

A woman in a blue and yellow patterned dress is working in a field, using a wooden tool to tend to young plants. In the background, there is a small, single-story building with a corrugated metal roof and some trees. The scene is set in a rural area with hills in the distance.

DigiFarm Panel Study

Aggregate Report

Report completed by Busara on
behalf of Mercy Corps AgriFin

May 2021



AGRIFIN

BILL & MELINDA
GATES foundation

About Mercy Corps AgriFin

We work with over 9 million farmers and 150 partners across Africa

Mercy Corps' AgriFin was created with the goal of supporting the expansion of digital financial services to one million farmers in Sub-Saharan Africa (SSA).

- Objective is to enable the development of products and services that increase **farmer income, productivity and resilience**, with 50% outreach to women.
- Work with **private & public sector scale partners** such as banks, mobile network operators, agribusinesses, technology innovators and governments.
- We help our partners develop bundles of digitally-enabled services, including **smart farming, financial services, market access and logistics** supporting data-driven partnerships.

AgriFin and its partners provide increased access to digital services that help address some of farmers' pressing challenges. Over the years it has become important to assess the importance of increased access to digital services.



Busara and Mercy Corps AgriFin worked together to conduct a series of impact assessments of the adoption, usage and outcomes of digital services provided by AgriFin's partners, including Safaricom.

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Executive Summary

Adoption, Usage and Experience

- **Access to loan (i.e. using credit to get input) and Arifu are the most used and valued services**
 - Services that respond to users' urgent needs or daily needs are more likely to attract users and retain them.
 - Farmers highly value the ability to take credit to buy farm inputs particularly when they cannot afford to miss the timing of planting yet are low in cash. The good quality of inputs boost their trust in the service and willingness to stay. Of note, delay and failed delivery of inputs were mentioned by a couple of farmers as the main challenges with this service.
 - Flexibility and a convenient learning experience with Arifu are highly valued. Farmers suggested to add in-person contact to facilitate the learning process, such as calls to experts, and in-person training for farmers with limited literacy.
- **Farmers hold different attitudes towards selling products online, but all shared positive experiences with Access to market**
 - Fair prices and ability to repay using revenues from this market are most appreciated by the users.

Meaningful Changes Brought by DigiFarm Services

- **Attitude and behavior: users start seeking digital solutions to fulfill long-term purposes**
 - Arifu and other SMS-based advisory services have become the most highly valued channels for gaining additional knowledge on better farming practices. Some users tend to lean on Arifu even beyond adoption.
 - During external shocks, users seek for timely and comprehensive advice from DigiFarm or Safaricom SMS.
 - More users have started using mobile wallet as the primary saving platform.
- **Overall outcome: users have been able to expand farm or agricultural businesses, save more, gain knowledge on good farming practices, are able to pay for school fees, and build capacity for external shocks.**
 - Farmers who have been using multiple services from DigiFarm have reported positive impacts in more dimensions.
 - Positive experience with a service has inspired and encouraged some farmers to explore and try out other types of digital services.

(continued)

- **Farming outcome: significantly improved farming profit from October last year and February**
 - Farming profit is calculated by deducting expenditures on seed, fertilizer and labor from the revenue of the primary crop.
- **Powerful bundled services found to drive the perceived impact**
 - Capacity: loan, loan & market, loan & PA
 - Resilience: Arifu, Arifu & PA, Arifu & loan & PA, Arifu & loan & market & PA; or having been using 1 service, 3 services or 4 services.
 - Farming outcome: Arifu & market

Influential Factors for Usage

- **Onboarding through DVA, receiving training, and practicing crop farming significantly drive the usage of DigiFarm services**
 - Receiving training and practicing crop farming significantly contribute to the active usage of Arifu.
 - Onboarding through DVA and receiving training significantly contribute to the usage of DigiFarm loan service.
 - Receiving training significantly contributed to subsequent active usage of the service.
- **Human contact is highly preferred and valued during onboarding, as well as for any following ups**
 - Follow up is believed to be essential for not only addressing technical challenges but also to demonstrating a sense of care to users.



Study Objectives and Methodologies

Research Objective

A quantitative panel study in Kenya for 5 months, complemented by a qualitative follow-up, aimed to unpack:



WHO are DigiFarm users:

- What do user demographics and economic profiles look like
- What about their phone usage
- What is the typical user case and sequence of using various DigiFarm services



HOW are their experiences with DigiFarm services

- How are their experiences with onboarding and training
- What types of bundled services they have been using
- How is the adoption, usage, attitude and experience with selected end-to-end services



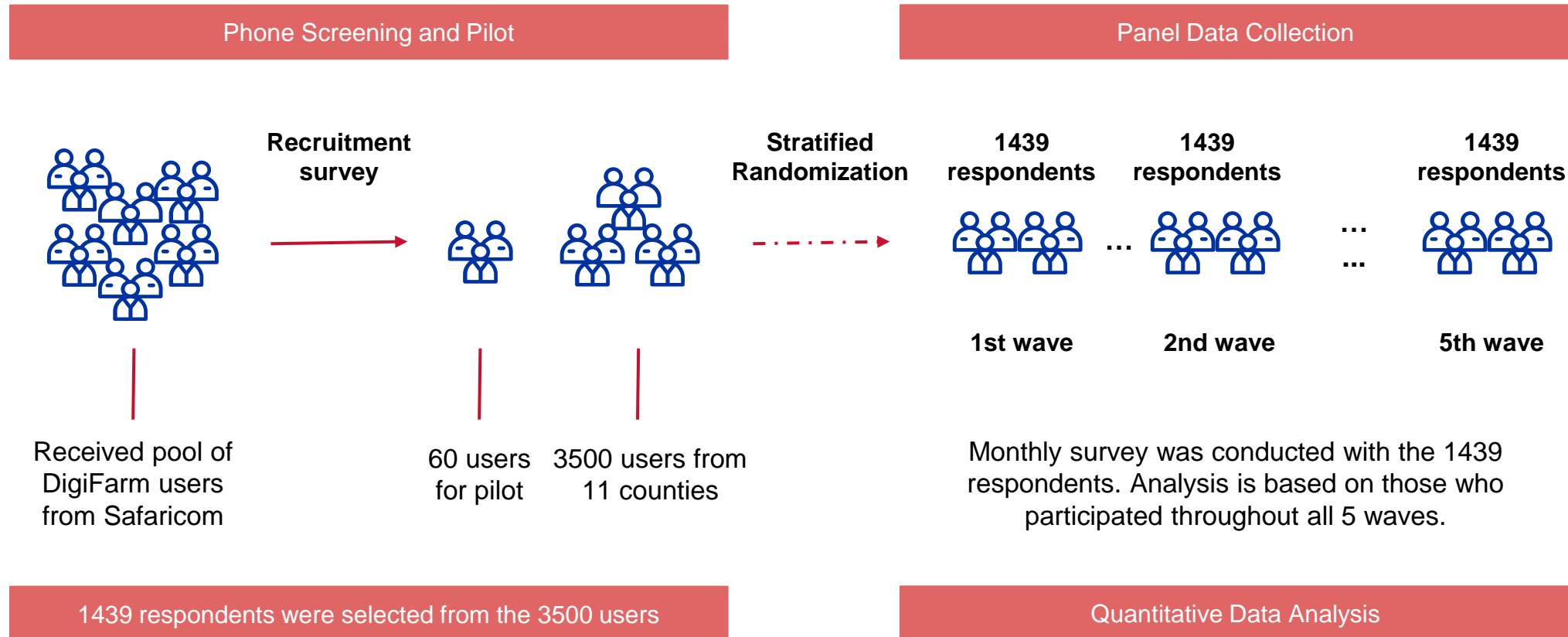
What is the impact of adopting and using DigiFarm services

- How has using DigiFarm influenced their financial behavior, resilience, farming practice and farming outcome
- What are the influential factors drives usage
- What are the impacts brought by different bundled services

Disclaimer: the usual activities of DigiFarm and farmers have been severely restricted by COVID, which affects some results from this study. Please bear in mind this contextual influence when making inferences from this study.

- Timespan of the study:
 - Quantitative: November 2020 - March 2021
 - Qualitative: March 2021
- Period of impact evaluated:
 - October 2020 - February 2021
- Quantitative panel data collection:
 - 1439 users in 11 counties targeted
 - Sample of 1185 in the analysis
- Qualitative follow-up:
 - 52 DigiFarm users in the same 11 counties
 - Half participated in the panel data collection
- This report highlights the key takeaways from both quantitative surveys and qualitative follow-up.

Methodology: Quantitative Panel Study



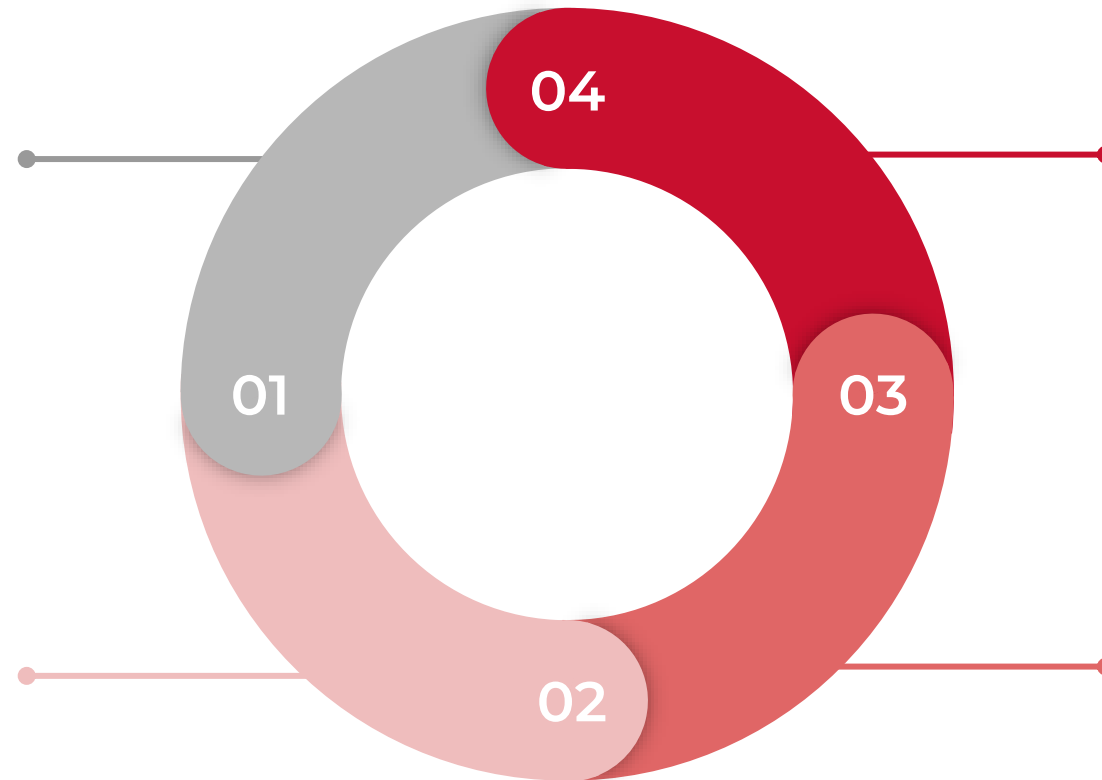
Methodology: Qualitative Study

Development of qualitative tools

Based on feedback from Mercy Corps, Busara reviewed the IDI tools to ensure alignment with the research questions and objectives.

Conduct in-depth interviews (IDIs)

Busara conducted 52 IDIs between March 16th 2021 and March 26th 2021. They were conducted with farmers from the 11 counties.



Interpretation and report

The analysis of the qualitative data brought out key findings that have been highlighted in this report.

Analysis of findings

The audio files from the in depth interviews were translated, transcribed and thereafter analyzed by Busara.

Learning Objectives and Study Design

Panel Surveys (November - March, monthly)

- To monitor how smallholder farmers have interacted with DigiFarm
- To measure the impact
- 1439 DigiFarm users
- 11 counties
- 3 (end-to-end services) + 1 (Precision Agriculture SMS)
- **Gaps** identified in panel data; need to **follow up** in the qualitative survey



Qualitative Follow-up (March)

- To gauge the gaps identified in the panel data for DigiFarm users
- Examples: why not use the credit for farm input; how attitude towards one service influences adoption & usage of another
- 52 DigiFarm users
- 11 counties



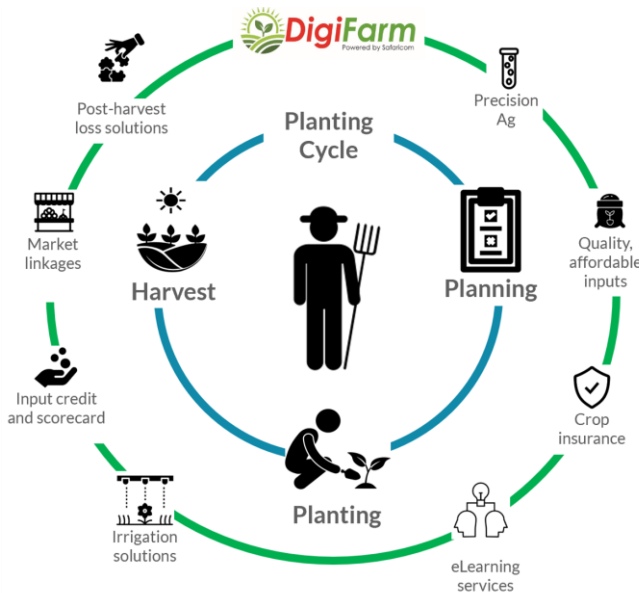
About DigiFarm

About DigiFarm

The DigiFarm Model

Launched in 2017, DigiFarm is Safaricom's (East Africa's leading network provider) integrated mobile platform of digital services for farmers. DigiFarm, accessible on a basic feature phone, provides farmers with access to products and services enabling them to conveniently source, transact, learn, and grow their farms. DigiFarm has had over 1.3 million registered users since its launch. Additional services have been added to the platform since 2017 to make DigiFarm a one-stop shop for Kenyan farmers.

Overview of DigiFarm services



Inputs

- DigiFarm works with agrovets to offer farmers high quality, certified inputs at an affordable price point.

Credit for inputs

- DigiFarm offers input credit to its farmers through credit partners, in the form of a code used to access the inputs. A 20% deposit is required to access input credit.

Learning

- DigiFarm shares knowledge through education partners e.g. Arifu on topics such as planting methods, farming, cultivation and best farming practices.

Crop insurance

- DigiFarm offers agri-insurance through partners in 2 forms: 1) bundled with input credit as mandatory insurance, and 2) a separate offering for farmers who decide to pay for inputs in cash.

Market linkages

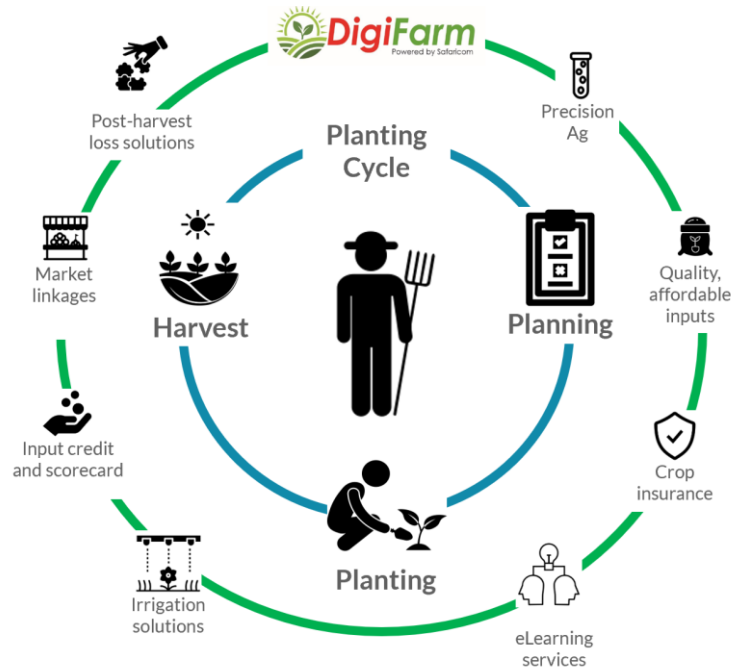
- DigiFarm links farmers to markets through Digisoko and other partners e.g. UNGA Group Limited, EABL, BIDCO and Capwell Industries.

About DigiFarm

The DigiFarm Model

DigiFarm's platform model opens up the marketplace for farmers to access products and services from financial institutions, agri-input providers, and other value-added service firms, enabling farmers to easily source, transact, learn and grow. The platform is accessible on a basic feature phone, allowing farmers to access information and complete transactions conveniently

Overview of DigiFarm services

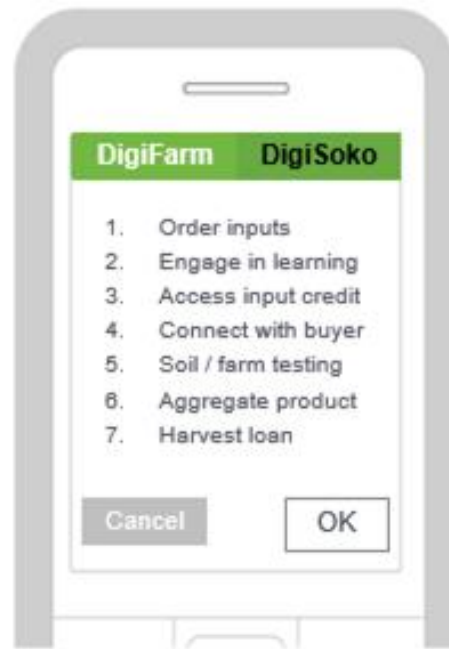


Of all the platform features and services, **access to markets**, **education** and **credit** are the most popular features, while **uptake of soil testing** is a less conventional option among farmers. In 2019, AFA, in partnership with Busara, conducted a baseline study with 3239 farmers (the total sample including non-users) with a relatively even split between men (60%) and women (40%). 27% (874) of registered users in this study were active users. Of the users that reported receiving agricultural loans, DigiFarm was among the top 3 sources. However, uptake of agricultural insurance was generally low. Despite the DigiFarm platform linkages to verified input vendors, a significant proportion of registered farms still get inputs from vendors outside the DigiFarm network of approved vendors. With appropriate data, it will be worthy to investigate how phone type influences the uptake and usages of particular services.

DigiFarm Menu on A Featured Phone

The DigiFarm Model

The following displays the menu interface on a featured phone. Smallholder farmers in Kenya can easily source, transact, learn, and grow their farms from this one-stop shop. Over time, additional services have been added onto the platform, including the recent introduction of DigiSoko, an open marketplace for agricultural produce.



1. Order inputs

DigiFarm allows farmers to purchase inputs through selected vendors

2. Engage in learning

DigiFarm provides access to educational content for best farming practices and financial literacy

3. Access input credit, harvest cash loans and insurance

DigiFarm provides digital credit products based on alternative credit scoring and bundled with insurance

4. Connect with buyer

DigiSoko connects farmers to buyers in specific value chains

5. Soil/ farm testing

DigiSoko tests soil to understand required inputs and suitability for value chain production

6. Aggregate products

DigiSoko facilitates aggregation of produce and final payment to farmers

Current services

Services of Interest

Arifu (Learn)

- Farmers learn about farming knowledge via interactive SMS
- No mandatory links with other services

Precision Agriculture

- SMS from Cropln to DigiFarm farmers on agronomy info
- To know if farmers know the difference between this and Arifu

Loan: getting credit for inputs

- Farmers can get credit from DigiFarm
- These credits can only be spent on DigiFarm to get farm inputs
- Farmers can also buy inputs with cash



Market (Harvest)

- After farmers sell farm products via DigiFarm, part of the revenue will automatically go to repay the “credit”
- Links with “Loan”



Sample Overview

Sample Summary: Panel Study

1439

Target Sample

1185

Engaged in all 5 waves

82%

Retention throughout the panel study

38%

females in the sample of 1185 users, mirroring the gender distribution of DigiFarm's customers

4.4%

Average dropout per window

11

Counties investigated

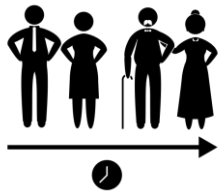
39 years

Average age

Sample Summary: Qualitative Study

We interviewed 52 DigiFarm users, half of whom participated in the panel study and went through the monthly quantitative surveys.

Age Group



18-35 - 33%
36-65 - 63%
65+ - 4%

Gender



Male - 60%
Female - 40%

Education



Primary School - 35%
Secondary School - 52%
Tertiary Education - 13%

Marital Status



Single - 6%
Married - 86%



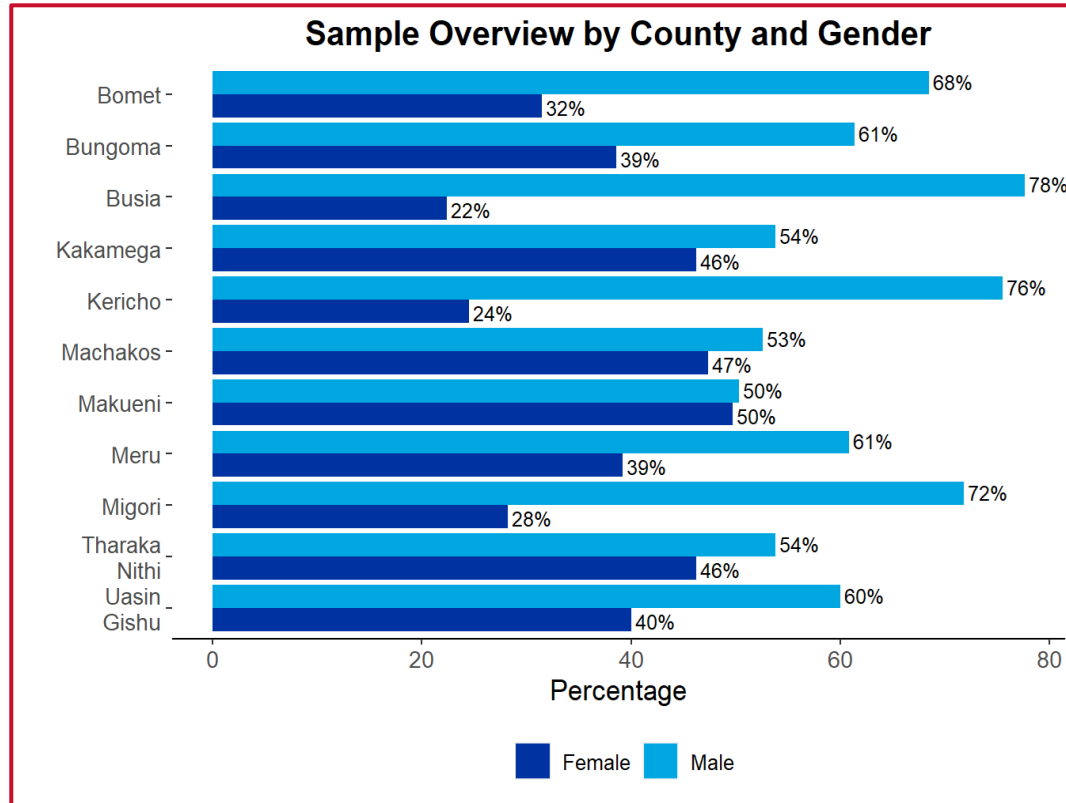
Who Are DigiFarm Users

The background of the slide is a photograph of a person, likely a woman, standing in a field of tall, leafy plants. The entire image is covered with a semi-transparent red overlay. The person is positioned in the upper right quadrant, looking down. The plants in the foreground and background are dense and green, though the red overlay gives them a reddish tint.

User Demographics and Economic Profiles

In this section, we presented the key demographic features of DigiFarm users as well as their economic profiles, including their primary income sources.

Women representation is relatively higher in Machakos and Makueni and relatively lower in Busia and Kericho



Data source: DigiFarm sample

39 years

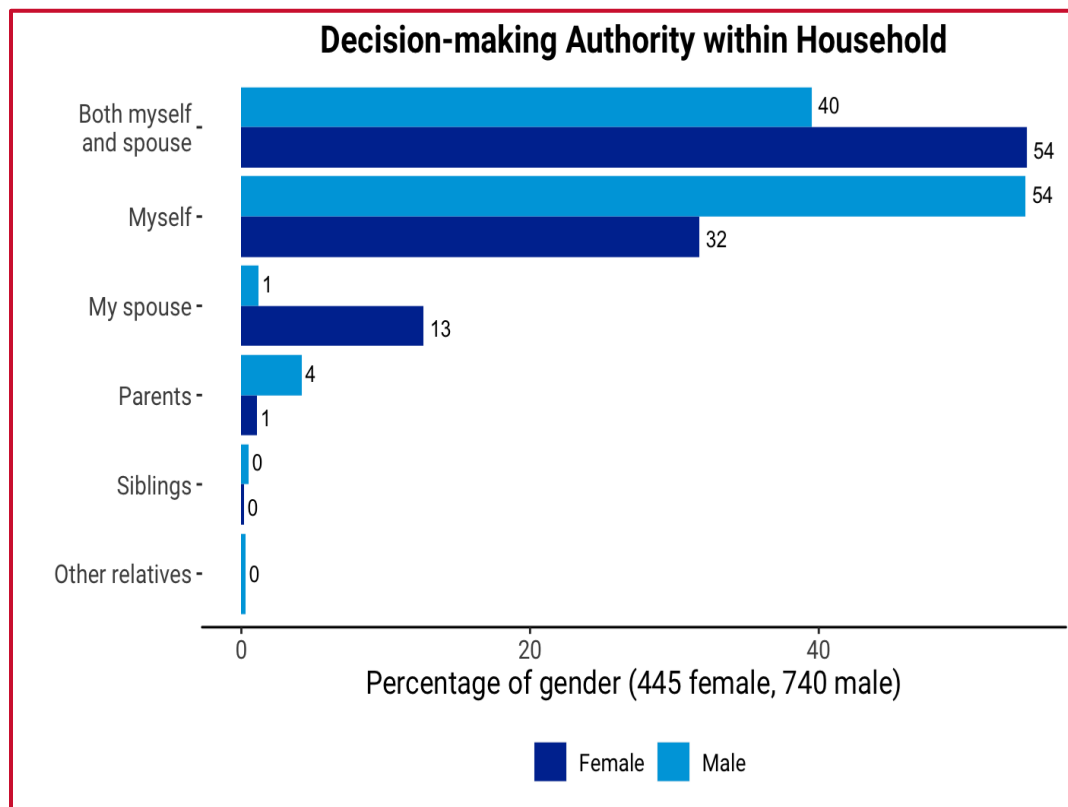
Average age of 1185
DigiFarm users

38%

Of them are less than 35
years old (i.e youth)

- 38% of sampled users are women (445), which is aligned with the women representation in DigiFarm's customer pool.
- No significant discrepancies in age are found between genders or among counties.
- There are a couple respondents from Meru, Makueni and Bomet who are much older than the majority, aged above 70. However, no evidence is found on age significantly influencing the usage of DigiFarm services.

Men users possess more decision-making autonomy than women users, particularly on finance related decisions



Data source: DigiFarm sample

72%

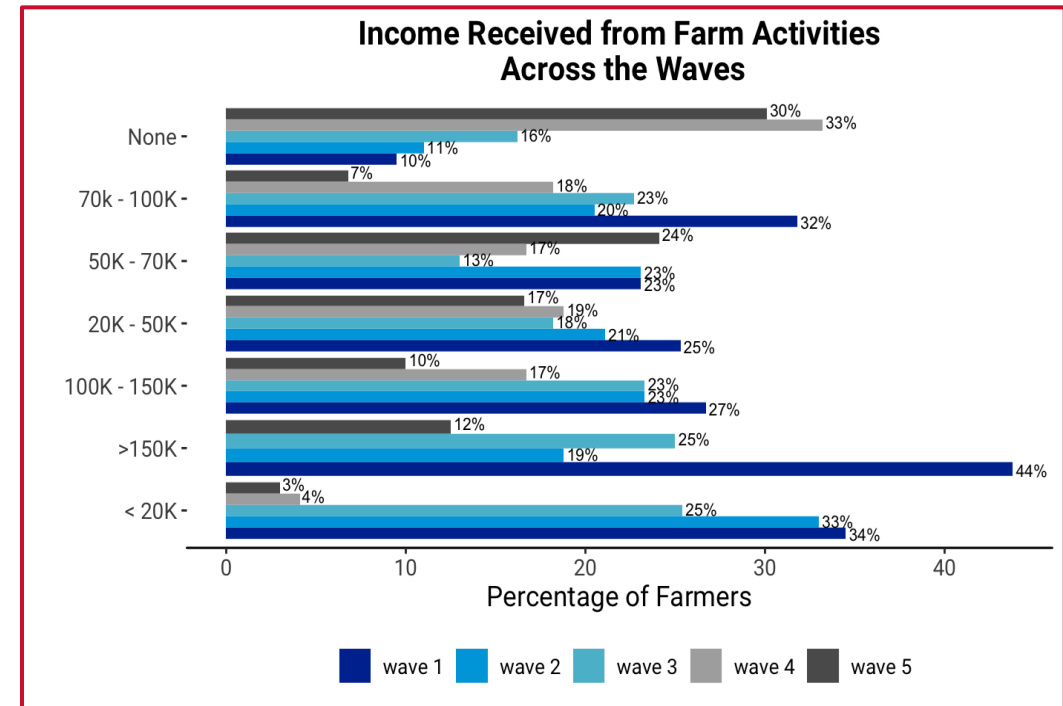
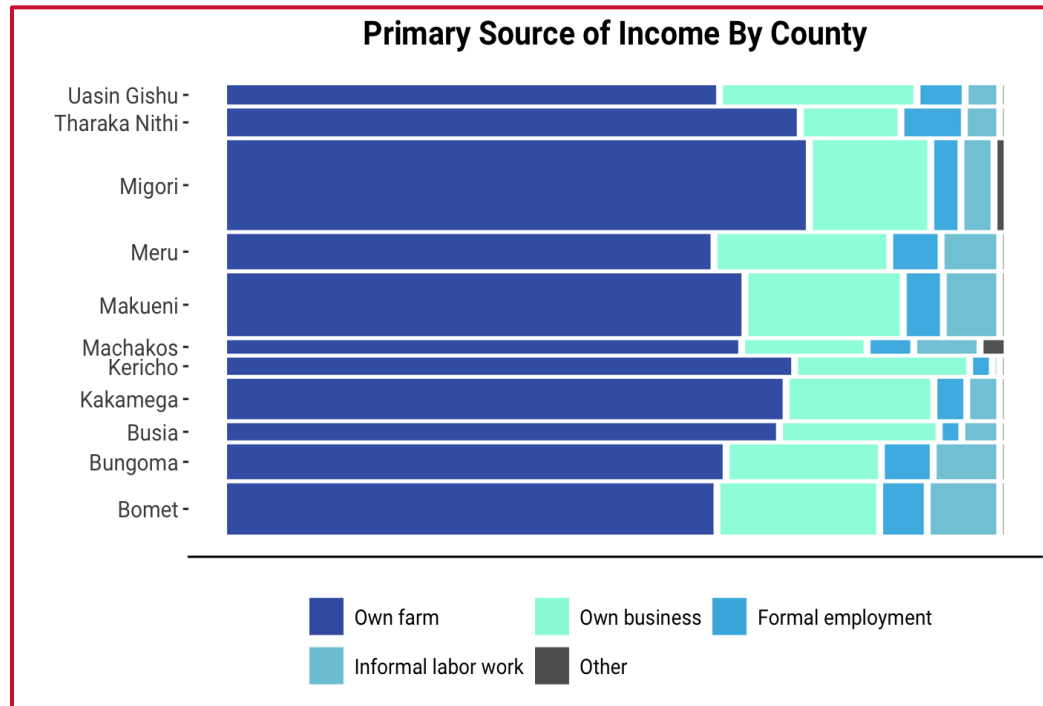
Achieved at least some secondary school education

88%

Married, with limited discrepancy across county

- Men have more autonomy in decision making.
- The majority of male users make decisions on their own (54%), 40% make joined decisions with the spouse. 32% of women users make decisions on their own, 54% make joined decisions with the spouse and 13% fully depend on the husband.
- This finding is further validated in the qualitative follow-up. Particularly, we found that decisions around **finances** are mostly led and made by the male head of household.

Over the 5 months, 9% of users switched the primary income source from own farm to business, informal labor and formal employment

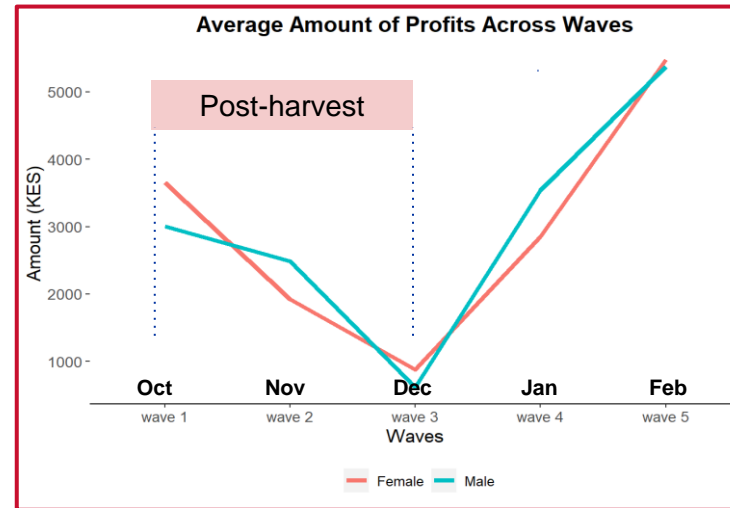
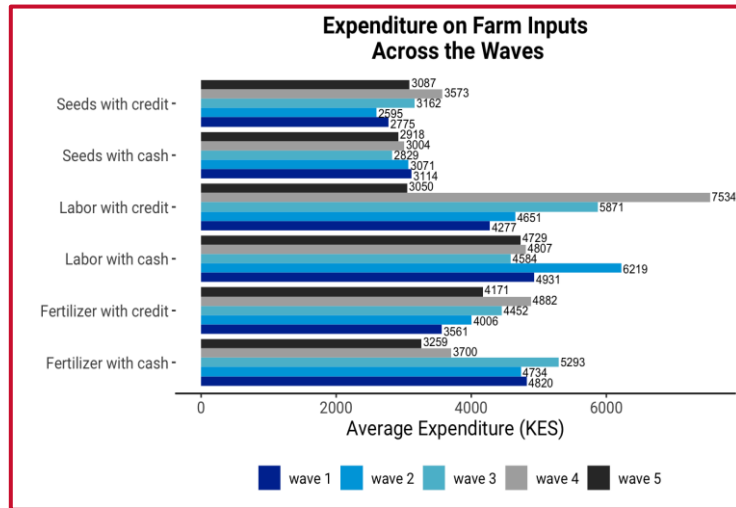


- In the baseline, 842 out of all (71%) reported that they primarily relied on own farms for a living. This percentage decreased to 62% in the endline survey. The gap come from users whose primary income changed from own farm to business, informal labor work and formal employment.
- Meanwhile, among those whose primary income came from own farm, the portion of people who earned nothing from farm has been increasing from Oct last year till Jan this year, and then slightly decreased in Feb. This trend is largely explained by the nature of farming season and cycle in Kenya.

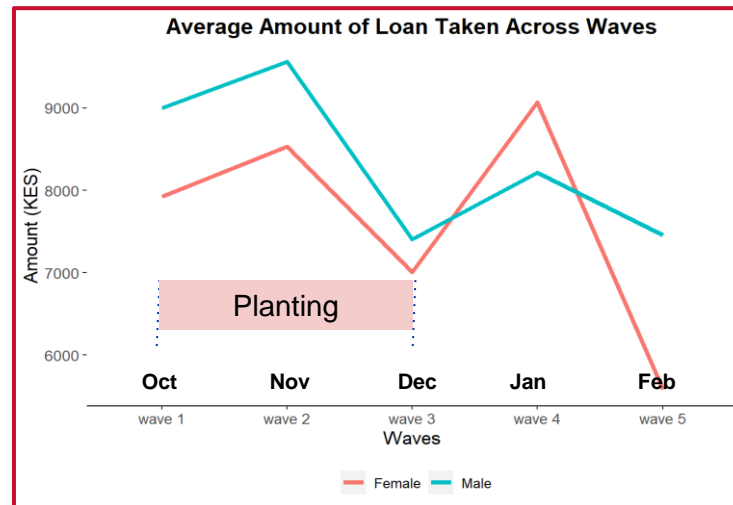
Data source: DigiFarm sample

Changes in farm profit from October to February are largely driven by the natural planting seasons in Kenya

Expenditures and Profits on Farm



Loan Taken over Time



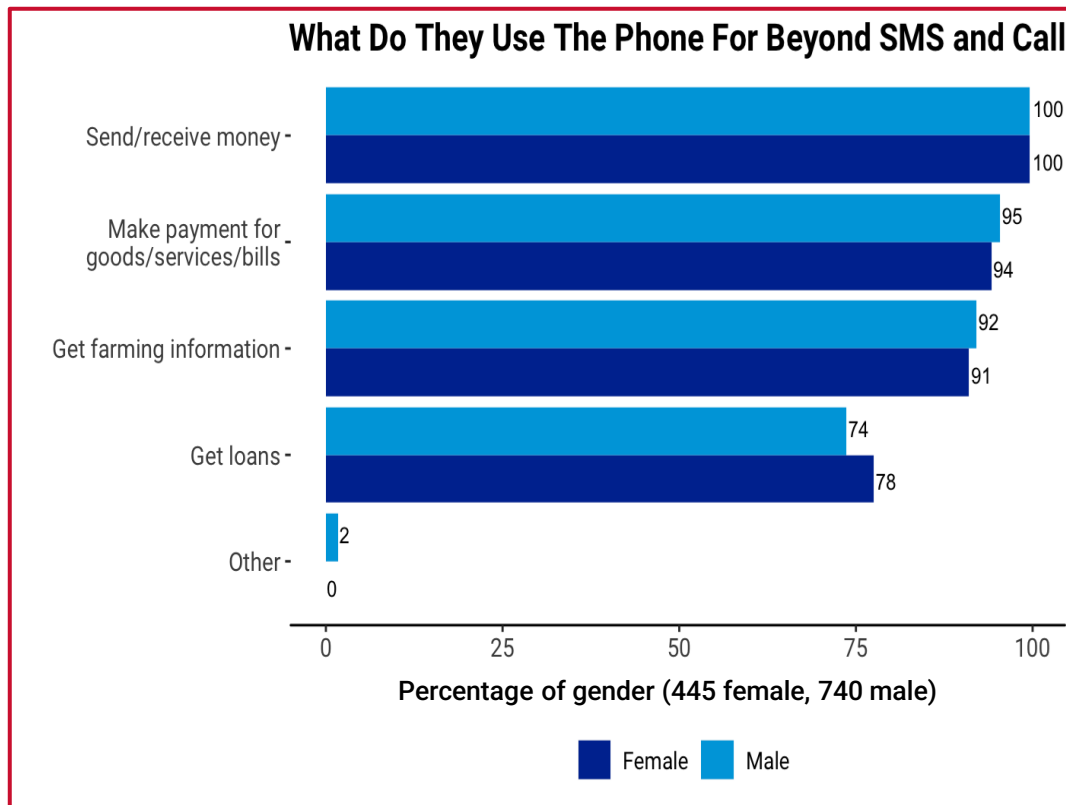
- Farm activities are heavily influenced by the planting season and cycle in Kenya. Typically:
 - Long rainy season (Mar/Apri- Aug)
 - Short rainy season (Sep/Oct - Dec)
- Expenditure on **labor with credit** showed the strongest trend of increasing.
- On average, monthly farm profit varied as: 3242 (Oct) -> 2270 (Nov) -> 717 (Dec) -> 3265 (Jan) -> 5413 (Feb), in KES.
- On average, amount of loan taken varied as: 8113 (Oct) -> 9021 (Nov) -> 7150 (Dec) -> 8598 (Jan) -> 6268 (Feb), in KES.
- The trend in average farm profit and average amount of loan taken follows the similar pattern between genders.

The background of the slide is a photograph of a person, likely a woman, standing in a field of tall, green plants. The image is heavily overlaid with a semi-transparent red filter. The person is positioned in the upper right quadrant, looking down. The field extends to the bottom of the frame, with some plants in the foreground being more prominent.

Phone Usage and Typical User Cases

In this section, we presented insights into what Digifarm users use their phones for and the typical scenarios during a day when they interact with Digifarm.

Some male users share their DigiFarm accounts with the wife because the wife takes main responsibilities on farm



Data source: DigiFarm sample

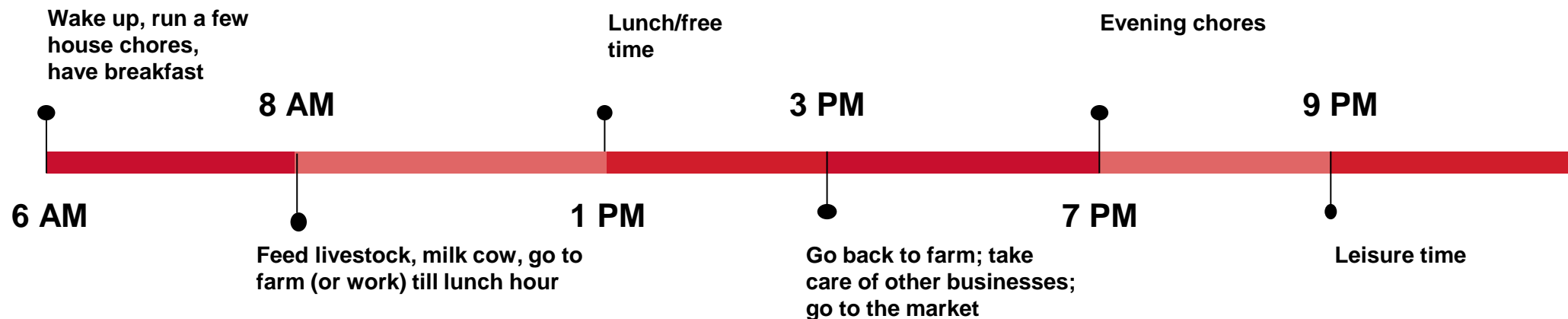
100%
Usage of mobile money

5%
Shared the DigiFarm account
with their family members

- There is no noticeable difference between men and women users in terms of what they use their phones for.
- All users are the primary owner of the DigiFarm account. In the panel survey, 5% indicated that they shared the account with their families. We further investigated into the spillover effect.
- Some male users indicated that they shared the DigiFarm account with the wife as the wife takes major responsibilities of farm work.

Users typically use DigiFarm when they are on lunch break or resting after work

A typical day of a typical DigiFarm user



DigiFarm services are typically used **when**:

- resting or free (lunch time, at night)
- right after going to farm to check weather conditions
- anytime when there is a message

Sequence of using various DigiFarm services

On a typical day when they use DigiFarm services, most farmers usually **first interact with Arifu**, so that they can continue learning about what to do on the farm.

For farmers who use more than one service, **access to input** is the next service they are most likely to interact with, which helps them plan the farm activities accordingly.

Getting information from phone before taking action becomes a habit for them:

"I first interact with Arifu, since that is where I get most information about farming. Every day is a day to learn." - Male User, Uasin Gishu

"The first service that I normally check is about the weather, because I want to learn more about farming. I love farming a lot. Sometimes you are being told [by some sources] that it will rain but doesn't rain." - Female User, Busia



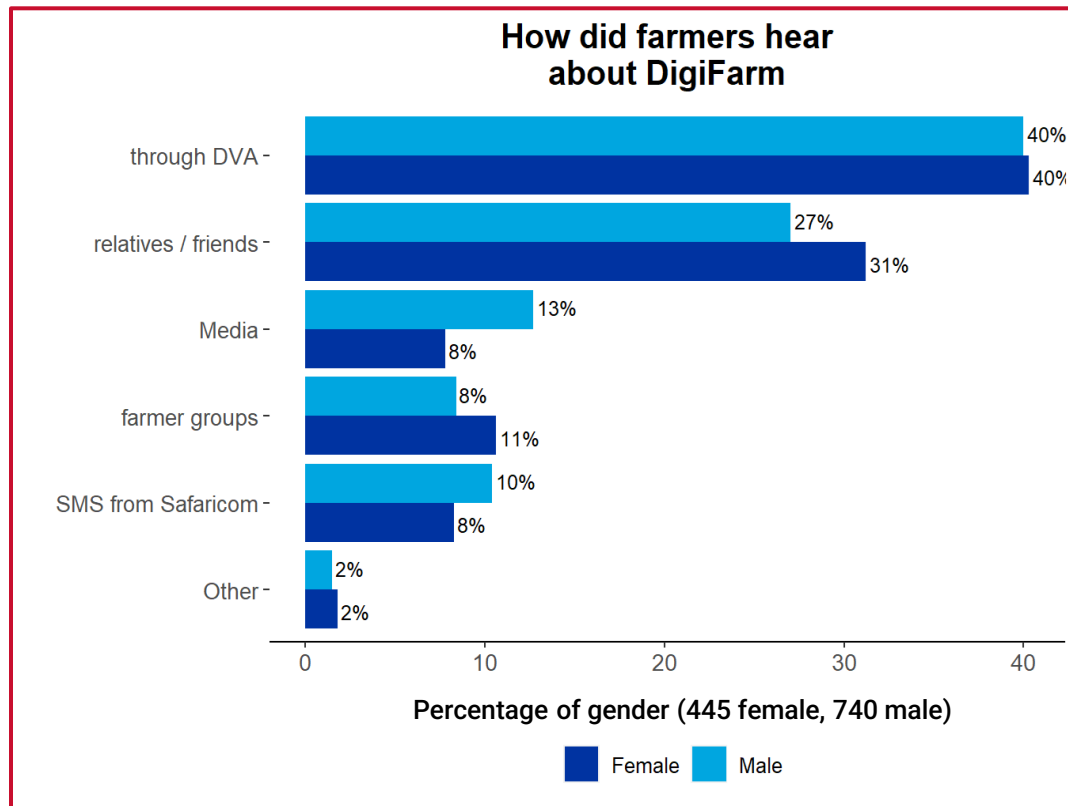
How Are Their Experiences with DigiFarm Services

The background of the slide is a photograph of a person, likely a woman, standing in a field of tall, green plants. The entire image is covered with a semi-transparent red overlay. The person is positioned in the upper right quadrant, looking down. The plants in the foreground are dense and leafy.

Onboarding Experience and Overall Usage

In this section, we analyzed the onboarding experience DigiFarm users have gone through and what could be improved for them. Here we also presented an overview of different types of bundled services being used.

Human (in-person) contact is highly preferred and valued in the process of onboarding, with a raised need for following up



Data source: DigiFarm sample

62%

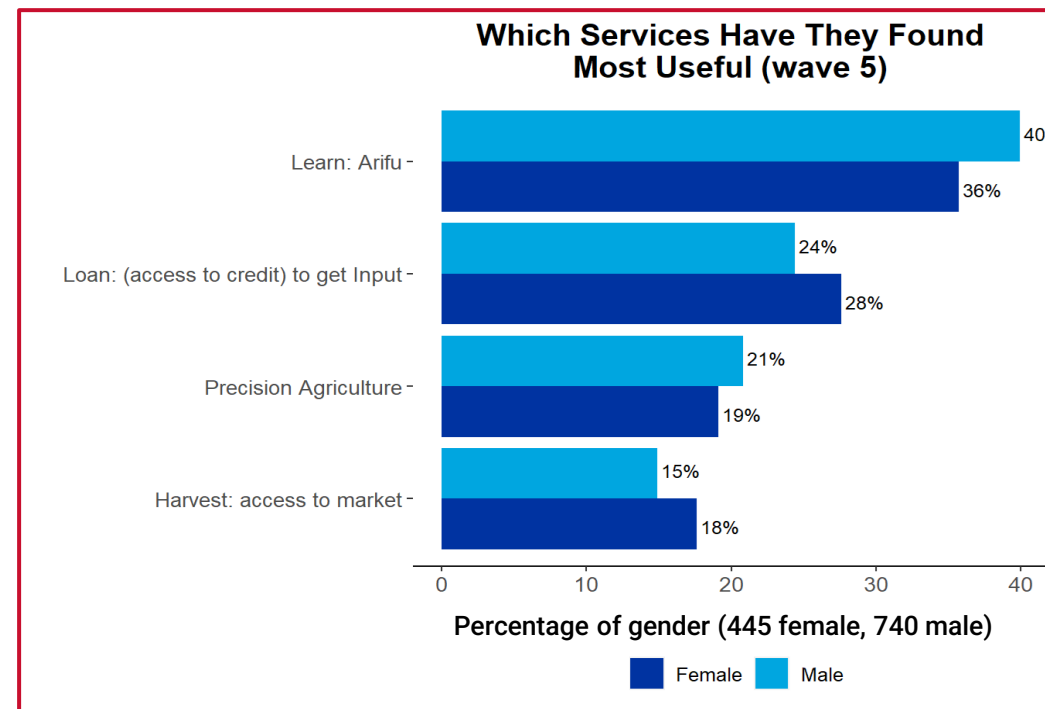
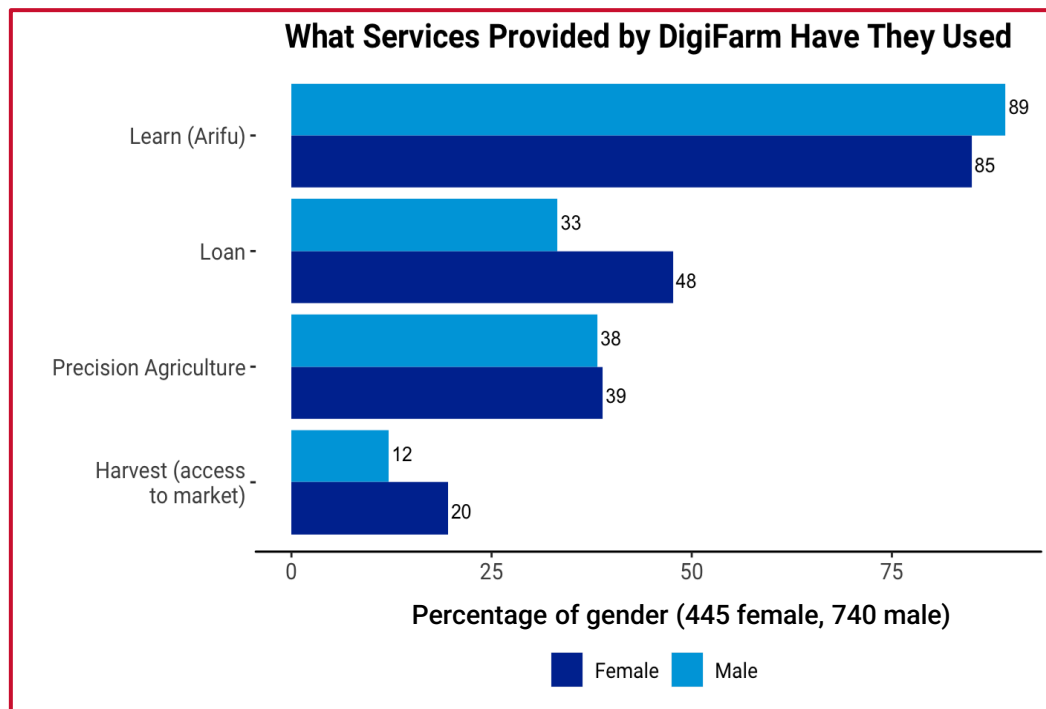
Stated they they had not received training by March

80%

Of those who received training found it very helpful

- A few users in Bungoma, Kakamega, Makueni, Meru and Migori found the training not helpful.
- Suggestions raised by users to improve the onboarding experience:
 - Digifarm to hold seminars at least once a month
 - Agents be more professional (e.g. be more efficient, use clean materials,)
 - Provide constant communication with technical service providers
 - Make sure to carry out the follow up exercises

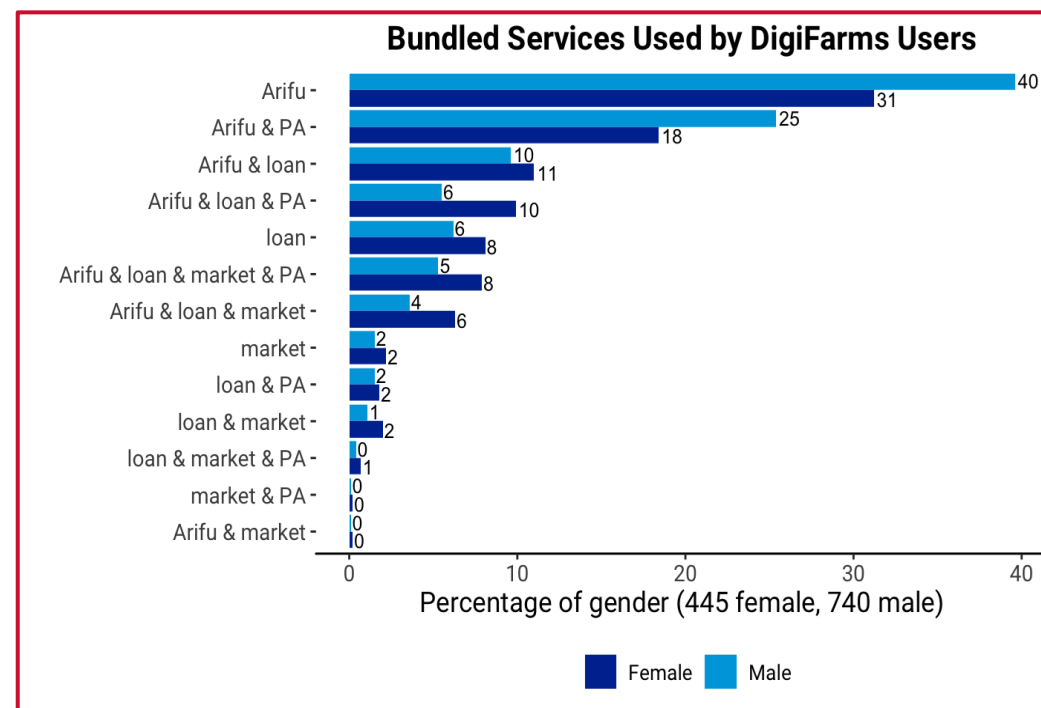
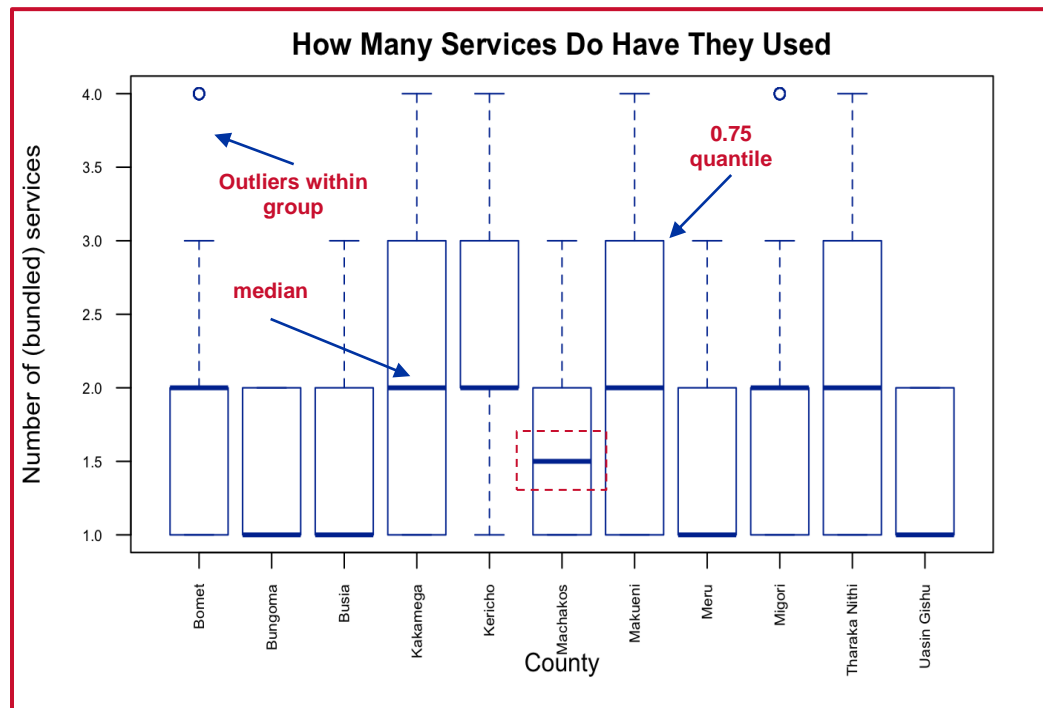
Arifu and Loan are the two stand-alone services being used and valued most; a positive relation is observed between frequency of usage and the perceived usefulness



- The typical sequence of using various DigiFarm services on a typical day could potentially explained the popularity of Arifu and Loan. Recall that most farmers usually first interact with Arifu so that they can continue learning about what to do on the farm.
- For those who use more than 1 service a day, loan (credit for input) is the next service they are most likely to interact with.

Data source: DigiFarm sample

The most popular service is Arifu used alone, followed by Arifu bundled with CropIn SMS or DigiFarm loan



- The reason why Machakos has a non-integer median of 1.5 is because the number of users in Machoko using 1 service (i.e. 19) is exactly the same as the number of those using more than 1 service (i.e. 18 users using 2 services and 1 using 3 services).
- 55% of them (i.e. 650) have used at least two services. When bundled, the most common combinations contain 2 types of services, the majority of with contains Arifu, loan or CropIn SMS.
- It is more likely to find people who use bundled services in Kericho, Kakamega, Makueni, and Tharaka Nithi.

Data source: DigiFarm sample

Reasons why Loan and Arifu are highly valued

Being able to access credit for farm inputs is a key factor in influencing farmers' valuation of the service, particularly when they are short of cash during planting season.

They appreciate the convenience of learning farming techniques from their phone and the vast range of farming knowledge they can learn from Arifu.

A few key features of access to credit and input that farmers value most:

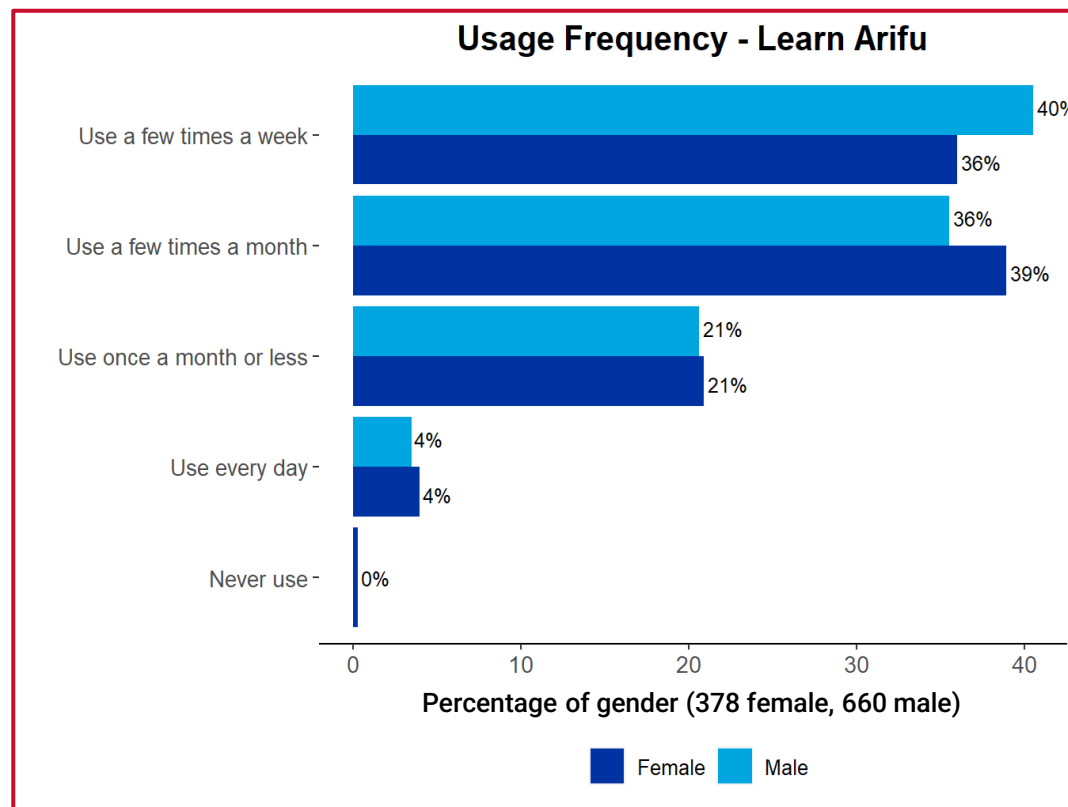
- ☐ Affordable prices
- ☐ Access to credits when it is urgent (i.e. cannot afford to miss the time window for planting seeds or adding fertilizers)
- ☐ Access to quality inputs (better than inputs they get from other sources)
- ☐ Flexible repayment structure, being able to repay from revenue earned from selling farm products via Digifarm

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Experience with Arifu

In this section, we analyzed their experience with Arifu, factors drive usage, and areas for improvement.

Receiving training and practicing crop farming significantly contribute to the active usage of Arifu



Data source: DigiFarm sample

Crop Planting

Is found the most useful learning content over time

Positive Reviews

Attracted the majority of users to use Arifu

- Income level does not affect the usage of Arifu.
- The majority understand well how it works.
- Many people now rely on Digifarm as the primary (or only in some cases) source for information and farming knowledge.
- 90% rated their experience with Arifu as “Helpful, will continue using” in the first 3 months. The percentage slightly dropped in 2021, as some of them found more areas for improvement over time.
- We investigated further in the qualitative follow-up on their thoughts.

Lack of in-person contact and incorrect information are the most common challenges users face

Lack of way to ask questions right after receiving an SMS is a challenge many farmers have encountered. Some also suggested that having a local Arifu office offering in-person training will largely benefit farmers with lower level of literacy.

Some farmers indicated that they sometimes receive incorrect information, prediction or guidance on farming. The inaccuracy partially comes from non-customized information without detailed guidance of procedure.

Other reported challenges include:

- ☐ Delayed messages
- ☐ Network problems
- ☐ Need farm visits or follow-up
- ☐ Pig farming related messages - not appreciated by muslims
- ☐ Language: messages to be in Kiswahili

How does the experience with Arifu affect users' attitude towards other services on Digifarm

The majority users of Arifu have expressed the confidence and trust on the service, given the quality learning experience, and they are enthusiastic for exploring more.

Some users expressed an interest in exploring other digital services. They were inspired to want more kinds of services via phone. Some others stated that it did not affect how they feel about other services even they experienced something negative in the past.

"They make me more excited about the services provided by DigiFarm. Also, they give me the enthusiasm to even try other services offered by DigiFarm that I haven't used yet." - Male User, Uasin Gishu

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Experience with Loan: Credit for Input

In this section, we analyzed DigiFarm users' experience with Loan, what they value most and what they hope for improvement.

Access to credit has enabled farmers to access inputs even when they are not financially stable

Common loan sources farmers are aware of

- Banks, agrovets, M-Shwari, Digifarm and One Acre fund are among the sources farmers are aware of.
- Farmers have been able to use these loan sources in the past in order to cater to **family expenses** including paying for their children's education and **agricultural purposes**.

How Digifarm access to credit works (user perceived)



The Digifarm agent visits the farm and conducts a survey



The agent then communicates to the farmer where to get the inputs



Farmers then pick the inputs from the agrovet, once they have deposited the down payment

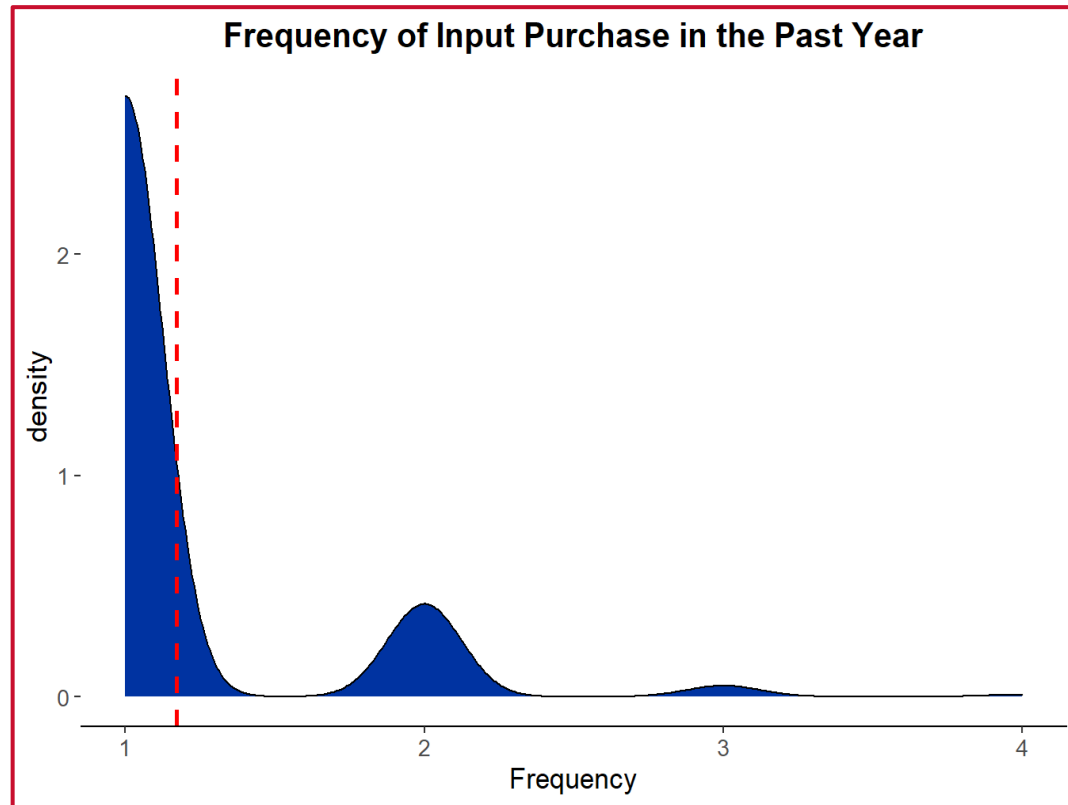
“The process of taking it was that there was an agent of Digifarm who came and measured the land then we went to their Agro vet where we were given the paybill number to pay the down payment and then we were given the inputs.” - Male User, Busia

“I used M-Shwari Loan to build [house] and Digifarm loan in agriculture” - Male User, Busia

“The one for KCB I used for fees because my child was in campus and one for One Acre Fund was for farming purposes.” - Male User, Busia

Note that DigiFarm loan service is also bundled with **insurance**, but not all users interviewed had been fully onboarded with insurance by the time when study was carried out.

Farmers tend to buy inputs from other agrovets when they have cash; they tend to turn to DigiFarm when lack of cash



Note: based = 320. 865 respondents who did not take DigiFarm loan in the past 1 year are excluded

Data source: DigiFarm sample

66%

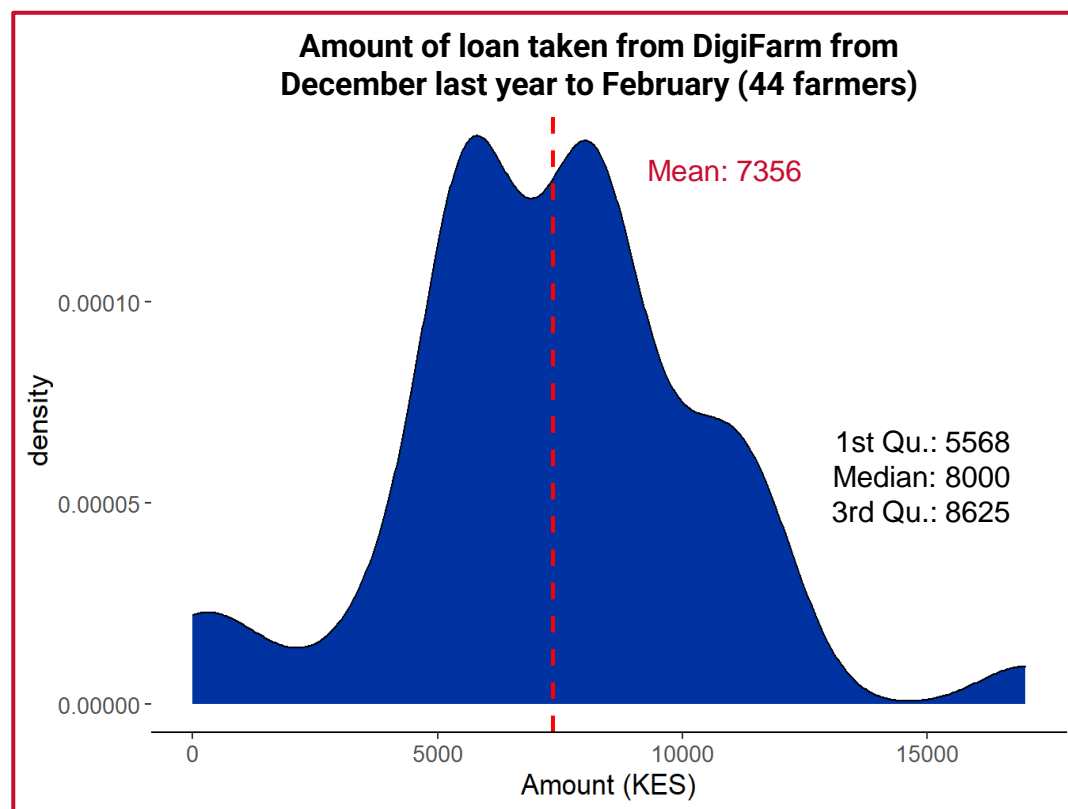
Of all get input primarily from other agrovets or dealers

85%

of the DigiFarm loan takers took it once in the past year

- There are relatively more active users in Kakamega and Busia who used the loan service more than once in the past 1 year.
- Farmers typically source for inputs right before the planting seasons, which varies by crops. Overall, it concentrates during August - October and February - March.
- Seed, fertilizer and pesticide are the top 3 inputs they got from DigiFarm regardless of month.

Being able to access affordable input without holding when low in cash is the most valued feature of the service



Note: 1114 respondents had not taken any loan in the last 3 months and 27 respondents who didn't remember the actual amount are excluded

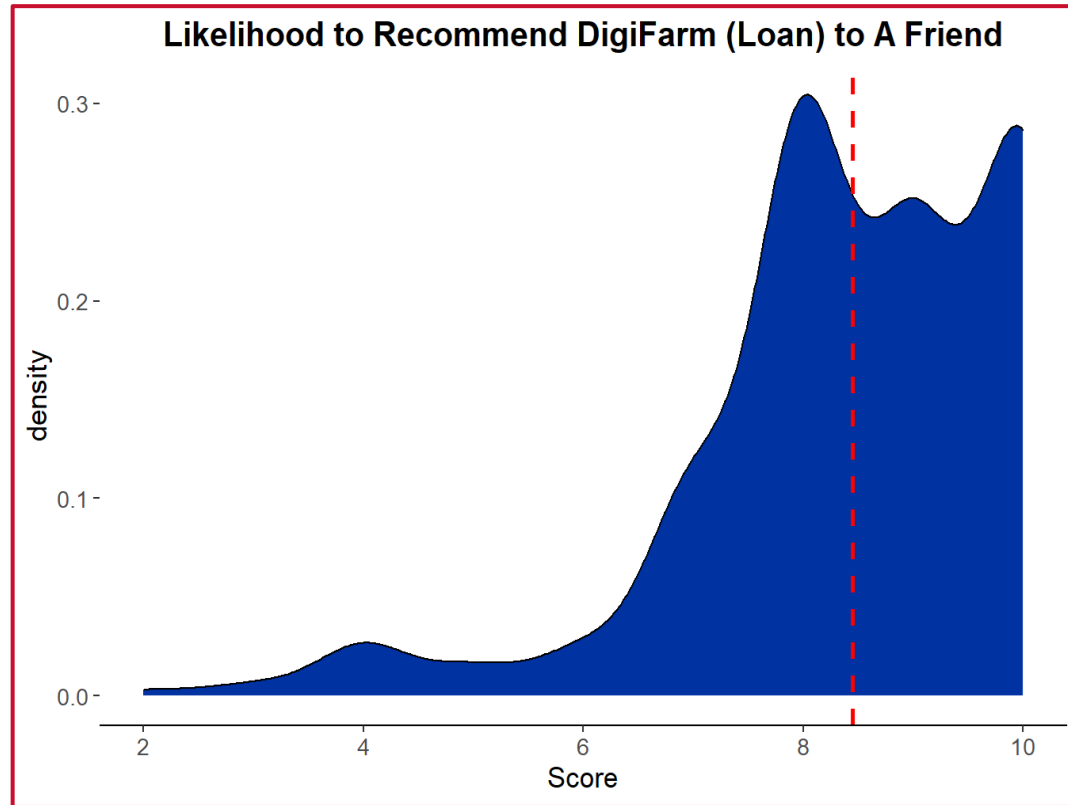
Data source: DigiFarm sample

70%
Have started making
repayment

72%
Managed the repayment
through harvest income

- Flexible repayment scheme is another highly appreciated feature, especially by women.
- Low usage of loan is largely explained by the farming season and when farmers seek for input.
- 90% users rated the experience as “Helpful, will continue using” initially, and the percentage kept dropping to 74% in February. The gap comes from users who did not use it in the past 1 month and users who find more areas for improvement.

Onboarding through DVA and receiving training significantly contribute to the usage of DigiFarm loan service



Note: based = 320. 865 respondents who did not take DigiFarm loan in the past 1 year are excluded

Data source: DigiFarm sample

33%

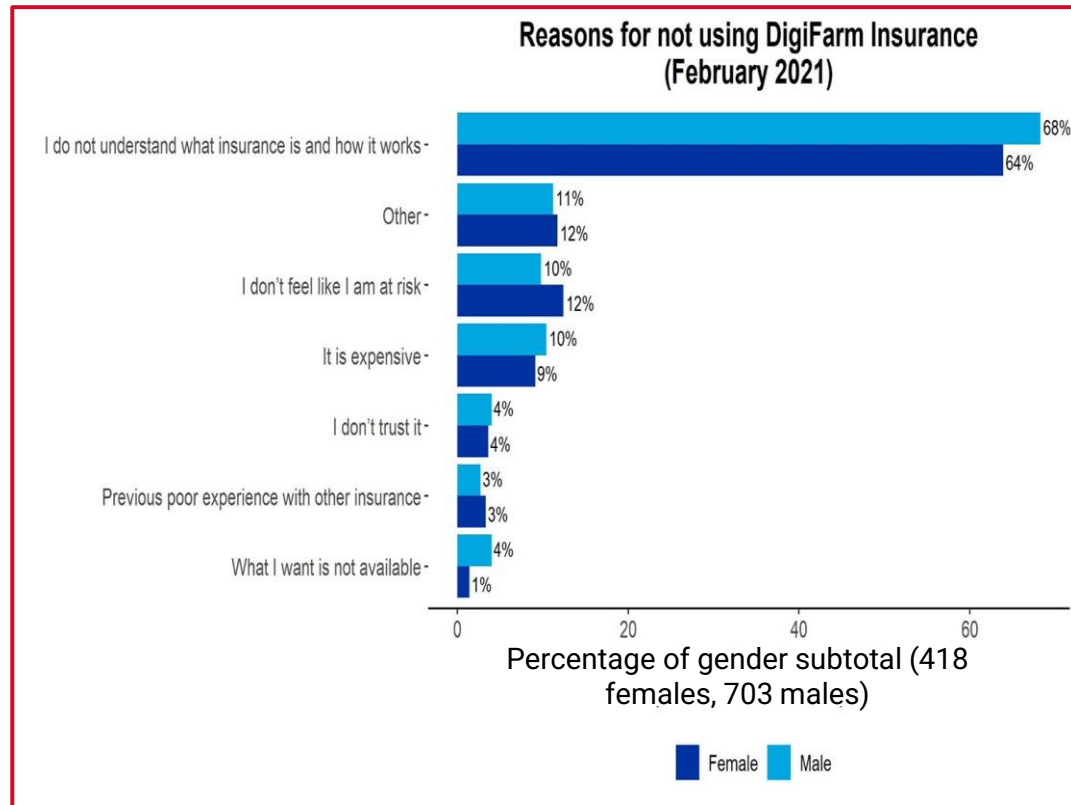
Are highly likely (score 10) to recommend it

100%

Highly likely recommendation in Machakos

- The high recommendation scores are linked to the overall positive experience they had with the service and its unique features.
- In terms of likelihood of recommending to others, visible within-country discrepancy between gender is only observed in Kericho. But the difference is not significant.
- Human contact -- in-person onboarding and training and follow-ups -- are key to drive the usage of loan service.

Farmers believe insurance is important but lack of knowledge on how DigiFarm insurance works undermines its usage



Note: based = 1121, who did not use DigiFarm insurance in February.

Data source: DigiFarm sample

90%
Believed that insurance was important for farmers

12%
and less have used DigiFarm insurance over the 5 months

- DigiFarm users generally believe that insurance is important. However, lack of knowledge on how DigiFarm insurance works undermines its usage.
- Over the 5 months, the uptake of DigiFarm insurance decreased from 12% (i.e. 140 users) to 5% (i.e. 64 users).
- The low uptake was partially explained by the finding in qualitative follow-up that most farmers were not fully introduced to or onboarded with it.
- Among the insurance users, over 70% found it useful and would continue using.

Challenges with the service are around delayed delivery, logistic and technical difficulties and lack of follow-up

Flexibility (i.e. using credit and the repayment scheme), affordability and quality of input are the most valued uniqueness of this service. Farmers appreciate that they do not have to wait for cash and miss the planting seasons.

The pains are around delayed delivery (in some cases, not inputs were delivered), distance to appointed agrovets, technical difficulties on the app, and lack of follow-up on progress. Lack of follow up gives them a wrong impression that DigiFarm cares only about people who are able to pay back credit.

Positive experience gives them the confidence of other Digifarm services. Additional suggestions include:

- ☐ Provide credit for non-farming items that could improve farmers' livelihood (e.g. TV)
- ☐ Inform or remind users on the repayment procedure and time

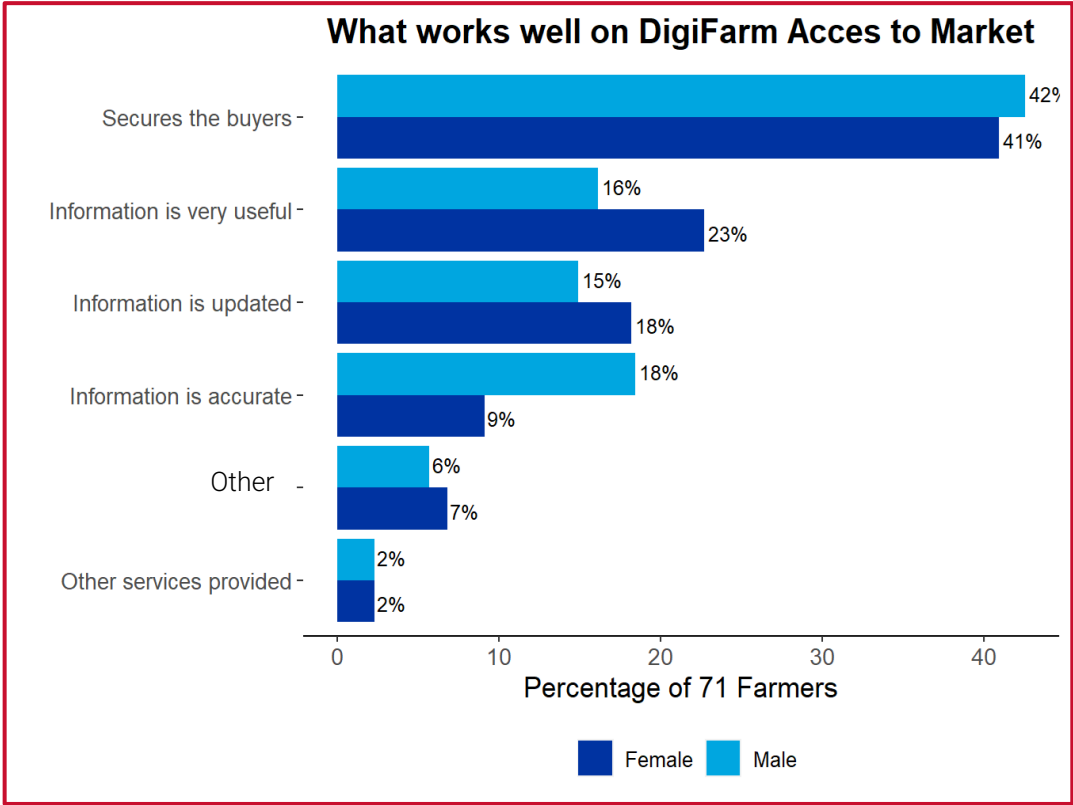
“Now I value to work with them instead of using other means which won't be good, for me I support Digifarm because I have used their seeds.” - Male User, Bomet

The background of the slide is a photograph of a person, likely a woman, standing in a field of tall, leafy plants. The entire image is covered with a semi-transparent red overlay. The person is positioned in the upper right quadrant, looking down. The plants in the foreground and background are dense and green, though the red overlay gives them a reddish tint.

Experience with Access to Market

In this section, we analyzed their experience with Access to Market compared to their experience with local markets, factors drive usage, and areas for improvement.

Receiving training from DigiFarm significantly contributes to the active usage of Access to Market



Note: based = 71 (wave 5). 1114 respondents who did not use it in the past 1 month did not get to answer the question thus are excluded

Data source: DigiFarm sample

50%
Self-consumption and selling
from November to February

70%
Farmers tend to primarily sell
to local markets

- From November last year to February, about 25% of the farmers did not have farm harvest. From December and onward, less than 5% of the farm products were purely for selling.
- Receiving training significantly contributed to the active usage of the service.
- The usage of this service dropped every month from 30% in October to 4% in January, then slightly went up to 6% in February.
- We investigated further on reasons to sell on local markets vs. DigiFarm in the qualitative follow-up.

Logistical challenges could potentially hinder farmers from selling products through DigiFarm

Main reasons for selling to local traders or agrovets

- Do not have enough volume of products to sell to DigiFarm
- DigiFarm agents are not around (to pick up products)
- Troubles of traveling to the DigiFarm store to sell
- Prices at local venues are sometimes better

Main reasons for selling to DigiFarm


- To pay off the credit taken for inputs
- Stable and secure channel for selling

“The person working in the Digifarm store is the one who linked us to the customers”. - Male User, 46, Tharaka Nithi


“Someone from Digifarm came to pick the produce”. - Female User, 30, Uasin Gishu

“I sell to those local business people in vibandas” - Male User, 55, Busia

Majority of users have a better experience with DigiFarm, compared to local markets, primarily due to better prices and quality inputs



Most of the farmers appreciate that DigiFarm offers less inflated prices, compared to what is offered at most of the local venues.



A few farmers suggested that Digifarm could have an alternative cash payment option, instead of using m-pesa, to save the transaction fees.

Influence of positive experience:

Generally, farmers expressed their satisfaction with the market service, more so because of reasonable prices, favorable for small-scale farmers, and effective payment structure (e.g. repaying credits by revenue from the harvest). The positive experience further inspires and encourages some farmers to explore and try out other digital services.

“I just want them to bring on board other services so that we can check on the prices and subscribe to it. This is because they give us enough time to complete our payments.” - Male User, Busia

Experience of transition to e-commerce for farm products varies

Some farmers do not like the experience of not seeing buyers, mostly because in the e-commerce environment they are unable bargain for better prices, to interact with buyers at the personal level, or get feedback on the products they sell.

Others find little difference between selling online and offline. It is not important to such users whether they can see or interact with buyers, as long as they get fair prices.

How do they feel about the prices offered by DigiFarm market service:

The vast majority have expressed their satisfaction with the prices on Digifarm, compared to prices at the local markets.

“The pricing is good. I’m just holding onto DigiFarm, I cannot turn back to where I was.” - Male User, Busia

“I feel good because they [DigiFarm] have better prices in the market than the other sellers so I really like them.” - Female User, Kitui

Expanded category of what can be sold through DigiFarm is what many farmers look forward to in the future

Farmers have expressed the strong hope to sell non-crop products via DigiFarm, such as vegetables, dairy products, and livestock including cows and goats.

"I want to see vegetables. Maybe they [DigiFarm] don't buy them because they are perishables, but I wish if they did." - Female User, Uasin Gishu

A couple of farmers would like to have a technical team from DigiFarm to help the evaluate their products before taking them to the market.

Some farmers also raised the needs for more information and training from DigiFarm to better prepare them for e-commerce environment.

"I need more training from Digifarm to enable me ask more questions." - Female User, Bomet

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Precision Agriculture

In this section, we analyzed their experience with CropIn's SMS and area for improvement.

About CropIn and the specific context of this study

CropIn is an intuitive, intelligent, self-evolving system that delivers future-ready farming solutions to the entire agricultural sector.

- CropIn delivers decision-making tools that bring consistency, dependability and sustainability to agri-businesses.
- With capabilities of live reporting, analysis, interpretation and insight that span across geographies, CropIn is digitizing every farm, while data-managing the entire ecosystem.
- Its smarter agri-solutions are powered in real-time; for users to archive patterns, predict trends, to make a blueprint for their business in the times to come.



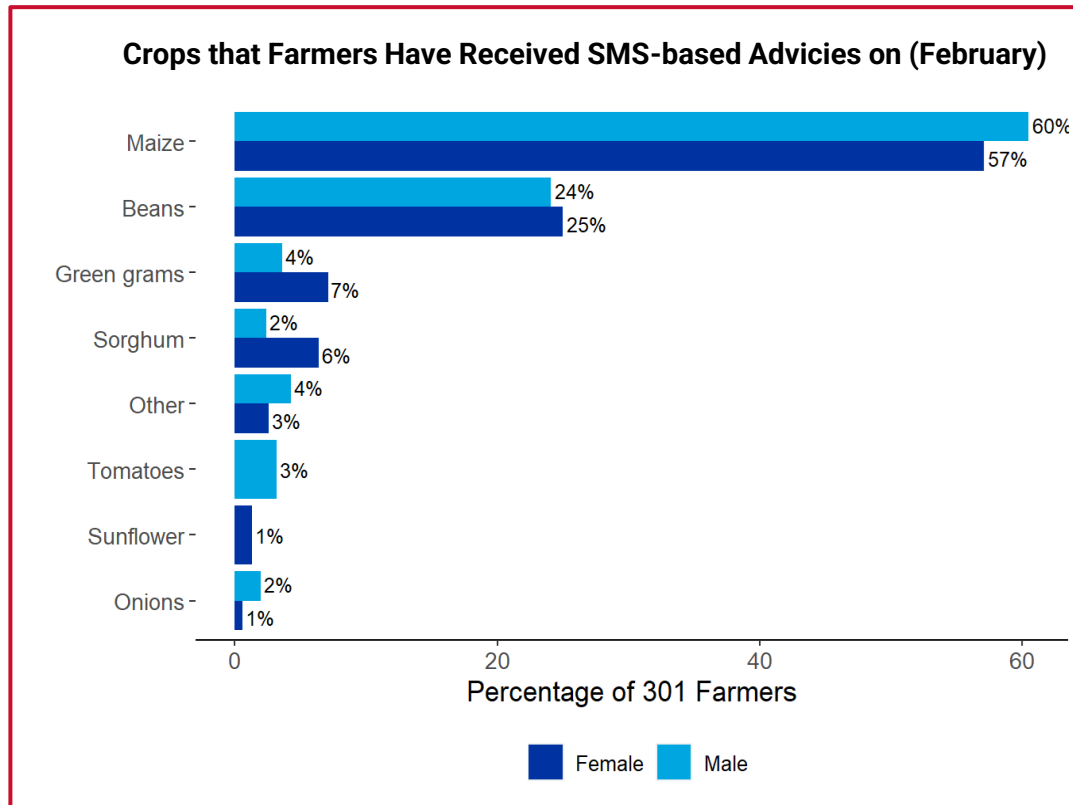
By one of its solutions, SmartFarm, CropIn provides comprehensive farm management solutions, including but not limited to:

- Satellite and weather input based advisory
- Crop reports & insights
- Standard package of practices
- Alert Log & Management (pest infestation, diseases etc.)

Through partnership with DigiFarm, CropIn sends SMS to a subgroup of DigiFarm users.

Given that the recipients of CropIn SMS in this study were not purposely recruited but interviewed on a random basis (i.e. recruited for DigiFarm services and interviewed for CropIn SMS experience if the respondents happened to receive the SMS in the past 1 month), the uptake and experience of CropIn SMS in this study is limited and might not be applicable for the general users of CropIn SMS.

User who have read the SMS with more attention are more likely to have a positive experience and attitude towards it



Note: based = 301 (wave 5). 884 respondents who did not receive the CropIn SMS are excluded

Data source: DigiFarm sample

95%

Have adjusted farming practices based on the SMS

98%

Rated the experience as "helpful, will continue using"

- The major changes happened around "the way I plant (19%)", "the crop I grow (17%)", "the way I plan (17%)", and "type of fertilizer used (14%)".
- Among those who have adjusted their farming behavior, 99% of them expressed their belief in SMS increasing the yield or farm income (65% strongly agree, 34% agree).
- The main reasons for not taking actions include: did not pay full attention to the SMS, information being inconsistent and hard to follow; SMS-based advice not being the top priority/need (i.e. inputs).

A majority of the farmers have not received tailored messages from CropIn

Some farmers stated that they do receive messages related to the weather conditions but not from CropIn. It may be case that they cannot differentiate the messages from CropIn with those from Arifu.

For the few farmers that have received these messages from CropIn, one challenge they face is that the messages are not regularly updated. It is important for these messages to be timely as the farmers work with seasons.

Panel data shows that in the typical month during the study, 30% or less users received the SMS

“I just received message (twice) about weather condition but not from CropIn.” - Male User, Nandi

“I did soil sampling and instead of using DAP I used NPK, I had to apply chemicals for warms twice from what CropIn was advising.” - Male User, Bomet

“No challenges, only sometimes the CropIn is not usually updated, but I have called for the update to be done.” - Male User, Bomet



What Are Impacts of Adopting and Using DigiFarm Services

The background of the slide is a photograph of a person, likely a woman, standing in a field of tall, leafy plants. The entire image is covered with a semi-transparent red overlay. The person is positioned in the upper right quadrant, looking down. The plants in the foreground and background are dense and green, though the red overlay gives them a reddish tint.

Observed Impacts

In this section, we analyzed the various impacts DigiFarm has brought to users, observed in both quantitative panel data and qualitative follow-up.

The majority has observed positive changes DigiFarm services bring

Arifu, loan and access to market have together responded to most farmers' needs of capacity building (i.e. better farming practice), provision of food and money for family, and improved standards of living.

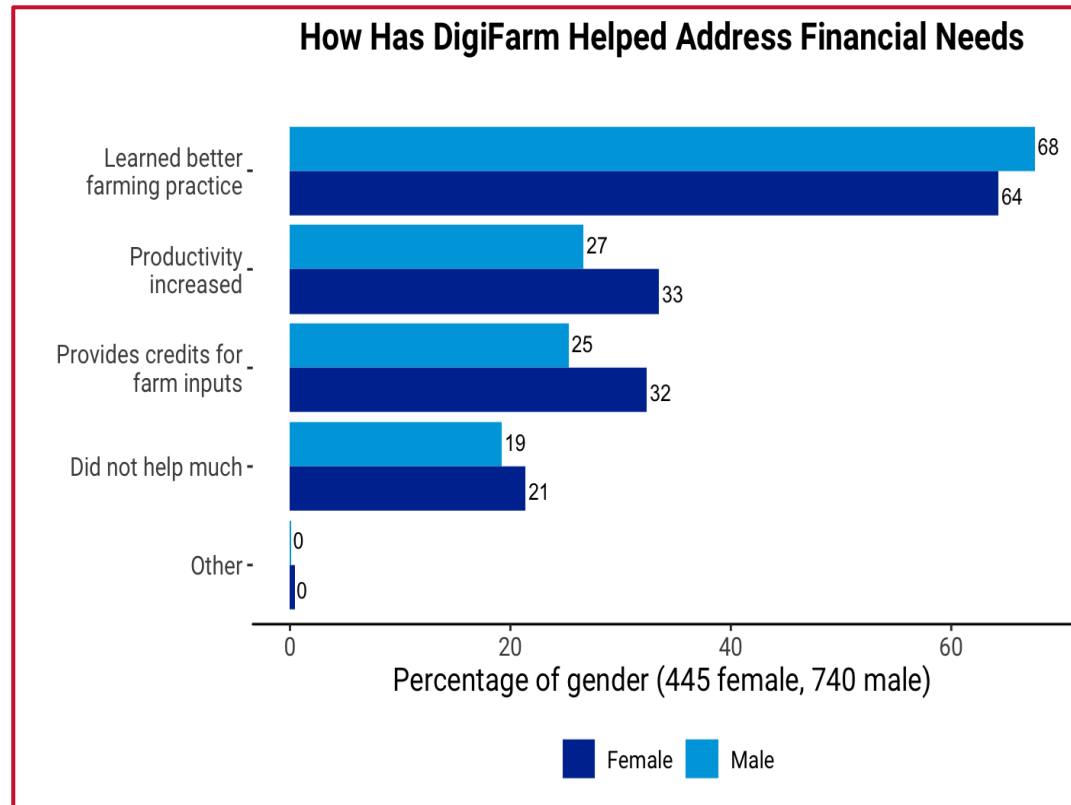
*"Yes, it has fulfilled some of my needs especially on food sustainability. I have enough food for my family."
- Male User, Busia*

Through these services, they have been able to expand farm or agricultural businesses, save more, and get education for themselves on good farm practices and for their children.

"Whenever I encounter any challenges on my farm, I usually get the information on how to correct it from the messages. I am very satisfied and comfortable with the service." - Male User, Uasin Gishu

"I can pay school fees and I can meet my needs at home, I can save." - Female Users, Machakos

Long-term behavioral changes in learning better practices and mobile saving help farmers cope with financial stresses



Data source: DigiFarm sample

70% +

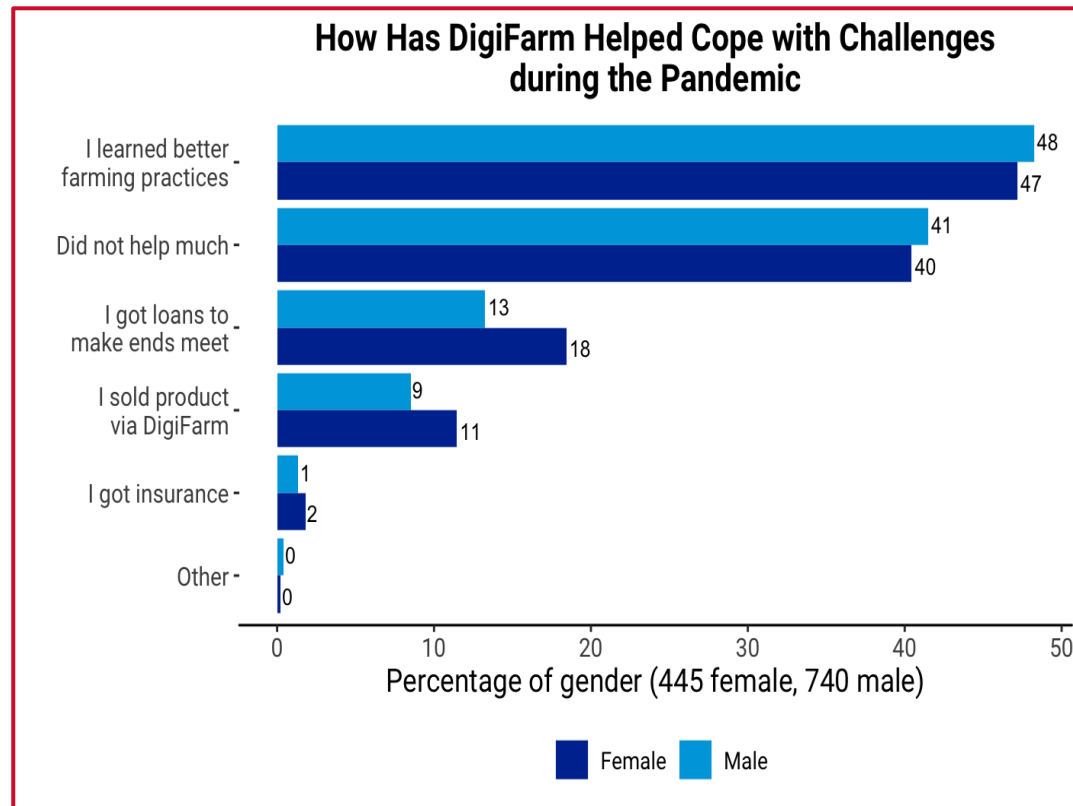
Use income and saving to address financial needs

40%

Use mobile wallet as the primary saving platform

- DigiFarm is used by approximately 5% users as a source for addressing pressing financial needs.
- The top 3 reported financial stresses are:
 - Inputs for the farm
 - Other agricultural expenditures
 - Education related expenditures
- Long-term positive impacts such as able to learn better farming practices are well recognized by DigiFarm users. In the qualitative follow-up, they also emphasized their gain of increased knowledge in using modern farming techniques.

Users expect DigiFarm to do more on helping them go through challenges posted by COVID-19



Data source: DigiFarm sample

71%

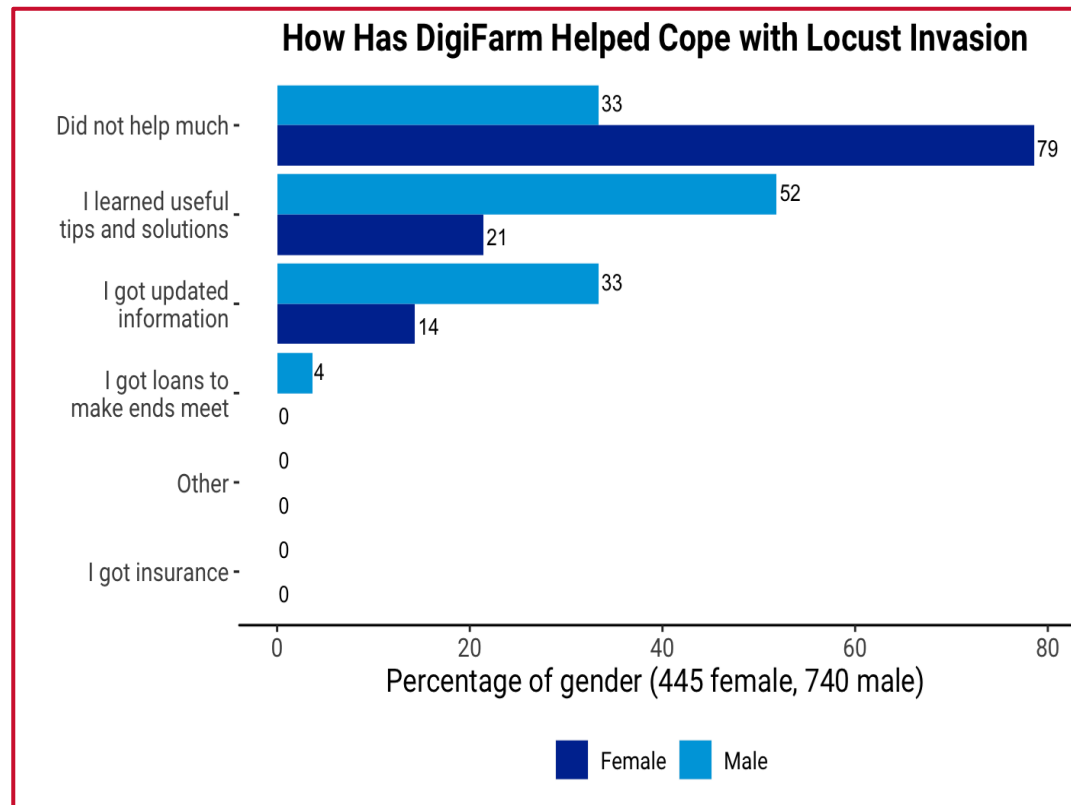
Experienced reduced farm income due to COVID

37%

Reported the main suffer being access to market

- Approximately 80% responded to the challenges by working harder to make end meets.
- Type of information received
 - Covid-19 symptoms
 - How people get the virus
 - Guidelines to help farmers stay safe
- Most farmers suggested during the follow-up that Digifarm provide medical kits such as masks, sanitizers, soaps to help them stay safe during the pandemic.

Early and more comprehensive information via SMS can be an inexpensive solution to building resilience against shocks



Data source: DigiFarm sample

99%

Reported not being hindered by locust invasion

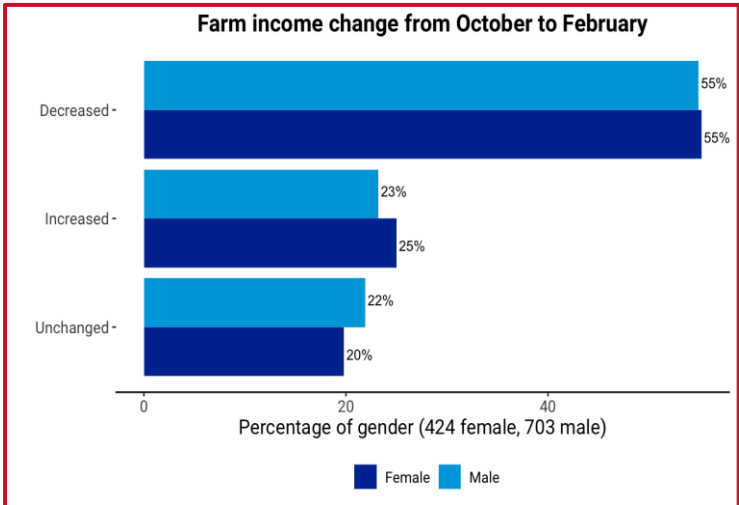
56%

Reported the main suffer being harvest and production

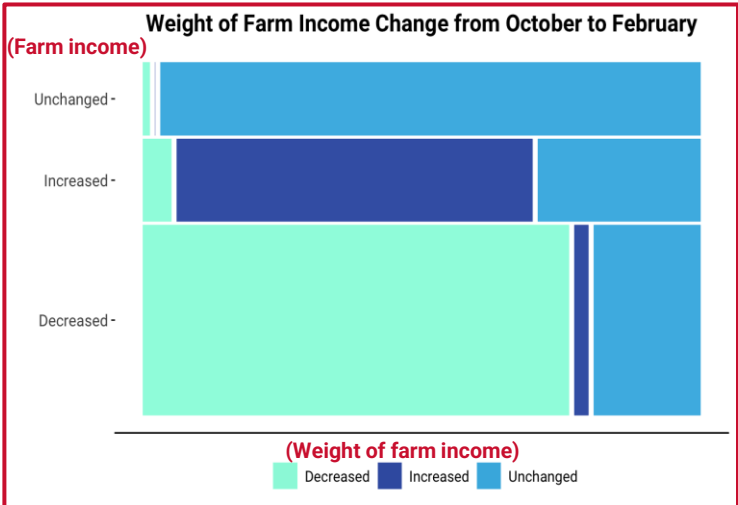
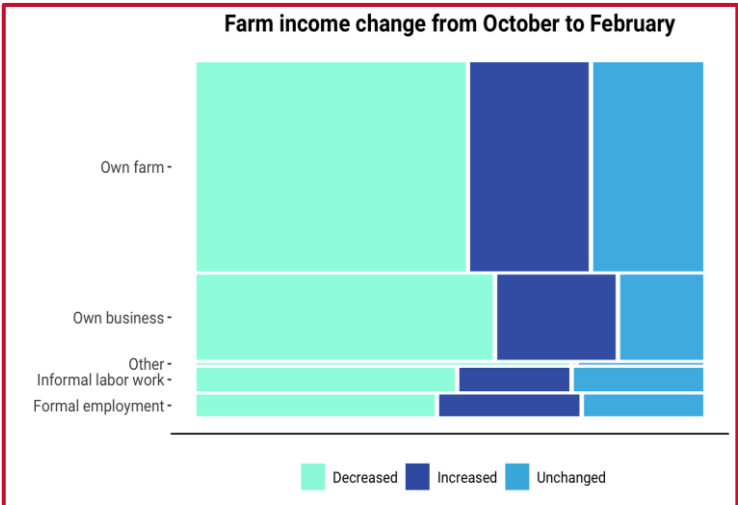
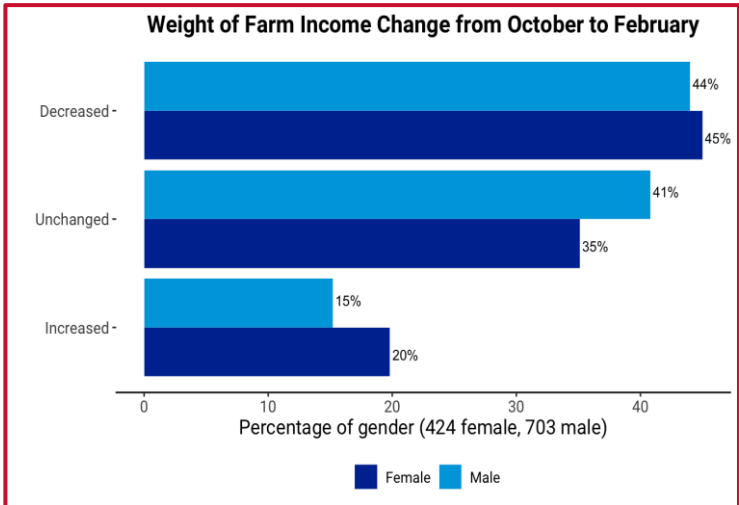
- For the few who were affected, they found some support from DigiFarm. During the follow-up, they shared more details about the impact story:
 - DigiFarm sensitized and educated them on the best practices of modern farming (e.g. SMS)
 - DigiFarm provided pesticides and chemicals to mitigate the effect of the locusts
- Farmers expressed the eagerness for more information on farming products and raised the need of being informed such shocks in advance.

Change in weight of farm income largely drove the change of users' income from farm, affected by season and COVID

Change of Income from Farm



Change in Weight of Farm Income



- From October last year to February, 55% users reported a decreased income level from farm. 21% remained unchanged and 24% experienced the increase.
- The trend remains true for both genders. The similar trend is also observed by type of primary income source.
- This trend is largely driven by the change in weight of farm income. 44% users reported that the percentage of income from farm had decreased over the period. They consist of the majority of those who experienced a decreased farm income level. Similarly, The majority of those who experienced unchanged farm income level kept the same weight of income from farm.
- The change in weight is reported due to seasonal and COVID related reasons.

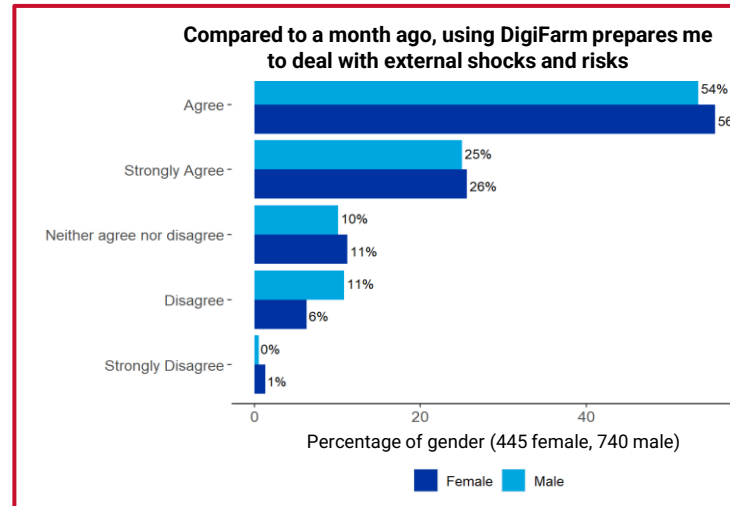
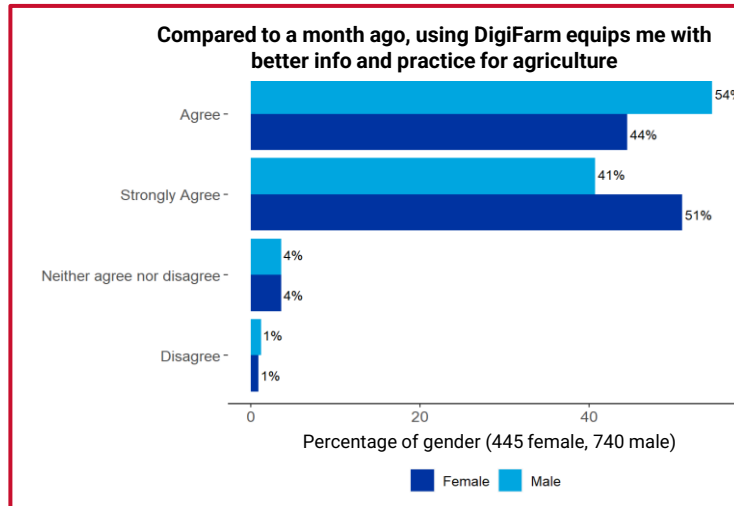
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Perceived Impacts

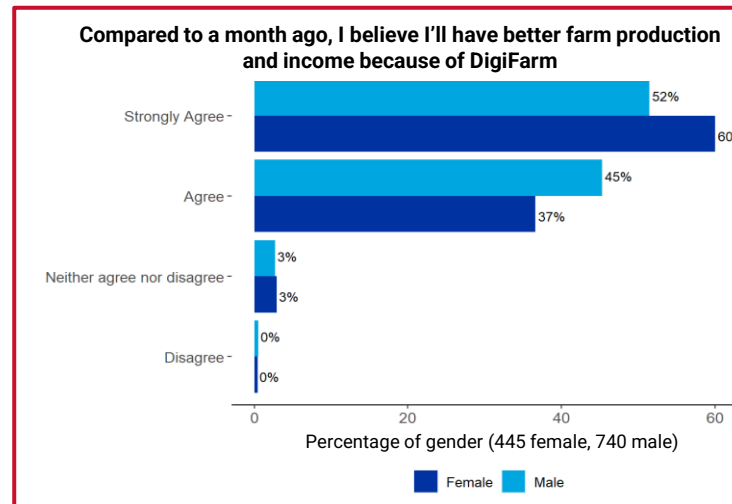
In this section, we presented the perceived impacts by DigiFarm users over time with respect to capacity, resilience and farming outcome.

The majority have perceived strengthened capacity and resilience and promising farming outcome

Capacity and Resilience



Farm Production and Income



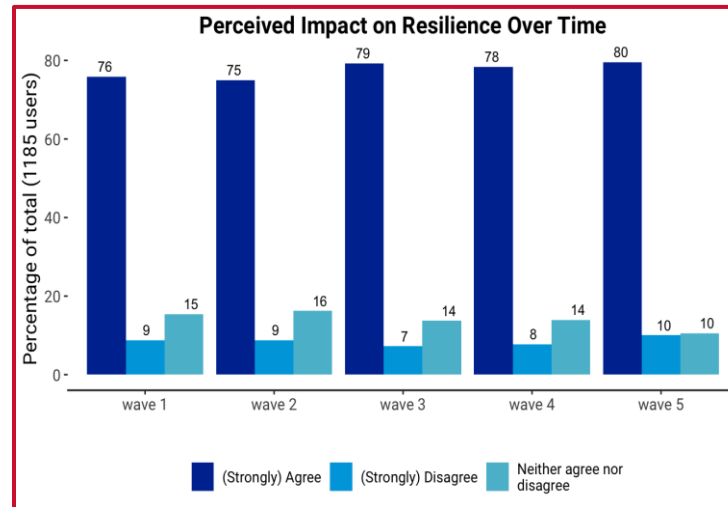
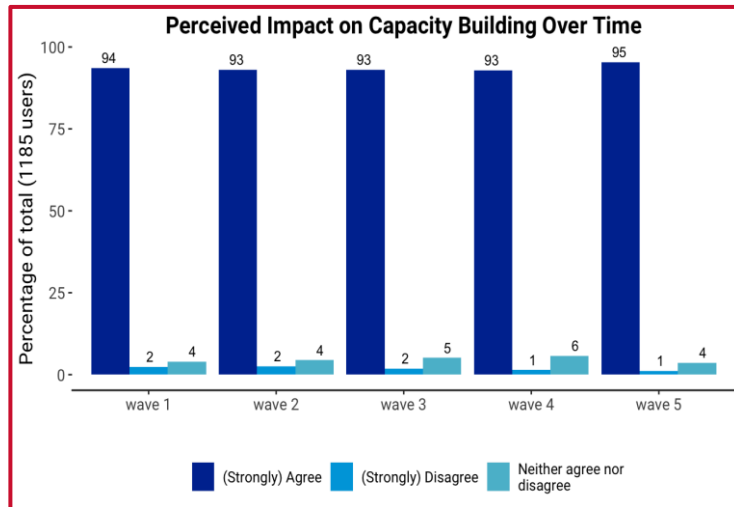
Note: data is from endline (March 2021; trends are similar in all months).

Data source: DigiFarm sample

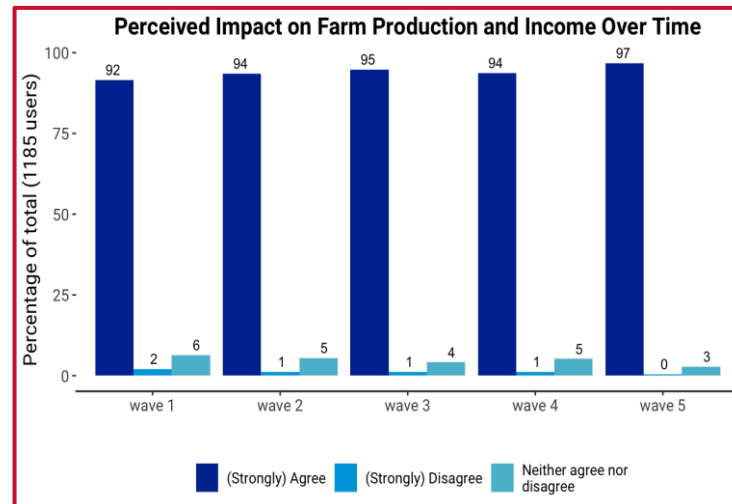
- When asked about perceived changes, approximately 90% users agreed or strongly agreed that DigiFarm had strengthened their capacity by equipping them with better farming knowledge and information. Approximately 75% users acknowledged the improved resilience because of using DigiFarm.
- During the follow-up, most farmers told their stories of experiencing an improved standard of living, ability to provide for basic needs (e.g. pay school fees and food), and their increased knowledge in using modern farming techniques.
- Quote from a male user from Bomet, “my income has changed, I was able to get money for my own use and also paid school fees for another child. It has improved my standard of living, I have buy another land.”

Trends in perceived impacts are consistent over the timespan of this panel study

Capacity and Resilience



Farm Production and Income



- Respondents were asked the same questions about perceived impacts brought by DigiFarm in the past 1 month.
- For instance, “compared to a month ago, using DigiFarm equips me with better info and practice for agriculture” is the question for impact in capacity.
- Re-grouping the likert scale, (strong) agree here indicates that the user has perceived and acknowledged a specific impact brought by DigiFarm.
- There is no noticeable discrepancies observed over time.
- The perceived impact of DigiFarm on Resilience is relatively less than the other two aspects. A potential continental reason could be that this panel study was conducted in the midst of COVID when most people felt powerless towards external shocks.

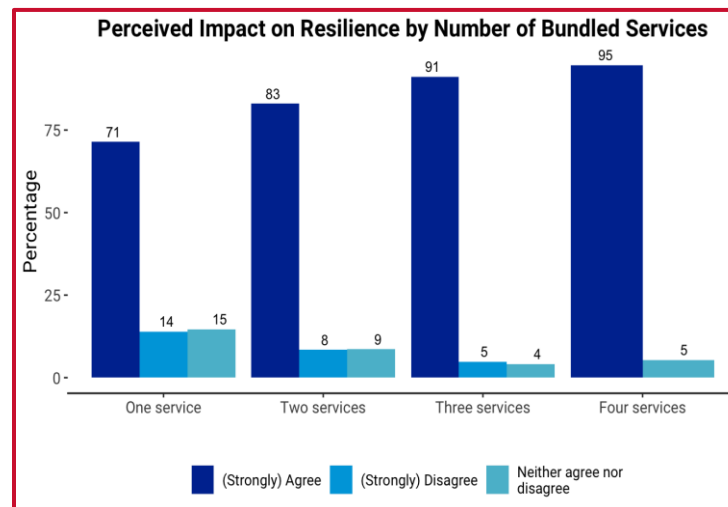
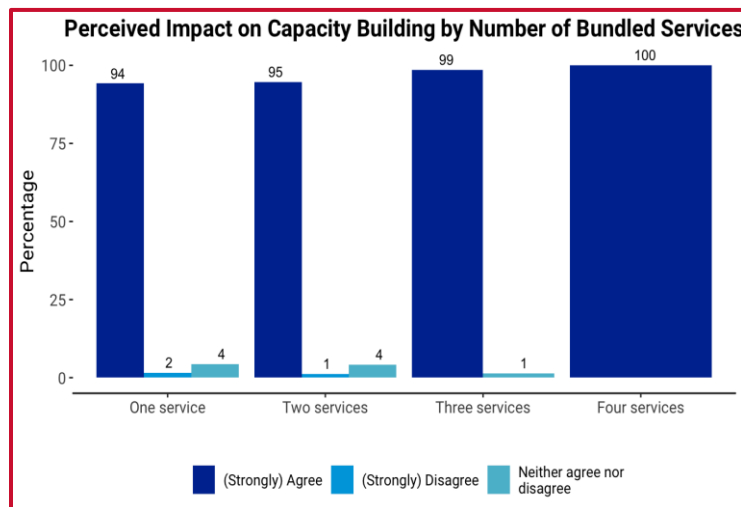
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Relation Between Bundled Services and Impacts

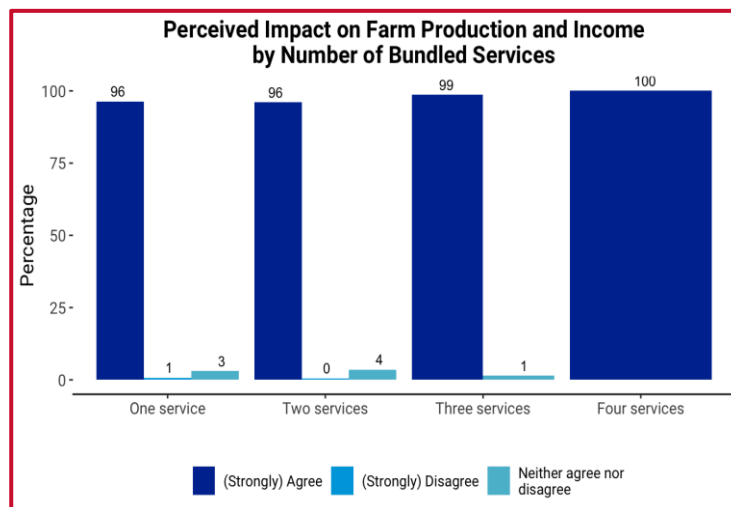
In this section, we identified how different bundled services might result in different impacts.

A positive relation between the number of bundled services used and perceived impacts

Capacity and Resilience



Farm Production and Income



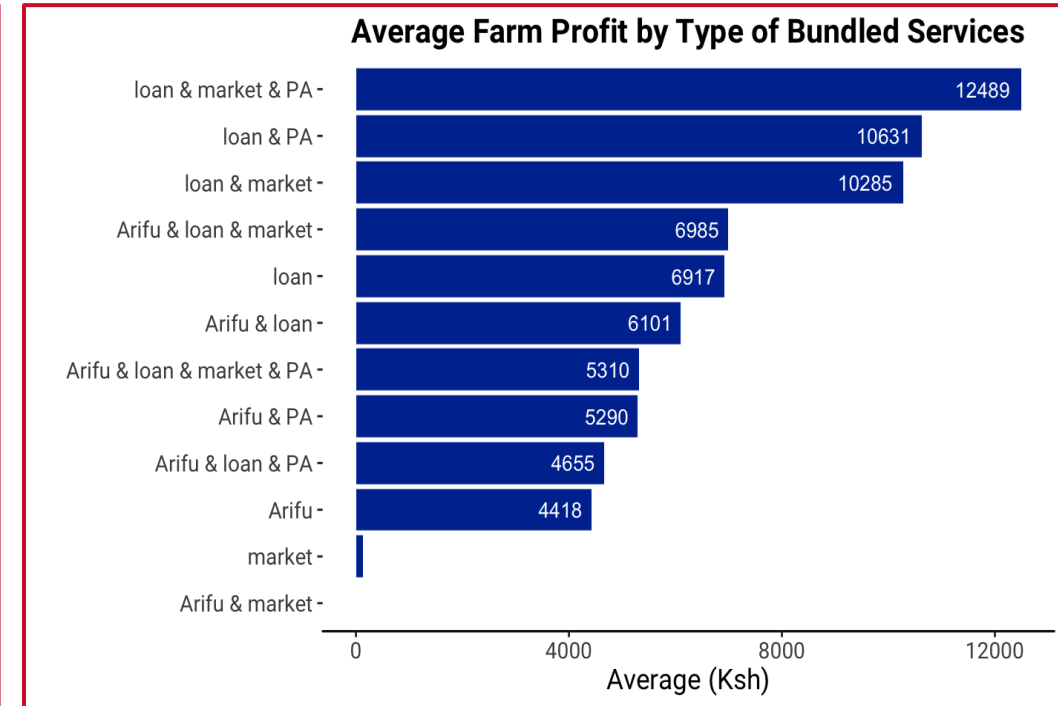
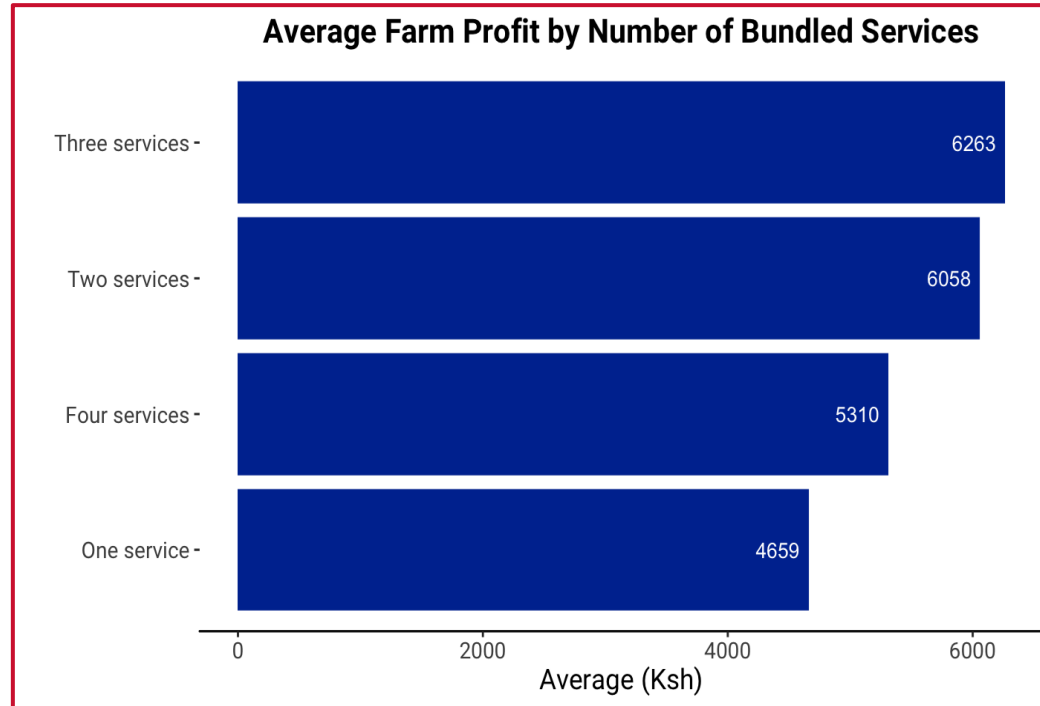
- In all 3 dimensions of perceived impacts (i.e. capacity, resilience, farming outcome), the more services are used, the more likely that the user would perceive and acknowledge the impact.
- This is particularly true in the case of resilience. Meanwhile, there is a negative relation observed: the more services are used, the less likely that the user would disagree with the stated impact on resilience.
- This positive relation between the number of bundled services used and perceived impacts is further supported by rich stories shared by users during the qualitative follow-up. From the user narratives, we find that farmers who have been using multiple services from DigiFarm have reported positive impacts in more dimensions.

Arifu and DigiFarm loan appear salient in significantly driving impact, used alone or bundled

Perceived Impact	Type of Bundled Service	Number of Bundled Service
Capacity (learned better information and farming practice)	<ul style="list-style-type: none"> loan loan & market loan & PA 	
Resilience (to cope with external shocks and risks)	<ul style="list-style-type: none"> Arifu Arifu & PA Arifu & loan & PA Arifu & loan & market & PA 	<ul style="list-style-type: none"> 1 service 3 services 4 services
Farming outcome (production and income)	<ul style="list-style-type: none"> Arifu & market 	

- To further examine the relation between different bundled services and perceived impacts, Chi-square test was conducted:
 - Type of Bundled Services
 - Number of Bundled Services
- Capacity: Those who have been using loan, alone or bundled with access to market or CropIn SMS, are more likely to see the impacts brought by DigiFarm.
- Resilience: DigiFarm's impact on resilience is particularly strong on those who have been using Arifu, alone or bundled with others. Meanwhile, users who have been using 1 service (likely to be Arifu), 3 services or all of them are more likely to experience the change..
- Farming Outcome: Using Arifu plus access to market is more likely to experience positive impacts brought by DigiFarm.

By the end of February, average monthly farm profit significantly differed by the type of bundled services



- We also examined the relation between different bundled services and the farm profit. There is not significance detected in farm profit across the groups of people who use different numbers of services.
- The overall significance is found among groups defined by the type of bundled services. However, when running the post-hoc test for difference between any 2 groups, no significance was found. One potential reason could be that size of some groups are too small for detecting the significance.

Data source: DigiFarm sample



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