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DIGITAL CHANGE IN SMALLHOLDER FARMING IN THE PHILIPPINES

EMERGING PRACTICES IN E-COMMERCE AND FINANCE

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“MOST FARMERS HAVE LIMITED ABILITY TO FACE THEIR PAIN POINTS HEAD-ON. FIRST, THEY LACK THE RESOURCES TO GAIN FAVOURABLE SELLING CONDITIONS. THE AMOUNT OF LAND THEY FARM MATTERS BECAUSE IT AFFECTS THEIR ABILITY TO CHOOSE WHAT AND HOW MUCH TO PLANT, WHICH AFFECTS THE PRICES FARMERS CAN GAIN. LACK OF AFFORDABLE TRANSPORTATION MEANS THAT THEY HAVE LIMITED CHOICE IN TERMS OF WHERE THEY SELL THEIR PRODUCE. LACK OF CAPITAL MEANS THAT THEY CANNOT AFFORD TO WAIT FOR BETTER PRICES”

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FOREWORD



Picture: KOPIA greenhouse in Lucban, E. B. Taylor

By Dr. Todd Sanderson, Research Program Manager,
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In recent decades, significant progress has been made in the digitisation of financial services, the creation of market facilitation platforms, and the extension of agricultural services to farmers. However, there is limited understanding of how farmers respond to the introduction of these services. This includes the factors influencing varying adoption rates among farmers, the diverse functions they employ these services for, the extent to which such services align with their needs, and their impact on the pre-existing trading systems.

The Australian Centre for International Agricultural Research (ACIAR) is mandated under the ACIAR Act (1982) to work with partners across the Indo-Pacific region to generate the knowledge and technologies that underpin improvements in agricultural productivity, sustainability and food systems resilience. We do this by funding, brokering and managing research partnerships for the benefit of partner countries and Australia. This includes a commitment to promoting the adoption of innovations that can enhance the ability of smallholder farmers to engage with development opportunities, particularly within market chains and information systems.

In the current study, ACIAR has partnered with Finthropology to investigate practices arising from the introduction of e-commerce and digital financial tools among vegetable farmers in the Philippines.

This study provides a valuable first step in understanding farmers' experiences and willingness to adopt new possibilities. It illustrates the long road from formal public strategies to widespread adoption of technologies like digital payments and e-commerce solutions—especially in the presence of challenges like a lack of price transparency and issues with market access.

The study emphasises the significance of engaging community structures and organisations in determining the most effective path for adoption and utilisation. It also highlights the necessity of involving younger generations in transitioning from traditional work methods to contemporary practices.

Similar to many parts of the Asia Pacific, the Philippines is in the early stages of adopting e-commerce, and the research suggests substantial potential for further exploration to comprehend farmers' experiences and refine designs to suit their distinct needs and preferences. It particularly underscores the importance of longitudinal research on the processes of change and their impact, both within the Philippines and throughout the region.

***“THIS STUDY PROVIDES A VALUABLE FIRST STEP
IN UNDERSTANDING FARMERS’ EXPERIENCES AND
WILLINGNESS TO ADOPT NEW POSSIBILITIES.”***

EXECUTIVE SUMMARY

Agriculture in Southeast Asia is undergoing digital transformation, affecting the whole society, including smallholder farmers and also creating changes throughout the whole farming value chain, from suppliers to farmers, distributors, retailers and end consumers. But little is known about how farmers react to the introduction of such services, including why some farmers tend to adopt them more quickly than others, the range of functions they use them for, the extent to which such services meet their needs, and their impact on the pre-existing trading system.

To begin to address this gap, we undertook an empirical study in Lucban, a town of approximately 53,000 people located 120 kilometres to the southeast of Manila. We interviewed 23 smallholder farmers and a few local representatives of farmers' organisations to explore the practices emerging from the introduction of e-commerce and digital financial tools in the area. During the interviews farmers expressed their frustration with their situation as small vegetable farmers and the farming value chain. We identified the following pain points:

- Uncertainty in planning—Making decisions about what to plant is complex, since many factors can affect what is possible to grow (e.g. seed availability, plot size, soil quality, climate), the results of harvest (e.g., weather, pests, labour), and selling the crop (e.g., quality of crop, quantity of crop, prices). Farmers have diverse strategies to make decisions, but many risks are hard to measure.
- Lack of access to farming tools and techniques—Farmers rely on local associations or authorities for access to seedlings and fertiliser. Their choice of produce and their possibility to grow for the most lucrative markets is limited. A good example is greenhouse production which is only becoming possible with the KOPIA project.
- Lack of price transparency—Farmers find it difficult to determine what price their produce will fetch on the market, even in the short term. Prices for fruit and vegetables can change rapidly and for a wide variety of reasons. Few farmers use available tools to track prices or record their own sales data, although doing so could help them better understand changing prices over time.

- Unfavourable market access—Most farmers face issues accessing markets under favourable conditions. Farmers generally only have access to local or regional markets and many perceive that traders in these markets dominate pricing and sometimes collaborate to keep prices down. Geographical distance and safe transportation of vegetables is also a problem, as most farmers do not have the means to transport their produce, especially in large quantities. Quality and quantity also affects where farmers can sell their produce, and on what terms.
- Lack of power to change—The pain points severely limits farmers' agency and power. And yet, as we have seen, some farmers—the best educated and most used to work with technology—do indeed manage to find ways to overcome some of these barriers. They set up systematic record keeping, find new market outlets and digital sources of prices.

Most farmers are at a disadvantage when it comes to planning and selling their produce. Lack of market transparency not only affects planting decisions; it also makes it difficult for farmers to set prices. Lack of market access makes it even more difficult to set terms and choose where to sell, and generally farmers said they felt a lack of power to change.

We know that the uptake of digital tools can happen quickly if they solve an important pain point, there is sufficient access to infrastructure and good communication rails, and if people are positive towards change. We asked to what extent the new generation of digital tools, including e-commerce sites, value chain platforms, and online agricultural information could help farmers to overcome their pain points, and who such tools might help.

We found that some of our farmers were indeed benefitting from such tools. A number accessed online information, such as prices or information about agricultural techniques. Although farmers could not sell directly to e-commerce platforms due to insufficient quantity of crops, one cooperative in our field site had recently begun organising farmers collectively and had initiated a collaboration with an agricultural platform, Agro-Digital.

Yet most of our interviewees did not use such digital tools in their agricultural activities. The economy is still mainly cash-based, and while most interviewees had access to banks and insurance they often did not use them, or used them only occasionally. Very few had used online shopping or had experience with selling their produce online, and then mostly through social media like Facebook.

Nonetheless, the conditions for uptake are favourable. We found that access to infrastructure in our field site is quite good; most farmers owned a smartphone and had internet access. We further found a good educational level in the community, with no apparent literacy issues. There was a strong presence of government and local authorities offering information, agricultural insurance and agricultural input. Furthermore, many interviewees were members of at least one farming association. Finally, the farmers were clearly interested in learning and trying new solutions. Many interviewees felt that the new farmers' cooperative represents a common initiative that could bring future benefits. Together, this provides a solid communication infrastructure to support digital change.

Changing market systems may, however, require more than individual initiative. It seems clear that in order for farmers to gain more power in the market they need to cooperate more closely with each other. Formal groups, such as the Farming Association (Sipag), Lucban Farmers Agriculture Cooperative, or Kopia, seem likely to have more success than informal ones that have been formed for the purpose of a single sale. Moreover, such groups can provide pathways to learn about digital potential together which can support farmers who are reluctant (or unable) to experiment with such tools themselves. Indeed, groups like the Lucban Farmers Agricultural Cooperative may be a necessary bridge between smallholder farmers and e-commerce platforms. Formal groups therefore have the potential to help farmers navigate the market in ways that are digital, non-digital, or perhaps more often a hybrid of the two.

It is worth bearing in mind that smallholder farmers' efforts to change their practices are almost never an individual effort. Whether farmers learn from their children, adopt the practices of their neighbours, get advice from the municipality or work together in a cooperative, digital transformation in smallholder farming is a collective process.

“... THE UPTAKE OF DIGITAL TOOLS CAN HAPPEN QUICKLY IF THEY SOLVE AN IMPORTANT PAIN POINT, THERE IS SUFFICIENT ACCESS TO INFRASTRUCTURE AND GOOD COMMUNICATION RAILS, AND IF PEOPLE ARE POSITIVE TOWARDS CHANGE”

INTRODUCTION

Agriculture in Southeast Asia is undergoing digital transformation, affecting different groups of smallholder farmers and also creating changes throughout the whole farming value chain, from suppliers to farmers, distributors, retailers and end consumers.

In particular, agricultural e-commerce solutions, combined with mobile financial solutions and social media, have the potential to improve farmers' access to markets, market information, and payments infrastructures.¹ They may help to improve farmers' decision-making about what to grow and offer them greater choice as to where they sell their produce, leading to greater profit and control over their farming livelihoods.

But little is known about how farmers react to the introduction of such services, including why some farmers tend to adopt them more quickly than others, the range of functions they use them for, the extent to which such services meet their needs, and their impact on the pre-existing trading system. In a recent study for ACIAR we undertook a literature review on digital development in six SEA countries. We found that most studies of farming apps focused on issues such as app design and business cases. There was little research on farmers themselves, particularly in relation to e-commerce and financial apps.

To begin to address this gap, we undertook an empirical study in Lucban, a town of approximately 53,000 people located 120 kilometres to the southeast of Manila.² It is situated in the northern part of Quezon, part of Calabrazon (Region IV A), one of the most productive areas for crop and vegetable farming providing rice and lowland vegetables to the region's population and to Manila. We chose Lucban as the location of our fieldwork due to its proximity to Manila and the prevalence of fruit and vegetable production. We were interested in fruit and vegetable production because these are often sold on digital e-commerce platforms, such as Mayani, Session Groceries and Agro-Digital.

We interviewed 23 smallholder farmers and several industry professionals to explore the practices emerging from the introduction of e-commerce and digital financial tools in the area. Our main research questions are:

- How advanced is the adoption of digital tools for e-commerce and farming among smallholder farmers?
- What emerging practices exist regarding such tools, and how do they dovetail with existing practices in farming?
- How do farmers combine offline and online digital practices?
- How does usage connect with farmers' marketing activities and payments via social media/messaging?
- How do digital tools connect with sociocultural practices?
- What prompts adoption of digital tools for e-commerce and farming among smallholder farmers?
- What conditions are necessary for farmers to use digital tools?
- What role do farming communities or other organisations play in promoting adoption?

We know that the uptake of digital tools can happen very fast if:

1. **They solve a pain point (higher convenience, better value for money, better overview of transactions)**
2. **People have access to sufficient infrastructure (electricity, internet, smartphone, mobile or bank account)**
3. **Communication rails are in place and people have access to knowledge and learning**
4. **People are likely to experiment with new possibilities**

We therefore structure our findings along these elements. We first discuss farming pain points and how the uptake of e-commerce might solve some of these. In particular, we explore how the introduction of digital technologies is changing farming practices and decision-making, why some people are more likely to experiment than others, and the limits of farmers' ability to improve their position in the market. We then discuss the elements of access to infrastructure, communications rails and interest in experimentation. We ask what potential e-commerce and digital information hold for the farmers in our study, and whether the conditions are in place for change to occur. Finally, we make recommendations for future research.



BACKGROUND



- Pay Bills
- Buy Load
- Add E-Money
- Redeem Rewards
- Get Exclusive Deals
- Shop thousands of products @ CLIQQ SHOP

NETFLIX
Netflix codes are now available at 7-Eleven.
Purchase now through CLIQQ



Download our CLIQQ app to buy load and pay bills!

E-MONEY (Add eMoney through our CLIQQ App)

PAYMENT INSTRUCTION

Do you want to earn points and become a CLIQQ Rewards member?

YES

Please bring the slip to the cashier for payment.

GCASH CASH IN
Amount : Php 700.00
Convenience Fee : Php 0.00
Total Amount: Php 700.00

2319-5502-9351

Payment slip valid until July 14, 2023, Fri 6:55 PM.

The Philippines is a lower middle income country with just over half the population still residing in rural areas. Agriculture is based on rice, corn, and commercial crops like coconuts and sugarcane. A large proportion of rice is still grown by smallholder farmers.³ The Philippines has a more than 100-year-old tradition of building cooperatives, including farming cooperatives (see p. 14).

GDP: Aggregate 2022 ⁴ GDP: per capita 2022 ⁵	\$404 billion \$3,499
Population 2022 ⁶ % urban 2022 ⁷	116 million 48%
ID	PhilSys (2020)
Access to Internet 2021 ⁸ Access to mobile 2021 ⁹ Access to account 15 2021+ ¹⁰ Financial literacy 2021 ¹¹	77% 92% 51% 25%
Employment in agriculture 2021 ¹² % of male employment (7.9 million) % of female employment (2.8 million)	10.7 million 30% 16%

The Philippine government has strategies in place for the development of agriculture, and particularly encourages growth in vegetable production. The Philippine Vegetable Industry Roadmap 2021-2025 identifies gaps in the farming value chain for vegetable production.¹³ The gaps do not include discussion of e-commerce. They do, however, identify:

- A need to create higher efficiency and knowledge in farming management, including choice of crop, greenhouse projects, and better use of fertiliser.

- A need to reduce the number of middlemen between farmers and consumers; they recommend an increased role of “consolidators” and distributors/retailers.
- A need to manage distance and transportation.

Beyond agriculture, the Philippine government has strategies in place for the development of both e-commerce and digital payments. They introduced an e-commerce strategy for 2016-2021, and later an updated 2022 strategy, Basta e-Commerce Mmadali (eCommerce Made Easy).¹⁴ In 2022 e-commerce had a market share of 4% of the retail market.¹⁵

Agriculture is only expected to be part of later stages of the e-commerce strategy. In a recent report, *Digital Change in Southeast Asian Agriculture*, Finthropology did, however, find that a number of agricultural e-commerce apps are active in the country.¹⁶ A few of these are described later in this report (see p. 28). Such apps may start as direct trading platforms connecting farmers and consumers, but tend to develop into value chain providers.

Despite the government focus on e-commerce, and despite a youthful population who are active on social media, e-commerce amounts to only 4% of the total retail market in the Philippines.¹⁷ E-commerce is, however, developing fast. The Philippine government has an e-payment strategy including the introduction of instant payments, QR code based payments (Paleng-QR Ph), and access to digital identity. The use of cash is falling fast, from 84% of payments at point-of-sale in 2017 to 46% in 2022.¹⁸ In parallel, the use of digital wallets is increasing.¹⁹

Overall, development of a digital infrastructure in Philippine agriculture is still in the making. A well-founded understanding of user needs will support the development of successful policy measures.



COOPERATIVES IN THE PHILIPPINES ²⁰

There are a large number of cooperatives in the Philippines following a tradition going back more than a hundred years to 1915 when a law was passed to support particularly credit cooperatives. Today, the movement is anchored in the Cooperative Development Authority, providing regulation, technical advice and education, online services for registration and international work as well as development services.

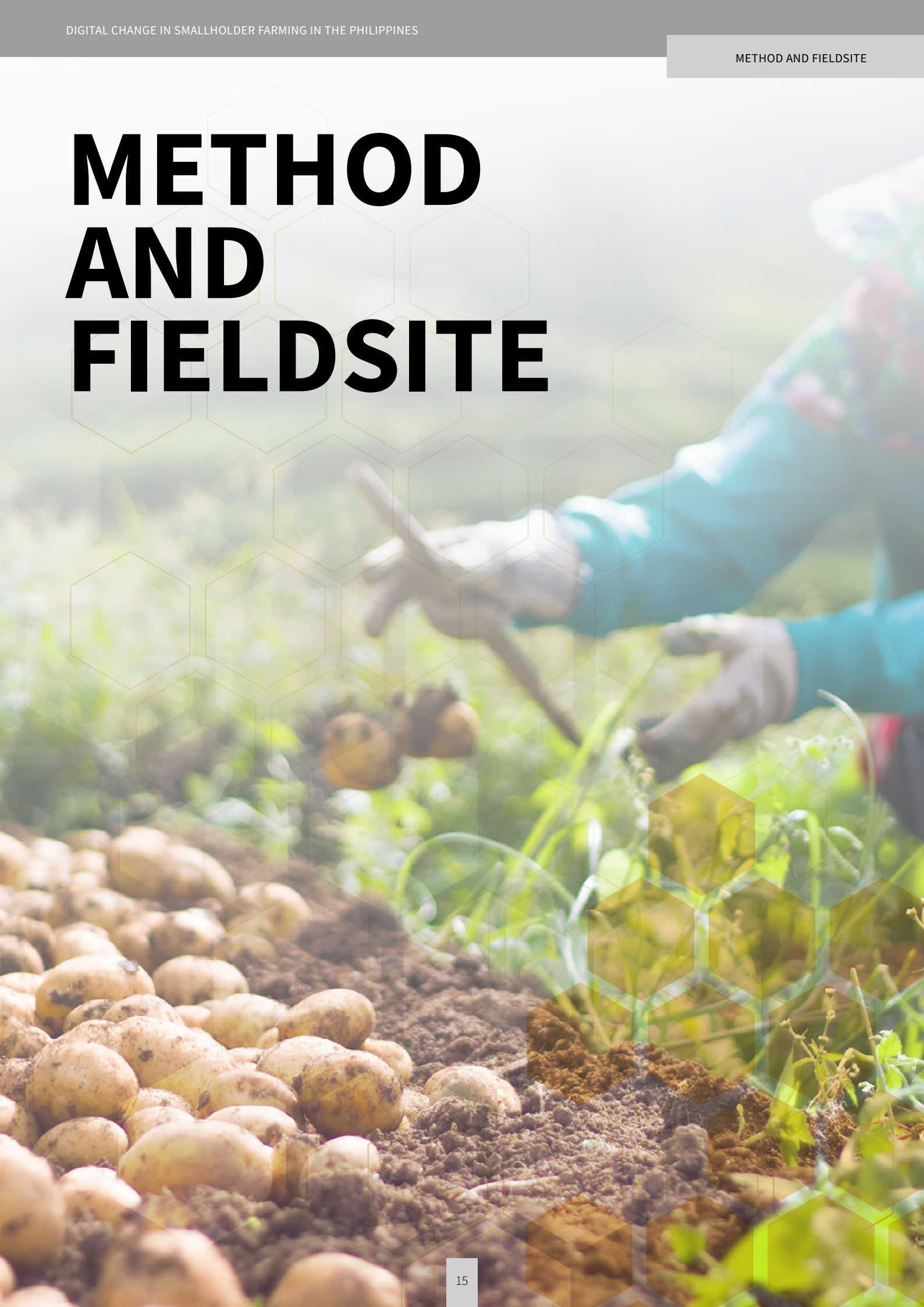
There are 27 different types of cooperatives but all must support the broad purpose of developing both the cooperative movement and the members' ability to develop self-help and self-employment to promote growth and poverty alleviation. The cooperatives include cooperative banks and agricultural cooperatives. The agricultural cooperatives can support farmers by better planning of production and sales. They also help with access to farming input, loans and education.

Overall, the cooperatives must be based on:

- Open and voluntary membership
- Democratic member control: one member, one vote
- An economic structure where members contribute equitably to, and democratically control, the capital of their cooperative
- Autonomy and independence (also when entering into partnerships)
- Shall provide education and training for members
- Should cooperate with other cooperatives local, regional, national and international
- Concern for community and sustainable development

To qualify as an agrarian reform beneficiary (landless farmers, including agricultural lessees, tenants, as well as regular, seasonal and other farmworkers), cooperatives must hold a certificate of ownership of any land, a confirmation by the department of agrarian reform as to necessity, be desired by the beneficiaries, be economically viable, and at least have a majority of the members being agrarian reform beneficiaries.

METHOD AND FIELDSITE



In this section, we describe our qualitative research method. We also provide an introduction to the group of interviewees and to the market structure and characteristics in the Lucban area.

Method

We undertook 23 semi-structured interviews with smallholder farmers (13 male, 10 female) who grow fruit and vegetables. Around two-thirds of the farmers lived within five kilometres of Lucban town centre.

The interviewees were invited to participate in the study during a local meeting. Those who indicated that they were interested in participating were put on a shortlist. From this list we identified eligible farmers (based on farm size, accessibility, and their production of fruit and vegetables). We then selected farmers to interview based on diversity, especially gender, age and location.

The interview schedule was designed to elicit responses about farmers' past and present practices in relation to farming, and the use of both digital and non-digital tools and strategies for production and market activities. The interview questions were grouped into five topics: 1) Interviewee's background (family, career, education, etc.); 2) Use of digital tools and cash; 3) Financial management practices; 4) Selling; 5) Technology and infrastructure.

We carried out the interviews face-to-face over the course of two weeks, with the assistance of a Filipino interviewer. One follow-up interview took place after fieldwork via an online video conference. Interviews were recorded using a professional voice recorder and a mobile phone. They were transcribed directly from Tagalog to English.

The interviewees

We endeavoured to interview a wide range of smallholder farmers, including men and women, people with different income sources, and farmers of different ages. Around 40% of the interviewees were women, all farmers in their own right. Interviewing young farmers proved difficult as the farming community at Lucban is ageing, with few young farmers to take over. Among our interviewees, only three farmers were below the age of 40, and the children present were more often grandchildren, while their parents were studying or following alternative careers. Our youngest interviewee was 35 years old; the rest were in their forties, fifties and sixties.

We might have expected smallholder farmers to come from a line of farming families living in the area for generations. This was, however, not the case. Interviewees' backgrounds were diverse in terms of their farming experience, education, and career trajectories. Some have grown up learning farming from their parents or extended family, but most had different careers in completely unrelated areas such as mining, international trade, or teaching. Some had lived in the Middle East and taken up farming when they returned to the Philippines. Most interviewees have a secondary education. Some have been to farmers' college, and some to university.

While many of our interviewees were locals, or who had moved to Lucban from nearby regions, there were also newcomers in Lucban who brought with them alternative knowledge about information seeking and new farming

“MANY OF THE INTERVIEWEES WERE BARELY SCRAPING BY, BUT OTHERS WERE CLEARLY THRIVING: THEY GENERALLY OWNED THEIR OWN HOMES AND LAND, AND COULD DEPEND ON REGULAR INCOME. MOST INTERVIEWEES WOULD COMBINE AGRICULTURE WITH OTHER JOBS AND LOANS.”

techniques. One example is a former teacher who was using knowledge from her former career to develop new farming methods. Another is an entrepreneur with a computer science degree who works both as a farmer and as an organiser of the Lucban Farmers Agriculture Cooperative.

Farm sizes varied substantially. Some farmers had small vegetable patches in addition to undertaking other types of work (such as in transportation, farm labour or shopkeeping). Others had larger plots that they managed with the help of farm labourers, both male and female. Interestingly most interviewees confirmed that male labourers were paid higher than females because of their greater strength. Some interviewees worked several plots, partly in collaboration with extended families.

Some families managed a farm collaboratively, often as a partnership between a married couple. Often they would undertake quite different tasks (for example, the woman would manage a vegetable garden and/or animals and communicate with traders, while the man tended crops such as rice). Often, however, farms were managed almost entirely by individuals, either male or female. In these cases, we saw little difference in how men and women managed their farms or made decisions. One exception related to childcare: women with young children were more likely to plant fruits and vegetables that require little maintenance so that they would have more time for their family.

Most of the interviewees farmed both rice and vegetables. Depending on their plot size they would cultivate several crops, but almost all said that they would rotate crops to obtain the best harvest. Some in addition had poultry or cattle. Interestingly there was conflict between different types of farmers as some had experienced having their crop destroyed by rats coming from poultry farms.

We asked extensive questions about farmers' economic situations. Income levels were relatively diverse. Many of the interviewees were barely scraping by, but others were clearly thriving: they generally owned their own homes and land, and could depend on regular income. Most interviewees would combine agriculture with other jobs and loans. Some were able to save at times, and/or invest in new tools and means of transportation. Several interviewees received regular payments from their children living in other cities (but not abroad) or were able to obtain credit from family members. A few had inherited land or money from their parents, which was often shared between a number of siblings. Generally farmers did not distinguish between farming accounts and personal economies. And few did systematic accounting. Most were, however, able to explain how their business decisions were made and when the season had been successful or not.

Farming and markets in Lucban

In 2016, there were around 1300 vegetable farmers in Quezon, representing just 6% of the 21,000 vegetable farmers in the whole Calabarzon region.²¹ The most important agricultural products produced in the region are *ampalaya* (bitter gourd), eggplant, squash, stringbeans and tomato. Interestingly, our interviewees also grew highland vegetables (cabbage, sweet potato, snap beans and carrots), although the area is relatively low-lying. Some vegetables can be planted all year round (*ampalaya*, carrots, eggplant, okra, *pole sitao* [long bean], and snap beans); some like cabbage are planted from October to December, and other crops (such as potato and tomato) are planted from September to January and from January and September, respectively. Our interviewees therefore had plenty of choice in what to plant, and would rotate crops throughout the year.

Calabarzon represents an interesting mix of old and new farming practices. According to the *National Agriculture and Fisheries Modernization and Industrialization Plan 2021-2030*,²² Calabarzon is the main area for the development of modern artisanal farming, generally run by well-educated entrepreneurs who are keen to experiment with new methods and approaches. As the *Plan* describes them:

“The typical modern artisan farm is initiated by an educated entrepreneur, including the newly retired baby boomer, who is keen on farming as a lifestyle to support good health and mindful of environmental impact. She is the opposite of the traditional artisan farmer who had dropped out of school due to poverty, earns barely enough, is afraid to take risks, is shunned by banks, is at the mercy of traders, does not inspire her own children to inherit her work, and continually looks to the government for support. The modern artisan farmer is a keen experimenter, constantly trying new products, processes, and markets. She will serve as a trailblazer and an inspiration to other similarly placed entrepreneurs, as well as traditional farmers.”²³

In the Lucban area there are 23 agricultural cooperatives, mostly covering larger crops such as coconuts. However, the Lucban Farmers Agriculture Cooperative, established in May 2023, is a recent new cooperative initiative in Lucban aiming to organise farmers' production and sell on their behalf. Membership is open to all Lucban farmers, whether vegetable or rice farmers. The cooperative can assist with education and loans, as well as a storage facility for rice to take advantage of better pricing at a later date. It is also developing ways to process leftover produce that cannot be sold, such as making hot sauce. This is in line with a government policy to lower post harvest losses. Lucban was also chosen as one of three centres for a project run by KOPIA (see p. 18). This project is similarly working to create greater quality and efficiency in both production and marketing.

Lucban farmers have several options when it comes to selling their produce. They can sell directly to consumers from small stores at the front of their homes (*sari-sari* stores) or from a tricycle within their neighbourhood. In terms of indirect sales, farmers sell to vendors in a market (the local Lucban market or regional markets), to traders at the Lucban trading post, or to the cooperative. To date, the only e-commerce app available in the region is Agro-Digital.

Within Lucban, farmers predominantly sell their produce to local traders who are part of a trading association. Most of these transactions occur at the local trading post. This trading post was established in 2017. In 2020 it was extended by the regional office of the department of agriculture and a number of partners to promote organic production. The trading post allows farmers to sell larger volumes of produce than their other market options. Traders often provide plastic packaging for the farmers to deliver their produce in, sorted by quality.

The largest market in the area is in Sariaya, located about 30 kilometres to the south of Lucban. It was established in 2004 and expanded with a wholesale market place in 2021. Sariaya Market appears to be unique in that volumes and prices are agreed upon well in advance of the sale. Farmers know prior to the harvest what volume they can expect to sell and at what price, and can expect to sell a higher volume of produce than they can through local vending. Selling to Sariaya is clearly advantageous, but farmers must be able to transport their produce there. As a result, few farmers are able to use this option.

Other regional markets include the Castillo Regional Market in Tiaong, the San Luis market, the Tanaunan market, the Siniloan regional market and the Pangsanjan regional market. Although it is unusual for Lucban farmers to sell to markets in Manila, one farmer mentioned selling in the Divisoria market. In addition to these fixed location markets, farmers sometimes sell to companies such as Dizon Farms and Agro Digital, which sell to consumers via their websites. More recently, farmers can sell to the Lucban Farmers Agriculture Cooperative.

The majority of the farmers sell as individuals or family units. When they negotiate with traders, market stall owners, and so on, they do so directly or perhaps through an agent—a person who helps traders find produce to buy. Agents may serve an aggregator function similar to traders, but do not participate directly in sales of produce. An agent may earn a flat rate commission or a percentage of a sale that they have arranged on behalf of a trader or a farmer. Some agents offer a fixed rate of pay for an agreed production of vegetables. This system is called “puhar” and allows farmers more security by knowing the price in advance. The price can however be lower than the market price at harvest time.

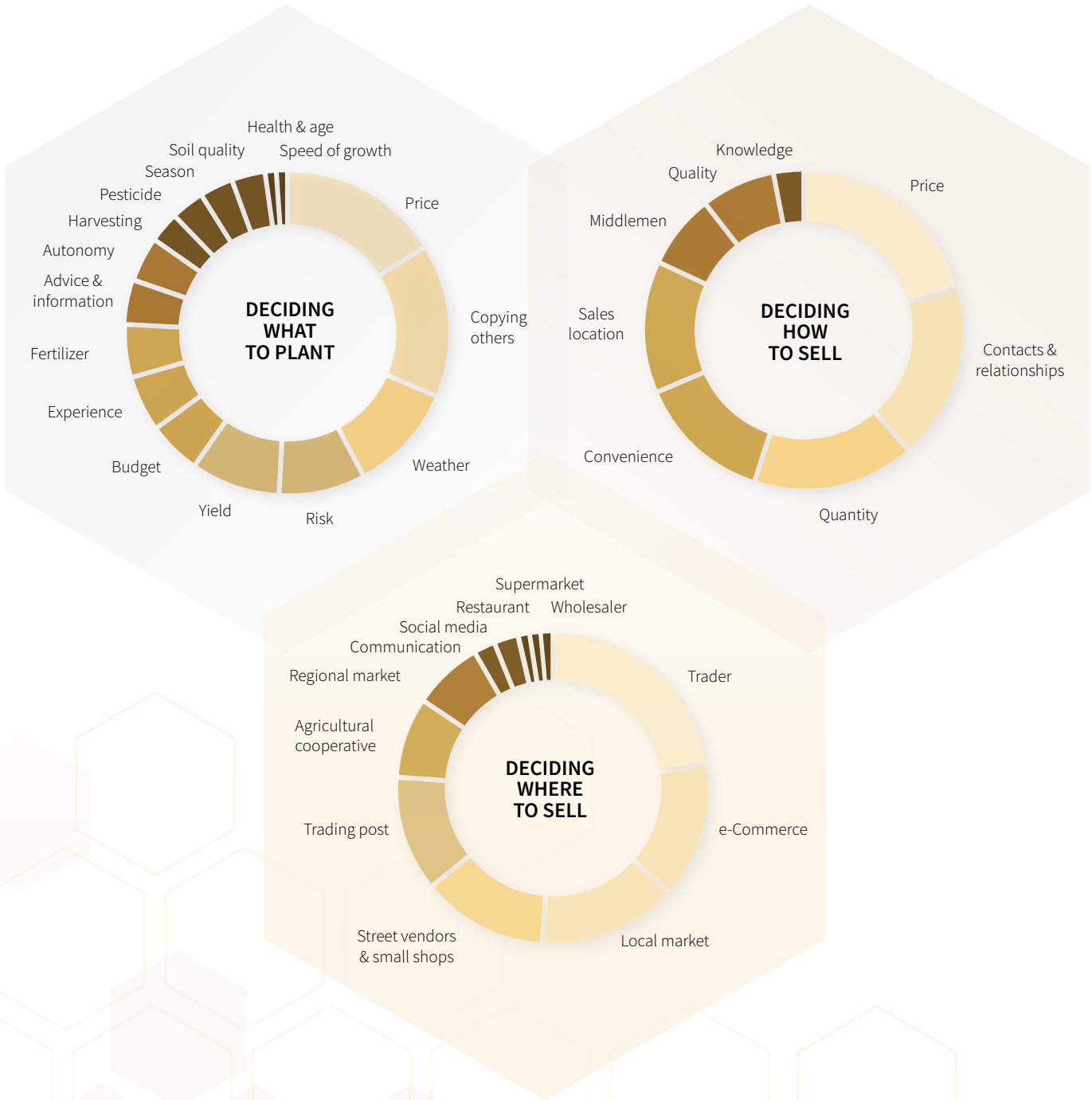
KOPIA AND THE GREENHOUSE PROJECT

KOPIA²⁴ is an initiative started by the Korean Rural Development Administration as part of a “give-back” initiative. The aim is to help developing countries that have supported Korea to develop more efficient and sustainable agriculture.

The KOPIA Center-Philippines, hosted by the Department of Agriculture-Philippine Rice Research Institute (DA-PhilRice), was established in September 2010 through a Memorandum of Agreement signed by RDA, Korea and DA, Philippines. It has four focus areas: (1) R&D on rice and other crops after rice; (2) Training and education of researchers, extension officers, and farmers; (3) Dispatch of Korean experts and scientists at the host institution; and (4) Exchange of research materials and technical information.

The latest initiative, started in 2022, is a three-year project that will include the innovative production and postharvest management of lowland vegetables and other developed vegetable cultivation technologies, use of bio-control agents for pest control, and Good Agricultural Practices (GAP) certification. Through the project, KOPIA will partner with more than 350 farmers from the three pilot villages and establish 10 greenhouses per village.²⁵

FACTORS FARMERS MENTIONED AS INFLUENCING WHAT TO PLANT AND WHAT TO SELL, AND FARMERS' PREFERENCES FOR WHERE TO SELL.



PAIN POINTS



Our interviews provided much information about farming life, work, income and expectations for the future. In the following section we describe some of the issues and pain points experienced by the interviewees. The descriptions were made with much emotion of anger, frustration and exasperation.

What pain points do farmers face?

We know from countless studies that people are likely to adopt a new solution if it solves a real pain point. We therefore asked interviewees about their problems and pain points in farming. The main pain points our interviewees identified include the complexity of decision-making regarding planting, insufficient access to tools and techniques, lack of price transparency, and a range of issues that make market access unfavourable to smallholder farmers. These issues indicate that the value chain is not streamlined. Instead, the value chain is inefficient for smallholders from access to farming input until the produce reaches the end consumers. This includes limited transparency in pricing and market demand.

Many of the pain points expressed by our interviewees have been described in policy and academic research,²⁶ yet diving a little deeper into farmers' experiences can help uncover possibilities for change and ideas to overcome the pain points. This is particularly important considering that pain points are not the same for all farmers. Some farmers depend upon farming income almost entirely, while others juggle several jobs or farm several plots of land. Poorer farmers with small plots have less choice in terms of what crop to grow, and their market power is quite limited, especially due to the low quantities they have to sell and lack of transportation to the market. In contrast, farmers with tertiary education and/or more diverse career experience often bring new knowledge to farming, and their preferences and experiences can be quite different from the rest of the community. Even if good digital solutions exist for real pain points, the path towards adoption is neither straightforward nor immediate.

In this section we flesh out a more detailed picture of these pain points. Because pain points tend to overlap in complex ways, we do not describe them one by one. Instead, we discuss them with regard to issues in the value chain, including agricultural inputs, market access, decisions on what to plant, and decisions about how to market and sell produce.

HOW DO PEOPLE EXPRESS THEIR PAIN POINTS?

Our interviewees talked about their experience and feelings about farming conditions and digital solutions in many different ways.

Some very **directly** blamed traders for collaborating to offer the lowest possible prices to farmers in order to profit themselves.

Others talked about their **frustration** with a market situation characterised by low price transparency. They felt that their individual bargaining position was weak with little power to change.

A few interviewees expressed strong **anger** with what they considered unreasonable systems like banks and traders profiting from the farmers' lack of choice.

Along other lines some interviewees were **worried** about not understanding digital payments and other tools and possibly doing something wrong. They would often ask their spouse or children to help them out.

Some—mostly elderly farmers—expressed **resignation** to the fact that the possibilities to control agricultural prices or income are limited to the smallholders.

On the positive side, many smallholders showed a keen **interest** in participating in new initiatives like the KOPIA greenhouse project (see p.18) or the Lucban Farmers Agriculture Cooperative as a road towards change.

Planning decisions: Upstream value chain

Our interviewees were diverse in how they made decisions about what inputs to use, what to grow, whether to obtain agricultural insurance, and how to manage crops. We found that most farmers did not formally track their farming processes. In terms of production, this includes things like when they planted certain crops and harvesting dates. In terms of expenses and sales, this includes things like how much they spent on inputs (seeds and fertiliser) and what prices they fetched for specific crops. Instead, they kept this information in their heads. While farmers certainly leaned on 'experience' to make decisions, they were not able to accurately analyse whether their past decisions would be successful in the future. Nonetheless, most of our interviewees were able to give an overview of profits and losses, what went wrong in specific years, and how they managed to overcome problems.

Many of our interviewees described having access to seedlings and fertiliser for free through the local office of the Department of Agriculture. They generally explain that in exchange, they must inform the office of their plans to grow, like Evenlyn, a 61-year-old farmer who rears pigs and grows vegetables:

“Since we became members of SIPAG (a Calabarzon group of vegetable growers, often referred to as the ‘farmers association’), we were given fertiliser (*abono*) and seedlings (*binhi*). When it comes to growing the plants, we buy the chicken manure (*ipot*), that’s what we use to grow the vegetables.”

Some also refer to buying farming equipment from companies. For example, Jeffrey, a 62-year-old who farms vegetables, rice and coconuts, explained that he buys (in cash) from agricultural suppliers.

We asked extensive questions about how farmers decide what to plant. Our interviewees take a broad range of factors into account when deciding what to plant. They can be grouped into four categories:

- Market information, including prices and selling conditions
- What others do, including advice from others and observations
 - Personal background and situation
 - Farming experience
 - Desire for autonomy
 - Budget for inputs
 - Health and age
 - The amount of work required to grow the crop
 - Assistance needed to grow and harvest the crop
- Farming knowledge
 - Risks involved in growing certain crops, dependent on factors such as the weather, season, pests, and so on
 - Crop yield, which determines where produce can be sold
 - Speed of growth
 - Need for fertiliser and pesticides
 - Harvest requirements
 - Soil quality
- Seasonal situation
 - Time of year
 - Weather conditions

This list is not exhaustive. Other problems may include things like not being able to plant rice due to rat infestation from poultry farms; the extent to which they depend on farming income versus other income; personal preferences, (which may not be rational), and family involvement. Our interviews did not collect enough information on these factors for us to comment on their level of influence.

The two factors mentioned most often in terms of deciding what to plant were price and copying what others were planting. It is not surprising that farmers are primarily concerned about what price their produce will fetch in the market. Farmers have a range of ways to figure out what price their produce might fetch. Some monitor prices at the trading post, local market, Sariaya, or online. It is common to look at the weather, both locally and elsewhere in the Philippines. However, there appears to be a great deal of speculation and guesswork when it comes to making planting decisions based on price. Most people do some research and hope for the best. As described by Noel, a 39-year-old man who has been active in local organisation:

“We are still using the system of “jackpot”, in which farmers just gamble or aspire that maybe this time we will hit the big payout.”

Noel further explained that this jackpot system is based on copying others:

“We have a “*gaya-gaya* system” (copy your neighbour system). If you see another person plant *kamote* (sweet potato) or *sayote* (*chayote*), you also plant them. Come harvest time, maybe there will be too many in the market.”

Most of our interviewees were highly critical of this approach, since if everyone plants the same crop at the same time, it causes a drop in prices. We frequently heard comments such as the following by Teresita, a woman with six children who has many income sources besides farming:

“We shouldn’t plant the same thing (*tulad-tulad*)... But the farmer is hardheaded. They insist on planting whatever they want. So if the farmer sees that the current price of this produce is high, they plant that.”

There may be good reasons why following the lead of others might seem reasonable. People may assume that if other people are planting a certain crop there must be a good reason, whether they expect a good price or good weather. Some may not have the means or the time to follow the market themselves. Others may not really be copying their neighbours, but rather making the most reasonable decisions based on factors such as which seedlings are the cheapest, whether the weather is favourable, or whether the crop fits the farmers experience and situation.

Moreover, all farmers face a range of risks, whether they experiment or not. For example, farmers who plant what their neighbours plant run the risk that an oversupply of one particular vegetable will cause prices to drop. On the other hand, copying one’s neighbours increases the chances that the crop will be successfully harvested, since choice of crop is often season- or weather-dependent. Similarly, farmers who experiment may benefit from a successful crop gaining high prices, but the same crop may also fail. Making decisions

in such an environment is complex and, while agricultural insurance is relatively accessible, there are insufficient support mechanisms in case of failure.

Indeed, few of our interviewees actually followed the system of copying one’s neighbour. Mario, a 63-year-old with six children, explained to us:

“Since farmers here often sell the same crops at the same time, what I do is I don’t join the trend. For example, if the current market price is plummeting, that’s the best time for you to sow and plant in order for you to have a higher price during your harvest season.”

Our interviewees had a wide range of strategies to diverge from their neighbours. Some farmers planted what their neighbours planted, but a month or two later, so that by the time their crop was ready to harvest the prices would have risen. Others actually do extensive research to find crops with the most promising earnings. Allan, a 39-year-old man with two children, does extensive monitoring of prices in Sariaya market, using his smartphone to take screenshots of prices displayed on their website, which he then saves in folders. He will not plant a new crop until he has monitored the prices for a whole year, and he claims that he always manages to hit “nice” prices:

“I will choose the crops using my database from 2017 of various vegetables. Like if I plant around September, during the second week of July or first week of August, I will swipe around my screenshots of possible winning crops. The question I have in mind is, ‘Does this crop have good prices around August last year?’ If yes, if the successive three months have good prices, I will choose that crop.”

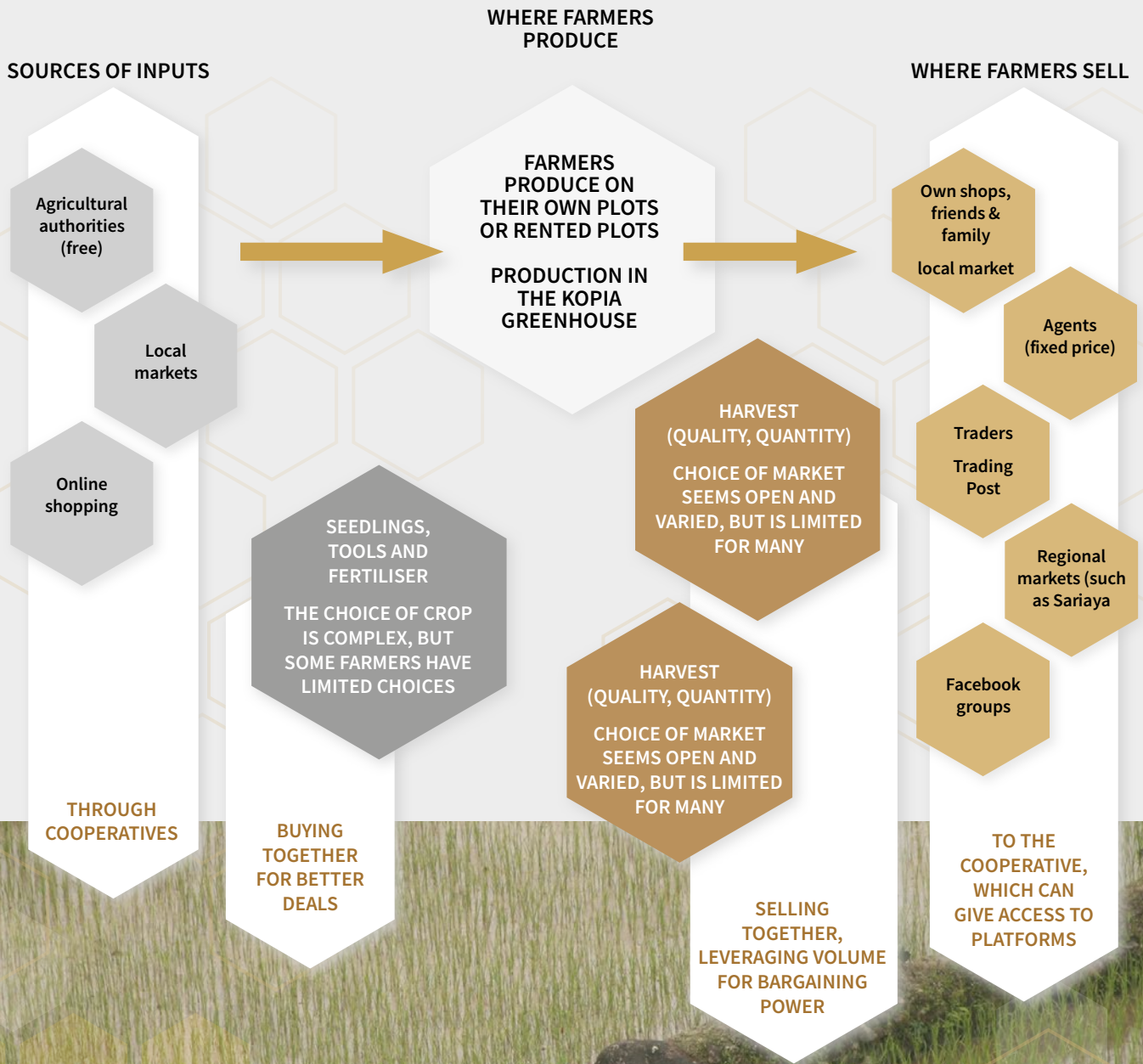
In order to discourage farmers from planting the same things as each other, the Farmers’ Association (SIPAG, as described earlier) asked farmers to tell them what they were planning to plant, so that they could coordinate among them.

Of course, price and copying one’s neighbours aren’t the only factors that farmers take into account when deciding what to plant: budget, weather, and convenience are among the other factors people consider. Indeed, farmers make decisions about what to plant based on various factors simultaneously. Evelyn, a 61-year-old woman who grows vegetables and raises pigs, has a particular order for deciding what to plant:

“First is the climate, second is the possible expenses, third is how easy it is to manage, and lastly fourth is whether a crop has a consistent price or an average price, like the native chilies.”

Experience is also an important factor. Some people plant the same things at the same time every year based on the season and whether the strategy worked in the past. Michael,

FARMING VALUE CHAIN AND FARMER COOPERATION



a 35-year-old man and the youngest of our interviewees, explained:

“Mostly just my choice, and this is like a routine of what I plant every year, I will also plant this for the next years to come. I have a chart, like I base this on the climate and which time I could probably harvest the best quality and price.”

Farmers also make decisions based on how much time they have available. Many of our interviewees undertook multiple income-generating activities. Perhaps the best example of this was Elizabeth, a 48-year-old woman. She not only farms, but also acts as a traders’ agent, is a community healthcare worker, sells clothes in the local market, and collects life insurance payments. Her husband is a police officer. Between the two of them they know everyone in the community, which is what makes her a valuable agent for traders. Understandably, she only grows crops that require little maintenance, such as native chillies (*siling pansigang*), onions and *kinchay* (a herb).

Summing up, it is clear that making planning decisions involves a high degree of complexity, uncertainty and risk. Given the importance farmers place on prices, we can conclude that the lack of market transparency is the major pain point they face. We should, however, bear in mind that the ways people make decisions are fairly individualised, despite interviewee’s insistence that most people simply copy each other. Further, some of our interviewees are confident that they have developed systems to make solid decisions. It is clear that some farmers find this easier to achieve than others. We will explore this point—the difference between farmers who rely on guesswork and farmers who have systematised processes and are willing to experiment—later in this report.

Selling decisions: Downstream value chain

Unsurprisingly, the factors farmers consider when choosing where to sell are related to the ones that help them decide what to plant. We already saw above that price is a serious consideration in planting, and that some farmers have pre-sale agreements with traders. As well as price, farmers also

make decisions about where to sell based on their existing contacts and relationships, often selling to the same traders. Other factors include quantity, (some buyers require a minimum or maximum amount), quality, (some buyers only take high-quality produce), sales location, convenience, and payment conditions (especially whether they will get paid immediately).

There is no doubt that price is the most important factor for farmers approaching harvest. Some farmers prefer the safety of the *puhar* system, which involves selling the crop at a fixed price in advance of planting, or soon after planting. Michael explains it like this:

“They way it is here is *puhar*. Agents come to your field and estimate how many kilos you will produce. And when you agree upon it, you can choose to sell it to them. For example, if a trader estimates that your plot will produce 500kg and the price is 20 pesos per kilo, then you will be paid 10,000 pesos upon harvest... Sometimes it works well. It’s really up to you to negotiate or decide if you think the trader is earning too much, because he will be the one to pack it and transport it. So you personally assess if it is good enough for you.”

This system is advantageous for farmers because they know in advance what they will earn for their harvest, and they do not have to worry about transporting their produce to market (which is expensive). But since the price is fixed, farmers cannot benefit from the ‘jackpot’ described in the previous section, in which a crop fetches a higher price than expected. As a result, many farmers sell at harvest, contacting several traders in the area to get the best price. Elizabeth explains that if a trader shows interest but their price is too low she will tell them that she hasn’t managed to harvest her crop yet. This way she can sell to a higher bidder without damaging her relationship with the lower-priced trader.

However, according to most farmers we interviewed, traders have the most power when it comes to setting prices, and calling around to different traders may only result in small gains. Farmers’ commonly experience that the traders dominate the market place and work together in a form of cartel. As Mary, a 57-year-old woman with an elementary school education, told us:

**“WE HAVE NO CHOICE WITH THE PRICING
IF THE TRADER SETS IT. NO OTHER BUYERS
COME IN WITH A BETTER PRICE.”**

“... ALL FARMERS FACE A RANGE OF RISKS, WHETHER THEY EXPERIMENT OR NOT”

“We have no choice with the pricing if the trader sets it. No other buyers come in with a better price.”

Michael explains that this is because they have more knowledge and cooperate with each other:

“Even if I know the pricing in the market, it won’t affect anything. They say because they are the ones travelling outside of Lucban. They know who to pass on to and the wholesale centres. All of us here in Lucban are held by the traders... They are all together in the same trading post.”

This point is backed up by Teresita, who among other things acts as a traders’ agent:

“The reason for low prices is the multiple traders that form a chain. If there is a direct market, then if there’s a fixed price, high or low, they will still get the same price.”

To bypass the traders, some farmers experiment with selling through other neighbouring markets such as Sariaya, San Luis, Tanaunan and Divisoria, or to organisations buying in broader areas like Castillo and Dizon Farm Deliveries. This is, however, only possible for farmers with some means of transportation or for groups of farmers that join together to create larger volumes of produce to sell. For example, in the Kopia project, farmers collectively manage a greenhouse, and work together to contract buyers for the produce.

The new Lucban Farmers Agriculture Cooperative has been selling to Agro-Digital with mixed success: they get groups of farmers together, none of whom produce enough quantity individually to sell directly to the platform, and then sell collectively to Agro-Digital. They have met with mixed success in this venture, but the farmers who have sold through them report being happy with the prices they received. Most interviewees had heard of the new cooperative and were interested enough to participate in a first pre-registration meeting. Many also saw the cooperative as a key driver of future agriculture in the region. The cooperative is in an early stage where potentials are many and both plans and finance uncertain. It is, however, already building partnerships with SIPAG and the KOPIA Lucban greenhouse project, as well as Agro-Digital for digital trading.

Farmers with their own transport also have greater power in selling. Some farmers we interviewed own their own tricycles, which allow them to sell within their neighbourhood or transport their produce easily to the Lucban market. One of our interviewees, Allan, bought a truck with the profits he made selling Japanese cucumbers. The truck allowed him to sell his produce at Sentrong Pamilihan, which gave him access to sales managers that coordinate production and discourage farmers from creating an oversupply of a given crop.

In some cases, these initiatives to bypass the traders have failed, as traders have managed to contact other traders and buyers in further markets or to hinder transportation by putting pressure on drivers (see p. 27).

A related issue is that selling in other markets may entail later payment whereas payment in the Lucban market or to traders who pick up the produce from the farm is usually cash on delivery, which avoids risk of offering credit to buyers. Mark, a 52-year-old who farms and does small jobs, explained that some farmers used to sell to Dizon (a company that supplies fast food restaurants) but they stopped because it takes them a week to pay, and they pay by cheque.

Small farmers also take into account that small amounts of produce or even surplus crops cannot be sold at larger markets. These markets similarly require a certain quality standard for vegetables, particularly if their target groups are urban consumers. Allan explains that it isn’t worth spending money on fuel if you do not have much to sell; this is why it is better to sell to traders. Jennifer, a 41-year-old who studied agricultural techniques at college, explains that she will sell her higher-quality produce to the traders, and sell the lesser quality produce at the town market.

Overall, we can conclude that most farmers are at a disadvantage when it comes to selling their produce. Lack of market transparency not only affects planting decisions; it also makes it difficult for farmers to set prices. Lack of market access makes it even more difficult to set terms and choose where to sell. As with planting decisions, some farmers have more agency and control than others. Overall, it seems clear that in order for farmers to gain more power in the market they need to cooperate more closely with each other. Formal groups, such as the Sipag, Lucban Farmers Agriculture Cooperative, or Kopia, seem more likely to have success than informal ones that have been formed for the purpose of a single sale.

Lack of power to change

Most farmers have limited ability to face their pain points head-on. First, they lack the resources to gain favourable selling conditions. The amount of land they farm matters because it affects their ability to choose what and how much to plant, which affects the prices farmers can gain. Lack of affordable transportation means that they have limited choice in terms of where they sell their produce. Lack of capital means that they cannot afford to wait for better prices; for example, selling to organisations that pay higher prices but take longer to pay. Reliance on cash also affects who they sell to; for example, Mark was unwilling to accept a cheque.

Second, farmers lack the market information and contacts necessary to sell on favourable conditions. Although most farmers own smartphones, few look up price information on the Internet, and some state that knowing the prices would not help them because they have little option but to sell to the local traders. They do not generally have contacts further afield, or know much about distant markets, for example, in Manila.

Third, middlemen control trade through influence and collusion. The Lucban traders organise around the trading post and cooperate with each other. They are sometimes able to persuade other middlemen, such as drivers and market wholesalers, not to buy from the farmers.

All of this severely limits farmers' agency and power. And yet, as we have seen, some farmers do indeed manage to find ways to overcome these barriers. Such farmers tend to have studied at a tertiary level and have followed other careers before becoming farmers. While not necessarily from wealthy backgrounds, they have greater resources, often accumulated during their former careers. They are more likely to use digital tools, such as laptops and mobile phones, and find information on the internet. They are more likely to experiment with farming techniques, undertake record-keeping, and explore new ways of selling.

All this suggests that there is a strong divide between farmers in our group, with some advancing while others are left behind. This begs the question: to what extent can the new generation of digital tools, including e-commerce sites, value chain platforms, and online agricultural information, help farmers to overcome their pain points? And who might such tools help? Can they assist the poorest farmers, or will the farmers that are already thriving be the ones most likely to benefit? We explore these questions throughout the rest of this report.

TRADERS: A STORY OF INTERVENTION

Most of the farmers we interviewed believe that the traders in Lucban control the trading post and collaborate to keep prices low. Traders may punish farmers who attempt to circumvent the traders' market by excluding the errant farmer from the market.

Mark told us a story about farmers trying to bring their vegetables to the market in Divisoria to avoid selling to traders. He explained that several farmers formed a group, and sent a representative to Divisoria to make a sale agreement on the type of vegetables, amount and price. The traders found out, and were able to block the sale by two interventions. First, they convinced the drivers not to transport the produce. Second, they contacted the buyers both in Divisoria and other markets, cautioning them not to buy from the farmers. In this way the initiative was stopped. Mark commented that the group did not have enough capital to buy from the farmers themselves.

Noel tells a similar story as experienced by the new Lucban Farmers Agriculture Cooperative when they tried to sell members' vegetable produce through Agro-Digital. Agro-Digital offered a better price than the traders, but when they contacted the farmers to consolidate the sale, they found that the traders had contacted the farmers with better price offers. This led to a pause in trading through Agro-Digital. They had sold to Agro-Digital previously, and were planning to sell to them again, but the path was by no means smooth.

E-COMMERCE FOR AGRICULTURE IN THE PHILIPPINES

Agrabah Wharf

Website	https://wharf.agrabah.ph
Year Founded	2019
Locations	Philippines
Target groups	Farmers and fishermen
Reach	Claims to reach more than 5,000 farmers and fishermen

Agrabah Wharf is a trading platform developed to manage large volumes of trade via the direct contact of farmers and buyers, markets and services. It is expanding from a trading platform to a broader platform including logistics, finance and trading.

Mayani

Website	https://www.mayani.ph
Year Founded	2019
Locations	Luzon (Calabarzon, Ilocos, Cagayan Valley, Cordilleras and Zambales)
Target groups	Smallholder vegetable farmers
Reach	Claims to connect more than 139,000+ farmers, 13,500+B2C customers, and to have a solid B2B portfolio

Mayani buys at harvest from a network of over 139,000 smallholder farmers. Leverages demand-matched supply data to achieve efficiencies in a direct value chain, creating cost savings on the part of buyers while making their supply chain more resilient and dependable. The farmers' farm-gate and post-catch incomes are boosted by at least 30 percent while reducing food loss by 20 percent.²⁷

Session Groceries

Website	https://www.sessiongroceries.com/
Year Founded	2018, after Typhoon Ompong
Locations	Based in Benquet; covers provinces across Luzon and Visayas
Target groups	Farmers
Reach	Claims to "empower" 2800 farmers

Session Groceries connects farmers directly to markets to support the continued growth of fresh farming produce. Farmers using the platform are encouraged to take part in education as farmers and entrepreneurs.

Agro-Digital

Website	https://www.agro-digitalph.com
Year Founded	2019
Locations	Based in Manila and Batangas
Target groups	Groups of farmers
Reach	Website states contact with 26 farmers and 5 groups of farmers

Agro-Digital provides a value chain management solution aggregating groups of farmers and consolidating their assets and capabilities to enable a sustainable business. This builds digital enterprises for small farmers. They undertake production management, demand management, order fulfilment and digital payment (via EASYasCASH).

DeliverE

Website	https://delivere.tech/
Year	Founded 2019
Locations	Muntinlupa City in Manila area
Target groups	Farmers and traders
Reach	Website states contact with 16,000 farmers (54% of them are women) and 252 small and medium-sized enterprises

DeliverE established a partnership between the Department of Trade, the Department of Agriculture and private actors to deliver value chain services and training farmers in understanding the dashboard, warehouse management and logistics. It has a broad portfolio of value chain services focused on efficient transportation and financing. It also works with blockchain solutions. The promise to customers is 90% reduction in crop waste, to increase farmer income by 100%, and a guaranteed monthly income.

iFarms

Website	https://ifarms.ph/
Year Founded	2018
Locations	Quezon, Manila area
Target groups	Farmers, vegetables and fruits
Reach	Not available

iFarms provides a digital solution, Umà, that connects farmers and buyers to apps, one for growers and one for buyers, to trade farming produce efficiently. The goal is to provide farmers and cooperatives with advantages through digitalisation and innovation.

“OVERALL, WE CAN CONCLUDE THAT MOST FARMERS ARE AT A DISADVANTAGE WHEN IT COMES TO SELLING THEIR PRODUCE. LACK OF MARKET TRANSPARENCY NOT ONLY AFFECTS PLANTING DECISIONS; IT ALSO MAKES IT DIFFICULT FOR FARMERS TO SET PRICES. LACK OF MARKET ACCESS MAKES IT EVEN MORE DIFFICULT TO SET TERMS AND CHOOSE WHERE TO SELL. AS WITH PLANTING DECISIONS, SOME FARMERS HAVE MORE AGENCY AND CONTROL THAN OTHERS. OVERALL, IT SEEMS CLEAR THAT IN ORDER FOR FARMERS TO GAIN MORE POWER IN THE MARKET THEY NEED TO COOPERATE MORE CLOSELY WITH EACH OTHER.”

PERSONA

GABRIEL

TYPE A farmer with little strategy, few possibilities and a low income

DEMOGRAPHICS

Gender Male | Age 65 | Education High school | Family Wife and three grown children | Farm type Small rental plot and own vegetable patch, member of the Farmers' Association

FINANCIAL NEEDS

- Paying for farming inputs
- Getting paid for crops at harvest
- Agricultural insurance
- Shopping for personal needs
- Receiving money from children via GCash

BACKGROUND Gabriel has lived in Lucban for his whole life. His parents were farmers and so are some of his siblings. He has always been a farmer, but his three children were all educated in other areas and have moved away. He lives on the farm with his wife, who manages a small sari-sari store. He is proud of his children and they sometimes help him economically when the harvest is bad.

Gabriel farms a small plot with rice and vegetables. The rice plot is rented from another farmer. He pays the rent with part of the harvest and sometimes by helping out with the harvest on the rest of the land. He shares the vegetable plot with his siblings. They mostly plant crops for which they can get free seedlings and fertilizer, even if that means planting the same crop as many other farmers. At harvest they sell to local traders and sometimes in the local market. They are all getting older now and do not want to experiment with new ways of farming and selling.

Gabriel once had a bank account at CARD Bank. When the children were younger he wanted to save money for poor harvest seasons so that his family would have enough to live on. He also valued CARD Bank's personal insurance solution. In his early days as a farmer, he had a bad experience with a grey market loan. He bought a tricycle on credit with the idea of using it to earn extra money and transport his produce to market, but crashed it and still had to pay back the loan at very high interest. Now he mostly uses cash, except for when his children send him money via GCash. His wife helps him withdraw the money. He does not trust banks as he thinks they make profit at the expense of farmers.

Gabriel has no experience with online shopping or selling. He only recently got his first smartphone from one of his children. His brother has persuaded him that next year he should insure his vegetable crop, but he feels very uncomfortable about it as it is new to him.

PAIN POINTS FARMING

- Little choice in what to plant (dependent on free seedlings)
- No means of transportation at harvest
- Feels that traders collaborate to offer poor prices and take advantage of the smallholders

PAIN POINTS FINANCIAL

- Lack of trust in banks
- Difficulty using GCash
- Lack of trust in digital payments
- No experience with e-commerce



PERSONA

JASMINE

TYPE A farmer with a highly diversified income strategy who relies on low-maintenance farming

DEMOGRAPHICS

Gender Female | **Age** 52 | **Education** Elementary school | **Family** Lives with her husband and two of their grandchildren, whose parents are working abroad | **Farm type** Rents land, member of the Farmers' Association

FINANCIAL NEEDS

- Paying for farming inputs
- Getting paid for crops at harvest
- Agricultural insurance
- Shopping for personal needs
- Receiving money from children in GCash
- Small loans when times are difficult
- Paying bills
- Saving

PAIN POINTS FARMING

- Farming
- Little choice in planting (needs to plant low-maintenance crops)
- No means of transportation at harvest
- Mostly uses the puhar system with agents but feels that the price is too low
- Would like to sell online instead but lacks the experience and knowledge about prices

PAIN POINTS FINANCIAL

- Finds banks expensive
- Is curious to use digital shopping and payments more but does not need to since the community is cash-based
- Gave up selling on Facebook after the pandemic as sales were slow

BACKGROUND Jasmine moved to Lucban with her parents as a child. Her father married several times and she has many siblings, some of whom are farmers. She was encouraged to find work early instead of studying, and has worked in many different jobs, including washing, healthcare, and as a payment collector. She does handicraft and prepares bread and food to sell in a small shop. Her children help her economically by transferring money regularly.

Jasmine started renting land for farming when she married. She only has a small plot on which she plants low-maintenance vegetables. She usually agrees with an agent on what crop to plant and sell at harvest (puhar). She thus has time to do other things as well. She sometimes raises a pig or chickens. During the pandemic, she sold ornamental plants. Her youngest child helped her sell them on Facebook but now the market is too slow.

Jasmine likes to try new things. She has two bank accounts in CARD Bank and Landbank (which her daughter prefers). She learned about paying her bills online from her children and finds them easy. Although she has a bank account, she has joined a ROSCA because she likes to be part of the community and because she feels more comfortable receiving loans from them. It will be her turn to receive a loan soon and she is considering buying a tricycle.

THE POTENTIAL OF DIGITAL TOOLS



In this section we examine the potential of e-commerce and ask whether the conditions are in place to take advantage of it. We begin by asking whether interviewees have access to the infrastructure and financial services that will facilitate their use of e-commerce. This includes identification, financial services (digital and non-digital). We next examine access to information rails as obtaining information is so important to farmers' positioning. Finally, we explore whether there is sufficient community interest in experimenting with new digital tools.

Could e-commerce solve pain points for farmers?

In recent years, many digital tools have appeared on the market to assist farmers with their agricultural and commercial activities. Our previous report, *Digital Change in Southeast Asian Agriculture*, documented a wide range of such tools currently available in Southeast Asia in five categories: Digital Advisory, Agri Digital Finance, Agri e-Commerce, Digital Procurement and Smart Farming. We found that few studies have been done on the potential of these apps to meet farmers' needs, or on their impact once farmers have adopted them.

While most of the apps we found fell into the categories of Digital Advisory and Digital Procurement, we were interested to note the growing number of e-commerce apps in the region. E-commerce is generally seen as a way of providing consumers with larger reach and more price transparency and competition. For merchants, the advantages include the possibility to reach larger markets, access to more customer data, and in principle an efficient sales process. For farmers, benefits are largely an increase in market transparency and market access, especially the ability to obtain higher prices. In sum, the potential benefits may be characterised as follows:

- E-commerce and a more efficient value chain may help overcome pain points of value for money and transparency, creating a smarter and more transparent farming production value chain and as such be part of the solution.
- E-commerce can support price transparency both for farmers using e-commerce platforms and for their competitors.
- Collecting data on supply and demand locally, as well as throughout the country, can provide farmers and/or farmers' organisations with access to detailed and continuous information as a basis for their planting and marketing decisions.

- E-commerce can support a more efficient value chain and provide access to new customer groups, including a better understanding of their requirements with regard to type and quality of produce.
- E-commerce in combination with community collaboration with farmers' associations and cooperatives can support bundling the buying of farming inputs, as well as farming produce thus reaching larger and more efficient markets and circumventing middlemen. Working together to access means of transportation at a reasonable cost is part of this.
- It is likely that digital solutions will result in higher convenience for farmers, including digital payments.

Whether e-commerce and digitally based agricultural value chains actually end up as an advantage for small holder farmers will in the end depend on the integrity, trustworthiness and efficiency of the operators.

We should also bear in mind that the presence of digital markets can affect farmers whether they directly engage with them or not. The additional possibility to sell produce may affect prices, both for those who participate and for those who don't. The option of higher prices may also affect decisions on what and when to plant, how to fertilise and harvest and how to sell. The quality of produce may particularly be affected as e-commerce platforms seem to require a certain minimum standard.

Although some of these apps started purely as e-commerce solutions connecting growers and consumers, they tend to develop into broader value chain platforms. Most of them cover the whole value chain from planting to harvest and bundling wares ready for retailers and consumer groups. They generally also provide digital payments, and sometimes even education. Since most smallholder farmers do not produce enough quantity to sell directly to e-commerce platforms, the platforms generally work with farmers' associations and cooperatives.

Our interviewees used e-commerce tools in a range of ways, including direct selling but also as information sources. As a result, we adopt a broad definition of e-commerce, including dedicated e-commerce sites, value chain platforms, and platforms like Facebook that incorporate ways of selling.

In this section we examine the potential of e-commerce and ask whether the conditions are in place to take advantage of it. We begin by asking whether interviewees have access to the infrastructure and financial services that will facilitate their use of e-commerce. This includes identification, financial services (digital and non-digital). We next examine access to information rails as obtaining information is so important to farmers' positioning. Several interviewees used the internet to get price information, but few sold directly online (Facebook or Agro-Digital).

Finally, we explore whether there is sufficient community interest in experimenting with new digital tools. Here we examine the cases of individuals who are innovating with new approaches to agricultural planning and commerce, and we explore the potential of community cooperation to overcome issues of market transparency, information asymmetry, and market access.

Are the necessary conditions for the uptake of e-commerce in place?

The uptake of digital solutions very much depend on the context and the characteristics of the farmers and households involved. This includes whether farmers can access the necessary infrastructure and hardware. It also includes access to financial services. E-commerce connects the physical part of trading (mainly transport) with digital matching of supply and demand, price information and settlement. For this reason, access to digital financial tools is important as part of the basis for e-commerce, particularly with regard to payments, credit and the use of agricultural insurance. The active use of digital savings and agricultural capital is perhaps of less direct importance for e-commerce, but nevertheless form part of the overall experience of the digital economy.

Access is also affected by less tangible—but no less real—issues such as knowledge and trust. Access is facilitated by farmers' knowledge in technology, the kinds of information available digitally, and financial literacy. We therefore discuss communication rails and tools used to access information. It also depends on how trusted digital providers are, which can rely on quite specific experiences and circumstances,

“DIGITAL IDENTITY IS AN IMPORTANT FACILITATOR SUPPORTING THE USE OF DIGITAL SOLUTIONS, AND IS THEREFORE ALSO OFTEN PART OF GOVERNMENT POLICIES IN DIGITAL DEVELOPMENT. IN OUR FIELDSITE, ID IS NEEDED FOR MANY RELEVANT PURPOSES, INCLUDING OPENING A BANK ACCOUNT, GETTING A CARD BANK LOAN, ACCESSING MOST OF GCASH’S FUNCTIONS, AND REGISTERING WITH THE MUNICIPALITY FOR CERTAIN SERVICES, INCLUDING AGRICULTURAL INSURANCE AND SEEDS. ”

such as a bad experience of fraud with a particular institution or mistrust in government. To get a good understanding of trust requires a more in-depth study than we have undertaken. Finally, access and uptake depend upon people's attitudes to new tools and their willingness to try new things. In the following, we go through the availability of digital and financial infrastructure as well as the presence of change agents and farmers' mindsets with regard to change and development.

Infrastructure

We start this section with just a short comment about the general access and use of digital solutions. We then move on to the use of ID and financial solutions including digital services. Some possess laptop computers.

People generally have access to electricity, cable or wireless internet, smartphones and financial services. Two participants have Piso Wifi connections, which allow them to earn money selling access to the internet connection to their neighbours. Some complain about insufficient signal and others mention difficulties in using the phone for financial purposes. Most, however, use Facebook and Messenger, watch Youtube and take photos with their smartphones. None of the interviewees report using their smartphone for activities like note taking, checking the weather, or navigation using maps. Games are popular among our younger interviewees.

ID

Digital identity is an important facilitator supporting the use of digital solutions, and is therefore also often part of government policies in digital development. In our fieldsite, ID is needed for many relevant purposes, including opening a bank account, getting a CARD Bank loan, accessing most of GCash's functions, and registering with the municipality for certain services, including agricultural insurance and seeds. Out of our 23 interviewees, 14 answered our question about whether they have ID, and if so, what kind. They all mention having some kind of ID, mostly their bank ID and their driver's licence. Others have a card with their tax identification number. Some have obtained a new National ID.

Bank accounts and savings

Most interviewees have a bank account. The savings account may be in the name of one person, but both husband and wife may use it, and they often ask children or siblings to help with withdrawals and other transactions. Often they chose their bank based on a recommendation from a family member. CARD Bank, Landbank and Philippine National Bank (PNB) are the most common among our interviewees. A few mention having an account with their cooperative's bank; for example, Rogelio, a 49-year-old man, uses the United Coconut Planters Bank (UCPB).

DIGITAL ID IN THE PHILIPPINES²⁸

The Philippine Identification System (PhilSys) is a digital ID system that provides Filipinos with the means to establish a verifiable digital identity. This digital ID enables Filipinos to open accounts, use financial services more efficiently, and participate in an increasingly digital economy.

PhilSys was introduced in October 2020 and has been implemented in three steps, beginning with 32 priority provinces (including Laguna, Rizal, Batangas and Cavite in Region IVA) but had not yet been introduced to Quezon.

Step 1: Demographic information is collected digitally, as well as through house-to-house visits.

Step 2: The registration of biometric information (iris, fingerprint scans and facial photographs).

Step 3: The issuance of PhilSys Numbers (PSN).

By the end of October 2023, 81 million people (88% of the target population) had completed Step 2.

PhilID can be used as proof of identity for both public and private transactions. Public transactions include social and welfare benefits, passports and driver's licenses as well as tax transactions. For private transactions, PhilID can be used for opening bank accounts and for bank transactions.

BANKS AND AGRICULTURE IN THE PHILIPPINES

According to the Philippines Central Bank,²⁹ the Philippine banking structure includes:

- 45 universal and commercial banks, including foreign banks in the Philippines
- 43 thrift banks focused on savings
- 374 rural banks, including CARD Bank
- 23 cooperative banks, including the cooperative bank of Quezon Province in Lucena³⁰
- 6 digital banks, including Maya Bank and GoTyme Bank
- 57 savings and loans associations (NSSLAs)
- 28 e-money licences to banks, including Maya Bank
- 43 e-money institutions

CARD BANK ³¹

CARD Bank is among the top 10 Philippine rural banks and is by far the most used by our interviewees. It was founded in 1986 by a group of rural development practitioners as a social development foundation through responsible financial services.

In 1997, CARD bank was licensed as a microfinance-oriented rural bank that also offered payments and savings. The bank is part of the CARD Mutually Reinforcing Institutions (Card MRI), which aim to provide the poor with development solutions. Card MRI also includes a mutual benefit insurance company and provides services like health and education. The bank's vision is to be a world-class leader in microfinance and community-based social development.

Since 2000, CARD Bank has been owned by its members, who receive annual dividends. In 2017, CARD Bank launched its mobile banking service called konek2CARD. In July 2023, CARD Bank had 4.1 million clients and 900,000 members.

Five interviewees stated that they don't have bank accounts. Any savings are kept in cash about the home, and loans may come from friends and family members. They generally state that they do not have enough savings to need a bank account, and describe their incoming and spending patterns as "cyclical". Some interviewees distrust banks and will keep cash at home. Allan told us:

"I don't want to use the bank because the bank will have profit, and it's the bank that would get rich (laughs)"

Other interviewees do not use a bank, but rather a Rotating Savings and Credit Association (ROSCA). Jocelyn, a 51-year-old woman who grows vegetables and coconuts, explained that she contributes an amount every two weeks and is eligible for a loan or a payout within the annual cycle. The

ROSCA allows participants to contribute to a pool of money that is collected from members at a bi-weekly cadence, and where the collected money is paid out at the same cadence to some of the members. The members that are paid at the end of the cycle receive compensation for their prior contributions and acceptance of risk in the form of a higher payout, and for them the relationship is akin to a savings account with interest paid. Those that are paid early in the cycle are effectively taking a loan, and as such are paid less by the ROSCA and must pay at a higher rate to those who are collecting later in the cycle, akin to paying interest on a loan.

Many, however, deposit money in the bank to save up to improve their housing, pay for their childrens' education, or cover emergencies like illness and hospitalisation. Some save to purchase more land.

“...PEOPLE’S NEEDS FOR BANKS AND OTHER SAVINGS MECHANISMS ARE RELATIVELY LOW”

PAYMENTS IN THE PHILIPPINES

According to the *Global Payments Report 2022*,³² the use of cash in the Philippines has fallen from 84% of point-of-sale transactions in 2017 to only 46% in 2022.

The use of digital wallets is growing, amounting to 17% of point-of-sales transactions in 2022 and 33% of e-commerce payments. FIS Global identifies GCash as the wallet leader, stating that it is preferred by 80% of respondents in 2022.³³

As part of the Philippine digital payment strategy, in 2018 the government launched real-time payments via the InstaPay system. The government plans to connect this system with other regional real-time payment systems in collaboration with the Bank for International Settlements.

In 2020, the Central Bank of the Philippines announced the *Digital Payments Transformation Roadmap for 2020 to 2023*.³⁴ The Roadmap outlines a plan to establish an efficient, safe and inclusive payments ecosystem. The main strategic objectives were to convert 50% of retail payment volume into digital form and to increase the rate of financial inclusion to 70% of Filipino adults.

GCash and PayMaya are the two most-used digital wallets in the Philippines. Other available solutions are GrabPay, e-money solution BanKo, DragonPay, 7-Eleven Cliqq Pay, CoinsPh, Moneygment, AllEasy and Denarii Cash.

Paleng-QR Ph

To support and further the use of digital payments, in 2022 the Philippine government and the Central Bank of Philippines introduced a QR code-based payment solution. The solution targets merchants, transport workers, market vendors and tricycle hubs.

Paleng-QR Ph is based on banks’ mobile solutions and uses the real-time instapay rails as infrastructure. A merchant (or a person requesting money) can ask their payment service provider to generate a QR code and share it with the customer/payer. The user just needs

to scan and upload the QR code to his or her own payment service. The payment is then executed and a receipt sent.

GCash

GCash³⁵ was established in 2004 as a subsidiary of Globe Fintech Innovations, operating as Mynt. Mynt is a joint venture between Ant Group (part of the Alibaba Group), Ayala Corporations (a Philippine business conglomerate) and the telco Globe Group. As of May 2023, GCash claims to have 81 million active users and 2.5 million sellers and merchants across the Philippines. Users having difficulties with GCash have created user groups in both Facebook and Viber to seek help from other users.

According to the GCash website, the organisation provides a broad range of services. Including game credits, green finance, bill pay, QR code payments, online shopping, bill splitting, and more. Many offer promotions.

GCash provides a solution for international remittances called Padala. The organisation also partners with the Malaysian bank CIMB to offer savings (GSave) and credit and Buy-Now-Pay-Later (GCredit).

PayMaya³⁶

This payment solution started in 2000. It now works as a wallet, with 56 million users in 2022. Maya Center is a network of 55,000 partner agent touch points across the country to reach even people in remote areas.

PayMaya provides money transfers between Maya users; sending money to other local banks; paying recurring bills; purchasing mobile and gaming prepaid credits; paying offline merchants by scanning QRcodes; checkout from online stores, and more. Like GCash, PayMaya provides a remittances solution. It also offers credit and savings solutions through Maya Bank.

Cooperatives that do not have their own formal banking system still function as savings institutions as well in some ways. The cooperatives keep a small amount from every sale to be paid to members at the end of the year, and they also store unhusked rice for later sale. As Francisco, a 41-year-old man who grows vegetables and raises cattle, told us:

“Currently, as a cooperative we have the concept of ‘*Balik Tangkilik*’. It means that whenever you sell vegetables to the cooperative, the cooperative will get a peso for each kilo and at the end of the year or during the annual assembly cooperative meeting, you’ll receive it as a savings.”

Overall, Lucban farmers have good access to financial institutions. The fact that quite a few either do not use banks, or use them infrequently, does not seem to reflect a lack of access. Rather, people’s needs for banks and other savings mechanisms are relatively low.

Payments

The economy in Lucban is overwhelmingly cash-based. Digital payments, though rare, are predominantly used to pay bills or to receive remittances from children. Most interviewees have heard of GCash, but were not aware of other money transfer services. People generally find the service convenient. As Teresita put it:

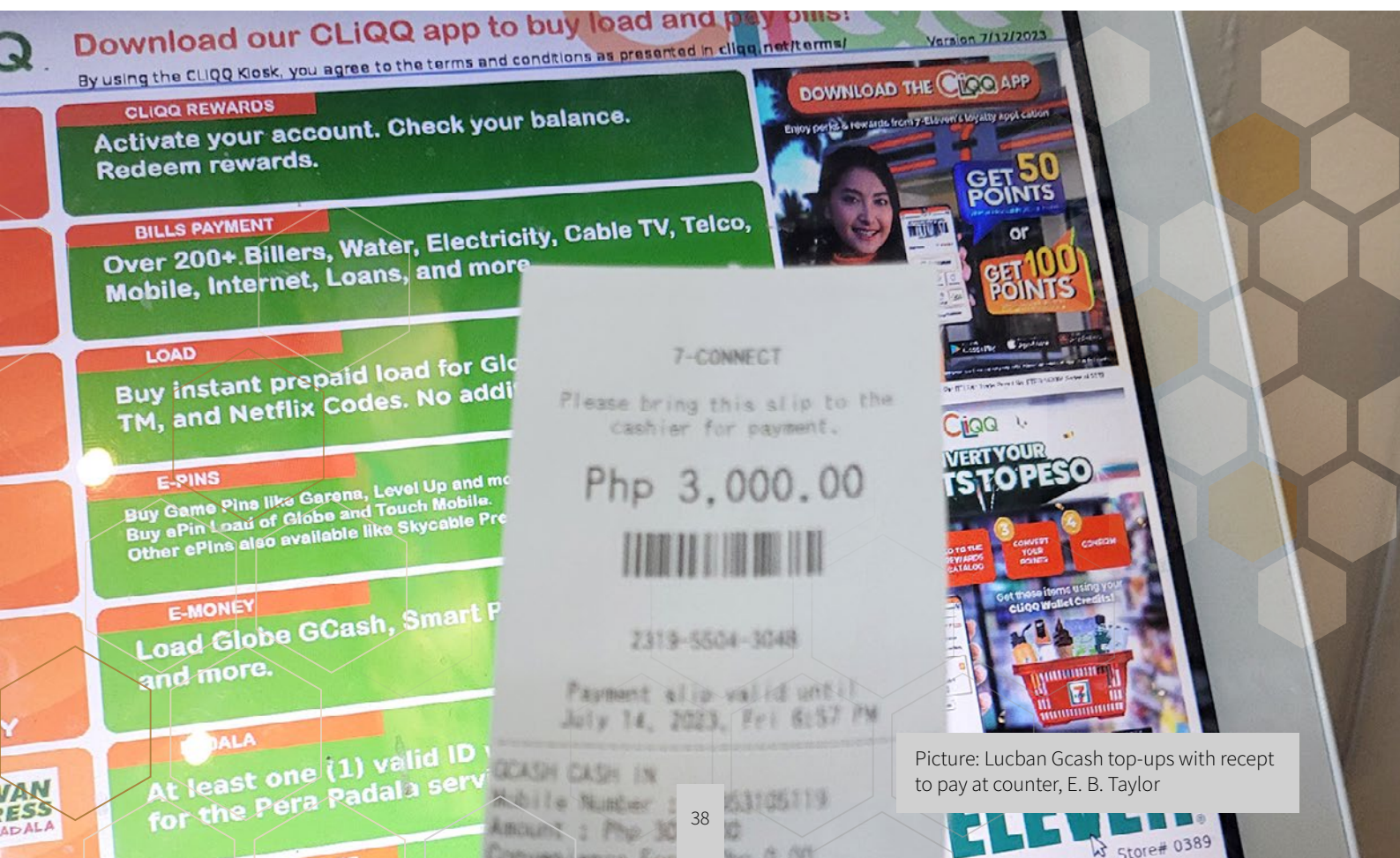
“If I use GCash, transactions will be easier and faster. Then I don’t have to go to the city centre to pay.”

People reported having a number of issues with using GCash. One issue was a lack of mobile signal to transact efficiently. Jocelyn mentions that she has difficulties keeping track of payments when there is no signal. To make sure everything is paid or received, she needs to manually keep track of outstanding payments until the signal comes back. Lack of trust is another problem, as people are worried about fraud. Quite a few people felt they did not understand the technology. Some overcome this by getting help from their children. However, the main issue here may not be lack of technical literacy or confidence, but rather the fact that the GCash interface is complex. It is not simply a payment service, but rather a platform offering all kinds of services, including shopping and gaming.

Loans

Our interviewees have experience with both formal loans (banks) and informal loans (friends, extended family or *tao* [non-kin]). CARD Bank was the main bank our interviewees used to take out loans. Some had obtained loans through their local cooperative banks, and some had taken loans directly from the Department of Agriculture (through Landbank), but they did not specify the purpose or reason.

In general, loans were personal and given without security or guarantees. Some, like Mary, however, explained that CARD Bank will only extend loans if there is a guarantor and that they will ask how the loan will be used. It is not possible to distinguish between loans for farming purposes and loans for other purposes. This is apparently driven by the farming



Picture: Lucban Gcash top-ups with receipt to pay at counter, E. B. Taylor

business but neither lender nor farmer make the distinction between private economy and farming business. No one seemed to have accounts of the farming business.

Insurance

A number of interviewees have personal insurance (mostly life insurance or funeral insurance) through their cooperative bank or through CARD Bank. Marilyn, a 56-year-old woman who grows vegetables and takes in laundry, explained to us that CARD Bank provides personal insurance along with their loans, granting 200 pesos in case of an accident and 50,000 pesos if a family member passes away.

A growing number of farmers are insuring their crops as well. The insurance system has been pushed out to broad areas of the country through the Department of Agriculture, and since it is generally free for low income farmers, it has become more accessible and awareness has grown. A number of our interviewees said that they had only recently learned that they could apply for it. Insurance is not available for short cycle crops that take less than six weeks to grow. Few seem to have experienced a payout from the insurance.

AGRICULTURAL INSURANCE IN THE PHILIPPINES

The major agricultural insurance company in the Philippines is the Philippine Crop Insurance Corporation PCIC,³⁷ which works in close collaboration with the Philippine government to provide services to small farmers and fisherfolk. The major goals are to:

- Secure against incidents
- Act as collateral for farming credits and loans
- Provide security to invest in higher profit crops

The government program started in 1981, focusing on insurance of rice crops. It has since developed to cover a broad range of agricultural produce such as corn, fruit and vegetables, livestock and fisheries. It also covers agricultural non-crop assets and credit and life insurance packages. PCIC also implements various special programs, under which insurance premiums are fully subsidised by the government.

In 2014, PCIC started implementing a special program named “Agricultural Insurance for Farmers and Fisherfolk Registered in the Registry System for Basic Sectors in Agriculture (RSBSA).” The RSBSA registration started in 2012 and is the responsibility of the local authorities. This special program fully subsidises the insurance premium of all subsistence farmers and fisherfolk registered under the RSBSA for almost all insurance product lines offered by the PCIC.

In general, application documents must be handed to the PCIC offices or agents before the date of planting up to 15 calendar days after planting. Claims must be filed within 45 calendar days for rice and corn, and within 30 calendar days for vegetables. All claims for indemnities are settled within 60 calendar days from the submission of complete claims documents. Meanwhile, crop farmers who have not filed any indemnity claims for three successive cropping periods are entitled to a no-claim benefit of 10 percent.

Coverage among smallholder farmers is still quite low. This is mostly due to lack of awareness of both availability and filing procedures.³⁸ In Lucban, however, we found that most of our interviewees had either taken out agricultural insurance or were planning to do so in the near future.

The Binhi crop insurance app is a collaboration between PCIC and CARD MRI insurance. Binhi offers crop insurance and is mandatory for CARD agri-loan borrowers who have corn and rice as crops.

***“...A GROWING
NUMBER OF
FARMERS ARE
INSURING THEIR
CROPS.”***

E-commerce

People's engagement with e-commerce for general household purposes is an important initial gauge of their readiness to use it for farming. Digital shopping and payments have not yet taken hold in the community. Only three interviewees mention ordering shopping online, and all of them ordered through Shoppee, which allows buyers to pay cash on delivery.

Very few of our interviewees had experience with e-commerce for selling their agricultural produce, though there was generally an awareness of the possibility. Those who mentioned e-commerce could name Facebook, Agro-Digital and Session Groceries as examples of sites that permitted the sale of crops.

Allan explained that he sells tomatoes through a Facebook group specialising in tomatoes. He sells them in amounts of 500-1000 kilograms. Similarly, Jocelyn began selling decorative plants via a Facebook group during the Covid-19 pandemic. She does not organise the selling herself; instead, her son would do it for her. However, she stopped selling online after the pandemic, partially because it was no longer as profitable, but also because her son's godfather was selling plants in the same Facebook group and she did not want to take away his potential clients.

Noel explained that the only e-commerce platform that he has explored is Agro-Digital. He checks prices also on the Session Groceries website, but he does not use the platform because it is not active in the region. He has used Agro-Digital twice, buying produce from five farmers and selling it through the platform. The farmers didn't engage with the digital interface but they were happy to get a higher price. Traders were not so happy and raised their prices to try to block the co-op from selling to Agro-Digital (see p. 28).

In summary, we see some practices emerging regarding the use of e-commerce platforms to sell agricultural produce. Some of these are direct sales, such as via Facebook. Farmers cannot sell directly to specialised agricultural platforms like Agro-Digital because they do not produce enough quantity. Instead, they need to sell collectively. This appears to be true for most, if not all, agricultural e-commerce platforms throughout the Philippines. Thus there is a hard limit on farmers' abilities to embrace digital platforms as individuals or households. Cooperation is necessary.

Communication rails: Access to information and assistance to adopt digital solutions

As well as infrastructure, we know from previous studies that access to information about new tools is crucial to their adoption.³⁹ This is not just about access to factual information, though this is of course important, especially with respect to market information such as price. It is also a question of introducing new tools to people within the contexts in which they will use them, so that it is clear how the tool could improve and speed up decision making processes, and also make them cheaper.

This means that existing knowledge and understanding of digital solutions should be taken into account. We know from previous studies that access to trusted people (children, neighbours, friends, community-based professionals) who can help explain the benefits of a new tool is important. Overall, the ability of people to use new information (and thus new tools) depends upon three broad categories: education, community collaboration and the presence of what might be called "change agents".

For a rural area in a low income country, the educational level among our interviewees is quite good. There were no apparent issues of illiteracy. Indeed, most interviewees had at least a high school education and some even had a university degree. Only a few said that they had only attended elementary school.

Most farmers gained information from fellow farmers in the neighbourhood, traders, the municipality, the farmer's association (SIPAG), the cooperative, the KOPIA project, and broadcast media such as the television and radio. The first information source among our interviewees is other people in the community. Most interviewees talk about how they keep an eye on what neighbours do and discuss new possibilities, planting decisions and prices in the community as they go about their daily business.

Farmers also meet and participate in information meetings held by cooperatives or by the Department of Agriculture's representatives in the local community. They offer training sessions and general information on things like the availability of seeds and fertilisers, how to apply for agricultural insurance, neighbouring farmers' intentions to sow certain crops, and likely typhoons. This means that organisations are in place to offer both information about new digital solutions and advice on how to put them to use.

The farmers we interviewed are quite diverse with regard to land ownership and income. This influences their need and interest in developing their farming abilities and results. Yet even farmers with low incomes, little land and few digital skills mention taking part in information meetings organised by the cooperatives of the municipality/ Department of

Agriculture, where they learn about crop management, available inputs, and selling. Generally farmers were interested in learning, and even farmers who did not find information online would make use of face-to-face channels.

During the interviews, we quickly realised that though most interviewees had both smartphones and access to the internet, they still made limited use of farming information available online, such as the weather forecasts, agricultural knowledge, general market expectations or prices (we will discuss exceptions later in this report). Some, but not many, farmers gained information from Facebook, YouTube, and commerce websites. Some farmers found these information sources helpful to access market information that could help them understand which crops would likely fetch a good price in the market. Eduardo explained how he looks for ideas and information online:

“I actively look for it and I’m interested. I even join online groups for vegetables, rice, and coconuts, therefore I can read discussions about them and see videos.”

He explains that before, his plants used to “get sick”, but now he is able to use the information he found online to grow healthy vegetables.

As we described earlier in the report, some interviewees, such as Allan and Noel, obtain price information from the internet, mostly from the Sariaya or Agro-Digital websites. They explain that this information is helpful in understanding what to grow and what price to expect for their produce.

Our findings indicate that the communication rails necessary to reach farmers with digital solutions are in place. However, few farmers are accessing information via the Internet although they have the possibility. Those who did use the Internet tended to have an informational advantage over those who did not. We suspect that most farmers are simply not accustomed to finding information over the Internet, preferring to use familiar, face-to-face or telephoned sources.

However, we should also bear in mind that many of our interviewees were quite new to owning a smartphone. We would expect that within two or three years, many more of our interviewees will be accessing information online from a variety of sources, particularly among the younger farmers or those willing to learn from their children. However, we should keep in mind that some relevant information - like prices - might not be publicly available but either negotiated in private or restricted to members in different groups or organisations. We cannot assume that digital tools will provide smallholder farmers with access to all the information they need.

Community interest in trying new solutions

Experimentation in farming production and sales could potentially help farmers to overcome some of the streamlining issues and gain a better position in the market. There are a range of possibilities for farmers to try new solutions or even invent their own. For example, we interviewed farmers who experimented with planting less common crops, inventing their own methods of tracking and interpreting price data, and selling in new markets (such as online platforms). Several of the farmers in our study reported having benefited from experimentation, and many considered the system of copying one’s neighbour as being a losing strategy.

Not all new endeavours must be complex: simply getting information from the Internet can help farmers to better understand their position in the market or discover new ways of growing crops. Similarly, the farmer who planted the same crops as everyone else, “but six weeks later”, found a simple solution to a common problem. It is not necessary for all new solutions to be high-tech: the KOPIA greenhouse is a good example of a relatively low-tech project that substantially changed farming production. Many benefits can also be gained from merging low-tech and high-tech capabilities. The Lucban Farmers Agriculture Cooperative for example, facilitates farmers to access an online market without the farmers themselves having to learn to use the solution.

Some farmers are, however, better positioned to experiment than others. This may be due to the fact that they have accumulated more assets or have a more regular income. Some bring knowledge to farming from their studies or non-farming work experience. There are quite a few examples of farmers experimenting with new ways of farming. Allan said:

“For me sir, I’m like the person who can never get contentment on things. That is why I explore and make some trials and experimentation. Whether with the variety of crops and the market for the crops, I am consistent with trying various things. Because I know, as the years progress, more varieties of crops and seeds emerge that are much better.”

Some farmers are quite advanced in their endeavours to try new things. Jennifer explained how she is experimenting with hydroponics to grow lettuce. She came to the area without farming experience. She studied university courses in hydroponics and was able to buy used equipment and learn from friends. The production is not yet very profitable because the market is not developed:

“Before I observed another Home Economics teacher setting up their garden greenhouse that was overlooking my classroom. So whenever I had free time, I looked at it and then eventually had the courage to ask the teacher: how does the system work?. Eventually I found out the technical aspect on how to set it up. Because of that curiosity, I brought that skill here in Lucban.”

The creation of collectives could help farmers obtain a better position in the market. Uniting farmers opens the opportunity to market higher volumes of attractive produce. This creates better bargaining power, which we have seen is a major pain point for the interviewees. Working together may also help farmers obtain better prices for farming input and transportation. Cooperatives are actively chosen as attractive partners for existing e-commerce or value chain platforms like Agro-Digital (see p. 28) Quite a number of interviewees talk about the development of the KOPIA greenhouse project in Lucban as a basis for new ways of farming. As Gina, a 63-year-old woman with five children, told us:

“We started the association or the group, KOPIA, to gather us farmers together and to look for direct buyers in order to channel the produce to them.”

Many farmers are experimenting with new ways of selling or finding sales prices, moving from the traditional choice between growing crops at fixed prices for agents, or selling to traders in the market. Interestingly, Noel mentioned that the most active participants of the collectives has been the small farmers:

“Usually, the easily convinced farmers are the small-scale farmers. Because their produce is not that large when it comes to quantity, therefore their pricing is dependent on local traders. And they are aware that these traders exploit the prices. Therefore, a way they think about is to consolidate all of our crops or produce, and then find a

direct market.”

In other words, the smallest farmers have the greatest incentive to collectivise, and they are actively doing so. This appears to also be true of the new Lucban Farmers Agriculture Cooperative. Noel explained:

“We are the ones who built this cooperative from the grassroots level, because the problem here in Lucban is the system of trading. Because usually, here in the town, the one who dictates the price for the produce is the traders. Our farmers here in Lucban do not have the power to dictate prices for their produce.”

Farmers expect the development of a cooperative to lead to community decision making with regard to crops. Not all, however, are entirely positive about collective organisation. A number of interviewees express worry about losing their autonomy. For example, Gina told us:

“It depends, if you are part of an association and they provided you a plot you would listen. But for our own individual plots, I think people here would more likely decide on their own.”

In sum, our interviewees had a diverse range of experiences and attitudes in relation to change. This is not surprising, since all strategies involve risk. Their responses suggest that willingness to change is not the problem. Rather, change brings insecurity, which is particularly problematic for people with precarious incomes. For smallholder farmers to feel comfortable instigating change they need to have confidence not only that such changes will bring them long-term benefits, but also that their risk of losing is low in the short-term.



Picture: ATM in Lucban, E. B. Taylor

PERSONA

NATALIE

TYPE A farmer who innovates

DEMOGRAPHICS

Gender Female | **Age** 44 | **Education** College | **Family** One child | **Farm type** Small rental plot and own vegetable patch. Member of the Farmers' Association, the Lucban Farmers Agriculture Cooperative and a participant in the KOPIA project

BACKGROUND Natalie grew up in a different part of the country and has a degree in IT. Her family used to live in Lucban. When her husband died a few years ago, she moved back to Lucban with their child, a young girl.

With money she saved from her previous job and a loan from CARD Bank, she was able to buy a small vegetable plot and started learning how to farm—something she had never tried before. She asks for advice from the other farmers and participates in information meetings in the Farmers' Association. She also looks for information and educational videos on YouTube. She has even completed a course in organic greenhouse farming to develop her business. She sells her basic produce in the area, making sure to check prices online if possible. With help from friends, she has built a greenhouse to grow and sell more fragile crops like lettuce and herbs. She sells these in Facebook groups. She never sells to traders in the area as they pay too little.

FINANCIAL NEEDS

- Paying for farming inputs
- Getting paid for crops at harvest (selling online)
- Agricultural insurance
- Shopping for personal needs
- Paying bills
- Getting a loan to grow her business
- Saving

PAIN POINTS FINANCIAL

- Finds it annoying to go back to using cash
- Too few people accept digital payments—and then mostly GCash
- Uses online shopping and would like to do it more often
- Would like to have better access to e-commerce for selling produce

PAIN POINTS FARMING

- Seedlings for specialised crops are too expensive
- Too little information/education available to evolve her farming
- Misses an e-commerce solution to sell her produce and has joined the new cooperative hoping they will use Agro-Digital (the platform does not deal with individual farmers)
- Is dissatisfied with the trading system too expensive and too many middlemen



Picture: KOPIA greenhouse in Lucban, E. B. Taylor

PERSONA

JACOB

TYPE A farmer engaged in organising farmers

DEMOGRAPHICS

Gender Male | **Age** 37 | **Education** Tertiary
Family Wife and two children | **Farm type** Part of a family plot planted with coconut and a rental space with vegetables; member of the Farmers' Association and the Lucban Farmers Agriculture Cooperative

BACKGROUND Jacob grew up in Lucban where his family has farmed for many years. He has five siblings, most of whom are trained professionally. He trained as an engineer and worked as such for a long time. The pandemic put a stop to that, and he decided to work with his family, bringing his wife and children to Lucban.

Jacob currently manages the family plot together with two brothers. They grow coconuts and are able to harvest them several times a year. Jacob also rents a plot where he grows vegetables. He bargains to get the best prices on seedlings and keeps track of selling prices through one of the larger nearby markets. He quickly decided not to sell to local traders because of their business model. He joined the Farmers' Association but found their progress too slow. Instead, he is currently engaging the community in building the Lucban Farmers Agriculture Cooperative with the help of authorities and personal contacts. The cooperative is looking to create partnerships with digital platforms to buy farming inputs, sell produce, and process lower-quality crops that cannot be sold as-is.

Jacob has continued his urban habits of saving in a bank, paying bills online and using digital wallets whenever possible. He has become a member of CARD Bank since he took up farming and has a loan to expand his business). He is taking out agricultural insurance for his crop.

FINANCIAL NEEDS

- Paying for farming inputs
- Getting paid for crops at harvest
- Agricultural insurance
- Shopping for personal needs
- Loans for business purposes
- Paying bills
- Saving

PAIN POINTS FINANCIAL

- Misses the choice he used to have

PAIN POINTS FARMING

- Too little price transparency (not all markets offer price information)
- The Farmers' Association is not efficient
- The adoption of new farming techniques is too slow, as is the development in market access



CONCLUSION

Agriculture is undergoing digital transformation, affecting both large farmers and smallholder farmers, and creating changes throughout the whole farming value chain. Climate change and the need to move towards sustainable solutions is enhancing this development. Smallholder farmers increasingly have access to smartphones and the internet, offering possibilities of agricultural e-commerce solutions, mobile financial solutions and social media. But as we found in an earlier study,⁴⁰ little is still known about how farmers react to the introduction of such services and their impact on the pre-existing trading system.⁴¹

When listening to the interviewees we first noticed that the Lucban vegetable farming community is very diverse. As might be expected some come from a farming background, but others have taken up farming in the area in spite of very different backgrounds in teaching, IT, mining etc. We also noticed that there are very few young people following in their parents' footsteps. There were few young farmers and many in their fifties and sixties.

The characteristics of the community can affect digital change in several ways. On the one hand, they could lead to a reduction in the number of people farming, if young people do not wish to take up this occupation. On the other hand, both young people and new entrants to farming, such as those with higher education and previous careers, can hasten the change process.

With regard to our main focus, the digital uptake and the development and impact of agricultural e-commerce, we found that this development is still in the making. Overall, Lucban farmers have good access to electricity, internet connections and financial institutions. Few, however, seemed to take full advantage of digital tools to further their business. The economy is still mainly cash-based, and while most interviewees had access to banks and insurance they often did not use them, or used them only occasionally. Very few had used online shopping or had experience with selling their produce online, and then mostly through social media like Facebook.

This means that the farmers are still on a journey from getting their first mobile phone to putting the new technology to full use. Indeed, many of our interviewees told us that they had only recently bought their first smartphone, opened a bank account, or downloaded a banking app. It takes time to shift from formal access to a full understanding of how the internet can open up access to both market information and learning. In a few years' time, we may find that most farmers are using digital tools extensively.

During the interviews, farmers expressed their frustration with their situation as small vegetable farmers and the farming value chain. First, they conveyed uncertainty regarding the planning process, as they have highly complex decisions to make and few tools to support them. Second, they described a deep frustration with the lack of price transparency in the market, which makes it very difficult to make reliable decisions regarding both planting and selling. Most of our interviewees only have access to local or regional markets, and many perceived that the traders in these markets dominated pricing and sometimes collaborated to keep prices down. These points severely limit farmers' agency and power to change.

We know that the uptake of digital tools can happen quickly when an important pain point is addressed or resolved if people are positive towards change and there is sufficient access to infrastructure and good communication rails. We asked to what extent the new generation of digital tools, including e-commerce sites, value chain platforms, and online agricultural information could help farmers to overcome their pain points, and who such tools might help.

We found that access to infrastructure in our fieldsite is quite good, with a number of farmers already experimenting with online sales. We further found a good educational level in the community, with no apparent literacy issues. There was a strong presence of government and local authorities offering information, agricultural insurance and agricultural input. Furthermore, many interviewees were members of at least one farming association. Finally, the farmers were clearly interested in learning and trying new solutions. Many interviewees felt that the new farmers' cooperative represents a common initiative that could bring future benefits. Together, this provides a solid communication infrastructure to support digital change.

“...SMALLHOLDER FARMERS’ EFFORTS TO CHANGE THEIR PRACTICES ARE ALMOST NEVER AN INDIVIDUAL EFFORT. WHETHER FARMERS LEARN FROM THEIR CHILDREN, ADOPT THE PRACTICES OF THEIR NEIGHBOURS, GET ADVICE FROM THE MUNICIPALITY OR WORK TOGETHER IN A COOPERATIVE, DIGITAL TRANSFORMATION IN SMALLHOLDER FARMING IS A COLLECTIVE PROCESS.”

Changing market systems may, however, require more than individual initiative. It seems clear that in order for farmers to gain more power in the market they need to cooperate more closely with each other. Formal groups, such as the Farming Association (Sipag), Lucban Farmers Agriculture Cooperative, or Kopia, seem likely to have more success than informal ones that have been formed for the purpose of a single sale. Moreover, such groups can provide pathways to learn about digital potential together which can support farmers who are reluctant (or unable) to experiment with such tools themselves. Indeed, groups like the Lucban Farmers Agricultural Cooperative may be a necessary bridge between smallholder farmers and e-commerce platforms. Formal groups therefore have the potential to help farmers navigate the market in ways that are digital, non-digital, or perhaps more often a hybrid of the two.

Finally, it is worth bearing in mind that smallholder farmers’ efforts to change their practices are almost never an individual effort. Whether farmers learn from their children, adopt the practices of their neighbours, get advice from the municipality or work together in a cooperative, digital transformation in smallholder farming is a collective process.

RECOMMENDATIONS FOR FURTHER RESEARCH

The insights from this small study in Lucban vegetable farming illustrate that smallholder farmers are on a journey of digital change. More research, both in the Philippines and across Southeast Asia, could help to build an understanding of how farmers react to the introduction of digital services and how they impact the farming value chain. A well-founded understanding of user needs could support the development of successful policy measures.

We recommend that research be directed towards an understanding of the connection between digital design and digital adoption. Studying the use of digital solutions will help to build better knowledge of user needs. We further recommend studies in the impact of digital solutions on smallholder farmers, the surrounding communities and the farming value chain. Topics could include:

Design and adoption

- What kinds of smallholder farmers are more likely to adopt digital tools such as e-commerce apps and digital finance (e.g., age, gender, crop, type of farming, geographic location, education, resources, desire to innovate)?
- How can local organisations support farmers to adopt e-commerce and digital finance tools, and by whom (e.g., local organisations such as government or cooperatives)?
- Given the changes taking place in agriculture, what kinds of future tools and use cases might be developed? Who is best placed to develop them?

Usage

- How usable are the e-commerce and finance apps currently on the market? What kinds of advantages do they provide to farmers compared with non-digital solutions?
- Are there special agricultural needs for financial solutions, or are mainstream digital tools sufficient? If so, in what areas (savings, payments, e-commerce, insurance, credit, etc.), and how should tools be integrated with platforms?

Impact

- How does the use of digital tools (finance, agricultural extension, e-commerce, digital platforms) impact smallholder farmers? Who gains the most?
- What is the impact of digital tools as measured by changes in agricultural practices and income, and how does it affect household welfare?
- To what extent do e-commerce platforms provide farmers with better market conditions?

Overall, the study has developed interesting insights in both digital user needs among smallholder farmers, in the issues and challenges of the farming value chain as well as the importance of the community in ensuring the impact of digital change.

APPENDIX A: LIST OF PARTICIPANTS

NAME	SEX	AGE	EDUCATION	FARM STATUS	INCOME SOURCES
John	M	48	Secondary	Renting	Farming, trading, transport
Jose	M	49	Secondary	Owner	Farming
Mark	M	52	Tertiary (auto electricity)	Renting	Farming, small jobs
Michael	M	35	Secondary	Renting	Farming
Mary	F	57	Primary	Renting	Farming
Jocelyn	F	51	Primary	Owner and renting	Farming, small jobs, support from daughter
Teresita	F	47	Tertiary (secretarial)	Owner	Farming, trading, healthcare worker, collects life insurance payments, trader's agent, sells clothes in a market
Evelyn	F	61	Secondary	Owner	Farmer, farm worker
Josephine	F	56	Secondary	Owner / employees	Farming
Romeo	M	43	Secondary	Renting	Farming, transportation
Marilyn	F	56	Primary and one year of secondary	Renting	Farming, washing, selling, support from children
Antonio	M	66	Primary	Owner and borrowing land	Farming, store, support from children
Rogelio	M	49	Tertiary (radio communications)	Owner	Farming, farm worker
Eduardo	M	56	Tertiary (engineering)	Owner and manages siblings' land	Farming (disabled)
Jennifer	F	41	Tertiary	Owner	Teacher, Farming
Erlinda	F	55	Tertiary (agriculture)	Owner and renting	Farming, sari-sari store
Mario	M	63	Primary	Owner	Farming
Gina	F	63	Tertiary	Renting	Farming, sari-sari store, support from children
Noel	M	39	Tertiary (IT)	Owner	Farming, management of KOPIA
Allan	M	39	Tertiary (IT)	Renting	Farming, selling seedlings
Francisco	M	44	Tertiary	Renting	Farming, transportation
Elizabeth	F	48	Secondary	Renting	Farming, trader's agent, some support from children
Jeffrey	M	62	Secondary	Owner	Farming



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Dr. Anette Broløs is Director and Founder at Fintthropology. A fintech analyst based in Denmark, she is an experienced network leader working with strategic innovation and partnerships. Anette is an experienced speaker and facilitator. She holds an industrial PhD in collaborative innovation and has a background in economics. Anette has extensive work experience in finance including consultant work on the implementation of PSD2 and six years as CEO of Copenhagen FinTech Innovation and Research.

Matthew Levasseur is a researcher and mobile application developer, most recently serving as Digital Product Manager at Point32Health Inc. At Point32Health, Matt helped guide the development and design of digital technology platforms for marketing. Matt has previously implemented public health, agriculture, social services and research applications in a number of countries including Haiti, Ghana, Thailand, India, and the United States. Matt holds an MBA and MS in International Health Policy and Management from the Heller School at Brandeis University, and a BA in Anthropology and Psychology from Marlboro College.

ABOUT FINTHROPOLOGY

Fintthropology creates human insights for finance. We help organisations to understand their customers' financial behaviour and innovate to meet their needs. We connect organisations with their customers and train teams to be truly client-centric, helping organisations to get ahead of their competitors in a fast-changing market.



The logo for Fintthropology features the word "Fintthropology" in a sans-serif font. The "Fi" is in a teal color, and the rest of the word is in a dark blue color.

ENDNOTES

- 1 This focused study does not look at digitalisation of agricultural practices (smart farming, drones etc.) or network building across the farming value chain.
- 2 The total vegetable production in the Philippines amounted to 7% of crop production in 2020; see Department of Agriculture. 2022. Philippine Vegetable Industry Roadmap 2021-2025, <https://www.da.gov.ph/wp-content/uploads/2023/05/Philippine-Vegetable-Industry-Roadmap.pdf>
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