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Farmers' Purchasing Preferences and their Readiness and Willingness to E-Business

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ABSTRACT: *This study examined the farmers' purchasing preferences as well as their readiness and willingness to purchase products and services online.*

It was found in the study that while farmers have access to digital devices and basic internet connectivity, their readiness for e-business has not reached its peak yet. The cost of internet access and a passive level of engagement with social media functionalities present notable barriers to practical use. However, there's a general willingness among them to adopt digital tools for agriculture, including learning about online shopping, participating in online seminars, and trying new farming technologies advertised online. This suggests a positive inclination towards digital integration in their farming practices.

The findings also showed that farmers' purchasing preferences continued to rely on physical stores, although there was a neutral to willing attitude towards trying online platforms for agricultural supplies. Decisions to purchase online are not impulsive; farmers tend to be cautious, often requiring multiple exposures to advertisements before making a decision. Significant demographic differences exist, with younger, more educated, and female farmers demonstrating greater readiness and willingness to engage in e-commerce. A significant influence exists between a farmer's willingness to adopt digital tools and their purchasing preferences, where higher engagement with online resources correlates with more informed and satisfactory online purchasing experiences.

KEYWORDS - *social media, social media applications, farmers, e-readiness, purchase preference*

I. Introduction

Changes in ways of communication change fast, making catching up with the latest trends a means of survival in society. Communication technology has become a necessity not only in the corporate and educational sectors but also among individuals running small businesses and even in farming. The need for dissemination of the latest trends in agriculture became one of the tools to uplift the economy of the country, especially since most of the population relies on farming. Communication technology is essential to help farmers cope with the challenges of the times by shifting from traditional to modern farming techniques, from physical to online sales of their products, and online purchasing of equipment and supplies. Sharing of information through forums and seminars is often conducted online.

The need to cope with communication technology trends falls under the United Nations' Sustainable Development Goal (SDG), which encompasses reduced inequality (SDG 10), decent work, and economic growth (SDG 8), particularly in the areas of industry, innovation, and infrastructure (SDG 9). It will only be sustainable if everyone has access to the information needed in developing farming techniques, as well as agricultural business opportunities in supplying farmers' needs, as well as marketing farmers' products. The cycle of farm production and selling of products relies on one of the essential tools, which is communication technology.

Mohammed (2022) proves in his research on online advertisements that businesses are spending more on online advertisements than before. Understanding the factors that influence online advertisement effectiveness is crucial. Thus, his study shows that online businesses these days should also be sustained through the efforts of the government to support the improvement of the internet facility in the country, especially in rural areas. Reaching out in areas with weak access to technology will sustain the need for farm improvements and will eventually affect the economy of the country.

Somehow, some factors affect the reluctance of farmers to use technology. Aside from weak access, their level of e-readiness is low. Moreover, ArunBabu (2005) evaluated the e-readiness of the farmers and suggested E-access, E-Learning, E-Society, E-governance, and E-willingness are indicators of e-readiness. The suggested indicators were used to assess the E-readiness of the farmers in Echague, Isabela, as a baseline study for the online selling of farm supplies. Moreover, the researcher aimed to examine the correlation between the e-readiness of farmers and their purchase preferences for farm supplies advertised online. Its output was a basis for the production of farm supplies, improving the marketing strategy of farm supplies businesses, as well as determining the purchase preferences of the area.

On the other hand, some gaps can be identified with the previous studies conducted on the farmers' e-readiness, especially in the area of Isabela. The place is known to be one of the country's major suppliers of farm products like corn and rice, and the majority of its population is inclined toward farming. Yet, there are places in the province that have not yet improved in terms of internet connectivity. This becomes a challenge for online advertisers to promote their products, especially in far-flung areas. In assessing the e-readiness of the farmers in the area, Echague, the farm suppliers will gain an idea of the improvements as well as interventions on how to reach out to the farmers with low e-readiness.

The researcher predicts that farmers in Echague, Isabela, are somewhat e-ready. Yet, some of them are reluctant to engage in online purchasing of farm products due to trust issues with online advertisements. It is predicted that the advertisers should establish credibility by gaining positive reviews from customers as well as by educating them on the proper use of farm supplies to get the desired results from the products. This study suggests that the data on e-readiness and purchase preference can be a basis for the marketing strategies of those in the farming supplies business. If it turns out that the hypothesis is acceptable, the farm suppliers can modify their strategies in terms of selling their products to the farmers of Echague.

II. Statement of the Problem

This research evaluated the readiness and willingness of corn and rice farmers to use e-business in Echague, Isabela. Moreover, it also aimed to assess how social media advertisements affect the purchasing habits of farmers.

Specifically, the researcher aimed to answer the following questions:

1. What is the degree of readiness of farmers to purchase agricultural products as affected by social media advertisements based on the following aspects:
    a. access;
    b. learning; and
    c. social media app.

2. What is the level of willingness of the respondents to purchase agricultural products as influenced by social media advertisements?
3. What is the purchase preference of the farmers in the presence of social media advertisements?

III. Scope and Delimitation of the Study

This study covered the digital literacy and availability of mobile technology and internet connectivity among the respondents. It involves the social media advertisement of agricultural supplies on common social media platforms in the Philippines, including Facebook, TikTok, YouTube, and Instagram. This study will only survey the rice farmers within the area of the Lower Forest Region in Echague, Isabela, where 60% of the municipality's farmland is situated. However, the farmers who raise livestock, fruits, vegetables, poultry, and fish were not included in this study. The social media contents being assessed were the agricultural supplies and techniques, and other products not related to agriculture were excluded. The researcher gathered data about the perception of the farmers towards social media advertisements of agricultural supplies and how they affect their purchase preferences. There were no specific products being tested in the study, and only random social media advertisements with content related to agricultural supplies and techniques were used as examples.

IV. Definition of Terms

Various terms were involved as variables in this study. The researcher observed that the jargon in communication technology varies when it comes to agriculture. The following are the conceptual and operational definitions based on an agricultural perspective.

Digital Literacy. It refers to the exposure of farmers to mobile technologies and the way they discern and utilize information on social media.

E- Readiness. It is the ability to use information and communication technologies to develop one's economy and foster one's welfare. E-readiness refers to the capacity and state of preparedness to participate in the electronic world. Others refer to this as the maturity of citizens, businesses, NGOs, and government offices in participating in the electronic world (e-commerce, e-government, etc.).

E-Access. It covers the connectedness, internet availability, internet usage, and internet affordability.

E-Learning. It is the learning acquired by the farmers that is obtained through the experience of using the technology. It covers the E-literacy, which means literacy acquired online, E-experience that pertains to farmers' experience of using the technology, and E-training of the farmers, which refers to training conducted online.

E-business. It pertains to the awareness and usage of online business. The business relies heavily on social media and other technological channels for its marketing and operations.

E-willingness. It pertains to the willingness of farmers to access ICT and utilize technology in their farming operations.

Farmers. It refers to the rice farmers within the vicinity of Echague, Isabela, Philippines.

Purchase Preference. It refers to the preference of farmers in their purchasing decisions for local enterprises, as well as their clear inclination towards a specific product, service, or brand.

Screen Time. The time spent by a farmer using a device such as a mobile phone or laptop.

Social Media Application. It refers to the means of interactions among people in which they create, share, and or exchange information and ideas in virtual communities and networks.

Social Media Advertisements. It refers to the type of digital marketing strategy that uses social networks such as YouTube, Facebook, TikTok, and Instagram. In this research, the researcher pertains to social media advertisements promoting agricultural supplies.

V. Review of Related Literature

There was various related literature on the use of social media and advertising, and most of them are focused on how entrepreneurs use social media for business. Only a few studies discuss social media and its role in farming. The following review of related literature was arranged based on themes.

5.1 Farming and the Use of Social Media

Social media is used not only to communicate with people but also to promote businesses these days. Social media advertisements and online shopping applications have become increasingly popular since the COVID-19 pandemic and continue to serve their purpose even today. People had adjusted their purchasing styles from physical stores to virtual shopping, and the use of gadgets among people of all age brackets and economic statuses became a way of life, even in rural areas. Digital literacy was so vast that it reached even those who were in the farming sector.

There has been a dearth of studies that have considered the role that social media may play in representing rural spaces and activities. Social media has reached even the far-flung places (Riley, 2021). Their study focuses on the exploration of farmers' social media use and the (re)presentation of farming lives. It discusses how social media might enable farmers to expose the often-hidden aspects of farm work, document and share their practices, and reflect on their perspectives when communicating with both farming and non-farming audiences, and how the content and communicative practices might improve their farming methods.

According to Petril'ak *et al.* (2020), the importance of communication with consumers through social networks such as Facebook is essential in today's marketplace for small businesses, for which this tool is one of the cheapest alternatives to communicating and selling products. This trend did not escape agriculture-specific local farmers who process local products.

Silalahi *et al.* (2019) studied building brand awareness through social media for their project, GianTree —a newly founded startup that produces poultry and fish feed using sustainable products such as coconut pulp, tofu dregs, and fish flour through a fermentation process. Results showed that Gian Tree's brand awareness was successfully built by utilizing social media, and also revealed a few important things that need to be considered in building brand awareness through Facebook and Instagram.

Labonne *et al. (2019)* explored the impact of access to information on poor farmers' consumption, and it turned out that purchasing a mobile phone has a large, positive impact on the household-level growth rate per capita consumption.

Moreover, Munoz (2020) discussed that although the primary sector plays an important role in the economic activity and growth of the Philippines, as it supplies basic food and raw materials to other sectors, it is still considered to be the poorest of the poor based on the 2020 Philippine Statistics Authority (PSA) report. Also, the author concluded that one of the problems was the poverty of those in the primary sector. Thus, the author developed a mobile application and utilized mobile technology as a medium to enhance the primary sector's economic activity, ultimately transforming it into entrepreneurs and business owners.

On the other hand, Fox *et al.* (2021) showed that farmers' initial acceptance of mobile digital platforms for farm management is shaped by social influence, which mediates the impact of performance and effort expectancy. The study highlights the importance of social influence, perceived usefulness, and perceived ease of use in increasing the adoption and sustaining the use of digital technology among family-operated farming communities. Thus, it concluded that although information technology is playing a significant transformative role in virtually every industry, within the agriculture sector, family-operated farming enterprises have been slow to adopt IT solutions to manage their operations.

In addition, Narine *et al.* (2019) emphasized the farmers' preference for modern information communication technologies in Trinidad. A convenience sample of 200 farmers in Trinidad yielded results showing that nearly all farmers used text messaging, with most utilizing multimedia messaging and WhatsApp. The authors stated that farmers were deliberate in their selection of media for receiving different types of information. Thus, the findings suggest that two-way ICTs are contextually appropriate for communicating with Trinidadian farmers. This study highlights the importance of understanding the information needs and preferences

of farmers to ensure effective extension service delivery. While many ICT mediums are available, communicators must seek to utilize those mediums that are widely accessible and adopted by a target audience.

Lokeswari (2016) stated that ICT helps with the growing demand for new approaches. It also helps empower rural people by providing better access to natural resources, improved agricultural technologies, effective production strategies, markets, and banking and financial services. Thus, the study concluded that the favorable attitude of farmers towards ICT is an effective and efficient extension program planning in a changing agri-rural environment.

Moreover, Chuang (2020) emphasized the innovative applications of smart technology that constitute a current trend in agricultural development. The study employed a technology acceptance model to explore the intention of young farmers to apply the Internet of Things system in the management of Taiwanese firms. It was suggested that agricultural administration agencies should consider farmers' farming needs and intentions when developing smart agriculture policies; agencies should employ problem-solving and design thinking approaches. Insightful design of incentives and guidance measures enables young farmers to maximize achievement and minimize effort.

Awan *et al.* (2019) studied the use of information and communication technology (ICT) in agriculture to uplift small-scale farmers in rural Pakistan. The research was conducted to determine the rural farmers' agricultural information needs and to provide a solution to access this information in the province of Khyber Pakhtunkhwa (KPK) Pakistan. The results indicated that most of the respondents aged 41-50 years found that the first preferred source of information for farmers is fellow farmers, followed by Radio advertisements. On the other hand, major barriers to accessing modern information systems are high illiteracy and the non-availability of local information centers. During the study, a large number of farmers acknowledged that they are not familiar with modern agricultural practices because they lack access to new technologies that facilitate the acquisition of agricultural information; as a result, they are not utilizing such techniques and instead rely on traditional methods. Thus, due to the highly localized nature of information and several barriers, this current study is essential to equip rural farmers with updated information through the use of ICT to enhance production and improve their livelihood.

In addition, the size and range of online advertisements are increasing dramatically. Businesses are spending more on online advertisements than before. Understanding the factors that influence the effectiveness of online advertisements is crucial. While much research has addressed this issue, few studies have considered the case of developing countries.

Mohammed *et al.* (2012) described how online advertisements affect consumer purchasing intention with empirical evidence from a developing country. The five dimensions theoretical model shows that Income, Internet skills, Internet usage per day, advertisement content, and advertisement location were identified as significant factors that affect the effectiveness of online advertisement. However, two notable findings emerged: first was the key significant role of website language, and secondly, and maybe most importantly, the impact of other people's opinions on the effectiveness of online advertisement.

Tavor (2011) concluded that the internet has become a major source of information consumption and, to some extent, has replaced old media such as radio, television, and the newspaper. The main advantages of the Internet include its mass availability and its almost instant access to current information. As a result of the public's reaction to these advantages, Madison Avenue realized the potential of the new media and soon incorporated it into its budget. The two main types of online advertisements are the less intrusive, conservative banner advertisements and the aggressive pop-up advertisements. The study aimed to investigate the relative effectiveness of the two types of advertisements and to identify the unique characteristics that distinguish one manager as predominantly banner-preferring and another as preferring a different tool. Regarding efficiency, three stages were examined. The first determines whether a user finds more interest in a banner or a pop-up advertisement. Second, they discovered if there is a difference between the calling rate induced by each of the two forms of ads. The third is whether one type of ad increases sales more than the other. It was found that, at all three stages, banner ads were more efficient. Thus, the number of users that clicked on a banner advertisement was higher, the percentage of callers was higher, and the percentage of clients was higher than those for a pop-up advertisement.

More research came in connection with online advertising. One of them is the study of Thompskin (2019). Since the appearance of the first banner ad, online advertising has evolved significantly and now accounts for a substantial portion of all advertising spending. As online advertising tools proliferate, academic research in this area has also matured over time. As a result of the study, key literature has been summarized around six themes: (1) online advertising effectiveness; (2) online advertising mechanisms; (3) creative elements in online advertising; (4) the role of context in online advertising; (5) online personalization; and (6) search advertising. Knowledge gaps in existing research are identified, and important future research questions are suggested.

According to Balkrishna *et al.* (2017), social media is a new and emerging area in agricultural marketing that encompasses blogs, microblogs, pages, groups, and other platforms. They also added that social media paved the way for the rural community to reach out to the information that was scarce during the times when the technology was rare in the provinces. Social media also gave opportunities for farmers to showcase their farm produce as well as find the best inputs for their farms. Social media is a very useful tool in agricultural marketing. It saves time and cost for farmers to set up information. Moreover, social network sites are web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system and (2) articulate a list of other users with whom they share a connection and those made by others within the system.

Somehow, some are not yet convinced that the digitization of agriculture has already succeeded. Abdulai (2022) stated that Digital agriculture (DA) has become a potent driver for transformation in rural areas. But little is known about how digitization is affecting smallholder farming, which is at the core of rural life. This may be because farmers are low-key on social media. They do not share much content, and most of them use social media for entertainment purposes only and not for sharing content on farming.

In the study of Lavange *et al.* (2018), the researchers aimed to enhance the need for the adoption of contemporary technologies to solve the current challenges facing agricultural inputs, entrepreneurial marketing, firms' sustainable operational efficiency, and competitive advantage in the marginalized areas, not only in developing and emerging economies, but also dotted around the world.

One of the main reasons why farmers use social media is to find ways to distribute their farm products. This makes sense when it comes to how the farmers learn to use social media.

5.2 Purchase Preference of the Farmers

The good customer service category was comprised of two coding schemes: (1) extending services through online platforms and (2) customization and responsiveness, as indicated by Bhalchandra *et al.* (2017). He also stated that a bigger market means being non-critical of the quality of the products. If they find your product expensive, they need to see the justification for why it is expensive. The only way you can justify the price is through the quality and the certifications provided as proof of the quality.

Xiao (2021) believes that applying big data technology to the intelligent marketing of agricultural products in the development trend of agricultural production and marketing information service is an important measure to promote the construction of regional characteristic informatization and a precise poverty alleviation model. It is a concentrated embodiment of the organization.

5.3 Marketing of Farmer's Products

In the era of mobile internet, the characteristics of agricultural products with high quality in economically backward areas highlight the limitations of their marketing, leading to the current situation where wine is afraid of deep alleys (Xiao, 2021). The study also noted that the rapid development of the new generation of information technology will be a key trend in the development of agricultural production and marketing information services.

In line with this, Laveange (2018) showed in his study that markets are not well organized in terms of information, technology, quality, and accessibility across a wider range. Crop programming should be practiced. Farmers should be aware of the negative consequences of planting too many similar crops at the same time. They should have good information on how the market works in their locality and should acquire some business sense.

In addition, market linkages must be created with the help of the local government unit. Thus, developing more markets would entice farmers to plant more crops.

Somehow, in the local literature found by researchers, there was a positive review of the modernization of agriculture in Isabela. Maddela *et al*. (2021) stated that the Cagayan Valley Region is a continuing agri-based economy, while there has been an establishment of industrialization and modernization efforts in various capacities, the sustainability of agriculture, with the continuing empowerment of farmers, regardless of scale and amount of productivity in various efforts, is extensive."

5.4 E- Readiness of the Farmers

The E-readiness of the farmers can be directly affected not only by the availability of technology and connectivity but also by their demographic profile. Several studies demonstrate how the demographic profile of farmers can influence their response to agricultural modernization.

Labonne (2009) stated that purchasing a mobile phone is associated with greater increases in per capita consumption (excluding all communication-related expenses).

In addition, Abdulai (2022) also stated that the apparent effects of farming services were addressed to some farmers who were low engagement due to low literacy and other barriers, and a general lack of understanding by some farmers of what impacts may be attributed to services.

In the study of Pal *et al.* (2020), identification and relevance of E-readiness Assessment Tools for ICT Use in Agriculture, the researchers describe their paper as a help in understanding the importance of measurement tools of E-readiness so that it can leverage ICT integration in agriculture development and improve the exchange of information between the stakeholders of agriculture by using limited resources wisely.

With the prevalence of scams on social media, some people are reluctant to make purchases from these platforms. Challenges included the adoption of social media as a marketing tool. People are less trusting in e-buying and e-selling of agricultural commodities on social media, as stated by Bhalchandra *et al.* (2017).

In the study of Nyagadza *et al*. (2023), the researchers proved the role of social media word-of-mouth on consumer purchase intentions of commercialized indigenous fruit products in fast-moving consumer goods retailers. The researchers found that the quality, source, credibility, and usefulness of information, as well as information adoption, influenced the social media electronic word-of-mouth on consumers' purchase intentions of commercialized indigenous fruit products in fast-moving consumer goods retailers.

Moreover, the importance of communication with consumers through social networks, such as Facebook, is essential in today's marketplace for small businesses, for which this tool is one of the cheapest alternatives to communicating and selling products and information about them (Horska *et al.*, 2020).

The application of a social network theory lens has provided new insights into the role of trust in shaping social media influence on farmers, with variations in the trust farmers place in information from technology vendors and peers (Dileen *et al.,* 2023).

VI. Synthesis

In previous studies by Abdulai (2022), there has been a broader perspective on the intersection of technology and farming that researchers must explore. One reason is that the availability of technology in one location may differ from that in other locations; thus, studies on agricultural technology in one place are only applicable to other places with a similar demographic profile.

Madela et al. (2021) proved that the scale and amount of productivity in various efforts are extensive in the Cagayan Valley Region and that rural livelihood activities are primarily connected to agriculture (Xiao, 2021).

According to Abdulai (2022), the effects of farming were low engagement due to low literacy and other barriers. In this study, the researcher aims to explore the E-readiness of people in a specific location, which may

vary in other areas, and this must be matched with the type of agricultural products that farmers raise in their respective locations.

The demographic profile of farmers, as well as the availability of internet connectivity, may impact their social media activities and access. In this regard, the researcher wanted to see how online advertising thrives in the countryside, considering the challenges of the e-readiness of the farmers. It opens a new perspective that not only low literacy levels may hinder the low engagement of the farmers, but also the other elements of E-readiness suggested by ArunBabu (2005).

In the study conducted by Balkirshna *et al.* (2017) on the role of social media in Agricultural Marketing, the participants were dominated by males between 30 and 40 years old. However, brands with a solid gender identity character will support customer-branding commitment and brand love (Xiao, 2021).

Nyagadaza *et.al.* (2013) proved the role of social media word-of-mouth on consumer purchase intentions, while Pat *et.al's* (2020) paper helped in understanding the importance of measurement tools of E-readiness.

On the use of technology, La Bonne (2009) stated that purchasing a mobile phone is associated with an increase in per capita consumption, which affects the E-readiness of the farmers.

Abdulai (2022) concluded that the effects of farming services were addressed to farmers who were low-engaged due to low literacy and other barriers.

VII. Theoretical Framework

This study used ArunBabu's (2005) evaluation of the e-readiness of the farmers and the indicators that he suggested were E-access, E-Learning, E-Society, E-governance, and E-willingness. His theory will be used in this study to evaluate the E-readiness of the farmers in Echague, Isabela.

E-access pertains to the facilities available to the farmers, like internet connectivity and the availability of gadgets. In contrast, *E-learning* pertains to farmers' knowledge of accessing technology through their social media accounts and understanding how to use it. On the other hand, *e-society* refers to the everyday use of technology in society and the virtual community it fosters, with a focus on improving farming methods. *E-governance* is also suggested by ArunBabu (2005) as an indicator of E-readiness. This pertains to the government's support for improving internet facilities in the area and the programs it is promoting online to support local farmers. Lastly, *E-willingness* was also listed as an indicator that encompasses the farmer's willingness to learn more about the technology, access it, and apply it in their farming practices.

Moreover, this study also relies on Thorndike's Law of Readiness (1910), where he states that learning can only occur when a person is ready to learn. This study aims to assess the readiness of farmers to adopt technology in farming. The prominent variables in this research are the e-readiness of the farmers (independent variable) and the purchase preference of the farmers (dependent variable). The intervening variable would be the quality of social media advertisements on farm supplies, where the e-readiness of the farmers will be challenged, and the purchase preferences will be varied depending on the ads that they watch.

E-Readiness, according to Pena-Lopez (2010), is the ability to use information and Communication Technologies to develop one's economy and to foster one's welfare.

Thorndike's Law of Readiness is a law that states that learning is dependent upon the learner's readiness to act, which facilitates the strengthening of the bond between the stimulus and response. Thus, an athlete who is highly motivated and eager to learn is more likely to be receptive to learning than a poorly motivated one. This law can be a basis for social media advertising in conceptualizing their advertisements. Learning that comes from the ads, as well as the motivation to purchase the products, can only be compelling if the farmers are ready to learn and accept the introduced products in the market.

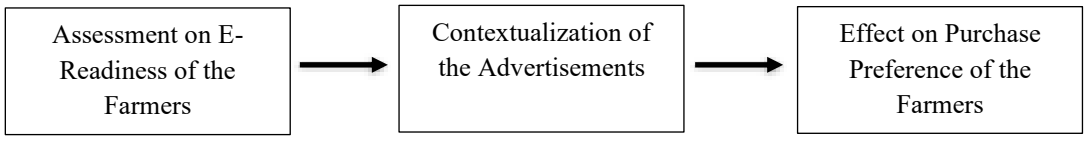

Figure 1: Theoretical Framework

VIII. Conceptual Framework

The study relied on two variables: The e-readiness of the farmers, which is the dependent variable, and their demographic profile, which is the independent variable. The demographic profile is expected to make changes with the E-readiness and purchase preference of the farmers. This is a presumed cause or predictor. These are characteristics of the farmers expected to influence their e-readiness, willingness, and purchase preferences.

The dependent variable is the E-readiness of the farmers. The variable being measured or observed for change. This reflects the farmers' preparation, access, skills, and attitude toward using ICT (Information and Communication Technology).

Through these variables, the researcher will be able to formulate the research output, which is the data on the E-Readiness and purchase preferences of the farmers of Echague, which can be a basis for the farming supplies businesses in marketing their products. This data serves as a practical basis for:

1. Farming Supplies Businesses: The findings will provide crucial market intelligence, helping businesses in marketing their products by:
    - Targeting: Identifying which demographic profiles are most e-ready and thus suitable for digital marketing efforts.
    - Content Strategy: Understanding what kind of information or platform best engages different farmer segments.
    - Distribution Strategy: Determining the balance needed between online sales channels and traditional physical distribution based on the farmers' purchase preferences.
2. Policy and Extension: The data can inform agricultural extension programs and local government initiatives on how to tailor digital literacy training to different farmer demographics to improve overall agricultural productivity and market access.

The paradigm of the study was as follows:

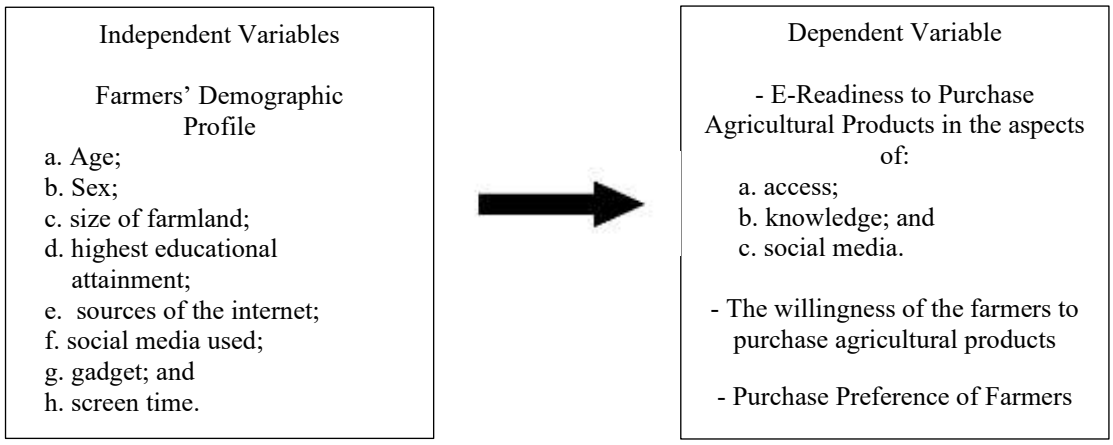

Figure 2: Conceptual Framework

IX. Null Hypothesis of the Study

1. There is no significant difference between the farmers' readiness to purchase agricultural supplies when they are grouped according to their demographic profile.
2. There is no significant difference between the farmers' willingness to purchase agricultural supplies when they are grouped according to their demographic profile.

3. There is no significant difference between the farmers' purchase preferences of agricultural supplies when they are grouped according to their demographic profile.
4. There is no significant influence between the farmer's willingness and readiness to purchase agricultural products and their purchasing preferences.

X. Methdodology

10.1 Research Design

The study employed quantitative and descriptive research methods. Descriptive research is an exploratory research method. It enables researchers to precisely and methodically describe a population, circumstance, or phenomenon. Quantitative research is a method that is used to generate numerical data and hard facts by employing statistical, logical, and mathematical techniques.

Quantitative methodology is the dominant research framework in the social sciences. It refers to a set of strategies, techniques, and assumptions used to study psychological, social, and economic processes through the exploration of numerical patterns (Coughlan, 2014). On the other hand, descriptive research, according to Aggarwal (2019), describes the characteristics of the group, situation, or phenomenon being studied without manipulating variables or testing hypotheses. This can be reported using surveys, observational studies, and case studies. Besides making observations and then comparing and analyzing them, descriptive studies often develop knowledge concepts and provide solutions to critical issues. It always aims to answer how the event occurred, when it occurred, where it occurred, and what the problem or phenomenon is.

To conduct effective research, the researcher aimed to specifically focus on the *individual farmers* in this locality, as they are the end-users of agricultural supplies and the target market for digital marketing efforts. In addition to this, the researcher also wanted to know who the farmer is (e.g., their age, education, income, farm size, access to internet/devices). This profile is the presumed cause of variation. Lastly, the researcher aimed to know what the farmer does regarding technology and purchasing.

The end goal of this research was to gather specific, actionable data on this local market for farming businesses, segment the farmers, and identify which characteristics lead to higher digital engagement and specific purchasing behaviors.

10.2 Locale of the Study

The study was conducted in the Municipality of Echague, particularly in the Lower Forest Region (Aromin, Narra, Salvacion, and Pag-asa), with the permission of the local government unit.

The researcher chose this as the venue of the study for the reason that Echague is primarily an agricultural municipality. Basic crops grown are rice, corn, vegetables, and root crops. There are 10,539 hectares of rice farms in Echague, Isabela. At 1.54 hectares average farm size, (land ownership), there are around 6,800 rice farmers in Echague.

Echague is also the seat of the Isabela State University, the Northern Philippine Grains Complex of the National Food Authority, Camp Melchor F. Dela Cruz of the Armed Forces of the Philippines, the Cagayan Valley Integrated Agricultural Research and Resource Development (CVARRD), as well as the National Irrigation Administration-Agricultural Development Division. Considering that the place has access to agricultural research facilities, the researcher would like to determine whether the farmers are also e-ready and e-willing to adopt new farming methods.

Figure 3: Municipality Map of Echague, Lower Forest Region (Source: https.provinceofisabela.ph)

10.3 Respondents of the Study

The respondents of the study were the farmers of Echague, Isabela, particularly in the Lower Forest Region, where 60% of rice areas in the town are situated. These farmers, as to inclusion criteria, must be classified as owning a minimum of 3 hectares of land, planting rice and corn as major crops, and providing their farm inputs. The farmers who answered the survey questionnaire were those who were planting rice and corn.

From the 6,800 farmers in the area, the researcher utilized a population proportion of 10% with a 95% confidence level and a 5% margin of error. This resulted in 101 rice farmers and 102 corn farmers.

Table 1: Respondents of the Study

Barangay	Population (Rice Farmers)	Sample Size	%	Population (Corn Farmers	Sample Size	%
Aromin	70	47	67.14	50	37	74
Narra	140	70	50	150	47	31.33
Pagasa	115	64	55.6	110	62	56.32
Salvacion	45	35	77.77	40	32	80
Total	**370**	**216**	**100%**	**350**	**102**	**100%**

10.4 Data Gathering

The researcher obtained preliminary data, including the demographic profile of the farmers, their exposure to mobile technologies and social media, and examples of existing social media advertisements in agriculture. A survey questionnaire was conducted to find out whether the social media ads these days are efficiently affecting the purchase preferences of the farmers. Their responses described how social media ads these days can be enhanced based on their profile and preferences.

The data gathering technique in this study involves distributing a survey questionnaire among 216 rice farmers and 102 corn farmers in Echague, Isabela. The samples were randomly selected, and these were distributed across the municipality. After which, the data were retrieved, collated, and analyzed.

10.5 Research Instrument

A survey questionnaire was utilized in this study to obtain the quantitative data. These data were used to measure the quantitative variables.

A Filipino version of the questionnaire was distributed to ensure that farmers understood the questions thoroughly, regardless of their educational attainment.

The internal consistency of each construct was measured using Cronbach's alpha (α). The results indicated that all sections of the questionnaire achieved acceptable to excellent reliability. Specifically, the Learning Knowledge in E-Business section yielded α = 0.87, suggesting strong reliability across its content, especially the Access to E-Business section had α = 0.84, which is considered good internal consistency, section demonstrated α = 0.81, indicating solid reliability, while the Learning or Knowledge in E-Business section achieved α = 0.89, reflecting excellent reliability. The overall reliability of the entire questionnaire was α = 0.91, surpassing the generally accepted threshold of 0.70 for social science research (Nunnally & Bernstein, 1994).

These results confirm that the questionnaire is a reliable instrument for measuring farmers' exposure to social media advertisements as well as their E-Knowledge. Therefore, the instrument was deemed appropriate for full deployment in the main study.

The researcher refers to the E-Readiness Indices for Agriculture to quantify the e-readiness of the farmers in Echague, Isabela. The Indicators were adopted and modified from the study of Arun Babu (2001) entitled: Comparative Analysis of E-readiness and Perception of Information Communication Technology (ICT) Beneficiaries in Kerala. It was adopted due to its suitability in measuring the E-readiness of farmers in various aspects, including e-access, e-learning, e-society, e-business, e-governance, and e-willingness.

The presence of these indicators determined the e-readiness of the farmers who were the subject of the study. Screen time will also be measured based on the latest study by Navarro (2023), which states that the average Filipino's screen time these days is equivalent to one-third of their day or an average of six (6) hours a day. Demographic profiles were also gathered and serve as a reference for other variables to be correlated.

Table 2: Likert Scale

Scale	**Range**	**E-Readiness and E-Willingness Qualitative Description**	
5	4.50 – 5.00	Very Likely	Respondents are very likely to be ready and willing to engage in E-Business
4	3.50 – 4.49	Likely	Respondents are somewhat likely to be ready and willing to engage in E-Business
3	2.50 – 3.49	Neutral	Respondents are neither ready/willing nor not ready/not willing to engage in E-Business
2	1.50 – 2.49	Unlikely	Respondents are somewhat unlikely to be ready/not willing to engage in E-Business.
1	1.00 – 1.49	Very Unlikely	Respondents are very unlikely to be ready and not willing to engage in E-Business

Scale	**Range**	**Purchasing Preference Qualitative Description**	
5	4.50 – 5.00	Strongly Agree	Respondents have a very strong agreement on the preference style for purchasing online.
4	3.50 – 4.49	Agree	Respondents have a slight agreement on the preference style for purchasing online.
3	2.50 – 3.49	Neutral	Respondents have no strong preference, or they are indifferent

2	1.50 – 2.49	Disagree	Respondents disagree on purchasing online.
1	1.00 – 1.49	Strongly Disagree	Respondents strongly disagree with online purchasing.

A five-point Likert scale was used to analyze the qualitative data on E-readiness, willingness to purchase, and purchase preference among farmers; thus, the researcher utilized the following qualitative descriptions.

In this Likert scale, the answers were based on the likelihood of the habits/ qualities being mentioned in the questionnaire. The likelihood is equivalent to the level of e-readiness of the respondents. The more that they have the likelihood of the projected qualities in the questionnaire, the more that they are considered to be e-ready.

In the Likert scale used in the Purchase Preference, the researcher also used the likelihood scale because it projected the indicators of an effective purchase, and the respondents will choose the best answer that corresponds to the likelihood of their experience in purchasing the farm supplies.

10.6 Statistical Treatment of Data

The gathered data were processed using the Statistical Package for the Social Sciences (SPSS). A simple frequency counts, percentage, and mean was used to describe the profile of the respondents. Conversely, the Kruskal-Wallis H-test and the Mann-Whitney U-test were used to analyze the difference between the variables.

The Kruskal-Wallis H test is a non-parametric statistical test used to determine if there are significant differences between the medians of three or more independent groups. It is the non-parametric alternative to one-way ANOVA and is used when the data is not normally distributed, or when dealing with ordinal data. The test works by ranking all the data from the groups together and comparing the sum of ranks for each group. If the calculated H value is greater than the critical value, you reject the null hypothesis and conclude there is a statistical significance.

XI. Presentation, Analysis and Interpretation of Data

1.1 Readiness of Farmers to Purchase Agricultural Products as Affected by Social Media Advertisements.

Based on Table 4, the data revealed the readiness of farmers to purchase agricultural products through social media advertisements by assessing three significant areas: access to e-business, learning or knowledge in e-business, and social media app usage.

Table 4: Readiness of the farmers to Purchase Agricultural Products as affected by Social Media Advertisements

ACCESS TO E-BUSINESS	**Mean**	**QD**
1. I always tend to own a gadget at home, which I use to browse on social media.	4.32	Likely
2. I have an internet connection at home.	3.92	Likely
3. There is a strong internet/fiber signal in my area.	3.54	Likely
4. The internet connection in our area is affordable.	2.85	Neutral
LEARNING OR KNOWLEDGE IN E-BUSINESS		
1. I have a social media account.	4.00	Likely
2. I can operate my mobile phone without assistance from a household member.	3.47	Likely
3. I can interact with social media through sending likes, sharing content, and creating content.	3.35	Neutral

4. I browse the net at a maximum of 6 hours a day, average adult screen time.	2.45	Unlikely
SOCIAL MEDIA APP		
1. I am aware of the social media advertisements that can be seen on social media.	3.32	Neutral
2. I use only one social media app.	2.91	Neutral
3. I use more than one social media app.	3.00	Neutral
4. I update my social media accounts often.	2.54	Neutral

Legend: 1 – 1.49 Very Unlikely, 1.5-2.49 Unlikely, 2.5-3.49 Neutral, 3.5-4.49 Likely, 4.5-5 Very Likely

In terms of access to e-business, most farmers are ready to access e-business.. The item "I always tend to own a gadget at home which I use to browse on social media" received a mean of 4.32, interpreted as Likely, indicating that most farmers own their digital devices. Likewise, having an internet connection at home (Mean = 3.92) and having a strong internet/fiber signal in the area (Mean = 3.54) are both rated as Likely, showing that the majority of farmers had basic internet access. However, the item on the affordability of the internet only garnered a mean of 2.85, rated as Neutral, suggesting that cost remains a moderate concern that could limit consistent access.

People seemed to be pretty good at getting the hang of learning about e-business and soaking up some knowledge in that area. Farmers generally have a social media account (Mean = 4.00) and are capable of operating a mobile phone without assistance (Mean = 3.47), both rated as Neutral. However, their ability to interact with social media through actions like liking, sharing, and creating content is only Neutral (Mean = 3.35), and time spent browsing the internet (Mean = 2.45) is rated as Unlikely, indicating limited engagement in extended digital activities. These findings imply that while farmers are familiar with basic digital tools, their deeper engagement with online platforms may still be limited, which means there is still a need to explore the use of their digital devices as well as maximizing it through expanding their knowledge on the use of digital platforms.

In the social media app category, the responses were more reserved. Farmers were somewhat aware of social media ads, with an average rating of 3.32, and they are also using multiple apps, scoring around 3.00. This suggests having some familiarity with these platforms, but not being fully immersed in or relying heavily across the board. Updating social media accounts often (Mean = 2.54) and using only one app (Mean = 2.91) also show Unlikely to Neutral ratings, implying that social media habits are relatively passive to the farmers which indicates their disinterest in using social media.

Overall, the results indicate that while access and basic digital literacy are present, there is a moderate readiness among farmers to purchase agricultural products via social media, with potential growth in areas such as engagement, frequency of use, and exposure to social media marketing content. This suggests a need for digital literacy programs and more affordable, reliable internet services to further enhance farmers' readiness to engage in e-commerce platforms. Farmers' willingness to explore digital technologies is influenced by perceived usefulness, ease of use, and social influence. Studies show that those who perceive digital agriculture as beneficial are more open to using online platforms to access market information, engage with stakeholders, and improve productivity (Acheampong & Hinson, 2020).

It is also cited in Awan *et al.* (2019), which shows that ICT in agriculture benefits small-scale farmers in rural areas. Thus, the use of ICT in improving farming techniques and inputs is beneficial, and the government must develop ICT facilities in rural areas to help more farmers in the region.

The above findings are supported by the study of Lendel et al. (2019), which emphasized the farmers' preference for modern information communication technologies in Trinidad. It suggests two-way ICTs, which are deemed appropriate for communicating with the Trinidadian farmers. Through the modern way of sharing information, it is easier for farmers to exchange knowledge regarding farming.

As stated above, the business side of farming is very crucial. Farm inputs should be carefully selected to achieve the best results in farming. Many products to improve farming are present in the market, especially on

social media. The following is the result of the survey regarding the willingness of the respondents to purchase agricultural inputs from social media.

1.2 Willingness of Respondents to Purchase Agricultural Products Through Social Media Advertisement

The respondents' overall willingness to purchase agricultural products through social media advertisements was somewhat likely in willingness to purchase, as reflected by the majority of the items having a mean within the range of 3.41 to 4.20, as shown in

Table 5. Willingness of the Respondents to Purchase Agricultural Products as Affected by Social Media Advertisement.

WILLINGNESS TO PURCHASE AGRICULTURAL PRODUCTS	MEAN	QD
1. I am willing to learn more about how to access the internet and social media pages.	3.57	Likely
2. I am willing to dedicate time and effort to sharing and creating social media content that may help my fellow farmers.	3.22	Neutral
3. I am willing to participate in and view social media advertisements on agriculture.	3.45	Neutral
4. I am willing to learn online shopping for my agricultural supplies.	3.53	Likely
5. I am willing to learn using gadgets for the advancement of my knowledge in agriculture.	3.19	Neutral
6. I want to buy new gadgets and learn how to use them.	3.07	Neutral
7. I want to have an internet connection at our home.	3.38	Neutral
8. I want to be a part of sharing knowledge online through participating in forums.	3.53	Likely
9. I want to watch seminars online about agricultural techniques.	3.63	Likely
10. I am willing to participate in online platforms that cater to discussions about agriculture.	3.54	Likely
11. I want to upgrade my farming techniques using the technologies I learned from online platforms.	3.65	Likely
12. I am willing to try new farm inputs that will enhance my yield	3.65	Likely
13. I want to shop for new farm products being advertised online.	3.47	Likely
14. I have the willingness to shift from traditional farming to e-farming when it comes to marketing my yields	3.70	Likely
15. I have the willingness to try farm services that use electronic techniques	3.59	Likely

Legend: 1 – 1.49 Very Unlikely, 1.5-2.49 Unlikely, 2.5-3.49 Neutral, 3.5-4.49 Likely, 4.5-5 Very Likely

The findings in TABLE 5 suggested that the respondents demonstrated a positive disposition toward adapting digital platforms in purchasing agricultural products.

The most liked parameter was the respondents' willingness to switch from traditional farming methods to using online platforms for selling their crops (M =3.70). On average, they scored 3.70, indicating that they are quite open to trying new technologies in farming. Similarly, respondents were likely willing to try new farm inputs

to enhance their yield (mean = 3.65) and to upgrade their farming techniques using technologies learned from online platforms (mean = 3.65). Many respondents demonstrated their efforts to boost productivity and income by utilizing new farming tools and techniques discovered on social media.

Many respondents expressed interest in watching online seminars, with a mean of 3.63. They were also interested in trying farm services that use digital tools, with a mean score of 3.59, and learning how to shop online for agriculture supplies, with a mean score of 3.53. These findings suggest that the respondents were open to expanding their knowledge and skills through digital means, implying that social media advertisements had a motivational effect on their engagement with agricultural advancements.

However, some items registered a "Neutral" response, including their willingness to dedicate time and effort in creating social media content to help fellow farmers (mean = 3.22), learn to use gadgets for agricultural advancement (mean = 3.19), buy new gadgets and learn to use them (mean = 3.07), and have an internet connection at home (mean = 3.38). These results indicated that while the respondents were willing to use online resources and tools, certain hesitations remained, possibly due to a lack of resources, digital literacy, or inconsistent access to technology infrastructure.

Filipino farmers are generally open to using social media ads for farming stuff, but they still need some help. Many could use more training on how to use gadgets and better access to a stable internet. Social media appeared to be positively influenced to try new practices, particularly in marketing and farm input adoption. This could provide stakeholders with a solid foundation for developing new initiatives that promote digital farming. It emphasized areas where things look promising but have not seen much activity yet. According to Rahman *et al.* (2022), digital divide issues, such as poor internet infrastructure and affordability, hinder rural farmers from fully engaging in digital commerce. Improving access through mobile data and affordable smartphones has been shown to bridge gaps in rural agri-commerce adoption.

This is supported in the study of Petril'ak *et al*. (2020), which stated that the importance of communication is essential in today's marketplace for small businesses and offers convenience in selling the products. Furthermore, Labonne et al. (2019) demonstrated that access to information and results show that purchasing a mobile phone has a significant, positive impact on the household level growth rate of per capita consumption.

Another aspect studied in this paper is the purchasing preferences of farmers. The convenience of purchasing, as well as the reliability of the products being sold, are key components of this aspect. The following results were gained from the interview.

1.3 Purchase Preference of the Farmers in the Presence of Social Media Advertisements

The purchase preferences of the farmers in Table 4 reveal mixed responses, indicating a cautious and transitional attitude among farmers toward online agricultural product purchases.

The item "I would rather buy from the physical store rather than online stores" had a mean score of 3.51, which was interpreted as Agree. This suggested that most farmers still preferred traditional buying methods due to familiarity, accessibility, or trust issues with online platforms.

Table 6. Purchase Preference of the Farmers

PURCHASE PREFERENCES	MEAN	QD
1. I would rather buy from a physical store rather than an online store.	3.51	Agree

2. I am willing to try purchasing online agricultural products.	3.37	Neutral
3. I am satisfied with my online purchases.	3.02	Neutral
4. It will take time for me to think before I purchase the product. I need to watch a few more advertisements.	3.67	Agree
5. I end up buying the product as soon as I watch the social media advertisements.	2.40	Disagree
6. The online advertisements are misleading, and I end up buying the wrong products.	2.37	Disagree

Legend: 1 – 1.49 Strongly Disagree, 1.5-2.49 Disagree, 2.5-3.49 Neutral, 3.5-4.49 Agree, 4.5-5 Strongly Agree

Meanwhile, the statement "I am willing to try purchasing online agricultural products" obtained a mean score of 3.37, which fell under the Neutral category. This indicated that while some farmers showed interest in digital purchasing, others remained hesitant, possibly due to a lack of experience, trust, or digital literacy.

The item "I am satisfied with my online purchases" also received a Neutral rating with a mean score of 3.02, reflecting uncertainty and inconsistency in user satisfaction when it comes to buying agricultural products online. This may imply that while online purchases were attempted, they did not always meet expectations.

Interestingly, the item "It will take time for me to think before I purchase the product, I need to watch a few more advertisements" had a mean score of 3.67 (agree), which was considered a slight preference in purchasing. This implied that advertisements had some influence on purchasing behavior but not immediate action, indicating that farmers needed further reassurance and multiple exposures to product information.

On the other hand, the items "I end up buying the product as soon as I watch the social media advertisements" and "The online advertisements are misleading and I end up buying the wrong products" were both rated Disagree, with mean scores of 2.40 and 2.37, respectively. The results showed that farmers did not really tend to buy on impulse, but were worried about trusting ads. When ads were misleading, it often left them feeling unhappy and led to wrong purchasing decisions.

Digital literacy and competency in using e-commerce platforms are essential for successful participation in online markets. Farmers with knowledge of using smartphones, accessing apps, and processing digital payments are more confident and efficient in transacting online (Kebede et al., 2021).

The study by Xiao (2021) emphasized that the rapid development of new-generation information technology will be a key trend in the development of agricultural production and marketing information services, which is increasingly linked to the use of gadgets by farmers. This is further strengthened by the study of Maddela et al. (2021), which shows a positive review of the modernization of agriculture in Isabela.

XII. Summary, Conclusions and Recommendations

This chapter presents the summary of findings, conclusions, and appropriate recommendations in relation to the research conducted.

12.1 Summary or Findings

1. The respondents were composed of diverse demographic characteristics in terms of sex, age, farm size, educational attainment, internet source, social media used, gadget owned, and screen time. These characteristics provided context for understanding the variations in their digital readiness and purchasing behaviors.

2. The level of digital literacy as to access, learning, and using social media apps indicates the e-readiness of the farmers, and it turned out to be varied. While some could operate mobile phones and engage with social media content independently, others required assistance or had limited interaction.
3. The farmers demonstrated varied levels of willingness to engage in online agricultural activities. Many expressed interest in learning how to use gadgets, join online forums, watch agricultural seminars, and transition to e-farming. Their readiness to explore digital tools reflects a growing openness to innovation in agricultural practices.
4. Purchasing preferences among female farmers showed a greater preference for physical stores, yet expressed stronger reactions to advertisements. Younger and more educated farmers were more open to online purchases and showed higher satisfaction. Those with better internet access and use of multiple social media platforms displayed more trust and willingness to engage in online shopping.
5. There are significant differences in the profile of the farmers in terms of purchase preferences in gender, age, and internet connectivity.
6. Significant differences were found in the willingness of farmers based on their profile characteristics. Younger, more educated, and female respondents were generally more willing to use digital tools in agriculture. Access to reliable internet and specific social media platforms also influenced levels of willingness.
7. Significant differences were observed in the respondents' purchasing preferences when they are grouped according to profile.

12.2 Conclusions

In view of the findings, the following conclusions were drawn:

1. The demographic profile of the respondents varies, which means that the answers drawn from the survey questionnaire have differences based on the demographic profile of the respondents.
2. The farmers are ready to embrace ICT in farming.
3. The willingness of the farmers to purchase agricultural products as influenced by social media advertisements is still low. There is, however, a growing trend for farmers to learn how to use gadgets and social media for their agricultural needs.
4. The farmers' preference in purchasing their agricultural needs was still the traditional type - physical stores.
5. There is a significant difference in the readiness of the farmers in e-business when they are grouped according to profile as younger, more educated and women have higher interest to e-business compared to their older male counterpart.
6. Farmers' willingness to adopt digital tools in agriculture significantly varied across demographic profiles, particularly those with better internet connectivity and access to specific social media platforms.
7. Farmers readiness and willingness to e-business significantly influences their purchasing preferences. With improved skills in media use and e-commerce, farmers become more confident and effective in making online purchases, showing that willingness and readiness play a key role in shaping their purchasing preferences.

12.3 Recommendations

Based on the results and conclusions of the study, the following recommendations were given:

1. Improve the quality of the internet in the area, since the farmer's willingness to adopt digital tools varies depending on their profiles and internet connectivity.
2. Encourage suppliers create diversified digital advertisements which cater to different profile of farmers such as age, gender and educational attainment.

3. The farmer's willingness to embrace ICT in farming should be seen as an advantage for the LGUs to develop programs channeled through digital platforms.
4. Accessible list of accredited and legitimate online sellers from various social media platforms to enhance the trust of farmers and encourage them to maximize the use of e-business.
5. Provide product review pages to raise awareness among the farmers in terms of the available products in the online market.
6. Forming social media pages and groups dedicated to farmers is one of the best steps to begin with to establish strong connections among farmers, where the suppliers can also join to showcase their products.
7. Explore how to utilize the business model recommended in this paper.

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