TECHNOLOGY Readiness of Rice Farmers in Compostela Valley: Basis for an Agricultural INTERVENTION

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ABSTRACT

This research focused on evaluating the technological readiness of rice farmers in Compostela Valley and Davao de Oro to develop tailored interventions to support their adoption of agricultural technologies. Using a quantitative design, particularly a descriptive-comparative approach, the researcher gathered data from 60 rice farm owners, selected through a purposive quota sampling technique. The analysis relied on statistical tools such as mean, standard deviation, t-test, and ANOVA to determine the status of farmers' technological readiness. Results showed that farmers displayed a high level of readiness, indicating that they are well prepared. It can be noted that sex and educational attainment do not differ significantly. Whereas age and monthly income significantly impact technological readiness. The study found that experience in farming played a crucial role: the most seasoned farmers exhibited higher levels of inventiveness. In comparison, those with fewer years of experience displayed lower levels of innovation. Furthermore, the level of Technology readiness was moderate, as manifested. These insights suggest that while farmers are generally optimistic and innovative, challenges such as costs, accessibility, and lack of trust hinder their full technological readiness. Efforts to provide better financial support, training, and demonstrations of technology's tangible benefits could help bridge this gap.

KEYWORDS: *Business management, technology readiness, descriptive-comparative, Compostela Valley, Davao de Oro.*

INTRODUCTION

The use of technology in the agricultural sector helps farmers boost their productivity and livelihood (Diao et al., 2016). However, Yap et al. (2023) noted that, despite these benefits, adoption of technology remains low among farmers in developing countries. Similarly, Agussabti et al. (2022) found that low

readiness among small farmers is due to limited literacy and technical mastery of the technology, which hinders their transition from traditional to specialized farming technology. Moreover, Oyetoro (2022) pointed out that most technologies fail due to their complexity, which is difficult for farmers to handle. According to recent research, Filipino farmers face numerous mental, emotional, and financial challenges, including rotting crops (Rivas, 2020) and surplus harvests that go unsold (Madarang, 2021). The study by Calibuso (2021) reported a decline in farmers' pay when this equipment became available, resulting in lower earnings than when they employed traditional methods.

The technology readiness for rice farmers has enabled them to play dual roles as producers and sellers, increasing their profits, expanding their market to include more prospective purchasers, and reducing the need for middlemen and associated expenses (JSL Co., 2017). Additionally, Liu et al. (2023) highlighted that, through technology, rice sellers could sell their products directly to consumers, boosting earnings and profits, opening new trading opportunities, and cutting expenses. Further, technology is designed as an instrumental action to reduce the cause-and-effect relationship in achieving the desired goal.

Results from the study by Thar et al. (2023) revealed that in Myanmar, younger farmers with higher education have greater knowledge and better skills and are likely to embrace mobile apps. They are more inclined to embrace mobile applications in agriculture. Also, younger farmers are generally more technology-ready and are more likely to adopt new technologies than older farmers. This suggests that age plays a significant role in shaping receptiveness to technological advancements, as younger farmers tend to be more familiar with digital tools and more open to innovation, whereas older farmers are often more reliant on traditional farming practices (Ayalew, 2025). The findings of Awang et al. (2021) revealed no significant difference in gender regarding technological knowledge and readiness towards digitalization among accountants. This indicates that factors such as education and professional experience may exert a stronger influence on technological adoption than gender.

A study of readiness to adopt the technology is crucial to ensuring the success of government strategies, which depend on paddy farmers' anticipation and interest in the technology. It is also important to study technologies, as they are widely implemented in the paddy industry and encompass the entire rice cultivation process, according to Masitoh (2023) and Rozana et al. (2023). These technologies in the agriculture industry include tools, processes, methods, and

systems (Khalil, 2000). Furthermore, being technology-ready empowers those in the paddy industry to differentiate their yields through organic certifications and marketing unique cultivars such as Sangyod and Riceberry. Through creative branding, specialized packaging, and narrative-driven approaches, farmers can significantly improve the value of their crops and strengthen their position in a competitive marketplace (Custodio et al., 2019; Worapongpat, 2022)). Moreover, in a consumer context, technology readiness is defined as "people's propensity to embrace and use new technologies for accomplishing goals in home life and work" (Parasuraman, 2000). While technology readiness in rice farmers is broadly defined, there is limited research on how specific socio-economic, cultural, and environmental factors influence farmers' willingness to adopt new technologies. Additionally, some studies highlight technological barriers; further exploration is needed of psychological, financial, and policy-related obstacles that hinder adoption.

The findings of this study will be shared with rice farmers to help them improve the technology readiness of their employees. Results will be presented at national and international conferences for wider dissemination. Further, the author also desires to publish the study in refereed journals; a copy will also be provided to the UIC library for future reference.

Statement of the Problem

1. What is the profile of rice farmers in terms of Age; Sex Education attainment Monthly income; and Experience within agricultural;
2. What is the level of technology readiness as rated by the farmers in terms of Optimism; Innovativeness; Discomfort; and Insecurity;
3. Is there a significant difference in the technology readiness of rice farms personnel when grouped according to profile?
4. Based on the results of the study, what action plan can be proposed?

METHODOLOGY

Research Design. The research study used a quantitative research method, specifically a descriptive-comparative research design. Descriptive design is used to gather information to make accurate predictions about a particular problem or hypothesis. Alarima et al. (2011) examined factors affecting the adoption of sawah technology in Nigeria using descriptive statistics. This approach typically involves gathering data to provide a detailed understanding of current conditions, characteristics, or phenomena, rather than exploring cause-and-effect relationships. This study applied a descriptive

research design to assess how prepared rice farmers in Compostela Valley, Davao de Oro, are to adopt and utilize technology.

Likewise, a comparative descriptive design is used to evaluate differences among the variables being studied (CITE). In this study, the technology readiness of farmers is compared across sex, gender, educational attainment, monthly income, and years of experience.

This study was conducted among selected rice farms in Compostela Valley, Davao De Oro, a province in the Davao Region of Mindanao, Philippines. The region is well known for the variety of farming activities and the rich agricultural environment. A major crop in the Compostela Valley is rice. It is a perfect place to grow rice because of the rich plains and plentiful water supply from irrigation systems and rivers. Farmers combine traditional and modern farming methods, employing mechanical equipment alongside human planting and harvesting.

Respondents of the Study. The study participants were 60 farm owners selected from rice farmers in Davao De Oro who owned one hectare of rice farm. They were chosen using purposive quota sampling. Farmers were selected based on the following inclusion criteria: must be currently working at one of the rice farms in Davao De Oro; must have at least 1 year of experience operating as a rice farmer to ensure they have sufficient insight and knowledge. Rice farmers must voluntarily agree to participate in the study and provide informed consent.

Data Collection. In gathering the information needed for the study, the researcher followed the proper procedures to collect data from the rice farmers. The researcher sought approval from the Dean of Graduate Studies and ethical clearance from the UIC-Research Ethics Committee (UIC-REC). Once permission was granted, the researcher sent a letter to the owners of the identified rice farms requesting permission to conduct the study on their farms. In addition, data collection began after the owner approved it. After approval to conduct the survey, the researcher asked the owner for help in identifying qualified rice farmers for the study.

Once they agreed to participate, they were asked to sign the informed consent form. After they signed the consent form, survey questionnaires were distributed to selected farmers face-to-face. It took 5-10 minutes to complete the instrument. Subsequently, the researcher collected the completed questionnaires,

ensuring that personal data and responses remained confidential. The survey lasted two months. The gathered data were analyzed and interpreted using the appropriate statistical tools. The Data Privacy Act of 2012 was strictly followed. To protect their identity, participant data were coded, shared only with approved study professionals, and stored securely to prevent unauthorized access. Additionally, after the study was over, data were appropriately disposed of in compliance with ethical and regulatory guidelines. Throughout the research process, these steps were intended to protect the privacy, confidentiality, and integrity of the information provided by the rice farmers.

RESULTS AND DISCUSSION

The status of readiness is measured by four indicators: optimism, innovativeness, discomfort, and insecurity. Farm owners demonstrate a moderate level of technical readiness, as shown by the overall mean score of 3.19. Their ingenuity and great optimism indicate a readiness to adopt and use new technologies. However, several obstacles, such as limited funds, the perception that technology is difficult to use, and doubts about its efficacy, may prevent broader use. Interestingly, the technology readiness standard deviation falls between 0.90 and 1.07. Responses with scores below 1.0 are consistent, while those with ratings above 1.0 show more variation in viewpoints.

Table 1
Level of Technological Readiness

Domains/Statements	Mean	SD	Description
Optimism	**3.69**	**0.97**	**High**
Innovativeness	**3.76**	**0.90**	**High**
Discomfort	**2.79**	**1.07**	**Moderate**
Insecurity	**2.54**	**1.06**	**Low**
Overall Mean	**3.19**	**1.00**	**Moderate**

Comparison of the technological Readiness of farmers based on their profiles. The tables present the results of the statistical analysis examining significant differences in rice farmers' technological readiness across its key dimensions (optimism, innovativeness, discomfort, and insecurity), specifically by sex, age, monthly income, and years of farming experience.

Generally, differences in optimism, innovativeness, and insecurity were not statistically significant ($p>.05$), although males reported slightly higher

scores across the dimensions. This comparable level of optimism, innovativeness, and insecurity supports the conclusion of Aznar-Sánchez et al. (2020) and Thorsøe et al. (2019) that in some situations, both men and women are identified as active adopters. However, discomfort shows a significant difference in favor of females ($p<.05$). This suggests that males experience greater discomfort with technology adoption than females do. As Kennedy and Bouis (2013) noted, women's greater adoption of technology may result in higher labor demands and less time for additional household responsibilities (including child care, gathering firewood, and collecting water.

Given the contradictory findings of the current analysis on farmers' age and gender, it remains difficult to determine the true influence of these characteristics on innovation adoption. In fact, conflicting results have been reported in various studies on the association between farmers' acceptance of innovations and age. Some research indicates that older farmers are more likely to adopt new ideas (García-Cortijo et al., 2019). Other studies emphasize the role that younger farmers play in promoting agricultural innovation (Bianchi et al., 2022).

Regarding Monthly Income, the results indicate no significant difference across all four dimensions of technological readiness. This suggests that the income alone does not substantially affect the farmer's optimism, innovativeness, discomfort, or insecurity.

Moreover, regarding innovativeness, rice farmers differ significantly in years of farming experience, whereas other dimensions did not show statistical significance. The results indicate that those who have been in the field the longest are the most innovative. This further implies that experience can shape a farmer's openness to new ideas and practices. Finally, despite differing views in the literature, it has been found that farm size and years of experience also affect the innovation process.

Recent studies indicate that farm size can influence the rate at which farmers adopt innovations and new technologies. Larger farms often have more financial resources to invest in advanced technologies, while smaller farms may be more flexible and better able to adjust their operations more quickly to changing market conditions and consumer preferences (Llewellyn & Brown, 2020; Kendall et al., 2022). Regardless of size, innovation is vital to maintaining competitiveness, as farmers must continuously improve their production methods and management practices to keep pace with evolving market demands

and technological developments (Nybom et al., 2021; Judith et al., 2021). The result also validated the proposition of Aznar-Sánchez et al. (2020), and Thorsøe et al. (2019) affirm that both men and women can be active adopters of innovation, depending on the context. It implies that innovations are often evident, and these factors are key drivers of technology readiness in rice cultivation.

Table 2

Tukey Post Hoc Result for Innovativeness by Years of Farming Experience

Dimension	Lowest Mean Group	Middle Group	Highest Mean Group	Pattern Observed
Innovativeness	11–20 yrs (3.33)	21–30 yrs (3.76); <10 yrs (3.90)	>30 yrs (3.94)	U-shaped trend based on experience

The post hoc analysis in Table 5 shows that farmers with 11–20 years of experience have a noticeably lower level of innovativeness than those with less than 10 years, 21–30 years, or over 30 years of experience. Interestingly, the most innovative group is the most seasoned farmers, closely followed by those newer to farming. This implies that new farmers are enthusiastic and open to experimentation, and highly experienced farmers are wiser, more knowledgeable, and have refined their strategies over time. Farmers with moderate experience (11–20 years) may be more cautious or follow traditional practices, which may affect their openness to innovation. These findings resonate with contemporary investigations suggesting that the embrace of innovation is shaped by more than just tenure in the field; it is also driven by behavioral traits, a focus on learning, digital proficiency, and information accessibility. Agricultural producers who proactively pursue, assess, and implement new expertise are more likely to adopt breakthroughs and technological advances in the farming sector (Rizzo et al., 2024; Li et al., 2024; Li et al., 2025).

Proposed Action Plan

Issues	Objectives	Action/Intervention	Target Group	Responsible Agency	Time Frame	Expected Outcome
Technology Training	Increase technological innovativeness	Hands-on training workshops	Farmers with 11–20 years experience	DA, LGU Agricultural Offices	Quarterly	Improved tech adoption and innovativeness
Farmer Support	Reduce discomfort in tech use	Develop easy-to-understand manuals; deploy local tech support	Male farmers	Agricultural Extension Workers	6 months	Reduced tech-related discomfort
Youth Engagement	Strengthen peer learning	Establish farmer mentor programs	New & experienced farmers	Cooperatives, NGOs	1 year	Enhanced farmer-to-farmer tech diffusion
Knowledge Transfer	Boost confidence and reduce insecurity	Showcase success stories via community meetings and radio	All farmers, especially those with <10 years experience	DA, Local Media	Ongoing	Improved trust and optimism in technology
Technical Support	Make tech affordable and accessible	Provide subsidies or loan programs for agri-tech tools	All income levels, esp. low-income	DA, Financing Institutions	Annually	Increased affordability and access to tools

CONCLUSION

The rice farmers' strong educational backgrounds, stable incomes, and extensive experience suggest a high potential for adopting agricultural technologies. Their capacity to understand, invest in, and benefit from innovation makes them an ideal target group for technology-driven interventions and support programs. The level of technology readiness of rice farmers in Compostela Valley and Davao de Oro is moderate, interpreted as fairly evident, indicating that farmers generally have limited ability to use technology and need training. However, optimism and innovativeness garnered high category mean scores, indicating they are evident. Rice farmers exhibit high optimism and a strong willingness to adopt new technology in rice cultivation.

Farmers face limited technical support, high production costs, and difficulty using the technology. Addressing these issues through better support, cost reduction, and user-friendly solutions can improve technology adoption. Additionally, among low-rated rice farmers, confidence in the effectiveness of current agricultural technologies is low, with many doubting their ability to increase production or surpass human capabilities. This suggests that, without clear evidence of its benefits, rice farmers may be hesitant to adopt such technology. To encourage technology adoption, it is crucial to demonstrate the tangible advantages through real-world examples and success stories. Both

males and females show similar levels of optimism, innovativeness, and insecurity towards agricultural technology. However, males report significantly more discomfort, indicating a need for targeted support to address their challenges in adoption. The data reveal a U-shaped relationship between innovativeness and years of experience. Farmers with 11–20 years of experience show the lowest levels of innovativeness, while those with fewer than 10 or more than 30 years of experience exhibit higher levels. This suggests that both new and highly experienced farmers are more open to innovation, whereas those with moderate experience may face challenges or be less motivated to adopt new technologies. To enhance innovation, efforts could focus on supporting farmers with 11–20 years of experience.

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