmers have limited knowledge of digital financial services ▪ Those in the barley value chain get paid in cash as well as via the bank, but rarely borrow from banks ▪ Very limited use of digital payments & transactions among those in vegetable value chain - mostly use cash to transact and prefer cash payments ▪ Those with an account have a savings book with banks (mostly in CBE) ▪ A few bank with private banks. ▪ Those with bank accounts deposit during sale of their harvest and withdraw a few times a year ▪ Reject mobile/digital payments due to lack of understanding ▪ Find banking processes burdensome (e.g. withdrawal queues, distance to banks) ▪ They are happy to receive notification of payments via SMS, but not transacting via mobile phone	▪ Mobile banking saves time and makes it faster to transact ▪ Able to send and receive money in real time ▪ Banks help to save and avoid unnecessary spending	▪ Banks are at a distance from the farms ▪ Land and livestock are seized as collateral upon failure to repay the loan ▪ Long queues waste time ▪ Expensive to get credit from banks ▪ Loan amounts are not enough when FIs grant them
Traders	▪ Many have accounts with multiple banks ▪ Receive payments from value chain off-takers via bank transfer only ▪ Able to pay willing farmers and those that sell bulk produce by bank transfer, all others are paid in cash ▪ Several traders use mobile banking which they find convenient and time saving. ▪ Mobile banking is not common, most physical payments are made at the branch ▪ Credit is seldom used – it's a last resort if necessary ▪ Find it easier and more accessible to borrow from MFIs compared to banks. Banks have many complicated requirements and processing takes too long ▪ Very limited information and knowledge of insurance beyond vehicle 3rd party insurance ▪ No trust in insurance to settle claims ▪ Happy to receive payments via mobile banking from customers and verify the transfer via text message.	▪ Able to access loans from MFIs faster than Banks ▪ Like the ability to pay directly to a bank account for bulk purchases from farmers ▪ Bank transfers and having bank accounts eliminates risk of carrying cash (loss, theft ,etc.)	▪ Long bank queues consume time ▪ Where the trader and the farmer do not bank at the same bank, bank transfers and payments become a burden due to lack of interoperability between banks ▪ Low daily cash withdrawal limit of 50,000 birr, make transacting difficult when cash is required to buy in cash from farmers ▪ Banks offer low interest on savings accounts – this is eroded by inflation and declining value of Birr ▪

1. A funeral member association providing support during loss of a family member and members contribute an average of 50 birr monthly.

Insights for Digital Financial Products

There is growing evidence that access to a digital accounts and mobile money increases household resilience and farmers' access to financing and markets. This is also further corroborated by the positive experience of those Farmers and Traders that are using mobile banking services to conduct their transactions. They expressed that using mobile banking has made things easier, saves time, is more secured than carrying cash, allows instant transactions on the spot, and enables better tracking of transactions. However, these benefits are not understood or acknowledged particularly by elderly SHFs in both value chains. Owing to this reality there is a need to develop incentives and capacities for a wide variety of users, including the SH, other members of the farmer's household, agribusinesses, cooperatives, the community savings group, and service providers.

For SHFs, large value transactions are major harvest sale and production expenses with a low frequency (typically once or twice a year). Other expenses like school fees and hospitalization also have low frequency. This limits the business case for digitalization. Retail and small value transactions, for which cash is preferred, take place on a daily or weekly basis, and are mainly related to household consumption expenses and income from labor or on the side trading activities.

The assumption that digitizing payments from buyers to farmers drive adoption of digital finance is however not to be ruled out completely as this would constitute a first step to getting money into the farmer's accounts or mobile wallet. The second step, getting SHF to transact digitally, will require additional sensitization and incentives. To develop a rural digital financial ecosystem additional use cases may need to be developed. One such opportunity is to leverage contractual arrangements like those of Greenpath in the vegetable value chain, and Soufflet and Heineken in the Malt and Barley value chain, which facilitate input loans to farmers, access to seeds, fertilizers, mechanization service and extension services for which payments might be made digital. This can also create the opportunity to keep and build digital profiles of farmers and their farmland, providing financial service providers with data to assess creditworthiness of SHF, thus, facilitating uncollateralized digital lending. Such contractual arrangements can also help to bridge the information and service delivery gap for farmers, agri-service providers and financial institutions.

Payments

Awareness and Knowledge: To address the awareness and knowledge gap, it is important to educate SHFs using an easy training tool which is user friendly and accessible. (eg. USSD based IVR messaging that explains basic information about the digital services)

Annex 5: Insights from Focus Group Discussions with SHFs, model farmers and traders - *continued*

Language: Language considerations need to be made for SHFs in the Oromia region as most are not able to read the Latin words/letters used in the region, with some mentioning that English might be a better option. IVR enabled Oromifa language is the preferred and easier option.

Design for basic feature phones: It was observed that, except for some model farmers and traders, SHFs use feature phones and are not able to use App based offerings. Hence, it is important that USSD, SMS and IVR options are available.

Facilitate for bank-to-bank transfers: Currently bank to bank transfer is only possible through the Real Time Gross Settlement (RTGS) system, which is not available 24/7 and at times fails entirely resulting in reconciliation process of two to three weeks. As a result, some Traders maintain bank accounts with as many as thirteen banks to enable bank-based payments to SHFs. An open loop interoperable scheme with real time processing is required to facilitate bank-to-bank, and wallet-to-wallet transactions.

Use Model Farmers and Traders as a starting point: Some of the Model Farmers and Traders, especially the young and educated ones, have positive experiences with mobile banking. As key actors in both value chains, they continuously interact with SHFs and other actors like traders and buyers in the value chains. This presents an opportunity where these Model Farmers and Traders could be used as agents to promote the adoption/use of digital financial services because it solves some of their financial bottlenecks/pain points.

Input Credits (Loans)

In both value chains, the FGD participants expressed challenges accessing inputs (seed, fertilizer, and various chemicals). While this is mostly due to problems to supply driven inefficiencies, like unstructured distribution channels, the lack of access to funds further limits their ability to access the right quality and quantity of inputs. Contractual arrangement where large buyers engage in the provisioning of inputs on credit, possibly with intermediation by financial institutions, can help address the gap. It was learnt from the FGDs in both value chains that input credit is a primary concern the SHFs face. Based on FDGs, the design of a credit product must meet SHF needs in terms of loan amount, tenure, repayment and ease of access (six months bullet collateralized by movable assets). Some of the suggested considerations to be made include:

Enable digital customer acquisition: enabling loan applications to be submitted digitally at the convenience of the SHFs and other value chain actors, could simplify the application process and reduce the time it takes for loan origination. This can also help build digital data base for further data analytics and digital credit processing.

Introduce data analytics-based loan appraisal: using alternative data-based credit scoring and appraisal to enable uncollateralized lending.

Enable digital credit decision and disbursement: Introducing a dynamic and system-based credit decision making and digital disbursement. This can significantly reduce the time it takes to process and approve loans making funds available on a timely manner.

Introduce alternative collateral options: In circumstances where risk assessments do not permit for unsecured lending, the financial service providers could consider alternative collateral options like commodity-based financing, movable asset-based lending, value chain financing, factoring etc., while considering the limited secondary-market.

Easy loan repayment and servicing: By enabling digital repayment options, the SHFs and other value chain actors can service their debt using faster and efficient digital repayment options. This will help to address unnecessary pain/price points that can be avoided.

The text box on the following pages provides some basic product design concepts to be considered in providing input credit by looking at the challenges to be addressed, main features, functionality, and business case.

Annex 5: Insights from Focus Group Discussions with SHFs, model farmers and traders - *continued*

Farmer Data Enabled Input Credit: An app for Agro dealers/Traders where farmers input farm data, to access tailored inputs & financing [Question: who is entering the data, who is validating it?]

- Needs met or challenge addressed: Need to access finances and information on the right inputs for the farm. Yet unable to access traditional credit and are challenged by stringent repayment requirements for loans.
  The Concept: Inputs package based on the customized data on farm size and needs, offering a wholistic set of inputs and financing, information services etc.
  How it could function: Farmers go to a participating agro dealer and enter relevant data (farm size, crops planted, family size, etc.) in the app. The app creates a list of inputs tailored to the farmer based on the data (crop, finance needs, farm size etc.) entered by the farmer. If the farmer is getting inputs on credit, the app uses algorithm to decide their eligibility for credit. If approved, the farmer's deposit (where a farmer wishes to deposit) can be made via the farmers app cash wallet, and the farmer is issued a voucher to use on the inputs package recommended. When the farmer receives the inputs, the deposit is transferred from their app cash wallet to the agro-dealers account and the loan tenure commences. The farmer pays minimum monthly fees and gets SMS notifications monthly, and tips on how to use inputs effectively. Payment is done when produce is sold via the farmers mobile app cash wallet.

- Main features of the concept:
- Streamlined input credit requirements and process
- Smartphone or tablet-based data-capturing capabilities gives important information to agro dealer & mobile platform/credit providers
- Value added services can be bundled to the offering (digital payment options, farming tips and advice, mobile notifications etc.)
- Flexible repayment options (e.g., repayment moratorium while waiting for crop harvest & sale), or minimum monthly payments then larger payments post-harvest and sale of crop.
- Offers tailored planting, and other information
- Business Case:

- Collect data on farmers to build insights
- Grows number of users for the selected mobile app platform provider
- Introduces and promotes famer use of digital and/or merchant payments.
- Enable FSPs to conduct data analysis and credit offering based on SHFs Data

Savings

The culture of saving with banks seems to exist in both value chains, with no additional prominent savings related insights gained from the FGDs sessions. Nevertheless, the digital payment options like mobile banking offer some convenience to access savings. Hence, the digital saving options could be viewed in conjunction with digital payment options.

Help SHFs Save: Helping SHFs save for Inputs, school fees, emergencies – solution bundled with Digital Payments

- Needs met or challenge addressed: SHFs want to save for inputs, children's education, and emergencies, but struggle to save due to short-term demands that interfere with long-term saving.
  The Concept: A mobile, goal-based savings account that allows SHFs to save gradually for agri-inputs, children's school fees, emergencies, and build a banking record towards an optional microcredit line to cover the gap for the inputs, school fess etc.
  How it could function: uses a mobile money/banking platform to connect SHFs to this savings account to make minimum monthly deposits and have options to deposit bigger amounts when available. When it's time to pay for inputs/school fees, the mobile platform can transfer saved amount to a designated input supplier or school. The receiving supplier or school pays the mobile money platform the charges related to the transaction amount.

- Main features of the concept:
- Flexible payment terms, no penalties when clients miss a monthly payment.
- Savings are protected and paid on SHFs instruction to the input suppliers and to schools when inputs for agriculture are required and when the school term starts
- Low minimum monthly savings with the option to deposit more towards savings
- Using the data collected over a period, creditworthy SHFs (as determined by defined rules or algorithm) can opt to access a microloan to cover the funding gaps if the savings target was not met.
- Business Case:
- Mobilizes deposits for the FIs and/or Mobile Money operator accounts
- Mobilizes deposits for the FSPs
- Drives SHF adoption at low tx value and at own discretion and use of digital payments
- Gathers data to build data driven credit scoring models

Farmer Info: Awareness Creation and Knowledge Sharing

- **Needs met or challenge addressed:** There is a big awareness and knowledge gap regarding digital financial services, coupled with low levels of financial literacy among SHFs. It is important to educate the SHFs using an easy training tool that is user friendly and accessible

  The Concept: An information and social marketing campaign to improve farmers awareness of digital financial services (DFS), build trust in formal financial services in general. This can be done by highlighting positive experiences of DFS and FS in general and sharing inspiring stories from peer farmers.

  How it could function: Using USSD based IVR messaging that explains basic information about the digital services. It would feature SHFs sharing stories about their experiences and successes with digital services on posters, billboards, local radio, Kebele meetings, television, and SMS. Language consideration is key to ensure content and messaging cater to language differences and proficiencies of different farmers [this might be key for all products]. Has option for listeners to hear interactive voice response (IVR) stories via their feature/smart phones.

- **Main features of the concept:**
- Designed for both smart and for basic feature phones
- Messages communicating farmers experiences with digital financial services, and success stories
- Enabled via multiple channels (billboards, posters, brochures, local radio ads, SMS, Kebele meetings and IVR)
- Interactive and able to invite users (farmers, Traders etc.) to respond, share their own stories, access other relevant information, and sign up for services.
- **Business Case:**
- Raises awareness of DFS, and FS in general,
- Collects data that can be used to gain knowledge of SHFs segment including what drives their engagement ((e.g.., what types of campaigns / information they respond to most).

Annex 5: Insights from Focus Group Discussions with SHFs, model farmers and traders - *continued*

Group Savings Account: "Informalizing" Formal Financial Services to Support Informal Savings Groups.

- Needs met or challenge addressed: Low proportion of farmers save formally in financial institutions due to low interest on savings accounts leading many to save in informal groups like Equb and others.

  The Concept: A staged group account that digitizes savings group transactions using a mobile platform and allows groups to access instant group loans secured by group savings, and eventually enables creditworthy group members to apply for individual loans via mobile phones

  How it could function:

  A group savings account is set up in person at the bank branch, with 2-3 members leading the group required as signatories. A mobile wallet for the group account is set up to be accessible with USSD menus on the group leader's mobile phone

  Member details are captured on account opening for the system to allow group leaders to change plan details, make balance inquiries, view transaction history and more

  When groups get used to the platform, individual members can deposit regular savings contributions via their personal mobile wallet. They can also receive loans from the group in their mobile wallet and repay via their wallet.

  Once a credit history is built, individual group members can be graduated to access a wider range of financial products and services offered by the bank or FIs

Main features of the concept:

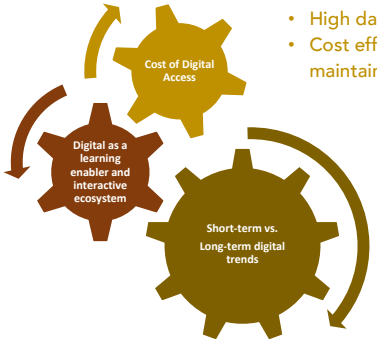
- Promotes the creation of alternative means of access to credit and a wider range of financial products and services by building customer credit histories using savings group data.
- Transactions from individual-to group and vice versa are tracked by the system and creates individual credit profiles for group members.
- Group members can access credit when needed urgently.
- Strengthens the capacity of savings groups without changing the known group structures and practices.
- Uses trust in and effectiveness of informal financial services to enable FIs to build SHF financial capabilities.

Business Case:

- Mobilizes deposits
- Introduces group members to formal financial services and DFS
- Generates data to build credit histories for enabling access to credit using data driven credit underwriting
- Enables bulk acquisition of customers via groups and builds long-term customer relationships
- Creates cross-sell opportunities for more provider or bank products and services.

Product Design Considerations

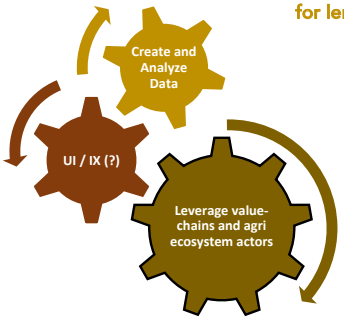
- Design enables access to financial services as well as act as a tool for knowledge and awareness creation among farmers
- Design generates data to make decisions on the impact of digital services on farmers financial literacy, adoption of DFS, and improvements in access to finance
- Design enables interaction between various Agri ecosystem actors (farmers, traders, aggregators, financial institutions etc.) [connect to market?]



- Prevalence of feature phones among farmers in Ethiopia due to costs
- Cost of smart phones is high
- Availability of reliable mobile networks in farmer locations is still a challenge
- High data charges
- Cost effective digital designs for purposes of scaling up and maintain such digital solutions.

- **In the short-term feature phone friendly design will play an important role in introducing and familiarizing farmers with digital products, services, and transactions**
- **Design needs to be forward looking beyond feature phone driven solutions to remain relevant with smartphone/ App driven ecosystems**
- **Design should be scalable as farmers digital literacy evolves.**

- Simple to access
- Easy to understand
- User friendly digital solutions



- **Solutions facilitate collection of all round data (transactional, product, repayments, digital engagement patterns) and analyzing such date to build farmer friendly credit models, products, services, and alternative collateral for lending**

- **Design to consider leveraging various agri-ecosystem actors (role of agronomists, traders, aggregators, farmer, FIs and mobile platform providers) to form partnerships to enable digital financial services roll out**

Annex 6: Survey Data Portal

Link to the FINBIT portal showing aggregated and anonymized survey data: https://ifc.portal.finbit.co

About the Authors

This report was authored by L-IFT, a social enterprise specializing in Low-Income Financial Transformation (L-IFT) L-IFT empowers communities through data, providing value for money and ensuring contributors benefit directly. L-IFT's mission is to foster self-awareness and confidence among respondents, enabling them to take control of their futures.

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Since 2010, GAFSP has pooled over $2 billion in donor funds and provided financial and technical resources – grants, technical assistance, concessional loans, blended finance, and advisory services – to demand-driven projects along the food chain, from 'farm to table'. Governments, farmers' and producer organizations, and the private sector are in the lead: designing and implementing these projects in partnership with a development agency of their choice.

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