

MAKERERE UNIVERSITY

SMALLHOLDER FARMERS' WILLINGNESS TO PAY FOR EZYAGRIC SERVICES IN UGANDA

BY

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DECLARATION

I, **KIGGUNDU JOSHUA**, declare that this report is my own original work and has not been submitted for any degree or academic award in any university.

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APPROVAL

This report has been submitted for examination with approval of my supervisor.

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DEDICATION

I dedicate this work to my family for their unwavering support and encouragement throughout my academic journey.

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List of Acronyms

Acronym	Full name
B2B	Business-to-Business
CVM	Contingent Valuation Method
DC-CVM	Dichotomous Choice Contingent Valuation Method
UGX	Uganda Shillings
WTP	Willingness To Pay
NWTP	Non-Willingness To Pay

ABSTRACT

This study examined smallholder farmers' willingness to pay (WTP) for EzyAgric's digital agricultural services in Iganga District. The research had three specific objectives i.e., to assess smallholder farmers' WTP for selected digital agricultural services on the EzyAgric App, to assess the factors influencing smallholder farmers' WTP for digital agricultural services on the EzyAgric App and to compare EzyAgric's current commercialization models (Agrishop, Ka-Ezy, and Ezy Credit) against farmers' actual WTP. Data were collected from 76 smallholder farmers and analysed using a double-bounded contingent valuation method alongside a binary logit model estimated in Stata. Overall, 69.74% of respondents were willing to pay for at least one digital service while 30.26% were not willing to pay for any. The full-service bundle recorded the highest mean WTP (UGX 4,474.49) and the highest bid acceptance rate (60.53%), followed by crop advisory (UGX 2,144.07, 38.16%). Weather alerts and market price information attracted lower amounts (UGX 836.80 and UGX 1,247.62 respectively). The logit results identified three significant predictors of WTP. Cooperative membership had the strongest effect: members were 25.9 percentage points more likely to be willing to pay than non-members. Marital status had a negative effect, with married farmers 28.3 percentage points less likely to be willing to pay than unmarried farmers, likely reflecting competing household expenses. Prior platform use raised WTP by 22.4 percentage points suggesting that direct experience builds trust in the service's value. The comparison of EzyAgric's commercialization models against derived WTP revealed a consistent pricing value gap for its currently monetized services. Agrishop's commission structure (5-10% margin) far exceeds farmers' mean WTP of 1.54%, corresponding to a low 21.62% acceptance rate. Ezy Credit's 3% monthly interest rate is roughly 24% above farmers' mean WTP of 2.42% yielding a 24.32% acceptance rate. Ka-Ezy's flat UGX 5,000 monthly fee performed better, close to farmers' derived WTP of UGX 4,474.49, with 60.53% acceptance. In terms of payment structure, pay-per-use was the most preferred model overall (89.47%), reflecting farmers' irregular, harvest-linked cash flows. These findings suggest that EzyAgric's pricing for Agrishop and Ezy Credit is currently set above what most farmers are willing to pay likely limiting uptake despite genuine underlying demand. Meanwhile, crop advisory, market price information and weather alerts which are currently unmonetized show strong potential as new revenue streams. The study recommends that EzyAgric revisit its pricing structures, prioritize pay-per-use and bundled pricing models and target cooperative members as an entry point for scaling adoption.

CHAPTER ONE: INTRODUCTION

1.1 Background

Agriculture remains the backbone of Uganda's economy contributing significantly to national GDP and rural livelihoods (Aggrey, 2009). Most producers are smallholder farmers who depend on agriculture for income, food security and employment, yet they often face limited access to timely extension advice, quality inputs, credit, weather information, reliable markets and transparent output prices. These constraints reduce farm productivity, weaken bargaining power and limit the ability of farmers to commercialize production.

Digital agricultural platforms have emerged as one practical response to these constraints across East Africa. By using mobile phones, digital agents, databases and online market places, such platforms can link farmers to input suppliers, extension information, financial services, weather updates, record keeping tools and produce (Ajambo et al., 2024). EzyAgric developed by Akorion Company Limited in 2015, is one of Uganda's prominent agricultural technology platforms and provides an integrated ecosystem for farmer advisory, input access, credit facilitation and market linkages (Humphrey Mpairwe, 2025; Techpoint Africa, 2024).

However, the long-term sustainability of agricultural digital platforms depends not only on adoption. A platform must also identify a commercialization model that generate reliable revenue while remaining affordable and acceptable to the smallholder farmers it serves. Common commercialization options include farmer subscriptions, pay-per-use charges, transaction commissions, business-to-business charges to input suppliers or buyers, bundled models, donor support and data reserved streams (Tsan et al., 2019). Each model has different implications for farmer inclusion, revenue reliability trust, transaction volume and operational feasibility.

Many digital agricultural platforms struggle to move beyond donor funded models towards financially self-sustaining operations in the Sub-Saharan Africa (Pantip, 2020). Like many Agri-tech platforms in Sub-Saharan Africa, EzyAgric faces the critical challenge of identifying a commercialization model that can sustain the delivery of digital agricultural content over the long term without pricing out the smallholder farmers it serves. Studies show that farmers' willingness to pay for digital services is influenced by perceived value, trust and the relevance of content to their farming needs (Muromba et al., 2025). Despite this, there is limited research that specifically examines which commercialisation models work best for agricultural digital

content in the Ugandan context and no known study has evaluated this question specifically for the EzyAgric platform.

For EzyAgric, the central strategic question is therefore not simply whether farmers use digital agricultural content, but which payment or revenue arrangement best matches farmer willingness to pay, perceived value, platform costs and business sustainability. This study therefore focuses on that question of assessing smallholder farmers' willingness to pay and comparing farmer preferences with EzyAgric's existing and potential income generation streams.

1.2 Problem statement

Agri-tech platforms globally have adopted different approaches to generating revenue from digital content ranging from transaction commissions, subscription fees to data monetization and donor partnerships (Tsan et al., 2019). However, evidence on which of these models is most effective in low-income smallholder dominated agricultural contexts remains limited (Tsan et al., 2019). Most existing studies focus on technology adoption and platform usability rather than the business models that underpin the financial sustainability of these platforms (Pantip, 2020).

EzyAgric provides smallholder farmers with digital agricultural content and related services such as advisory information, input ordering, credit facilitation and market linkages. Although these services can improve farmers' access to information and markets, continued delivery requires a sustainable revenue model. Like many agricultural technology platforms operating in low-income smallholder contexts, EzyAgric faces the challenge of generating revenue without excluding farmers who have limited and seasonal cash income.

Several commercialization models are possible, these include farmer paid subscriptions, pay-per-use charges, transaction commissions, business-to-business payments by agro-dealers or produce buyers, bundled services and data related models. However, there is limited empirical evidence on which of these models farmers consider affordable, trustworthy and valuable in the Ugandan context. Existing studies on digital agriculture often emphasize adoption, awareness and usability but pay less attention to whether farmers are willing to pay for specific digital services and whether platform revenue streams align with farmer preferences.

This evidence gap creates a practical business and development problem. If EzyAgric undercharges or relies heavily on unstable external fundings, it may struggle to maintain service quality, improve content and scale operations. If it overcharges farmers directly, it may reduce

usage, exclude poorer farmers and weaken the platform's social impact. Without farmer-level willingness to pay evidence and comparison with EzyAgric's income generation options, pricing and commercialization decisions remain largely uncertain.

Therefore, this study seeks to evaluate the most suitable commercialization model for agricultural digital content on the EzyAgric App by estimating farmers' willingness to pay, EzyAgric's current and potential revenue streams. This study will generate evidence to guide farmer-friendly and financially viable commercialization decisions.

1.3 Objectives of the study

1.3.1 General objective

- To access smallholder farmers' willingness to pay for selected digital agricultural services and determine the most suitable commercialization model for the EzyAgric App.

1.3.2 Specific objectives

1. To assess smallholder farmers' willingness to pay for selected digital agricultural services on the EzyAgric App.
2. To assess the factors influencing smallholder farmers' willingness to pay for digital agricultural services on the EzyAgric App.
3. To determine the most suitable commercialization model for EzyAgric App based on smallholder farmers' willingness to pay.

1.4 Study hypothesis

1. Cooperative membership has a positive and significant influence on smallholder farmers' willingness to pay for EzyAgric services.

1.5 Significance of the study

This study is significant to multiple stakeholders. To farmers, it will provide a voice in shaping how digital agricultural services are priced ensuring commercialization models align with their financial capacity and perceived value. To EzyAgric, the findings will offer evidence-based guidance for selecting a sustainable revenue model that balances profitability with farmer affordability and adoption hence strengthening the platform's long-term viability. To the policy makers, this study will contribute empirical insights into the commercialization of agricultural digital tools informing policy frameworks that support equitable access to agricultural digital technology for smallholder farmers in Uganda.

1.6 Scope of the study

The research partnered with the EzyAgric operations team (Akorion Company Ltd) for user pool identification. Lists of active farmers and village agents in the selected subcounty were obtained through the district EzyAgric coordinators. Field visits and interview scheduling were supported by EzyAgric's local agents who already maintain regular contact with registered farmers in the study area. The study focused on EzyAgric users and relevant platform actors in Iganga District, Eastern Uganda. The content scope covered digital advisory, market information, input ordering, credit facilitation, produce marketing linkages, weather alerts and bundled service options. The analytical scope covered willingness to pay, determinants of willingness to pay and comparison of commercialization models. The findings were most directly applicable to the study area and should be validated in other districts before being generalized to EzyAgric's national pricing strategy.

CHAPTER TWO: LITERATURE REVIEW

2.1 Willingness to Pay for Digital Agricultural Services

Willingness to pay (WTP) refers to the maximum amount that a consumer is willing to sacrifice in order to access a good or service (Schmidt & Bijmolt, 2019). In the context of digital agricultural services, WTP reflects the amount that smallholder farmers are prepared to pay for services such as digital extension advice, weather information, market prices, input recommendations, pest and disease alerts, financial services, farm records, mechanisation booking and produce marketing support. WTP is therefore an important measure for assessing whether farmers perceive digital agricultural services as useful, reliable, affordable and capable of improving their farming decisions and incomes.

The concept of WTP is particularly important in agricultural digitalisation because many advisory and extension services have historically been provided free of charge through public extension systems, donor-funded programmes or NGO interventions. As digital agriculture platforms shift towards commercialisation, subscription fees, transaction charges, freemium models, bundled services or commission-based models, it becomes necessary to understand whether smallholder farmers are able and willing to pay for these services. Muromba et al. (2025) argue that moving farmers from free or subsidised services to paid digital models requires that farmers clearly perceive the value of the service to be equal to or greater than the cost of accessing it. Where farmers do not see clear benefits, uptake of paid digital services may remain low even when the technical quality of the service is high.

Digital agricultural services have become increasingly important in addressing information gaps faced by smallholder farmers. Farmers often operate under conditions of limited access to timely extension advice, unreliable market information, climate risks, pest and disease outbreaks and weak linkages to input and output markets. Digital platforms can reduce some of these constraints by delivering information quickly and at lower cost through mobile phones, applications, SMS, interactive voice response, call centres and digital marketplaces. Fabregas et al. (2019) found that digital agricultural advice has potential to improve farmers' access to information, increase adoption of recommended practices and support productivity gains. However, they also note that the financial sustainability of digital advisory services depends on whether farmers value the information enough to pay for it.

Empirical studies show that farmers' willingness to pay for digital agricultural services varies depending on the type of service, perceived usefulness, farmer characteristics, and the payment

model used. (Hidrobo et al., 2022), in a study on farmers' willingness to pay for digital agriculture and nutrition information in Ghana, found that farmers were generally price sensitive, although many were willing to pay a small monthly fee for useful digital information. This suggests that smallholder farmers may not reject paid digital services entirely, but their WTP is often low and closely linked to affordability and perceived benefits. Similarly, Emeana et al. (2020), in a study on mobile phone-based agricultural extension services in northern Ethiopia, found that a high proportion of farmers were willing to pay for mobile-based extension, but the amount they were willing to pay was influenced by education, mobile phone ownership, information-seeking behaviour, distance to town and other socio-economic factors.

Other studies on agricultural advisory and extension services also show that farmers are more willing to pay when they believe the service can increase productivity, reduce losses, improve market access or solve a real farming problem. Shausi et al. (2019) studying crop farmers' willingness to pay for agricultural extension services in Tanzania, found that many farmers were willing to contribute financially to extension services, especially where they expected useful and practical benefits. Mudzielwana et al. (2025), in South Africa, found that willingness to pay for extension services was influenced by factors such as farm size, perceived improvement in production output and proximity to extension officers. These findings imply that farmers' WTP is not only about income or ability to pay, but also about trust, relevance, accessibility and confidence that the service will produce measurable benefits.

The literature further shows that bundled digital services may attract higher willingness to pay than single stand-alone services. Farmers may be more willing to pay when a digital platform provides a combination of services, such as weather forecasts, market prices, agronomic advice, input access, produce marketing, credit linkages and insurance. Gouroubera et al. (2025), in a review of farmers' willingness to pay for weather and climate information services, found that farmers were willing to pay more for bundled services than for stand-alone weather information. This is important for platforms such as the EzyAgric App because farmers may attach greater value to an integrated service package that addresses multiple farming needs rather than a single advisory product.

Despite the growing importance of digital agriculture, several barriers continue to limit farmers' willingness to pay. These include low income, limited digital literacy, poor smartphone ownership, unreliable internet access, low trust in digital platforms, preference for face-to-face extension, uncertainty about the quality of information, and limited evidence of direct financial

gains. Emeana et al. (2020) note that although mobile phone-enabled agricultural services can improve access to information, markets and payments, their benefits depend on farmers' ability to use mobile technologies and trust digital systems. Therefore, digital service providers must design services that are simple, affordable, locally relevant and clearly linked to farmers' production and marketing needs.

For the EzyAgric App, understanding farmers' willingness to pay is essential for identifying a suitable commercialisation model. If farmers are willing to pay directly for selected services, a subscription or pay-per-use model may be feasible. However, if farmers' WTP is low, alternative models such as freemium services, bundled premium services, commission from transactions, business-to-business partnerships, input supplier sponsorship, institutional contracts, or donor-supported cost-sharing may be more appropriate. The choice of commercialisation model should therefore be guided by evidence on what services farmers value most, how much they are willing to pay, how often they are willing to pay, and which payment method is most convenient.

In summary, willingness to pay for digital agricultural services is influenced by both demand-side and supply-side factors. On the demand side, farmer income, education, age, gender, farm size, smartphone ownership, digital literacy, prior use of digital services, perceived usefulness and trust in the platform are important. On the supply side, service quality, affordability, relevance, reliability, language, ease of use, payment flexibility and bundling of services shape farmers' payment decisions. Therefore, a study on smallholder farmers' willingness to pay for selected digital agricultural services on the EzyAgric App is important because it can generate evidence to guide the platform's commercialization strategy and improve long-term sustainability of digital agricultural service delivery in Uganda.

2.2 Factors influencing willingness to pay for digital agricultural services

Age of the farmer: The relationship between age and WTP for digital agricultural services is ambiguous and context-dependent. Younger farmers tend to be more comfortable with digital technology, have lower psychological barriers to using smartphone-based platforms and are more willing to pay for digital services (Muromba et al., 2025). Older farmers, by contrast, may have more experience, larger farms and more stable incomes which can positively influence WTP even if digital confidence is lower.

Pantip (2020) notes that in rural Sub-Saharan Africa, the age divide in digital technology adoption remains significant with younger farmers being substantially more likely to use digital

platforms independently compared to older counterparts. For EzyAgric specifically, this suggests that the agent-mediated access model may be critical for reaching older farmer segments who might otherwise not express WTP for direct digital services.

Gender of the farmer: Gender has an ambiguous but frequently observed relationship with WTP for digital agricultural services. In many smallholder contexts, male farmers exhibit higher expressed WTP than female farmers, but this disparity is largely explained by structural differences in income control, land ownership and smartphone access rather than differences in the valuation of information itself (Pantip, 2020). Female farmers who control land and income resources show comparable WTP to their male counterparts.

Tsan et al. (2019) note that digital agricultural platforms in Sub-Saharan Africa systematically underserve women farmers due to design assumptions that privilege smartphone-owning, market-oriented male farmers. For EzyAgric's commercialization strategy, accounting for gender differences in access mode and payment channel is important to avoid designing a revenue model that structurally excludes women farmers.

Household income: Household income is a significant predictor of WTP in agricultural economics literature. Wealthier farmers with larger farm holdings tend to exhibit higher WTP for improved services because they have greater financial capacity and more to gain from productivity improvements (Olum et al., 2020). Subsistence oriented smallholders with very small land holdings and irregular cash income may have limited financial capacity to pay for digital services even when they recognize their value.

In Uganda specifically, the majority of smallholder farmers derive income from seasonal crop sales, meaning that their capacity to pay fluctuates across the agricultural calendar. Aggrey, 2009 notes that irregular and seasonal cash flow patterns among Ugandan smallholders make fixed monthly payment models particularly challenging, and that WTP estimates must be interpreted alongside income timing, not just income level.

Farm size: The majority of smallholder farmers in Uganda operate on less than five acres of land and derive income from a mix of crop sales, livestock and off-farm employment (Aggrey, 2009). This income diversity affects both the absolute level of WTP and the preferred payment mechanisms with many farmers expressing preference for payment structures tied to harvest seasons rather than fixed monthly subscriptions.

Larger farm enterprises generally demonstrate a higher willingness to pay for digital agricultural services due to their greater production scale and the potential to obtain higher economic returns from technology enabled farm management (Olum et al., 2020). Consequently, farmers operating larger enterprises are more likely to invest in digital agricultural services than those managing smaller farms.

Farming Experience: Farming experience is hypothesized to have a mixed effect on willingness to pay for digital agricultural services. On one hand, more experienced farmers may have developed established knowledge networks and traditional advisory channels, reducing their perceived need for digital services. On the other hand, experienced farmers may be better positioned to recognize and value the efficiency gains offered by digital platforms, particularly in accessing timely market and agronomic information. Muromba et al. (2025) found that years of farming experience positively influenced technology adoption among smallholders when farmers had prior exposure to extension services. Pantip (2020) similarly argued that experienced farmers tend to be more discriminating in evaluating new technologies, often valuing services that demonstrably reduce decision-making costs. In the Ugandan smallholder context, where many farmers have accumulated decades of experience under rain-fed subsistence systems, digital services that complement rather than replace existing knowledge are more likely to attract willingness to pay.

Off-farm income: Off-farm income has a positive relationship with WTP for digital agricultural services. Households with off-farm income are likely to have increased purchasing power which enhances their ability to pay for digital agricultural services. Off-farm earnings provide supplementary financial resources that can facilitate investment in agricultural innovations and information technologies thereby supporting improved farm management and productivity (Gong et al., 2024).

However, the relationship is not always straightforward. Farmers who are heavily engaged in off-farm work may have less time to engage with digital platforms, which can reduce their perceived value of the service and dampen WTP despite having the financial capacity to pay (Kameswari et al., 2011). This suggests that platform design must account for time constraints alongside income levels when targeting mixed-income farmer households.

Education level of the farmer: Education level has a positive and significant influence on WTP for digital agricultural services. More educated farmers are better able to interpret and apply digital content, which enhances the perceived usefulness of the service and raises their

WTP (Dady Mangole et al., 2024). Education also reduces the learning curve associated with new digital tools, making educated farmers more confident in engaging with platforms like EzyAgric and more willing to pay for continued access.

Muromba et al. (2025) confirm that education level is a consistent predictor of both technology adoption and WTP in Sub-Saharan African agricultural contexts. Farmers with secondary or post-secondary education demonstrated significantly higher WTP for mobile advisory services compared to those with no formal schooling, even after controlling for income and farm size.

Household size: Household size has a negative expected relationship with WTP for digital agricultural services. Larger households face greater competing demands on household income, which reduces the share of income available for discretionary payments such as digital service subscriptions or per-use fees (Kameswari et al., 2011). In contexts where household income is pooled and expenditure decisions are made collectively, larger households may also face greater internal resistance to committing funds to services whose benefits are perceived as individual rather than shared.

However, larger households may also benefit more from digital services that improve farm productivity or market access, which can partially offset the income competition effect. The net relationship between household size and WTP therefore depends on the degree to which farm income is the primary household livelihood source.

Smartphone ownership among farmers: Smartphone ownership is a positive and significant predictor of WTP for digital agricultural services. Farmers who own smartphones can directly access platform features without intermediary support, which increases their frequency of use, deepens their familiarity with the platform and raises perceived value (Muromba et al., 2025). Direct access also reduces transaction costs associated with agent-mediated use, making paid arrangements more attractive.

In Uganda, smartphone penetration among rural smallholder farmers remains uneven, with a significant share of farmers accessing digital platforms through village agents rather than personal devices (Pantip, 2020). Farmers who own smartphones are therefore likely to exhibit systematically higher WTP than those dependent on agent access, making smartphone ownership a critical segmentation variable in WTP analysis.

Internet access: Frequency of internet access is positively associated with WTP for digital agricultural services. Farmers who access the internet regularly, weekly or daily are more likely

to perceive digital platforms as useful are more familiar with online payment mechanisms and are more comfortable committing to paid digital arrangements (Tsan et al., 2019). Irregular or no internet access, by contrast, creates a practical barrier that suppresses both platform-use and expressed WTP, regardless of willingness in principle.

In rural Uganda, internet connectivity remains inconsistent and mobile data costs represent a meaningful share of smallholder household budgets (Pantip, 2020). Platform designs that offer offline functionality or agent-mediated delivery are therefore important for extending WTP-relevant service access to farmers in low-connectivity areas.

Mobile money use: Mobile money use is a significant positive predictor of WTP for digital agricultural services. Farmers who already use mobile money platforms such as MTN Momo or Airtel Money have demonstrated comfort with digital financial transactions, which lowers the psychological and practical barriers to paying for digital services electronically. The availability of mobile money infrastructure effectively enables WTP that might otherwise be suppressed by the absence of convenient payment channels.

Muromba et al. (2025) found that mobile money adoption was among the strongest technology-related predictors of WTP for digital services among smallholder farmers in East Africa. For EzyAgric specifically, mobile money integration is not only a payment enabler but also a trust signal farmers who already transact digitally are more likely to trust a platform that charges fees through familiar channels.

Frequency of App Use: Frequency of app use is hypothesized to positively influence willingness to pay for digital agricultural services. Farmers who interact with a platform more regularly are likely to derive greater cumulative value from it, developing familiarity with its features and integrating it into their routine farm decision-making processes. This repeated engagement builds perceived utility over time, reinforcing the farmer's willingness to pay for continued or enhanced access. Muromba et al. (2025) found that frequency of platform engagement was a significant positive predictor of WTP, noting that habitual users were more likely to accept higher bid amounts in contingent valuation scenarios compared to infrequent users. Pantip (2020) similarly observed that usage frequency served as a proxy for technology embeddedness with farmers who used digital services more often demonstrating stronger revealed and stated preferences for paid access. In the Uganda, where smartphone penetration and mobile data access are growing but uneven, farmers who have overcome initial barriers to

regular app use are likely to have already internalized the value of the service making them more willing to commit financially to its continued use.

Cooperative membership: Membership in a farmer group, cooperative or SACCO has a positive relationship with WTP for digital agricultural services. Cooperative members benefit from shared information, peer learning and collective purchasing power, all of which reinforce the perceived value of digital advisory and market linkage services (Tsan et al., 2019). Cooperative structures also provide social proof and peer endorsement effects that raise WTP among members who receive recommendations from trusted group leaders.

In Uganda, cooperative and farmer group membership is associated with greater market orientation and more commercial farming practices, both of which increase the relevance and perceived value of platforms like EzyAgric (Aggrey, 2009). Cooperative members are therefore likely to exhibit higher WTP and may represent a priority segment for EzyAgric's subscription or bundled model rollout.

Extension contacts: The number of extension contacts a farmer receives from any source has a positive relationship with WTP for digital agricultural services. Farmers who are regularly exposed to extension advice develop stronger appreciation for the value of agricultural information, which raises their perceived utility of digital advisory platforms and consequently their WTP. Extension contact also builds familiarity with the advisory content format delivered by platforms like EzyAgric.

However, farmers who receive frequent free extension advice from government or NGO sources may exhibit lower WTP for the same content delivered through a paid digital platform, creating a substitution effect (Muromba et al., 2025). The net relationship between extension contact and WTP therefore depends on the quality differential between publicly funded extension and the digital platform's content.

Distance to market: Distance to the nearest output market has a negative expected relationship with WTP for digital agricultural services. Farmers located far from markets face higher transaction costs and weaker market integration, which can either increase the value of digital market linkage services raising WTP or reduce the practical ability to act on digital market information, dampening WTP (Kameswari et al., 2011). On balance, the dominant effect in the literature is negative, as remoteness is associated with lower income, weaker connectivity and reduced capacity to pay.

For EzyAgric, distance to market is particularly relevant for the produce buyer linkage and market price information services, where farmers in remote areas may perceive the highest potential benefit but face the greatest barriers to converting digital information into tangible income gains.

Access to credit: Access to formal or informal credit has a positive relationship with WTP for digital agricultural services. Farmers with credit access have greater financial flexibility and are better able to manage the upfront cost of paid digital services, particularly in contexts where platform payments precede the harvest income that would fund them (Muromba et al., 2025). Credit access also signals a degree of financial inclusion that is associated with greater comfort with digital financial transactions more broadly.

In Uganda, access to credit through SACCOs, mobile loan products or input dealers is growing but remains uneven across farmer segments. Credit-constrained farmers may express lower WTP not because they undervalue digital services but because they lack the liquidity to commit to any form of advance payment, making payment timing flexibility a critical design consideration.

Seasonality of agricultural income: Seasonality of agricultural income significantly shapes the timing and form of WTP expression among smallholder farmers. Because farm income is largely concentrated around planting and harvest periods, many farmers prefer payment structures that are tied to these seasonal cash flow peaks rather than fixed monthly obligations (Tsan et al., 2019). A farmer who earns the bulk of household income at harvest time may have a high theoretical WTP but be unable to sustain monthly subscription payments during off-season periods.

For EzyAgric's commercialization strategy, seasonality implies that flat monthly subscription models may suppress expressed WTP relative to seasonal or transaction-linked payment arrangements, even among farmers who genuinely value the platform's services. Designing payment timing around agricultural cash flow cycles is therefore as important as setting the right price point.

Social influence: Social influence defined as the degree to which recommendations from trusted individuals affect technology adoption and payment decisions has a positive and significant relationship with WTP for digital agricultural services. Farmers who receive endorsements from trusted peers, community leaders, cooperative officers or extension

workers are significantly more likely to adopt paid digital services and to express higher WTP than those who encounter the platform without social validation (Muromba et al., 2025).

Muromba et al. (2025) found that peer recommendation was among the strongest social predictors of WTP in East African digital agricultural service contexts, operating partly through trust formation and partly through reducing perceived risk of paying for an unfamiliar service. For EzyAgric, this finding underscores the strategic importance of farmer champions, village agent networks and cooperative endorsements as commercialization enablers alongside pricing design.

Service Quality: Service quality is expected to positively influence smallholder farmers' willingness to pay for digital agricultural services. Farmers who perceive a platform as reliable, accurate, and responsive are more likely to assign higher value to it and express greater willingness to pay for sustained access.

Service quality in the context of digital agricultural platforms encompasses the accuracy of agronomic advice, timeliness of market price information, ease of navigation, and responsiveness of customer support channels. Muromba et al. (2025) established that perceived service quality was a significant determinant of WTP, with farmers rating highly reliable platforms demonstrating markedly higher bid acceptance rates in contingent valuation exercises. Pantip (2020) further noted that service quality perceptions directly shaped user satisfaction and retention intentions, with poor quality experiences significantly dampening farmers' stated willingness to pay even among otherwise motivated users. In the Ugandan smallholder context, where farmers often rely on a single digital platform for multiple advisory and market functions, inconsistencies in service delivery can erode trust and reduce WTP substantially. Platforms such as EzyAgric that maintain high standards of information accuracy and user experience are therefore more likely to command sustainable willingness to pay among their target users in districts such as Luweero.

Perceived value: Perceived value is the primary driver of willingness to pay (Schmidt & Bijmolt, 2019). It is shaped by the relevance, timeliness and accuracy of the information and services provided. Farmers are more likely to pay when they believe the platform improves production, marketing or income outcomes (Morepje et al., 2024). Farmers who perceive that a digital service directly contributes to higher yields, better market prices and reduced input costs are more likely to assign a positive WTP to that service.

Muromba et al. (2025) found that the perceived usefulness of mobile agricultural applications was the strongest predictor of continued use and WTP among smallholder farmers in Sub-Saharan Africa. Services that addressed specific pain points in farmers' production and marketing activities generated higher perceived value and consequently higher WTP compared to generic information services.

Trust in platform: Trust in the platform provider is a significant and positive determinant of WTP for digital services. Farmers are more likely to pay for services offered by platforms they perceive as credible, transparent and committed to their interests (Gyimah et al., 2026). Trust is built through consistent service delivery, transparent pricing, responsible data handling and demonstrated outcomes such as income improvements attributable to platform use.

Muromba et al. (2025) found that trust in the platform operator was a stronger predictor of WTP than price level in several East African digital agricultural service studies, suggesting that trust-building investments may generate higher returns than price reductions for platforms seeking to grow their paying user base. Farmers who trust EzyAgric to handle their data and transactions responsibly are more likely to accept and sustain direct payment arrangements.

Perceived Improvement in Productivity or Income: Perceived improvement in productivity or income is expected to positively influence smallholder farmers' willingness to pay for digital agricultural services. When farmers believe that a digital platform will tangibly enhance their yields or earnings, their motivation to pay for such services increases correspondingly. This variable captures the subjective value farmers assign to a service based on anticipated economic returns, making it a demand-side determinant rooted in rational utility maximization. Muromba et al. (2025) established that perceived economic benefit was among the strongest predictors of WTP for digital agricultural services, with farmers who anticipated productivity gains demonstrating significantly higher bid acceptance rates in contingent valuation exercises. Pantip (2020) similarly found that income improvement expectations positively and significantly influenced farmers' adoption decisions and their stated willingness to pay for agri-digital tools. In the Ugandan context, where smallholder farmers operate under tight margins and weather-related production risks, the perceived ability of a platform like EzyAgric to improve yields through timely agronomic advice or increase revenues through better market linkages is particularly salient in driving WTP (Ajambo et al., 2023).

Awareness of digital agricultural services: Awareness of the availability and features of a digital service is a precondition for WTP. Farmers who are unaware of what a platform offers

cannot rationally assess its value and are therefore unable to express a meaningful WTP, regardless of their income level or digital capacity. Therefore, awareness functions as a gateway variable and its absence effectively sets WTP to zero irrespective of all other factors (Tsan et al., 2019).

Studies have consistently found that awareness of digital agricultural platforms among smallholder farmers in Sub-Saharan Africa remains incomplete even in areas where platforms are actively operating. Muromba et al. (2025) found that a significant proportion of non-paying users of mobile agricultural services in East Africa were unaware of the full range of services available, meaning their expressed WTP reflected only partial knowledge of what the platform offered. When farmers were given complete service information during the study, their WTP estimates increased substantially, confirming that awareness gaps directly suppress WTP measurements.

For EzyAgric specifically, awareness campaigns combining digital outreach with face-to-face demonstration through village agents are likely to be most effective in reaching smallholder farmers, particularly in areas with low literacy rates and inconsistent internet access. This has direct implications for commercialization strategy investments in awareness building are not merely marketing expenditures but preconditions for generating any farmer-level revenue at all.

Access to digital agricultural services: Access to digital agricultural services is distinct from awareness and operates as a separate predictor of WTP. While awareness determines whether a farmer knows a service exists, access determines whether they can practically use it. Access constraints including smartphone ownership, internet connectivity, affordability of mobile data, language of the user interface and physical proximity to network coverage mediate WTP by limiting the pool of farmers who can realistically engage with and pay for digital services (Pantip, 2020).

Farmers who face severe access constraints may express zero or very low WTP not because they do not value the service but because the practical barriers make the service functionally unavailable to them. Pantip (2020) documents that in rural Sub-Saharan Africa, access gaps driven by device ownership and connectivity costs remain the primary structural barrier to digital platform adoption among the poorest smallholder segments, even where awareness and perceived value are high.

Platforms that have invested in offline functionality, local language content and agent-mediated delivery have generally achieved broader penetration among lower-income and more remote farmer segments (Tsan et al., 2019). For EzyAgric, this means that access mode, whether a farmer uses the platform directly via smartphone or indirectly through a village agent is not simply a usage characteristic but a structural determinant of both platform reach and farmer WTP. Farmers accessing EzyAgric through village agents face lower direct access barriers, but their engagement depth and perceived ownership of the service may also be lower with corresponding effects on WTP.

2.3 Commercialization Models for Digital Agricultural Platforms

2.3.1 Overview of commercialization approaches

Commercialization models define how a digital platform generates revenue to sustain its operations. Tsan et al. (2019) identifies five primary commercialization approaches used by agri-tech platforms globally; subscription-based models, transaction or commission-based models, pay-per-use models, data monetization models and bundled or cross-subsidy models. Each model has distinct advantages and constraints depending on the target user base, the nature of the service and the competitive environment.

2.3.2 Subscription-Based Models

Subscription models charge users a fixed recurring fee typically monthly or annually for access to a bundle of services. This model provides platforms with predictable, recurring revenue and incentivizes platform providers to maintain and improve service quality to reduce turnover. However, subscription models face adoption challenges in low-income smallholder contexts because they require farmers to pay upfront before experiencing the value of the service (Pantip, 2020).

Several agri-tech platforms in Asia have implemented tiered subscription models in which a basic level of service is offered for free and premium features are locked behind a paywall. This freemium approach can lower the initial adoption barrier while still generating revenue from the subset of farmers who derive sufficient value to justify a paid subscription.

2.3.3 Transaction and Commission-Based Models

Commission-based models generate revenue by taking a percentage of the value of transactions facilitated on the platform such as input purchases, produce sales and credit disbursements. This model aligns platform incentives with farmer outcomes because the platform earns more

when transactions are larger or more frequent. It also reduces the financial risk for farmers since they only pay when they actually transact.

In Sub-Saharan Africa, commission-based models have been successfully implemented by platforms such as Agro Centa in Ghana and M-Farm in Kenya. Tsan et al. (2019) notes that commission models work best in contexts where the platform facilitates significant transaction volumes and where commission rates are transparent and perceived as fair by farmers. The main risk is that commission costs may be passed on to farmers through lower prices or higher input costs effectively reducing the net value of the service.

2.3.4 Pay Per Use Models

Pay per use also known as micropayment models charge farmers a small fee each time, they access a specific service. This model is attractive in contexts where farmers have highly variable cash flows and cannot commit to fixed subscription fees. Mobile money infrastructure in East Africa like Airtel Money and MTN Mobile Money in Uganda has made micropayment collection feasible even in remote rural areas.

However, pay per use models can create friction in user experience and discourage engagement with services that farmers might otherwise benefit from if it were freely accessible. There is also evidence that farmers are loss-averse and tend to avoid paying for information whose value is uncertain ex ante which can limit uptake even when per-use costs are very low (Aker & Mbiti, 2010).

2.3.5 Data Monetization Models

Data monetization involves generating revenue by selling anonymized or aggregated farmer data to third parties such as insurers, input companies, commodity traders or government agencies. As digital platforms accumulate large datasets on farmer behaviour, crop performance and market transactions, these datasets become increasingly valuable to commercial and institutional actors seeking granular agricultural intelligence.

While data monetization offers platforms a revenue stream that does not require direct farmer payments, it raises significant ethical and governance questions around data ownership, consent and the risk of exploitation Tsan et al. (2019). In contexts where farmers have limited understanding of how their data is used, data monetization without transparent disclosure can erode trust and undermine platform adoption.

2.3.6 Bundled and Cross-Subsidy Models

Bundled models generate revenue from one set of users or services and use that revenue to cross-subsidize access for another group. This often involves charging input suppliers, financial institutions or commodity buyers for access to the farmer network while providing services to farmers at low or no direct cost. This model has been adopted by platforms including iShamba in Kenya and Hello Tractor in Nigeria.

Cross-subsidy models are particularly relevant in markets where farmers have low WTP but where service providers have high willingness to pay for access to a verified, digitally active farmer base. The main risk of this model is dependency on B2B revenue streams that may be volatile or subject to renegotiation potentially undermining the sustainability of farmer-facing services (Pantip, 2020).

CHAPTER THREE: METHODOLOGY

3.1 Research design

This study employed a cross-sectional research design using quantitative data in a concurrent mixed methods approach to enhance validity and reliability. The quantitative approach was used to assess smallholder farmers' willingness to pay for digital agricultural services and to identify the factors that influence that willingness to pay. The qualitative approach provided deeper insights into EzyAgric's existing income generation streams and management's perspectives on commercialization which was then be compared against farmer willingness to pay findings to identify the most suitable commercialization model.

According to Kugonza et al. (2026) cross-sectional designs are suitable for digital platform studies where usability and business model preferences are assessed at particular point in time as they enable efficient collection of diverse data from multiple categories of respondents.

3.2 Study area

The study was conducted in Eastern Uganda, specifically in Iganga district. This area was chosen because it represents key agricultural hubs with active smallholder farmers who have adopted and interacted with the EzyAgric digital platform. Research shows that Iganga district has widespread usage of the EzyAgric, m-Omulimisa and Essymart, making them suitable for assessing user centered design and platform usability among smallholder farmers.

Additionally, Iganga district has active farmer cooperatives and connections with EzyAgric registered village agents, which enhances accessibility and data collection feasibility.

Selecting this location ensures validity, relevance and representativeness of results without regional bias, as it captures a cross-section of digitally engaged smallholder farmers central to Uganda’s agricultural economy.

The sample will be designed to span EzyAgric’s key value chains to strengthen internal representativeness.

3.3 Study population

The target population included smallholder farmers registered and actively using the EzyAgric app, those not using the app and village agents using the EzyAgric platform in Iganga as well as key staff from Akorion Company Limited who are directly involved in the management and commercialization of the platform’s digital content and services.

3.4 Sample Size and Sampling Procedure and Sample

3.4.1 Sample size determination

Using Yamane's 1967 formula for determining sample size;

$$n = \frac{N}{1 + N(e^2)}$$

Where:

n = sample size

N = target population

e = margin of error

N = 94

e = 0.05

Therefore:

$$n = \frac{N}{1 + N(e^2)}$$

$$n = \frac{94}{1 + 94(0.05^2)}$$

$$n = 76$$

3.4.2 Sampling procedure

A multistage sampling procedure was used. First, Iganga District was purposively selected because of EzyAgric activity and feasibility of data collection. Second, farmer clusters were identified in consultation with EzyAgric field teams and local agricultural officers. Third, farmers were stratified by value chain, gender where possible, and access mode distinguishing between farmers with direct smartphone access, agent mediated access or both. Finally, simple random sampling was used within each stratum using available lists of active users and farmer group registers.

Key informants were purposively selected because they possess specific knowledge of EzyAgric operations, revenue streams, pricing and farmer service delivery. These included EzyAgric management staff i.e. Chief Product Officer, Project Manager and the Operations Manager.

3.5 Data and Data Collection Procedure

Primary quantitative data was collected through Computer Assisted Personal Interviewing with questionnaire administered physically via Kobo Toolbox. The questionnaire captured demographic and socio-economic information such as age, education level, size of land as well as farmer specific data on willingness to pay for various EzyAgric services, preferred payment arrangements, EzyAgric usage and perceived value, trust and digital access of digital services.

Qualitative data was collected through in-depth semi-structured interviews conducted with two groups of respondents. The first group consisted of smallholder farmers who provided data on the willingness to pay figures and the pricing and access arrangements they find acceptable. The second group consisted of EzyAgric's management team who provided data on the platform's existing income generation streams, the services from which revenue is currently derived, the volume and reliability of that income and management's perspectives on viable commercialization options going forward. Specifically, the management interviews were structured to extract quantitative financial data including revenue by income stream, transaction volumes, gross margins per service, customer acquisition cost and retention rates.

3.6 Data analysis

Data analysis was conducted using both quantitative and qualitative techniques. Quantitative data from structured questionnaires was cleaned and entered into Stata for analysis. Qualitative data from semi-structured interviews was analysed thematically with codes developed to capture patterns in farmer preferences, perceived value and attitudes towards paying for digital services and themes emerging from management interviews regarding income generation and business model feasibility.

3.6.1 Smallholder Farmers' Willingness to Pay for Selected Digital Agricultural Services on the EzyAgric App.

To analyse objective one, the study used a Dichotomous Choice Contingent Valuation Approach supported by a follow-up maximum WTP question. Each farmer first received a simple explanation of the service or commercialization model. The enumerator then presented an initial bid amount and ask whether the farmer would pay or accept that amount. If the farmer said yes, a higher follow-up bid was asked. If the farmer said no, a lower follow-up bid was asked. Finally, the farmer stated the maximum amount they would realistically be willing to pay. This approach reduced unrealistic open-ended responses and allows estimation of both

acceptance probability and WTP amount. Descriptive statistics included means, standard deviations, Pearson chi-square tests, independent samples t-tests and medians.

To reduce hypothetical bias, the questionnaire included a brief 'cheap talk' statement reminding respondents to answer as if they were using their own money. Bid levels were pre-tested and adjusted to reflect local income, seasonal cash flow and current market prices for mobile services.

Table 1: Initial and follow-up bid levels by service/model

Service/model	Initial bid example	Lower follow-up bid	Higher follow-up bid
Crop advisory/month	UGX 2,000	UGX 1,000	UGX 5,000
Market price information/month	UGX 1,000	UGX 500	UGX 2,000
Full-service bundle/month	UGX 5,000	UGX 2,500	UGX 10,000
Product linkages	1%	2%	3%
Agricultural Credit	2%	3%	5%

3.6.2 Factors Influencing Smallholder Farmers' Willingness to Pay for Agricultural Digital Services on the EzyAgric App

To analyse objective two, a binary logistic regression model was used to identify and assess the factors that influence farmers' willingness to pay. The model specified as follows:

$$\begin{aligned}\mathbf{WTP}* = {} & \boldsymbol{\beta 0} + \boldsymbol{\beta 1 AGE} + \boldsymbol{\beta 2 GEN} + \boldsymbol{\beta 3 MARITAL} + \boldsymbol{\beta 4 EDU} + \boldsymbol{\beta 5 F_{EXPER}} \\ & + \boldsymbol{\beta 6 OCCUP} + \boldsymbol{\beta 7 COOP} + \boldsymbol{\beta 8 H_{SIZE}} + \boldsymbol{\beta 9 H_{INC}} + \boldsymbol{\beta 10 OFF_{INC}} \\ & + \boldsymbol{\beta 11 CREDIT} + \boldsymbol{\beta 12 F_{SIZE}} + \boldsymbol{\beta 13 VALUE_{CHAIN}} + \boldsymbol{\beta 14 PROD_{PUR}} \\ & + \boldsymbol{\beta 15 EXT} + \boldsymbol{\beta 16 SMART} + \boldsymbol{\beta 17 MMU} + \boldsymbol{\beta 18 DUR} + \boldsymbol{\beta 19 DIST} \\ & + \boldsymbol{\beta 20 DIGINC} + \boldsymbol{\beta 21 PLAT_{USE}} + \boldsymbol{E}\end{aligned}$$

Where WTP* is the willingness to pay variable observed as:

- WTP = WTP* if WTP* > 0
- WTP = 0 IF WTP ≤ 0

Table 2: Variables, Description and Expected signs for the Tobit and Logit Models

Variable	Description	Expected Sign
Dependent Variable		
Willingness to Pay (WTP)	Maximum amount in UGX the farmer is willing to pay for EzyAgric digital content per month	−
Independent Variable		
Age (AGE)	Age of the farmer in complete years	+/−
Gender (GEN)	1 if male, 0 if female	+/−
Household Size (H_SIZE)	Total number of people living in the same household	+/−
Household Income Level (H_INC)	Total monthly household income from all sources in UGX	+
Education (EDU)	Total years of formal schooling completed	+
Occupation (OCCUP)	1 if farming is the respondent's primary occupation, 0 if primarily engaged in non-farm work	+/−
Farm Size (F_SIZE)	Total land under cultivation in acres	+
Off-Farm income (OFF_INC)	1 if household earns income from non farm activities, 0 otherwise	+/−
Marital status (MARITAL)	1 if married, 0 otherwise	+/−
Farming Experience (F_EXPER)	Total number of years the farmer has been engaged in farming	+/−
Production Purpose (PROD_PUR)	1 if farmer produces primarily for sale, 0 otherwise	+
Smartphone Ownership (SMART)	1 if farmer owns a smartphone, 0 otherwise	+
Duration of Use (DUR)	Number of months the farmer has been using EzyAgric	+
Platform Use (PLAT_USE)	1 if farmer has used EzyAgric prior to the study, 0 otherwise	

Mobile Money Use (MMU)	1 if farmer uses mobile money, 0 otherwise	+
Frequency of Use (FREQ_USE)	Number of times per week the farmer accesses EzyAgric services	+
Cooperative Membership (COOP)	1 if member of a farm group, SAACO or cooperative, 0 otherwise	+
Extension Contact (EXT)	Number of times farmer receives extension advice from the past 3 months (from any source)	+
Distance to market (DIST)	Distance in walking time in minutes from market to nearest output markets	−
Credit Access (CRED)	1 if farmer has accessed any formal or informal credit in the past 12 months, 0 otherwise	+
Value Chain (V_CHAIN)	1=Crop, 0=Livestock	+/−
Digital Inclusion Status (DIG_INC)	1=Routine use, 0=non-routine use	+

3.6.3 Determining the Most Suitable Commercialization Model for the EzyAgric Platform

To analyse objective three, EzyAgric's current pricing and terms for each of its existing commercialisation models were obtained from management interviews. These current rates were then compared against the farmer acceptance rate and mean willingness to pay derived from the double-bound contingent valuation results in objective one for the corresponding service. This comparison made it possible to identify whether EzyAgric's current pricing fir each model was set above, at or below what farmers were actually willing to pay and highlight the extent of the pricing value gap for each service. Services that EzyAgric had not yet monetized were also assessed against farmer WTP to identify their potential as viable new revenue streams.

3.7 Ethical Considerations

The consent of all participants was first sought and they were informed about the purpose of the study. The respondents' data was anonymized and solely for academic purposes. Prior authorization was obtained from EzyAgric management. Additionally, participation was voluntary with freedom to withdraw at any time without repercussions.

CHAPTER FOUR: RESULTS AND DISCUSSION

This chapter presents and discusses the results obtained from the survey about willingness to pay for digital agricultural services by smallholder farmers.

4.1 Farmers' willingness to pay for selected EzyAgric Digital services

Figure 1 presents the overall distribution of willingness to pay for EzyAgric's digital agricultural services among the respondents. Results show that the majority of respondents (69.74%) expressed willingness to pay for at least one of the digital services offered on the EzyAgric platform while 30.26% were not willing to pay for any of the services assessed. This relatively high overall willingness to pay is an encouraging finding for the commercial viability of EzyAgric's digital service offerings suggesting that despite the platform's currently limited engagement levels among the sampled farmers, a substantial majority recognize sufficient value in at least one of the digital services to consider paying for it.

This pattern is broadly consistent with what has been reported elsewhere in Sub-Saharan Africa. Shausi et al. (2019) studying crop farmers in Tanzania found that many farmers were willing to contribute financially toward extension services once they expected practical benefits while Emeana et al. (2020) reported a high proportion of willingness to pay for mobile-based extension among farmers in Ethiopia. The result here adds to this body of evidence that smallholder farmers do not, as a rule, reject paid digital agricultural services outright, which runs against the common assumption that free-to-use models are the only workable option in low-income farming contexts.

However, the fact that nearly a third of respondents were not willing to pay for any service points to a meaningful segment of the sample for whom either the perceived value of EzyAgric's offerings, affordability constraints or trust in digital platforms remain barriers to adoption. This mirrors Hidrobo et al. (2022) finding in Ghana that farmers remain price sensitive even where they value the underlying information and is consistent with Fabregas et al. (2019) broader argument that the financial sustainability of digital advisory services ultimately hinges on whether farmers perceive the value of the service to be at least equal to its cost. This distribution sets the stage for the double-bounded contingent valuation results that follow which examine willingness to pay at a more service-specific level and for the subsequent logistic regression analysis that identifies the sociodemographic and institutional factors which distinguish willing from non-willing respondents.

4.1.1 Willingness to Pay for EzyAgric Digital Services

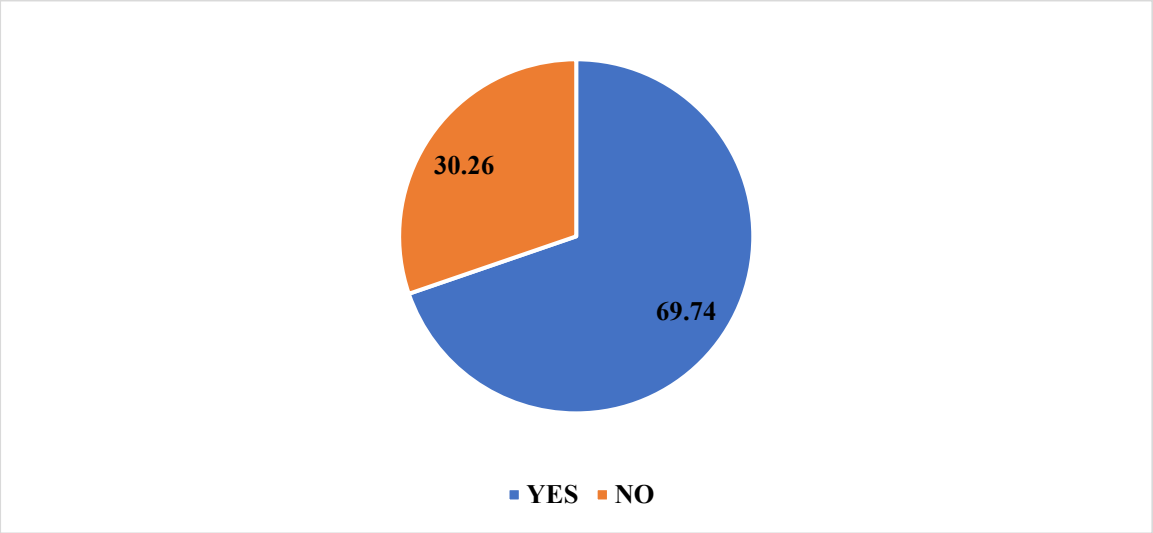


Figure 1: Willingness to pay for EzyAgric Digital services

4.1.2 Sociodemographic characteristics of farmers

Table 3 presents the sociodemographic and socioeconomic characteristics of the 76 respondents, comparing those willing to pay (WTP, n=53) and those not willing to pay (NWTP, n=23) for EzyAgric's digital services.

For the categorical variables, chi-square tests showed that cooperative membership was significantly associated with WTP (χ^2=9.2482, p<0.01). Among farmers who belonged to a cooperative, 81.63% were willing to pay compared to only 48.15% of non-members. This suggests that cooperative membership plays a role in shaping farmers' exposure and trust toward digital agricultural services, likely through peer influence and shared information within farmer groups. This result agrees with the broader literature on collective action in Ugandan agriculture. Aggrey (2009) notes that cooperative and farmer group membership in Uganda is associated with greater market orientation which raises the relevance of platforms like EzyAgric while Tsan et al. (2019) attribute the effect to the social proof and peer-endorsement mechanisms cooperatives provide. Muromba et al. (2025) similarly found cooperative linked social influence to be one of the strongest and most consistent predictors of WTP for mobile agricultural services across East Africa, which matches the strength of the association observed in this sample.

Platform use was also significantly associated with WTP (χ^2=14.0279, p<0.01). Among farmers who had prior experience using a digital platform, 89.47% expressed willingness to pay compared to only 50% of those without prior platform use. This indicates that prior exposure to digital agricultural services builds confidence in their value, making farmers more receptive

to paying for them. This is consistent with the Technology Acceptance Model literature summarised by Fabregas et al. (2019) and with Muromba et al. (2025) finding that perceived usefulness is more fully internalised and therefore more likely to translate into paid engagement after direct use rather than second-hand description.

Smartphone ownership showed a marginally significant association with WTP (χ^2=3.0945, p<0.10). Farmers who owned smartphones were somewhat more likely to be willing to pay than those who did not, which aligns with the digital nature of the services under study and with Muromba et al. (2025) finding that direct smartphone access without reliance on an intermediary raises familiarity with a platform and therefore WTP.

Gender, marital status, credit access, mobile money use and off-farm income did not show statistically significant associations with WTP at the bivariate level.

For the continuous variables, mean difference tests showed that duration of use was highly significant (Mean Diff = -9.8318, p<0.01). WTP farmers had used digital platforms for considerably longer on average than NWTP farmers, reinforcing the platform use finding above, sustained exposure to digital services appears to build the confidence needed to pay for them. Taken together with the platform-use result, this lends support to the experience-based trust mechanism described by Muromba et al. (2025), where repeated engagement cumulatively builds perceived value rather than value being fully apparent on first contact.

Extension contacts also showed a marginally significant difference (Mean Diff = -0.4725, p<0.10) with WTP farmers reporting slightly more contact with extension officers than NWTP farmers, suggesting that farmers with greater access to formal agricultural advisory services may also be more receptive to paying for digital ones. This positive direction agrees with Mudzielwana et al. (2025), who found extension contact to be a significant driver of WTP for advisory services in South Africa although the association here is comparatively weaker. One plausible explanation consistent with the substitution effect Muromba et al. (2025) describe, is that farmers who already receive frequent free extension advice may see a digital equivalent as less additive to what they already have, which would dampen the strength of the relationship relative to contexts where public extension coverage is thinner.

Age, education, household income, farming experience, farm size, household size and distance to market did not differ significantly between the two groups. This is a notable point of divergence from parts of the literature, Olum et al. (2020) and Dady Mangole et al. (2024)

which both report income, farm size and education as significant predictors of WTP. The absence of significant effects here for these variables most likely reflects the relatively small and homogenous sample which limits the statistical power available to detect differences that a larger or more heterogeneous sample would likely pick up rather than indicating that these factors are truly irrelevant to WTP in this population.

Table 3: Sociodemographic and Socioeconomic Characteristics of Respondents

Variable	Category/Range	Overall	WTP	NWTP	Chi-square(x^2)
Gender	Female	32.89	64.00	36.00	0.5810
	Male	67.11	72.55	24.45	
Marital Status	Married	63.16	64.58	35.42	1.6396
	Unmarried	36.84	78.57	21.43	
Credit Access	No	73.68	66.07	33.93	1.3547
	Yes	26.32	80.00	20.00	
Cooperative	No	35.53	48.15	51.85	**9.2482*** **
Membership	Yes	64.47	81.63	18.37	
Smartphone	No	11.84	44.44	55.56	**3.0945***
Ownership	Yes	88.16	73.13	26.87	
Mobile Money	No	3.95	33.33	66.67	1.9612
use	Yes	96.05	71.23	28.77	
Platform use	No	50.00	50.00	50.00	**14.0279*** **
	Yes	50.00	89.47	10.53	
Off-farm	No	11.84	55.56	44.44	0.9728
Income	Yes	88.16	71.64	28.36	
					Mean Diff
Age		34.7763	34.5283	35.3478	0.8195
		(7.8155)	(8.7872)	(8.7872	
Education		11.7368	11.9245	11.3044	-0.6202
		(3.3161)	(3.8222)	(1.6358)	
Household		629605.2	669811.3	536956.5	-132854.7
Income		(356854.6)	(407777.8)	(168021.5)	

Farming Experience	9.0526 (5.6211)	9.1698 (6.4442)	8.7826 (3.0742)	-0.3872
Farming size	2.0526 (1.2425)	2.1698 (1.4242)	1.7826 (0.59974)	-0.3872
Household size	4.0789 (1.2411)	4.1321 (1.3014)	3.9565 (1.1069)	-0.1756
Distance to market	26.3684 (10.5437)	26.4906 (1.5224)	26.0870 (9.4094)	-0.4036
Extension contacts	0.8947 (1.0780)	1.0377 (1.1260)	0.5652 (0.8958)	**-0.4725***
Duration of use	76	53	23	**-9.8318*****

4.1.3 Amount farmers are willing to pay

Table 4 presents the mean and median amounts farmers were willing to pay for each digital service, among those who indicated willingness to pay for it. The full-service bundle recorded the highest mean WTP (UGX 4,474.49, median UGX 5,000, n=59), followed by crop advisory (UGX 2,144.07, median UGX 2,000, n=59), suggesting farmers place the greatest value on comprehensive access and direct crop guidance. Weather alerts (UGX 836.80, median UGX 500, n=54) and market price information (UGX 1,247.62, median UGX 1,000, n=21) attracted lower amounts. Produce linkages (mean 1.54%, median 1%, n=35) and agricultural credit (mean 2.42%, median 2%, n=53) were expressed as commission/interest rate percentages rather than fixed amounts with responses clustering tightly around their median as reflected in their comparatively small standard deviations.

This ranking, with the bundle commanding the highest WTP, agrees with Gouroubera et al. (2025) whose systematic review and meta-analysis of WTP for weather and climate information services in Sub-Saharan Africa found that farmers consistently valued bundled services above stand alone information products. It also fits Morepje et al. (2024) observation

that farmers assign greater value to services with a clear, tangible link to production or income outcomes; crop advisory speaks directly to farm decisions, whereas market price information and weather alerts are more passive information goods whose value depends on the farmer's ability to act on them.

For the Uganda Shillings (UGX) denominated services, the mean generally sat close to or above the median, with the gap most visible for crop advisory and the full-service bundle, indicating a slight upward skew where a subset of farmers were willing to pay considerably more than the typical respondent. Given this skew, the median is arguably the more reliable measure of typical WTP across services. Overall, the spread between minimum and maximum values, together with the standard deviations, points to meaningful heterogeneity in how much farmers were willing to pay consistent with the sociodemographic and farm-level differences discussed in the preceding sections.

Table 4: Mean, standard deviation, minimum and maximum willingness to pay for each service

Service	Mean	Median	Std. dev.	Min	Max
WTP for crop advisory	2144.068	2000	1575.816	1000	7000
WTP for market price	1247.619	1000	572.3802	0	2000
WTP for produce linkages	1.542857	1	.7800022	0	3
WTP for agricultural credit	2.415094	2	.8645577	1	5
WTP for weather alerts	836.7963	500	773.29	0	5000
WTP for full-service Bundle	4474.492	5000	1661.982	0	8000

4.1.4 Bid Acceptance Rates by Service/Model

Table 5 summarizes the proportion of respondents who accepted the initial bid price for each of the five services tested. The full-service bundle recorded the highest acceptance rate (60.00%), followed by crop advisory services (38.75%). Market price information (24.05%), credit (23.08%), and produce linkage commission (20.51%) recorded considerably lower acceptance rates, suggesting farmers place greater value on integrated advisory type services

delivered on a subscription basis than on standalone informational or transaction-based offerings.

A noticeable pattern across the table is that the proportion of farmers indicating general willingness to pay for a service (around 69-71% for every service) is consistently well above the proportion who accepted the specific bid price offered. This gap between stated willingness in principle and acceptance of an actual price is consistent with the hypothetical bias documented in the WTP measurement literature of Schmidt & Bijmolt (2019) that shows stated WTP routinely overstates what respondents will actually accept once a concrete price is attached, which is precisely the pattern observed here across all five services. The relatively stronger acceptance for the bundle again echoes Gouroubera et al. (2025) finding that bundled offerings attract higher WTP than single services, reinforcing the pattern already observed in Table 4.

Table 5: Acceptance Rates of Initial Bid Price by Service/Model

Service/Model	Initial Bid/month	Willing to pay (%)	Accepted (%)	Rejected (%)
Crop advisory (n=75)	UGX 2,000	69.73	38.16	61.84
Market price information (n=74)	UGX 1,000	69.33	25.33	74.67
Produce (transaction) linkage (n=72)	2% commission	68.92	21.62	78.38
Full-service bundle (n=76)	UGX 5,000	69.73	60.53	39.47
Credit facilitation (n=74)	3% interest	68.92	24.32	75.68
Weather alerts (n=72)	UGX 1,000	71.2	31.51	68.49

4.1.5 Implied Willingness to Pay Ranges

Because the bidding procedure and the follow-up bids generate four possible response patterns. A **Yes–Yes** response indicates that the respondent's willingness to pay (WTP) is equal to or greater than the higher bid. A **Yes–No** response means that the respondent's WTP lies between the initial and higher bids. A **No–Yes** response indicates that the WTP falls between the lower and initial bids, while a **No–No** response shows that the respondent's WTP is below the lower bid. Figure 2 presents this classification and the implied WTP range for each service.

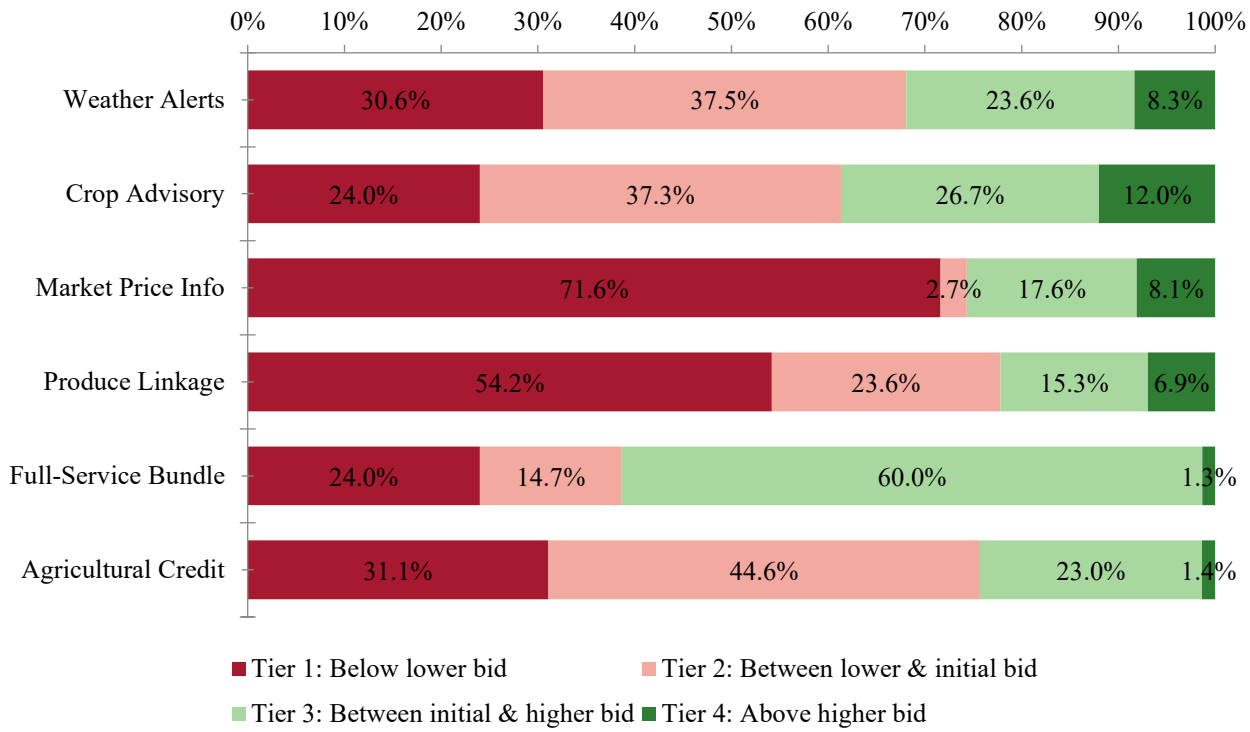


Figure 2: Response Patterns and Implied WTP Ranges by Service

4.2 Factors Influencing Willingness to Pay

4.2.1 Logistic Regression Results

Table 6 presents the full logistic regression results. Three variables were found to be statistically significant predictors of willingness to pay: marital (p=0.043), cooperative membership (p = 0.019) and awareness (p=0.079)

Marital status was a statistically significant predictor of willingness to pay at the 5% level with a marginal effect of -0.283. This indicates that holding other factors constant, married farmers were 28.3 percentage points less likely to be willing to pay for EzyAgric's digital services compared to unmarried farmers. This negative relationship may reflect competing household financial obligations i.e. married household heads in the study area typically bear a broader range of dependent related expenses e.g. school fees, healthcare, food security that compete directly with discretionary spending on agricultural digital services. It may also reflect a more risk-averse household decision making style among married respondents, who may be less willing to commit household income to an unfamiliar or unproven service without demonstrated returns. This finding is broadly consistent with Fadeyi et al. (2022) systematic review of technology adoption among African smallholders, which identifies household headship and the associated financial responsibilities as a recurring factor shaping how conservatively household heads allocate spending toward new agricultural technologies.

Cooperative membership was the strongest and most consistent significant predictor in the model with a marginal effect of 0.259 meaning farmers who belong to a cooperative were 25.9 percentage points more likely to be willing to pay than non-members. This result aligns closely with theoretical expectations where cooperatives serve as institutional platforms for information sharing, peer influence and collective bargaining which can reduce the perceived risk and uncertainty typically associated with adopting a new digital service. Farmers in cooperatives are also more likely to have been exposed to organized extension messaging, group demonstrations or peer testimonials about EzyAgric's services, all of which build trust and lower the informational barrier to adoption. Additionally, cooperative structures often allow for risk-pooling and shared costs making a paid service feel more affordable or lower risk at the individual level. This finding reinforces the broader literature on collective action and technology adoption reviewed in Chapter Two, which consistently identifies group membership as a key channel for diffusing agricultural innovations (Tsan et al., 2019; Aggrey, 2009; Muromba et al., 2025).

Prior platform use was significant at the 10% level with a marginal effect of 0.224, indicating that farmers who had previously used the EzyAgric platform were 22.4 percentage points more likely to express willingness to pay than those who had never used it. This is an intuitive result grounded in experience-based trust i.e. farmers who have interacted with the platform have firsthand knowledge of its practical value, reducing the uncertainty that typically suppresses willingness to pay for unfamiliar digital services. This supports the broader technology-adoption literature for example extensions of the Technology Acceptance Model discussed by (Fabregas et al., 2019) where perceived usefulness often only fully internalized after direct use is a stronger driver of continued or paid engagement than usefulness communicated second-hand. It also has a practical implication for EzyAgric, where free trial access or demonstration periods may be an effective strategy for converting non-paying users into willing payers since direct exposure appears to meaningfully shift willingness to pay.

Table 6: Logistic regression results

Variable	Coefficient (Std Err.)	Marginal Effect (robust std.)
Age	0.039(0.099)	0.005(0.012)
Gender	-0.486(0.926)	-0.057(0.109)
Marital Status	**-2.397**(1.186)**	**-0.283**(0.127)**
Education	-0.162(0.245)	-0.019(0.029)
Farming experience	0.015(0.131)	0.002(0.015)
Occupation	-1.452(1.893)	-0.172(0.220)
Cooperative membership	**2.197**(0.937)**	**0.259**(0.091)**
Household size	-0.148(0.397)	-0.018(0.047)
Household income	1.467(1.497)	0.173(0.172)
Off-farm income	0.867(1.58)	0.102(0.185)
Credit Access	-0.682(0.958)	-0.081(0.112)
Farming size	0.705(0.736)	0.083(0.086)
Value chain	-0.216(1.31)	-0.025(0.155)
Production Purpose	2.89(2.003)	0.341(0.224)
Extension contacts	0.16(0.493)	0.019(0.058)
Smartphone ownership	-0.464(1.834)	-0.055(0.216)
Mobile money use	2.199(1.968)	0.260(0.225)
Duration of use	0.047(0.057)	0.006(0.007)
Digital inclusiveness	0.472(1.479)	0.056(0.174)
Platform use	**1.898*(1.081)**	**0.224*(0.118)**
Constant	-24.351(18.385)	

Note*: ***, **, * Represents significancy at 1%, 5% and 10% levels respectively*

4.3 Comparative analysis of EzyAgric's commercialization models against farmer willingness to pay.

4.3.1 Farmers' preferred models

Figure 3 shows how farmers responded to six different payment models. Pay-per-use was by far the most accepted with 68 out of 76 farmers (89.47%) willing to go with it. Subscription came next at 68.42%, and the bundled model wasn't far behind at 61.84%.

On the other end, the transaction commission model was the least accepted with only 35.53% willing to take it on. Seasonal payment and data monetisation didn't do much better sitting at 40.79% and 42.11% respectively.

The pattern here makes sense once you think about how farming income actually works. Most farmers don't have steady predictable cash flow i.e. money comes in around harvest time and dries up in between. So, a pay-per-use model, where you only pay when you're actually using the service feels far less risky than something like a subscription or seasonal fee where you're expected to pay regardless of whether the season is going well. This lines up with the pay-per-use literature reviewed in Chapter Two where Tsan et al. (2019) notes that micropayment models are particularly attractive where farmers face highly variable cash flows and Aker & Mbiti (2010) argue that loss-averse farmers tend to avoid committing to payments whose value is uncertain up front which pay-per-use structures avoid by design. The commission model performs worst of all probably because it eats directly into whatever a farmer earns from a sale, which likely feels like a loss rather than a service cost, a pattern that fits Tsan et al. (2019) observation that commission models only work well where rates are transparent and perceived as fair.

This also lines up with what Agrishop is currently doing i.e. charging a commission and it's a weak fit given how unpopular that structure was in this sample. If EzyAgric wants better uptake, leaning toward pay-per-use or bundled pricing looks like the safer bet.

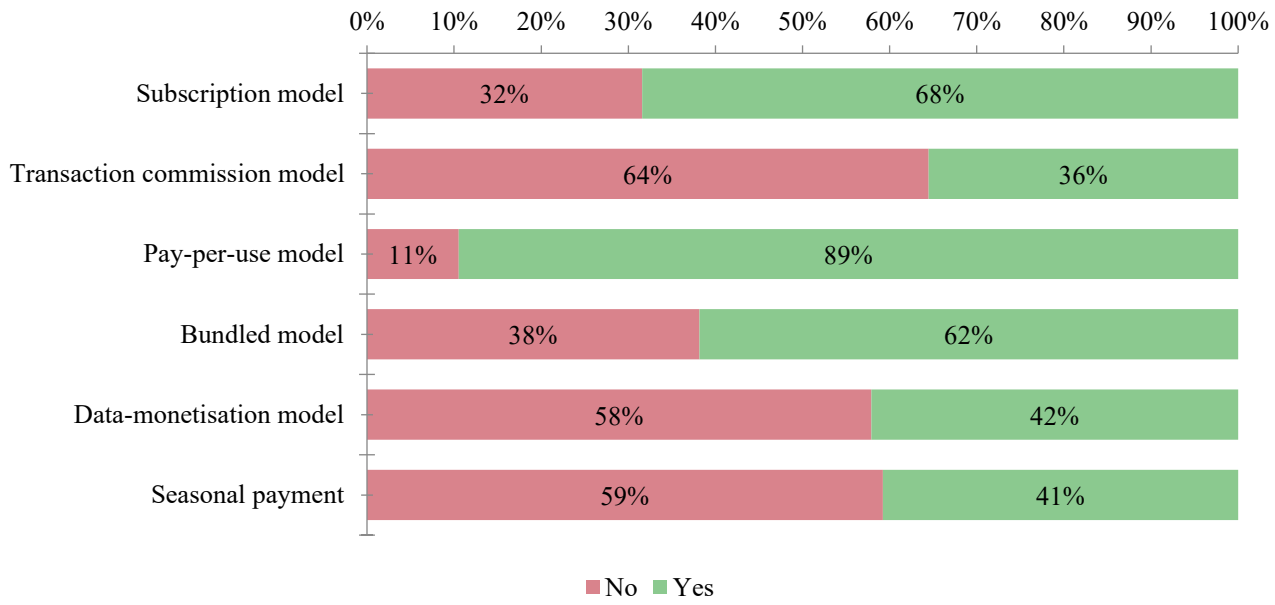


Figure 3: Farmers' preferred models

Willingness to pay by preferred payment channel

Figure 4 shows the distribution of preferred payment channels among respondents. Airtel Money was the most preferred channel overall, chosen by 59 of the 76 respondents (77.6%), with 39 of these farmers willing to pay for EzyAgric's services. MTN Mobile Money and deduction from produce sale were less common, at 7 and 3 respondents respectively while cash to agent was preferred by 7 farmers, all of whom were willing to pay. The dominance of Airtel Money likely reflects its wider network coverage and usage in the study area suggesting that payment integration for EzyAgric should prioritize mobile money channels particularly Airtel Money to align with farmers' existing payment habits. This dependence on mobile money as the default rail for digital payment is consistent with Aker & Mbiti (2010) account of how mobile money infrastructure lowers the transaction costs of digital payments in East Africa.

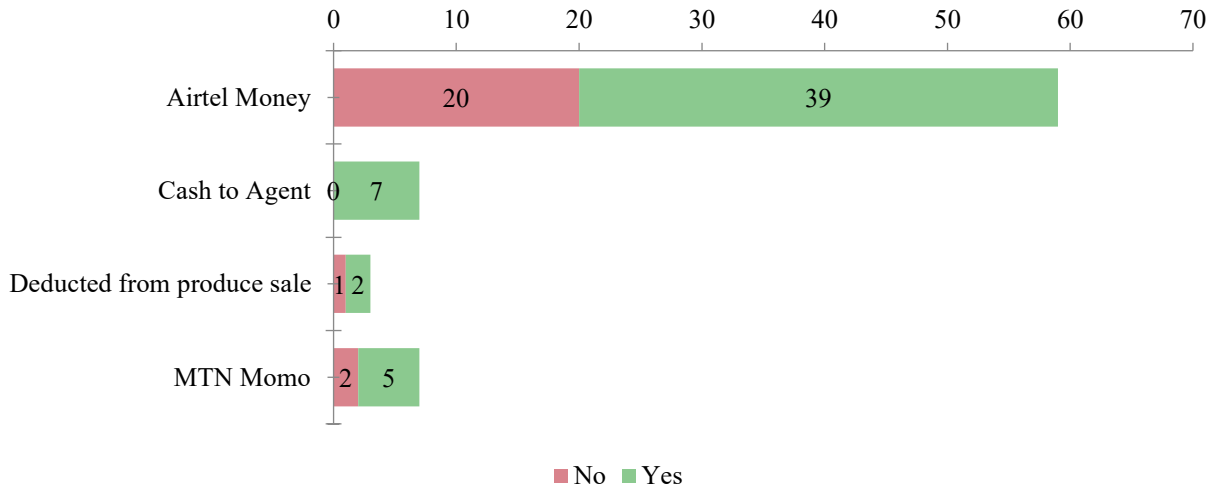


Figure 4: Willingness to pay by preferred payment channel

Willingness to pay by payment timing

Figure 5 presents the distribution of respondents' preferred payment timing and its association with willingness to pay for EzyAgric's services. Per-use payment was by far the most preferred timing option selected by 51 of the 76 respondents (67.1%) of whom 41 (80.4%) indicated willingness to pay, suggesting that farmers favor flexible, transaction-linked payment structures over fixed periodic commitments. Monthly, harvest season and planting season payment options were each preferred by very few respondents (4, 3 and 1 respectively), but notably all respondents who selected these timing options were willing to pay, indicating that where farmers do commit to a structured payment schedule, they are highly likely to follow through. Payment after a successful sale or loan was preferred by 4 respondents, 3 of whom (75%) were willing to pay. In contrast, 13 respondents (17.1%) selected "I don't want to pay"

as their timing preference and of these, only 1 indicated willingness to pay. These findings suggest that aligning payment collection with the timing of farmers' cash inflows, particularly around point of sale or transaction-based moments is likely to improve uptake of EzyAgric's services more effectively than fixed periodic billing cycles.

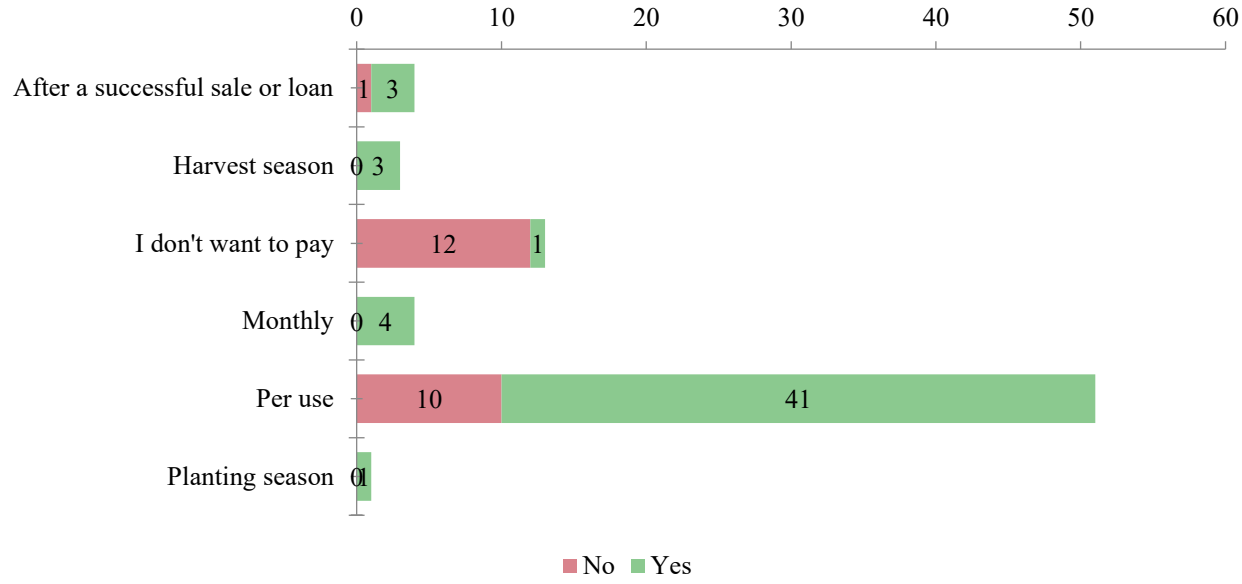


Figure 5: Willingness to pay by preferred payment timing

4.3.2 EzyAgric's existing income streams

Table 7 compares EzyAgric's current pricing structure with farmers' actual willingness to pay as derived from the double-bounded DC-CVM analysis. For the three services EzyAgric currently monetizes, a consistent pricing value gap emerges. Agrishop's commission structure (5-10% margin plus approximately 10% commission) substantially exceeds farmers' mean WTP of 1.54%, and this mismatch is reflected in its acceptance rate of only 21.62% despite 68.92% of farmers expressing general willingness to pay for produce/buyer linkage services. Similarly, KaEzy's flat monthly bundle fee of UGX 5,000 sits above the derived mean WTP of UGX 4,474.49, yielding a moderate acceptance rate of 60.53%. Ezy Credit shows the widest gap, i.e. its 3% monthly interest rate is roughly 24% higher than farmers' mean WTP of 2.42%, corresponding to a low acceptance rate of 24.32%.

Collectively, these results suggest that EzyAgric's existing pricing for Agrishop, KaEzy and Ezy Credit is set above what a majority of farmers are willing to pay, which may be limiting adoption and retention despite genuine underlying demand for these services. This is consistent with Fabregas et al. (2019) argument that the financial sustainability of paid digital agricultural services depends on farmers perceiving value that is at least equal to price and Muromba et al.

(2025) finding that trust in the platform operator was often a stronger predictor of WTP than the price level itself, implying that EzyAgric may gain more from closing the trust and value gap on these three services than from price adjustments alone. The size of the gap for Ezy Credit in particular also fits the hypothetical bias pattern discussed in section 4.1.4 Schmidt & Bijmolt (2019), a high proportion of farmers say they would consider paying for credit facilitation in general, but far fewer accept the specific rate on offer.

In contrast, the three services EzyAgric has not yet monetized, i.e. crop advisory, market price information and weather alerts, show comparably high or higher farmer WTP rates (69.73%, 69.33% and 71.20% respectively) alongside positive mean WTP values (UGX 2,144.07, UGX 1,247.62 and UGX 836.80). Because these services carry no current price to anchor against, their acceptance rates (38.16%, 25.33% and 31.51%) reflect farmers' raw willingness to pay a positive amount rather than resistance to an existing price. This indicates that crop advisory, market price information and weather alerts represent viable new revenue streams with crop advisory showing the strongest potential given both its higher acceptance rate and higher derived mean WTP. This pattern is consistent with the wider literature's emphasis on core agronomic and market information as the services smallholder farmers value most directly (Fabregas et al. 2019; Muromba et al. 2025) and suggests that EzyAgric's commercialization strategy may be better served by introducing modest pricing on these currently free high demand services than by trying to push up acceptance of the three services that are already priced above farmers' derived WTP.

Table 7: EzyAgric current pricing compared with farmer WTP

EzyAgric Model	Current Price/Terms	Corresponding Service Model	Farmer WTP	Acceptance rate	Mean WTP	Comparison
Agrishop	5-10% margin + approximately 10% commission	Produce/buyer linkage	68.92	21.62	1.542857 %	Current commission substantially above farmer WTP
KaEzy	UGX 5,000 per month (bundle)	Full bundle package	69.73	60.53	UGX 4474.492	Current price above farmer WTP
Ezy Credit	3% per month interest	Credit facilitation	68.92	24.32	2.415094 %	Current rate above farmer WTP
Not currently monetized	n/a	Crop advisory	69.73	38.16	UGX 2144.068	Potential new revenue stream
Not currently monetized	n/a	Market price info	69.33	25.33	UGX 1247.619	Potential new revenue stream
Not currently monetized	n/a	Weather alerts	71.2	31.51	UGX 836.7963	Potential new revenue stream

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusion

This study set out to examine smallholder farmers' willingness to pay for EzyAgric's digital agricultural services in Uganda, with a focus on Iganga District. Guided by three objectives, the study estimated farmers' WTP for specific EzyAgric services, identified the factors influencing that willingness and assessed EzyAgric's commercialization models against farmer preferences.

Findings from the sociodemographic and socioeconomic analysis showed that cooperative membership, platform use and duration of use were significantly associated with willingness to pay at the bivariate level while smartphone ownership and extension contacts showed marginal significance. Farmers who belonged to cooperatives, who had prior experience using a digital platform and who had used such platforms for longer periods were consistently more willing to pay than their counterparts.

The willingness to pay estimates further revealed that farmers valued the full-service bundle most highly with a mean WTP of UGX 4,474 per month followed by crop advisory services at UGX 2,144. This suggests that farmers see greater value in comprehensive, bundled digital offerings than in single, standalone services. Bid acceptance rates were highest for the full-service bundle at 60.53%, further reinforcing this pattern.

The logistic regression results confirmed that cooperative membership and platform use remained significant predictors of WTP even after controlling for other factors, while marital status emerged as a significant negative predictor in the multivariate model despite showing no significant relationship in the bivariate analysis. This suggests that being married is associated with a lower probability of willingness to pay, once other socioeconomic factors are accounted for, a relationship that may reflect competing household financial priorities among married farmers.

Overall, the study concludes that smallholder farmers in Iganga District demonstrate real and measurable willingness to pay for digital agricultural services, particularly when they have prior exposure to such platforms and belong to farmer cooperatives. However, this willingness is not universal and a purely commercial model risks excluding farmers who lack these enabling conditions.

5.2 Recommendations

Based on the findings above, the study makes the following recommendations:

To EzyAgric and similar digital service providers, the study recommends prioritizing the full-service bundle as a core commercial offering, given its higher WTP and stronger bid acceptance compared to individual services. Providers should also invest in strategies that extend farmers' exposure to their platforms before introducing paid tiers, since duration of use and prior platform experience were strongly linked to willingness to pay. This could include offering free trial periods or freemium access to build farmer confidence before monetization.

To farmer cooperatives and extension networks, the study recommends strengthening collaboration with digital agricultural platforms, given the significant role cooperative membership played in shaping WTP. Cooperatives could serve as trusted intermediaries, introducing digital services to their members and facilitating peer-based learning that builds trust in these platforms.

To policymakers, the study recommends against a fully privatized approach to farm advisory services. Given that WTP is closely tied to enabling factors such as cooperative membership and prior digital exposure, a purely market-driven model risks excluding farmers who lack access to these advantages. Instead, a blended model is recommended, where basic advisory services remain publicly supported or subsidized, while more specialized or bundled digital services are offered on a commercial basis. This would allow platforms like EzyAgric to build sustainable revenue while safeguarding access for less-advantaged farmers.

For future research, given the relatively small sample size (n=76) used in this study, future studies should consider a larger sample to improve the robustness of the logistic regression estimates, particularly given the number of predictors relative to observations. Future research could also explore WTP across other districts to assess whether these findings hold in different geographic and socioeconomic contexts.

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Appendix 1: Questionnaire

Introduction, Consent and Screening:

Dear Respondent, you are kindly requested to participate in this academic research study conducted by a student at Makerere University. This study aims to evaluate the best commercialization model for agricultural digital services provided through the EzyAgric App in Uganda. Your honest response will contribute to evidence that can improve how digital services are designed that can improve how digital agricultural services are designed and priced for smallholder farmers.

Your participation is entirely voluntary and your responses will be kept strictly confidential and used for academic purposes only. You are not required to provide your name.

No.	Question	Response options/coding
A0.1	Are you 18 years or older?	1=Yes, 0=No. If No, end interview.
A0.2	Do you farm or make farm-related decisions in this household?	1=Yes, 0=No. If No, end interview.
A0.3	Have you heard of or used EzyAgric services?	1=Currently use, 2=Used before, 3=Heard but never used, 4=Never heard.
A0.4	Do you agree to participate voluntarily?	1=Yes, 0=No. If No, end interview.

Section A: Demographic and Socio-Economic Information

This section provides background information about you and your household

1. What is your gender?
   ☐ Male ☐ Female
2. What is your age in completed years?
   Age: _____ years
3. What is your marital status?
   ☐ Single
   ☐ Married/Cohabitating
   ☐ Widowed
   ☐ Divorced / Separated
4. Farming experience in years _____ (years)
5. Number of years on schooling _____(years)

6. What is your main occupation?
   ☐ Farming only
   ☐ Farming plus off-farm work
   ☐ Trading
   ☐ Formal employment
   ☐ Other (specify) _____
7. How many people live in your household (including yourself)
   Household size: _____ people
8. What is your estimated total monthly household income from all sources? (farming, business, employment etc)
   Total monthly household income: _____UGX
9. Does your household earn any income from non-farming activities? (e.g. boda-boda, employment, trade etc)
   ☐ Yes ☐ No
10. Have you accessed any formal or informal credit (loan, SAACO, mobile loan) in the past 12 months?
    ☐ Yes ☐ No

Section B: Farm and Market Characteristics

1. What is the total size of your land you currently cultivate?
   Farm size: _____acres
2. What is your main cash crop/value chain?
   ☐ Coffee
   ☐ Maize
   ☐ Horticulture
   ☐ Banana / Matooke
   ☐ Livestock
   ☐ Beans
   ☐ Pineapple
   ☐ Other (specify): _____
3. What is the main purpose of production?
   ☐ Mostly home consumption
   ☐ Both home and sale
   ☐ Mostly sale
4. How far is your farm from the nearest output market and trading centre?
   Distance: _____ (walking time in minutes)
5. Are you a member of a farmer group or cooperative or SACCO?
   ☐ Yes ☐ No
6. Number of extension contacts in the past 3 months from any source
   _____ times

Section C: Digital Access and EzyAgric Use

1. Do you own a phone?
   ☐ No ☐ Basic phone ☐ Smartphone

2. If No. Does a family member own a smartphone?
   ☐ Yes ☐ No
3. How often do you access the internet on any device?
   ☐ Never
   ☐ Monthly
   ☐ Weekly
   ☐ Daily
4. Do you use mobile money services? (e.g. Airtel Money, MTN MoMo)
   ☐ Yes ☐ No
5. How do you access EzyAgric services?
   ☐ Directly on my own phone
   ☐ Indirectly through a village agent who uses the app on my behalf
   ☐ Both direct and through an agent
   ☐ Do not use
6. How long have you used EzyAgric?
   Duration of use: _____months
7. How frequently do you use EzyAgric?

   ☐ Never ☐ Rarely ☐ Monthly ☐ Weekly ☐ Daily
8. Which services have you used? (tick all that apply)
   ☐ Crop advisory/extension advice
   ☐ Farm record keeping
   ☐ Input (seed, fertilizer, agrochemical, ordering)
   ☐ Market price information
   ☐ Loan access
   ☐ Produce selling/buyer linkages
   ☐ Other (specify) _____
9. Overall, how satisfied are you with the EzyAgric App?
   ☐ Very satisfied
   ☐ Satisfied
   ☐ Neutral
   ☐ Dissatisfied
   ☐ Very dissatisfied

Section D: Perceived Value, Trust and Usability

CONSTRUCT	**Statement (**Use a 1-5 scale: 1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly agree.**)**
Perceived usefulness	EzyAgric information is relevant to my farming activities.

Perceived usefulness	EzyAgric has helped me make better farming or marketing decisions.
Perceived usefulness	EzyAgric has helped me access better inputs, markets or prices.
Service quality	The advisory content is timely and accurate.
Usability	The app or agent-supported service is easy for me to use.
Trust	I trust EzyAgric to handle my transactions responsibly.
Trust	I trust EzyAgric to handle my data responsibly.
Transparency	I understand any charges or deductions made through EzyAgric.
Social influence	I would be more willing to pay if a trusted farmer, agent or extension officer recommended the service.
Satisfaction	I would recommend EzyAgric services to another farmer.

Section E: Willingness To Pay for Digital Agricultural Services.

This section assesses how much you value EzyAgric's digital services and what you would be willing to pay for them

1. Will you be willing to pay for EzyAgric services?
   ☐ Yes ☐ No
2. If yes, how much will be willing to pay for each of these in UGX:

EzyAgric Service	Amount (UGX) per month
Crop advisory/extension services	
Market price information	
Input ordering (seeds, fertilizer, chemicals)	
Produce selling/buying linkage	
Credit facilitation	
Weather alerts	
Full bundle (all services combined)	

3. Cheap-talk script: Please answer as if you would actually have to pay this amount from your own money. There is no right or wrong answer. We only want to know what is realistic for you.

Service	Initial bid: Would you pay this amount?	If Yes: higher bid	If No: lower bid	Maximum WTP and preferred period

Crop advisory/extension content	UGX 2,000 per month: Yes/No	UGX 5,000: Yes/No	UGX 1,000: Yes/No	UGX ___ per month/season
Market price information	UGX 1,000 per month: Yes/No	UGX 2,000: Yes/No	UGX 500: Yes/No	UGX ___ per month/season
Produce buyer linkage	2% commission on sale: Yes/No	3%: Yes/No	1%: Yes/No	Maximum acceptable % ___
Credit facilitation	UGX 3,000 per successful loan: Yes/No	UGX 5,000: Yes/No	UGX 1,000: Yes/No	UGX ___ per successful loan
Weather alerts	UGX 1,000 per month: Yes/No	UGX 2,000: Yes/No	UGX 500: Yes/No	UGX ___ per month/season
Full-service bundle	UGX 5,000 per month: Yes/No	UGX 10,000: Yes/No	UGX 2,500: Yes/No	UGX ___ per month/season

Section F: Commercialization Model Preferences

Model	**Plain-language Description**	**Accept**	**Rank 1-6**	**Reason for the rank given**
Subscription Model	You pay a fixed monthly or seasonal fee to access a package of EzyAgric services	Yes/No		1=Hard to pay upfront 2=May not use the app regularly 3=Risky if benefits are not immediate 4=Predictable cost 5=Easy to plan for 6=Continuous access to services 99=Other specify
Transaction Commission Model	A small percentage is deducted only when you buy inputs or sell produce through EzyAgric.	Yes/No		Reduces farmers' sales income Maybe disliked if commission feels hidden or too high. Farmer pays only after buying inputs or selling produce Payment is linked to actual benefit 99= Other specify

Pay-Per-Use Model	You pay only when you request a specific service.	Yes/No	1=Costs may accumulate over time 2=May discourage use of important services 3=Farmer pays only when they need a service 4=Affordable for occasional users; feels fair 99=Other specify
Bundled Model	Farmers pay little or nothing; input suppliers, buyers or financial institutions pay EzyAgric to serve farmers.	Yes/No	1=Farmers may worry about bias toward certain suppliers or buyers; 2=Less control over services 3=Low or no direct payment by farmers 4=Costs covered by input suppliers, buyers or institutions 99=Other specify
Data-supported (Monetizatio n) Model	You receive services at low/no cost while anonymized data is used only with consent for research or business insights.	Yes/No	1=Concerns about privacy, misuse of data 2=Not understanding how their data is used 3=Low-cost or free services 4=Useful for farmers with limited ability to pay 99=Other specify
Seasonal Payment			1=Difficult if the season is bad 2=May exclude farmers with irregular income 3=Matches farmers' cashflow

4=Easier to pay during planting or harvest

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1. Which payment channel would you prefer?
   ☐ MTN MoMo
   ☐ Airtel Money
   ☐ Cash to agent
   ☐ Deducted from produce sale
   ☐ Other (specify) _____
2. Which payment timing is most convenient?
   ☐ Monthly
   ☐ Per use
   ☐ Planting season
   ☐ Harvest season
   ☐ After successful sale/loan
   ☐ I do not want to pay
3. What would most increase your willingness to pay?
   ☐ Proof of higher income
   ☐ More accurate advice
   ☐ Lower prices
   ☐ Better network/offline access
   ☐ Trusted recommendation
   ☐ More services in local language
   ☐ Other (specify) _____

Section G: General Comments

1. Would you allow EzyAgric to use your anonymized farm data to improve services?
   ☐ Yes
   ☐ No
   ☐ Maybe
2. Would you allow anonymized data sharing with researchers or partners if your name and phone number are removed?
   ☐ Yes
   ☐ No
   ☐ Maybe
3. What would make you more willing to pay for EzyAgric services?
   _____
4. What should EzyAgric improve to make services more useful, accessible or affordable?
   _____

Appendix 2: Key Informant Interview Guide for EzyAgric Management

1. What EzyAgric services currently generate income, and how is income earned from each stream?
2. What are the approximate transaction volumes, active users, paying users and revenue trends for each stream?
3. What are the major costs of delivering digital content, agent support, advisory services and transaction facilitation?
4. Which services are most costly to deliver and which are easiest to scale?
5. What pricing or payment models has EzyAgric tried or considered? What worked and what did not?
6. Which farmer segments are most likely to pay directly, and which require subsidy or agent support?
7. What are the main risks of subscription, pay-per-use, commission, bundled/B2B and data-supported models?
8. What data privacy, consent or trust concerns must be considered in commercialization?
9. What indicators would management use to judge a model as successful: revenue, retention, number of transactions, farmer satisfaction, impact, partner retention or other?
10. What recommendation would you make for the next commercialization pilot and why?

Logistic regression

WTP	Coef.	St. Err.	t-value	p-value	[95% Conf. Interval]		Sig
Age	.039	.099	0.40	.692	-.154	.232	
Gender	-.486	.926	-0.53	.6	-2.302	1.329	
Marital status	-2.397	1.186	-2.02	.043	-4.721	-.072	**
Education	-.162	.245	-0.66	.51	-.643	.319	
Farming experience	.015	.131	0.11	.908	-.242	.272	
Occupation	-1.452	1.893	-0.77	.443	-5.162	2.257	
Cooperative membership	2.197	.937	2.35	.019	.361	4.033	**
Household size	-.148	.397	-0.37	.709	-.927	.63	
Household income	1.467	1.497	0.98	.327	-1.466	4.4	
Off-farm income	.867	1.58	0.55	.583	-2.229	3.963	
Credit access	-.682	.958	-0.71	.476	-2.559	1.195	
Farming size	.705	.736	0.96	.338	-.737	2.147	
Value chain	-.216	1.31	-0.16	.869	-2.784	2.352	
Production purpose	2.89	2.003	1.44	.149	-1.035	6.815	
Extension contacts	.16	.493	0.32	.746	-.807	1.126	
Smartphone ownership	-.464	1.834	-0.25	.8	-4.059	3.13	
Mobile money use	2.199	1.968	1.12	.264	-1.657	6.056	
Duration of use	.047	.057	0.84	.402	-.063	.158	
Digital inclusiveness	.472	1.479	0.32	.749	-2.426	3.371	
Awareness	1.898	1.081	1.76	.079	-.221	4.017	*
Constant	-24.351	18.385	-1.32	.185	-60.386	11.683	

Mean dependent var	0.697	SD dependent var	0.462
Pseudo r-squared	0.400	Number of observations	76
Chi-square	37.293	Prob > chi2	0.011
Akaike crit. (AIC)	97.895	Bayesian crit. (BIC)	146.840

**** p<.01, ** p<.05, * p<.1*

Average marginal effects Number of observations = 76
Model

Delta-method

WTP	dy/dx	std. err.	z	P>z	[95% conf.	interval]
Age	0.005	0.012	0.400	0.691	-0.018	0.027
Gender	-0.057	0.109	-0.530	0.597	-0.270	0.155
Marital Status	-0.283	0.127	-2.230	0.026	-0.531	-0.035
Education	-0.019	0.029	-0.660	0.508	-0.076	0.037
Farming experience	0.002	0.015	0.120	0.908	-0.029	0.032
Occupation	-0.172	0.220	-0.780	0.435	-0.603	0.260
Cooperative membership	0.259	0.091	2.840	0.004	0.081	0.438
Household size	-0.018	0.047	-0.370	0.708	-0.109	0.074
Household income	0.173	0.172	1.010	0.315	-0.164	0.511
Off-farm income	0.102	0.185	0.550	0.580	-0.260	0.465
Credit access	-0.081	0.112	-0.720	0.470	-0.299	0.138
Farm size	0.083	0.086	0.970	0.330	-0.084	0.251
Value chain	-0.025	0.155	-0.160	0.869	-0.329	0.278
Production purpose	0.341	0.224	1.520	0.128	-0.098	0.781
Extension contact	0.019	0.058	0.320	0.746	-0.095	0.133
Smartphone ownership	-0.055	0.216	-0.250	0.800	-0.479	0.369
Mobile money use	0.260	0.225	1.150	0.249	-0.182	0.701
Duration of use	0.006	0.007	0.850	0.397	-0.007	0.019
Digital inclusiveness	0.056	0.174	0.320	0.749	-0.285	0.397
Awareness	0.224	0.118	1.890	0.058	-0.008	0.456