

Mobile Platform Capabilities and Agricultural Success: Empirical Evidence from Sunflower Farmers in Tanzania

Zarina A. Shuma

Business School

University of Dar es Salaam, Tanzania

Email: arinashuma@gmail.com

Tumsifu Elly

Business School

University of Dar es Salaam, Tanzania

&

Ulingeta Mbamba

Business School

University of Dar es Salaam Tanzania

Abstract

This study examines the impact of mobile platform capabilities on agricultural success among sunflower farmers, drawing on Human Capital Theory and Diffusion of Innovation Theory. It highlights the roles of farmers' innovativeness, technical skills, and personal relationships in driving their agricultural success. Survey data collected from sunflower farmers were analyzed using Structural Equation Modeling (PLS-SEM). The findings indicate that the three aspects of mobile platform capabilities (innovativeness, technical skills, and personal relationships) positively and significantly influence the success of sunflower farming. These results suggest that mobile technologies enhance farmers' abilities to innovate, improve their skills, and foster stronger networks, all of which contribute to greater agricultural success. The study recommends that farmers be given further support and training to leverage mobile platforms effectively. For policymakers and practitioners, the findings highlight the importance of incorporating mobile technologies into agricultural policies and development initiatives to boost productivity. This study inspires future researchers to examine other economic sectors, methodological approaches, and contextual settings. To deepen their understanding of the broader impact of mobile platforms.

Keywords: *Mobile platform capabilities and Agricultural success in Tanzania*

Introduction

Studies on the determinants of farmers' success have long been a key focus in strategic management and remain highly relevant in agriculture. The existing literature has explored factors influencing farmers' success, including attention to internet-based determinants (Reddy, 2022); however, there is no clear framework connecting mobile platforms to farmers' success. This issue is particularly relevant for sunflower farmers, as research on mobile platform usage and its impact on their success remains limited. While the use of mobile platforms varies across economic sectors (Stallkamp & Schotter, 2021), mainly due to sector-specific characteristics (Gawer, 2021), there is a lack of studies examining how these platforms influence sunflower farmers' success, particularly in developing contexts such as Tanzania.

Consequently, research on mobile platform usage has increasingly shifted its focus from individual-level technological tools to firm-specific applications (Stallkamp & Schotter, 2021). Mobile platforms consist of digital tools and applications that enable communication, information exchange, and service delivery. These platforms facilitate the integration of knowledge across individual, group, and community levels, allowing users to collaborate, share expertise, and enhance decision-making and productivity (Pejić Bach et al., 2023). Stallkamp and Schotter (2021) contend that mobile platforms offer unique value, particularly for farmers, which is not found in other internet-based applications. Additionally, mobile platforms empower farmers to engage with agricultural experts to perform specialized tasks and improve their operational efficiency (Emeana, Trenchard, & Dehnen-Schmutz, 2020; Kamal & Bablu, 2023).

The importance of mobile platforms is widely recognized, yet the literature reveals inconsistent findings regarding certain aspects of mobile platform usage and its relationship to individual success in various activities (Emeana et al., 2020). One such variable is individual innovativeness, which has produced conflicting results in studies on its impact on success. While some research indicates a strong link between innovativeness and success (Abbas et al., 2020), others report a weaker relationship (Lam, Nguyen, Le, & Tran, 2021). Kapoor et al. (2021) highlight the significance of users' technical skills, but do not directly connect them to individual success. Additionally, although relational capabilities are acknowledged as critical to success, most studies do not specify which types of relationships influence success (Lam et al., 2021). Furthermore, individual capabilities for deploying mobile platforms may differ from organizational ones. Suggesting that studies focusing on organizations, particularly in developed economies, may not fully apply to individual success in agricultural activities, especially sunflower farming in developing countries like Tanzania. Unlike organizational success, individual success in sunflower farming may rely more on the ability to adapt to change and leverage new features offered by mobile platforms. These abilities include

product innovation, skills for effective mobile platform use, and the capacity to build personal relationships (Ali, Hao, & Aijuan, 2020; Miguel, De-Pablos-Heredero, Montes, & García, 2022).

Building on the aforementioned background, this paper explores the influence of mobile platform capabilities on the success of sunflower farmers in Tanzania. Specifically, it examines how farmers' innovativeness, personal relationships, and technical skills contribute to the success of sunflower farming activities. Theoretically, the paper enhances our understanding of farmers' capabilities in the context of mobile platform usage and sunflower farming within a developing economy. Empirically, the study provides valuable insights into how these capability dimensions, namely innovativeness, usage skills, and personal relationships, are linked to farming success. Exploring this relationship allows it to offer actionable recommendations for strengthening farmers' capabilities to effectively utilize mobile platforms to improve their farming practices (Ali et al., 2020). These insights may contribute to the development of policies that foster the enhancement of key capabilities, including technical skills, interpersonal relations, and innovativeness, that enable farmers to better leverage platforms and boost agricultural success.

Additionally, agricultural production has historically yielded low profits due to factors such as outdated farming techniques, limited value addition, and price volatility in the local market (Felipe, Leidner, Roldán, & Leal-Rodríguez, 2020). These challenges have led many farmers to pursue alternative livelihoods. Ariong, Okello, Otim, and Paparu (2023) further emphasize that a lack of sufficient agricultural education and training in rural areas impedes success. Without knowledge of modern farming techniques, many Tanzanians may not perceive agriculture as a viable or lucrative career option. In such an environment, farmers must rely on their capabilities to learn and adapt farming techniques from diverse sources (YuSheng & Ibrahim, 2020).

In contrast, sunflower customers demand high-quality products that meet industry standards for purity, consistency, and nutritional value (Dhakal, Paudel, Pokharel, & Koirala, 2024). As health-conscious consumers become more knowledgeable about the benefits of sunflower products, they are more likely to prioritize quality and sustainability in their purchasing decisions. To meet these expectations, farmers must possess the necessary capabilities to implement best farming practices, quality control measures, and effective post-harvest handling techniques to consistently deliver products that align with customer needs (Ariong et al., 2023). These capabilities are crucial for ensuring that farmers can meet the market demand, increase product marketability, and build consumer loyalty (Li & Zhang, 2024). Additionally, developing these capabilities enables farmers

to access premium markets, resulting in higher profit margins and long-term success (Ariong et al., 2023). Despite the crucial role that capabilities play in agricultural success, studies on their impact in Tanzania remain limited. Moreover, no research has specifically focused on farmers' platform-usage capabilities and sunflower farming success in the region, highlighting a significant gap that warrants further investigation.

Objectives of the Study

The main objective of this study was to examine the impact of mobile platform capabilities on agricultural success among sunflower farmers in Tanzania. To address this main objective, the following hypotheses were tested:

1. **H1:** There is a positive relationship between farmers' relational capabilities and the success of sunflower farming.
2. **H2:** There is a positive relationship between innovativeness and the success of sunflower farming, and
3. **H3:** There is a positive relationship between technical skills and the success of sunflower farming

Review of Literature

Scholars in strategic management have introduced various theoretical frameworks to explain differences in success. Two of the most widely recognized frameworks are Human Capital Theory (HCT) by Gary Becker (1965) and Diffusion of Innovation Theory (DIT) by Rogers (1961). The HCT emphasizes the importance of education, training, skills, and experience in determining an individual's potential for success (Aboobaker, 2020), while DIT focuses on how new ideas, technologies, and practices spread within a society, enhancing success (Pinho, Franco, & Mendes, 2021). The DIT suggests that adopting innovative practices through digital technologies enhances success (Pinho et al., 2021), while HCT highlights the role of individual knowledge, technical expertise, and personal relationships in shaping success (Aboobaker, 2020). These theories provide valuable perspectives: HCT underscores the importance of personal relationships and skills, while DIT identifies individual innovativeness as a key driver of success.

The tools and resources provided by mobile platforms are essential for success (Albayrak, Rosario González-Rodríguez, Caber, & Karasakal, 2023), but they alone do not guarantee positive outcomes. The key to agricultural success lies in the farmer's ability to effectively use these platforms, adopting and applying innovative practices in a strategic manner (Abdurrahman,

Gustomo, & Prasetio, 2024). These platforms, including those initiated by Vodacom such as M-kulima in Dodoma and Singida, also play a crucial role in fostering personal relationships, enabling farmers to connect with suppliers, buyers, and other key stakeholders and enhance collaboration and knowledge-sharing, ultimately contributing to more informed decision-making and market access (Albayrak et al., 2023). The development of technical skills allows farmers to fully leverage mobile platforms, improving productivity and enabling them to seize opportunities, all of which collectively drive greater success in their agricultural ventures (Kapoor et al., 2021).

Initially, studies focused on the possession of assets and their direct link to firm success, emphasizing that owning the right technology was key to achieving competitive advantage (J.-h. Kim, Seok, Choi, Jung, & Yu, 2020). However, by the 2010s, attention had shifted toward the capabilities required to effectively deploy and leverage those assets, particularly those embedded in individuals within the organizations (Ferreira & Coelho, 2020). This change in focus recognized that having access to technological assets alone was not enough; rather, the capability of individuals to strategically utilize these resources ultimately determines success. For instance, Ferreira and Coelho (2020) argued that possessing the right assets does not guarantee success, as these assets may remain static and unproductive. Instead, success is more likely for individuals who possess the right capabilities to strategically utilize available opportunities. Thus, it is not merely the possession of technologies but the ability to adapt, innovate, and integrate these tools into practical solutions that truly drives success in agriculture (B. Kim, Yoo, & Yang, 2020). This highlights the critical role of human capabilities in translating technological potential into tangible outcomes that improve farming practices.

Various studies have identified key elements of capabilities that contribute to success, such as the effective use of technology, including mobile platforms and digital tools, which enhance productivity and align with modern demands (Abdurrahman et al., 2024; Ali et al., 2020). Additionally, innovation plays a critical role, enabling the development of new ideas, approaches, or products that provide a competitive edge in dynamic environments (Ali et al., 2020). Furthermore, building strong relationships with key stakeholders allows individuals to access valuable resources, knowledge, and collaboration opportunities, all of which are essential for success (MacDonald, Clarke, & Huang, 2022). In sunflower agriculture, capabilities are more closely linked to individual farmers, who are responsible for making strategic decisions, building resources, and developing competencies to ensure their success. To thrive, these farmers must proactively cultivate

their own capabilities to enhance their effectiveness in the agricultural sector (MacDonald et al., 2022). Specifically, in the context of mobile platform usage, these capabilities are defined by farmers' knowledge and skills, which are deeply rooted in their innovativeness, personal relationships, and technical expertise (Ferreira & Coelho, 2020). For Tanzanian sunflower farmers, these capabilities are particularly important, as many lack formal training in internet technologies and must navigate an ever-evolving technological environment (Khan, Ray, Zhang, Osabuohien, & Ihtisham, 2022).

In this dynamic environment, farmers' capabilities must continuously evolve to meet emerging challenges and seize new opportunities (Khan et al., 2022). This evolution depends on their ability to take proactive steps toward capacity-building, which allows them to access essential resources and build valuable relationships through networking and collaboration (Moeenian, Khamseh, & Ghazavi, 2022). Capacity-building efforts may include training programs, community support, and partnerships with agricultural experts to enhance technical skills, strengthen personal relationships, and expand knowledge (Musungwini, Gavai, Munyoro, & Chare, 2023). Therefore, the three core concepts of innovation, personal relationships, and technical skills are crucial for developing farming capabilities, especially for sunflower farmers in Tanzania. These concepts will be further explored to understand their impact on farmers' success in leveraging mobile platforms such as M-Kulima and improving agricultural productivity, to improve agricultural productivity and navigate the evolving technological and agricultural landscape in Tanzania.

Relational capabilities are critical for determining the acquisition, use, and sharing of resources and information and monitoring socio-economic and environmental conditions (Ngugi et al., 2010). These capabilities help reduce uncertainty by facilitating the flow of information and lowering the cost of interactions among individuals, such as buyers, suppliers, experts, and other agricultural stakeholders. This can ultimately lead to agricultural success (Skaalsveen et al., 2020). Zohdi et al. (2013) found a significant positive relationship between relational capabilities and performance (Mikalef, Krogstie, Pappas, & Pavlou, 2020). The literature identifies three types of relationships: individual contacts, communication with government and other institutions, and business networks (Capriotti, Zeler, & Camilleri, 2021; Sashi, 2021). While these studies highlight the importance of relational capabilities in achieving success, they focus primarily on firms and do not specifically address the types of relational networks that influence success in sunflower farming. Given the individualistic nature of sunflower farmers, many farmers may lack the institutional support or capacity to form formal relationships, which is why these existing studies

may not fully capture the role of relational capabilities in sunflower farming within the context of Tanzania.

According to Ali et al. (2020), innovativeness refers to the ability to develop new ideas, introduce novel ways of doing things, and apply creativity in operations or product development that provides a competitive edge in dynamic environments. Innovativeness allows farmers to creatively incorporate ideas from customers and competitors, resulting in the creation of new and unique products (Lone & Baba, 2024). Sarkar, Hazhar, Rawa, and Rezhwan (2024) suggest that in a competitive environment where substitutes are abundant and many sellers offer similar products, the ability to innovate becomes crucial for achieving success by differentiating products and meeting evolving consumer needs. Similarly, Kamyab et al. (2023) found that introducing highly innovative products leads to increased sales, underscoring the importance of innovation for organizational success. However, some studies, such as those by Nguyen, Nguyen, and Nguyen (2023) and Iddris, Mensah, Adjanor-Doku, and Yaa Akyiaa Ellis (2025), report weak or insignificant correlations between innovativeness and success. Researchers argue that innovative enterprises may struggle to profit from their innovations due to high development costs (Iddris et al., 2025), while imitators can easily replicate and benefit from these efforts. For instance, Nguyen et al. (2023) demonstrated that while innovation may not directly enhance the operational performance of small and medium-sized enterprises, it significantly improves product quality.

However, in Tanzania, innovativeness in sunflower farming is highly relevant for three key reasons. First, there is a lack of studies on innovation and success within sunflower farming, highlighting a critical research gap that must be addressed to better understand how innovation impacts the success of sunflower farming in Tanzania. Second, as customers increasingly demand higher-quality sunflower products (Adeleke & Babalola, 2020), farmers must innovate to meet these expectations and comply with market standards (Reddy, 2022). Innovations in cultivation techniques, processing methods, and packaging can improve product appeal and customer satisfaction, helping farmers maintain a competitive advantage and effectively meet consumer needs (Reddy, 2022). Third, as competition intensifies among sunflower farmers competing for the same customer base, innovation becomes vital, particularly in packaging design and sales strategies (Shodiya, Akintaro, & Olopade, 2024). Creative and visually appealing packaging can improve product appeal, enhance product differentiation, and distinguish their offerings in the marketplace, and ultimately lead to greater success (Sarkar et al., 2024).

Technical skills in the context of mobile platform usage among sunflower farmers refer to the ability to navigate and use mobile applications effectively for tasks such as accessing markets, receiving weather updates, and managing crop information (Bernacki, Greene, & Crompton, 2020). These skills enable farmers to harness technology to increase productivity, make informed decisions, and improve overall farm performance. According to Hargittai, Piper, and Morris (2019), workers' technical skills are closely linked to organizational marketing performance, as these capabilities allow individuals to execute tasks efficiently, adapt to evolving technologies, and contribute to more effective decision-making. In turn, these enhance an organization's ability to market its products successfully. However, empirical findings by Pramono, Sondakh, Bernarto, Juliana, and Purwanto (2021) in Indonesia show no significant relationship between technical skills and SMEs' success. This may be due to various factors, such as a lack of infrastructure to support the effective use of these skills, insufficient training, or the possibility that other factors, such as market conditions or managerial capabilities, have a more significant impact on success than technical skills alone (Hendrawan, Chatra, Iman, Hidayatullah, & Suprayitno, 2024).

Hendrawan et al. (2024) and Hargittai et al. (2019) found that employees' skills directly influence new product development and output volume, which in turn impact business performance. While these studies highlight the importance of employees' skills for organizational success, they do not specifically examine how the availability and application of technical skills contribute to success in the agricultural sector, particularly in sunflower farming. In developing countries like Tanzania, sunflower farmers have traditionally depended on basic hand tools such as hoes, machetes, and manual plows (Lyakurwa, 2021). A lack of advanced technical skills can prevent the adoption of modern agricultural techniques. These basic tools are inefficient for large-scale farming because they require more labor and time, making farming operations more labor-intensive and less productive (Coggins et al., 2022). In contrast, modern farming practices such as using machinery like tractors, seeders, irrigation systems, proper harvesting methods, and effective packaging require technical expertise to operate (Xu, Meng, Li, Chen, & Wang, 2024). Relying on outdated tools limits productivity, reduces efficiency, and hampers farmers' ability to scale their operations, ultimately affecting their success in sunflower farming (Kom et al., 2022).

Methodology

The study adopted a positivist philosophy, employing a quantitative approach and an explanatory design to objectively examine cause-and-effect relationships. The empirical setting for this study was the Dodoma and Singida regions in Tanzania, a developing country in Africa. As is common in many developing nations, Tanzanians' motivation to engage in agricultural activities has been hindered by limited access to essential resources such as modern technology, quality seeds, fertilizers, and machinery. A structured online survey questionnaire was purposively distributed to sunflower farmers in Dodoma and Singida, Tanzania, where over 74% of sunflower farmers are registered users of the M-kulima mobile platforms (Kisanjara & Matimbwa, 2024). To ensure the accuracy of the data, only farmers with at least three years of experience using mobile platforms were selected, as studies suggest that this level of experience allows for more reliable insights into usage and performance (Fox, Mooney, Rosati, & Lynn, 2021). Sunflower farmers were selected as the units of analysis due to their knowledge and engagement with mobile platforms in their agricultural activities. A stratified simple random sampling technique and a random number generator were used to select respondents, who were then contacted for self-administered questionnaires.

According to Berinsky, Margolis, Sances, and Warshaw (2021), self-administered questionnaires are appropriate as they allow respondents to provide their answers independently, reducing interviewer bias and enabling a more accurate collection of data from a larger sample size. In line with the requirements for Structural Equation Modeling (SEM), which typically necessitates a sample size of 200 or more observations (Hair et al., 2010), a total of 368 farmers were included in this survey, representing approximately 89% of the total sunflower farming population in the two regions. After data cleaning, 358 valid responses were analyzed. SEM was then used with Smart PLS software to test the hypothesized relationships among variables within the designated theoretical framework. SEM for this survey is appropriate because it allows for the analysis of complex relationships among variables, capable of handling large datasets and non-normal data distributions while providing robust results for testing theoretical models (Russo & Stol, 2021).

Scholars have utilized both financial and non-financial measures to assess success in technological usage (Kori, Muathe, & Maina, 2020; Monteiro, Vale, Leite, Lis, & Kurowska-Pysz, 2022), as these metrics provide a comprehensive evaluation of the economic impact and broader organizational or user-level outcomes (Kori et al., 2020). However, in developing economies, objective measures of success are often difficult to obtain, as individuals frequently lack proper record-keeping due to limited access to formal education and inadequate business management training (Monteiro et al., 2022). Furthermore, the lack of infrastructure and resources exacerbates the challenge, making it difficult for individuals and businesses to implement efficient record-keeping systems and maintain accurate financial data (Moyo, Litshani, Mashau, & Mohale, 2021). To address these challenges, survey questionnaires capturing perceived financial success

were used to measure the dependent variable, farming success. These measures, adapted from Govindarajan and Gupta (1992) and Hoque (2004), included items such as increased sales, customer satisfaction, business growth, cash flow from operations, market share, and increased profits.

The seven-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree), was used to measure the variables, as it provides a balanced range of responses, allows for more detailed feedback, reduces central tendency bias, and improves the findings' reliability and validity (Kusmaryono, Wijayanti, & Maharani, 2022). The study consists of two types of variables: dependent and independent variables. The independent variables include innovativeness, personal relations, and technical skills. Innovativeness (INV) was measured using modified instruments from Akman and Yilmaz (2008) and Issack, Charles, and Selomon, (2016), including items such as emphasis on better product design, resource improvement, the impact of platforms on improvements, the creation of new production lines, work system enhancements, and quality improvement through mobile platforms. Personal relations (PRL) were assessed using the Peltier and Naidu (2012) instrument, which focused on relationships with suppliers, customers, experts, government officials, and other farmers in the agricultural sector. Farmers' technical skills (TS) were measured using the Bacon (2001) instrument, with factors such as initiative, training, expertise, talents, teamwork, experience, competence, and technical know-how. Scholars have relied on both financial and non-financial measures to explain success; however, due to poor record-keeping among farmers, obtaining financial data is challenging. As a result, perceived success (SCC) was used to measure the dependent variable, with measures adopted from Selomon, Urassa, and Allan (2016), conceptualized as increased sales, market share, cash flow from operations, business growth, customer satisfaction, agricultural expansion, and increased profits.

Findings of the Study

The hypotheses that were tested in this study included: **H1**: *There is a positive relationship between farmers' relational capabilities and the success of sunflower farming*, **H2**: *There is a positive relationship between innovativeness and the success of sunflower farming* and **H3**: *There is a positive relationship between technical skills and the success of sunflower farming*. Findings are displayed in Table 1. The reliability of the variables was evaluated using factor loadings, Cronbach's Alpha, composite reliability, and the average variance extracted (AVE). The reliability of the indicators was evaluated based on their loadings, all of which exceeded the minimum threshold of 0.5. Loadings below 0.7 are generally recommended for removal only if doing so improves the Average Variance Extracted (AVE) or Composite Reliability (Hair, 2022). Since both criteria were met (i.e., AVE values above 0.5 and Composite Reliability values above 0.7; see

Table 1), all items were retained in the final model, confirming their reliability (Napitu, Simanjuntak, & Amal, 2021). Additionally, Cronbach's Alpha and Composite Reliability values supported the reliability of the constructs. Convergent validity, assessed through AVE, showed that all values were greater than 0.5, confirming the internal consistency of the reflective instruments (Grymowicz et al., 2020).

Table 1. *Outer model results*

Items	Mean	SD	Loadings	Cronbach's Alpha	AVE	CR
Innovativeness				0.816	0.521	0.867
INV1	4.589	1.500	0.694			
INV2	4.535	1.433	0.714			
INV3	4.575	1.387	0.732			
INV4	4.604	1.273	0.756			
INV5	4.742	1.322	0.741			
INV6	4.698	1.343	0.692			
Technical Skills				0.862	0.55	0.895
TS1	4.367	1.435	0.744			
TS2	4.658	1.429	0.791			
TS3	4.524	1.300	0.625			
TS4	4.545	1.460	0.802			
TS5	4.716	1.359	0.754			
TS6	4.68	1.460	0.765			
TS7	4.738	1.342	0.695			
Personal Relations				0.765	0.587	0.85
PRL1	4.818	1.342	0.530			
PRL2	5.135	1.221	0.727			
PRL3	5.116	1.268	0.809			
PRL4	5.229	1.219	0.776			
PRL5	5.145	1.296	0.750			
Farming Success				0.798	0.505	0.857
SCC1	5.029	1.235	0.517			

SCC2	5.451	1.535	0.784
SCC3	5.164	1.361	0.825
SCC4	5.058	1.339	0.752
SCC5	4.582	1.286	0.697
SCC6	5.044	1.398	0.647

From Table 1, convergent validity was confirmed as the Average Variance Extracted (AVE) values exceeded 0.5, indicating that each construct explains more than half of the variance in its indicators (Hair, 2022). Discriminant validity was assessed using both the Fornell–Larcker criterion and the Heterotrait-Monotrait Ratio (HTMT). The HTMT values for all three constructs were below 0.85, indicating sufficient discriminant validity for reflective variables (Napitu et al., 2021). The highest HTMT index was 0.697 (see Table 2). Additionally, the Fornell–Larcker criterion showed that the square root of the AVE for each construct was greater than the correlations between that construct and all other constructs (see Table 3). With both criteria satisfied, we confirm that the constructs exhibit satisfactory discriminant validity, ensuring the robustness of the measurement model.

Table 2: Discriminant Validity through Heterotrait-Monotrait Ratio

Variables	Farming Success	Innovativeness	Personal Relations	Technical Skills
Farming Success				
Innovativeness	0.697			
Personal Relations	0.678	0.347		
Technical Skills	0.604	0.542	0.446	

Note: Heterotrait–monotrait (HTMT) ratio values are less than 0.85

Table 3: Discriminant validity through the Fornell-Larcker criterion

	Farming Success	Innovativeness	Personal Relations	Technical Skills
Farming Success	0.711			
Innovativeness	0.576	0.722		

Personal Relations	0.513	0.270	0.707	
Technical Skills	0.521	0.455	0.341	0.742

Note: square roots of AVE are > the underlying values, indicating that discriminant validity was established

Path Analysis

The structural model analysis begins by evaluating potential multicollinearity through the variance inflation factor (VIF) (Napitu et al., 2021). As shown in Table 4, all VIF values are below 3, ranging from 1 to 2.090, which indicates no multicollinearity issues (Kock, 2015). Next, a bootstrapping procedure with 10,000 resamples was performed to calculate t-values and percentile-based confidence intervals. The coefficient of determination (R^2) for the dependent variables, along with the magnitude and effect size (f^2) of the standardized regression coefficients, were assessed (Hair et al., 2017). The results are presented in Table 5 and Figure 1.

Table 4: Structural Model Assessment Results

Hypothesis	Path	SD	T-values	P-values	f^2	Q^2	95CI	VIF	Supported
H1	0.379	0.061	6.17	0.000	0.228	0.105	0.268,0.474	1.286	Yes
H2	0.330	0.056	5.91	0.000	0.192	0.120	0.231,0.402	1.154	Yes
H3	0.236	0.059	3.994	0.000	0.085	0.109	0.145,0.337	1.349	Yes

Based on Table 4, the path coefficients for the hypotheses are greater than zero, indicating that the independent variables have a positive influence on the outcome variable (Russo & Stol, 2021). Hypothesis 1 (H1) examines the relationship between innovativeness (INV) and farming success (SCC). As shown in Table 4 and Figure 1, the path coefficient is 0.379 with a significance level of $p < 0.000$ and a t-value greater than 1.96, indicating a significant positive relationship (Kisanjara & Matimbwa, 2024) between innovativeness and farming success. Hypothesis 2 (H2) examines a significant relationship between personal relations (PRL) and SCC, with a path coefficient of $\beta = 0.33$, $p < 0.05$, and $t > 1.96$, suggesting a significant positive relationship. Hypothesis 3 (H3) predicts a relationship between technical skills (TS) and SCC, with findings revealing a positive

and significant relationship ($\beta = 0.236$, $p < 0.05$, and $t > 1.96$), indicating that technical skills have a significant influence on farming success.

The standard deviation values are below three, suggesting that respondents generally agree on the positive impact (Hendrawan et al., 2024) of mobile capabilities on agricultural success. The t -values, which exceed 1.96 at a 5% significance level, confirm the statistical significance of the relationships. The p -values below 0.05 further confirm the significance at the 5% level. The f^2 values, all above 0.02, indicate that the effect sizes are above the threshold for a small effect. F^2 measures the contribution of each independent variable to the R^2 values of the dependent variable, as per Hair (2022). The Q^2 values assess predictive relevance, with values greater than zero indicating that the model has predictive relevance for the endogenous constructs (Purwanto & Sudargini, 2021). The 95% confidence intervals (CI) for the path coefficients show that, when the interval does not include zero, the path is considered significant (Napitu et al., 2021). Finally, VIF values below 3 suggest no significant multicollinearity issues (Kock, 2015). Given these favorable indices- significant path coefficients, high f^2 , positive Q^2 , and low VIF, the relationships in the model are considered robust and reliable.

Research Model

The research model developed from the survey data demonstrates that the three aspects of mobile platform capabilities (innovativeness, personal relations, and technical skills) have a positive and significant relationship with sunflower farming success, as shown in Table 4. It can be argued that, strategically, mobile platform capabilities positively and significantly influence sunflower farming success, aligning with the hypothesized relationships and the assumptions of Human Capital Theory (HCT) and Diffusion Innovation Theory (IDT).

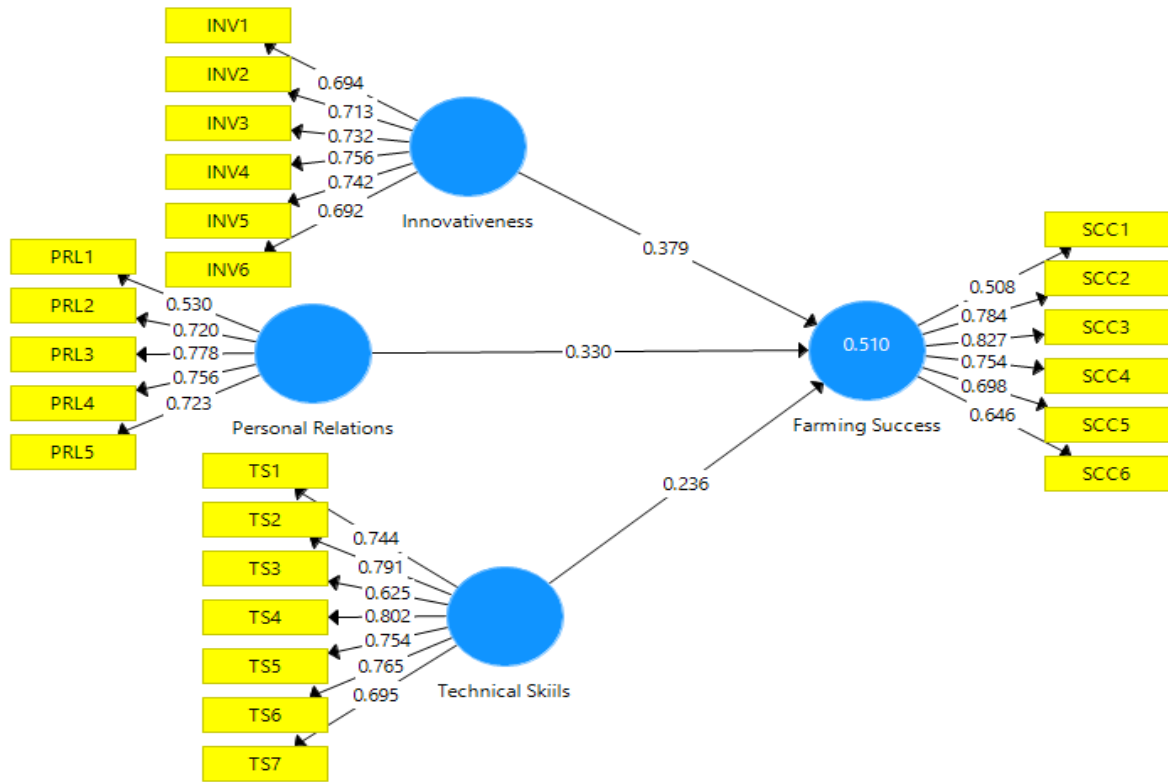


Figure 1: *The Research Model*

Source: Survey Data (2024)

Discussion of the Findings

In sectors like agriculture in Tanzania, where standardized product lines are less common (Mpogole, Dimoso, & Mayaya, 2020), innovation becomes particularly crucial. Many farmers operate as sole producers (Mpogole et al., 2020) and their success heavily depends on their ability to creatively leverage agricultural tools (Musungwini et al., 2023) such as mobile platforms. Consequently, farming success is closely linked to the innovative capacity of farmers to design cost-effective agricultural solutions. While experience is valuable, those with a strong understanding of the sector and the ability to innovate are better positioned to outperform their competitors.

The study's findings reveal that sunflower farmers' innovativeness (INV) has a positive and significant impact on farming success (SCC), supporting existing literature that underscores the role of innovativeness in achieving success. Specifically, we suggest that innovative farmers are better equipped to apply techniques for improved product design, resource optimization, the creation of new product lines, and quality enhancement through the use of mobile platforms. These results align with the findings of Wang and Lin (2021) and Azeem, Ahmed, Haider, and Sajjad (2021), who also identified a significant relationship between innovativeness and success.

However, it is important to note that farmers in Tanzania operate in an economically unstable environment lacking formal institutions to support relationships among farmers and other stakeholders (Mpogole et al., 2020). In such conditions, farmers often rely on personal relationships to access expertise, share information, and secure markets and resources (Mpogole et al., 2020). Specifically, when information about material supplies is limited, personal connections with suppliers and agents help farmers secure the required resources.

This study found a significant positive relationship between personal relations (PR) and farming success (SCC), suggesting that farmers can access and exchange valuable information and resources through collaboration with fellow farmers, suppliers, agricultural experts, and product buyers (Shukla, Kapoor, Gupta, & Arunachalam, 2023). These interactions help farmers develop strategies and tactics necessary to thrive in a dynamic environment. Our findings align with Chang, Shih, and Peng (2022), who highlight that personal relational capabilities promote innovation and value co-creation, where farmers and other stakeholders can jointly create value through cost or revenue benefits.

Farmers' technical skills (TS) were found to have a positive and significant relationship with farming success (SCC), a finding that aligns with previous research showing that individual technical skills directly influence their success (Khayer, Talukder, Bao, and Hossain 2020; Susanto, Rachmadtullah, and Rachbini 2020). This highlights the crucial role of technical skills in enabling farmers to adopt and effectively use new technologies. In the context of mobile platforms, these technical skills become even more important. Mobile platforms can provide farmers with access to valuable information, tools, and resources that enhance their decision-making processes, enable better crop management, and improve overall productivity (Kamal & Bablu, 2023). Farmers

who possess strong technical skills (TS) are better equipped to leverage these platforms, adapting them to their specific farming needs and maximizing their potential benefits. This positive relationship between TS and SCC highlights a need for continuous training, particularly in how to utilize mobile technologies effectively. By enhancing farmers' technical skills in using platforms, they can access real-time data, weather forecasts, market prices, and expert advice, ultimately leading to improved success. Thus, fostering both TS and mobile platform literacy is essential for farmers to remain competitive and thrive in a rapidly evolving agricultural and technological environment.

Conclusions

The findings of this paper suggest that innovativeness (INV), technical skills (TS), and personal relations (PRL) each play a crucial role in driving farming success (SCC). The positive relationship between these variables indicates that innovative farmers (INV), possess strong technical skills (TS), and maintain effective personal relationships are more likely to succeed in their agricultural endeavors. Innovativeness enables farmers to adopt new technologies and practices, enhancing productivity and adaptability. Technical skills (TS) equip farmers with the expertise to implement these innovations and manage their farming operations efficiently. Additionally, personal relations foster collaboration, knowledge sharing, and access to resources, all of which contribute to improved decision-making and agricultural opportunities. These findings imply that for SCC, farmers must focus on developing these three key areas that are innovative (INV), technical skills (TS), and personal relations (PRL) through training, education, and building strong connections with others in the agricultural community.

This paper contributes to the theoretical discourse by applying the Human Capital Theory (HCT) and Diffusion of Innovation Theory (DIT) to sunflower farmers in a developing economy, focusing on how farmers' mobile platform usage capabilities enhance SCC, which sets it apart from most previous studies that have primarily been theoretical. In examining the practical application of these theories, the study offers empirical evidence on how factors such as INV, TS, and PRL contribute to SCC in the context of agriculture. Furthermore, this research is among the few that explore how farmers' mobile platform usage capabilities enhance success, specifically in Tanzania's agricultural sector, providing important insights into how mobile platforms can enhance SCC in regions with limited formal support. The findings bridge the gap between theory and practice, offering valuable insights to policymakers and agricultural practitioners in improving farmers' skills and maximizing the potential of mobile platforms for better SCC.

The findings regarding the significance of capabilities can provide valuable guidance to policymakers, helping them better understand how these factors contribute to the SCC of the agricultural sector. Based on these results, we recommend that the government introduce programs that focus on enhancing farmers' capacities, particularly innovativeness (INV), technical skills (TS), and personal relations (PRL) through specialized training. For instance, in Kenya, the success of flower farmers is partly due to investments in high-quality training and boosting their entrepreneurial capabilities (Cheruiyot, 2022). This approach has been integral to the transformation of the agricultural sector, positioning the country as Africa's leading flower producer. From a practical standpoint, the results carry several important implications for farmers. Firstly, they highlight the critical role that individual capabilities play in achieving success in farming. Secondly, they highlight the value of these capabilities, especially in regions where formal institutions are limited in their ability to support resource mobilization in agriculture. Thirdly, they suggest that farmers should prioritize continuous skill development and foster collaboration within the agricultural community to remain competitive and respond to shifting agricultural demands.

The study focused on mobile platform usage capabilities among sunflower farmers, but it would be valuable to explore this topic in non-agricultural contexts or to examine other crops within agriculture for a broader understanding. Expanding the study of mobile platform usage capabilities beyond sunflower farmers and agriculture is important because it can provide valuable insights into how these technologies impact various sectors. By doing so, we can better understand the broader applicability of these platforms in enhancing productivity, innovation, and success in diverse industries. Additionally, focusing on other crops within agriculture would allow for a comparative analysis of how mobile technologies support different farming practices, potentially revealing sector-specific challenges and opportunities. Such studies can guide the development of tailored interventions and policies that maximize the benefits of mobile platforms across various sectors, ultimately driving economic growth and technological advancement in a wide range of contexts.

References

Abbas, J., Zhang, Q., Hussain, I., Akram, S., Afaq, A., & Shad, M. A. (2020). Sustainable innovation in small and medium enterprises: the impact of knowledge management on

- organizational innovation through a mediation analysis by using the SEM approach. *Sustainability*, 12(6), 2407.
- Abdurrahman, A., Gustomo, A., & Prasetio, E. A. (2024). Impact of dynamic capabilities on digital transformation and innovation to improve banking performance: A TOE framework study. *Journal of Open Innovation: Technology, Market, and Complexity*, 10(1), 100215.
- Aboobaker, N. (2020). Human capital and entrepreneurial intentions: Do entrepreneurship education and training provided by universities add value? *On the Horizon*, 28(2), 73-83.
- Adeleke, B. S., & Babalola, O. O. (2020). Oilseed crop sunflower (*Helianthus annuus*) as a source of food: Nutritional and health benefits. *Food Science & Nutrition*, 8(9), 4666-4684.
- Akimowicz, M., Del Corso, J.-P., Gallai, N., & Képhaliacos, C. (2021). Adapt to adapt? Farmers' varietal innovation adoption in a context of climate change. The case of sunflower hybrids in France. *Journal of Cleaner Production*, 279, 123654.
- Akman, G., & Yilmaz, C. (2008). Innovative capability, innovation strategy, and market orientation: an empirical analysis in the Turkish software industry. *International Journal of Innovation Management*, 12(01), 69-111.
- Albayrak, T., Rosario González-Rodríguez, M., Caber, M., & Karasakal, S. (2023). The use of mobile applications for travel booking: impacts of application quality and brand trust. *Journal of Vacation Marketing*, 29(1), 3-21.
- Ali, H., Hao, Y., & Aijuan, C. (2020). Innovation capabilities and small and medium enterprises' performance: An exploratory study. *The Journal of Asian Finance, Economics and Business*, 7(10), 959-968.
- Ariong, R. M., Okello, D. M., Otim, M. H., & Paparu, P. (2023). The cost of inadequate postharvest management of pulse grain: Farmer losses due to handling and storage practices in Uganda. *Agriculture & Food Security*, 12(1), 20.
- Azeem, M., Ahmed, M., Haider, S., & Sajjad, M. (2021). Expanding competitive advantage through organizational culture, knowledge sharing, and organizational innovation. *Technology in Society*, 66, 101635.
- Bacon, N. (2001). Competitive advantage through human resource management: best practices or core competencies? *Human Relations*, 54(3), 361-372.

- Berinsky, A. J., Margolis, M. F., Sances, M. W., & Warshaw, C. (2021). Using screeners to measure respondent attention on self-administered surveys: Which items and how many? *Political Science Research and Methods*, 9(2), 430-437.
- Bernacki, M. L., Greene, J. A., & Crompton, H. (2020). Mobile technology, learning, and achievement: Advances in understanding and measuring the role of mobile technology in education. *Contemporary Educational Psychology*, 60, 101827.
- Capriotti, P., Zeler, I., & Camilleri, M. A. (2021). Corporate communication through social networks: The identification of the key dimensions for dialogic communication. *Strategic corporate communication in the digital age*, 33-51.
- Chang, C. H., Shih, M. Y., & Peng, H. J. (2022). Enhancing entrepreneurial opportunity recognition: Relationships among green innovative capability, green relational capability, and co-innovation behavior. *Business Strategy and the Environment*, 31(4), 1358-1368.
- Cheruiyot, D. G. (2022). *The role of technical and vocational education training on entrepreneurial development in South Rift region, Kenya*. university of kabianga,
- Coggins, S., McCampbell, M., Sharma, A., Sharma, R., Haefele, S. M., Karki, E., . . . Brown, B. (2022). How have smallholder farmers used digital extension tools? Developer and user voices from Sub-Saharan Africa, South Asia and Southeast Asia. *Global Food Security*, 32, 100577.
- Dhakal, A., Paudel, D., Pokharel, P., & Koirala, S. (2024). Quality assessment of commercially refined sunflower oil found in the market of Pokhara, Nepal. *Nepal Journal of Biotechnology*, 12(1), 81-88.
- Emeana, E. M., Trenchard, L., & Dehnen-Schmutz, K. (2020). The revolution of mobile phone-enabled services for agricultural development (m-Agri services) in Africa: The challenges for sustainability. *Sustainability*, 12(2), 485.
- Felipe, C. M., Leidner, D. E., Roldán, J. L., & Leal-Rodríguez, A. L. (2020). Impact of IS capabilities on firm performance: The roles of organizational agility and industry technology intensity. *Decision sciences*, 51(3), 575-619.
- Ferreira, J., & Coelho, A. (2020). Dynamic capabilities, innovation and branding capabilities and their impact on competitive advantage and SME's performance in Portugal: the moderating effects of entrepreneurial orientation. *International Journal of Innovation Science*, 12(3), 255-286.

- Fox, G., Mooney, J., Rosati, P., & Lynn, T. (2021). AgriTech innovators: A study of initial adoption and continued use of a mobile digital platform by family-operated farming enterprises. *Agriculture, 11*(12), 1283.
- Gawer, A. (2021). Digital platforms' boundaries: The interplay of firm scope, platform sides, and digital interfaces. *Long range planning, 54*(5), 102045.
- Govindarajan, V., & Gupta, A. K. (1992). *Linking control systems to business unit strategy: impact on performance*: Springer.
- Grymowicz, M., Rudnicka, E., Podfigurna, A., Napierala, P., Smolarczyk, R., Smolarczyk, K., & Meczekalski, B. (2020). Hormonal effects on hair follicles. *International journal of molecular sciences, 21*(15), 5342.
- Hair. (2022). Partial Least Squares Structural Equation Modeling (PLS-SEM) in second language and education research: Guidelines using an applied example. *Research Methods in Applied Linguistics, 1*(3), 100027.
- Hargittai, E., Piper, A. M., & Morris, M. R. (2019). From internet access to internet skills: digital inequality among older adults. *Universal Access in the Information Society, 18*, 881-890.
- Hendrawan, S. A., Chatra, A., Iman, N., Hidayatullah, S., & Suprayitno, D. (2024). Digital transformation in MSMEs: Challenges and opportunities in technology management. *Jurnal Informasi dan Teknologi, 141-149*.
- Hoque, Z. (2004). A contingency model of the association between strategy, environmental uncertainty and performance measurement: impact on organizational performance. *International Business Review, 13*(4), 485-502.
- Iddris, F., Mensah, P. O., Adjanor-Doku, C., & Yaa Akyiaa Ellis, F. (2025). Enhancing firm innovativeness through HRM practices: the mediating role of innovation capability. *International Journal of Innovation Science, 17*(1), 218-235.
- Isinika, A., & Jeckoniah, J. (2021). The Political Economy of Sunflower in Tanzania: A Case of Singida Region|| APRA Working Paper 49.
- Issack, S. A., Charles, G., & Selomon, T. T. (2016). The effects of organisational capabilities on firm success Evidence from Eritrean wood-andmetal-manufacturing firms.
- Kamal, M., & Bablu, T. A. (2023). Mobile applications empowering smallholder farmers: an analysis of the impact on agricultural development. *International Journal of Social Analytics, 8*(6), 36-52.

- Kamyab, H., Khademi, T., Chelliapan, S., SaberiKamarposhti, M., Rezania, S., Yusuf, M., . . . Ahn, Y. (2023). The latest innovative avenues for the utilization of artificial Intelligence and big data analytics in water resource management. *Results in Engineering*, 101566.
- Kapoor, K., Bigdeli, A. Z., Dwivedi, Y. K., Schroeder, A., Beltagui, A., & Baines, T. (2021). A socio-technical view of platform ecosystems: Systematic review and research agenda. *Journal of Business Research*, 128, 94-108.
- Khan, N., Ray, R. L., Zhang, S., Osabuohien, E., & Ihtisham, M. (2022). Influence of mobile phone and internet technology on income of rural farmers: Evidence from Khyber Pakhtunkhwa Province, Pakistan. *Technology in Society*, 68, 101866.
- Khayer, A., Talukder, M. S., Bao, Y., & Hossain, M. N. (2020). Cloud computing adoption and its impact on SMEs' performance for cloud supported operations: A dual-stage analytical approach. *Technology in Society*, 60, 101225.
- Kim, B., Yoo, M., & Yang, W. (2020). Online engagement among restaurant customers: The importance of enhancing flow for social media users. *Journal of hospitality & tourism research*, 44(2), 252-277.
- Kim, J.-h., Seok, B.-i., Choi, H.-j., Jung, S.-h., & Yu, J.-p. (2020). Sustainable management activities: A study on the relations between technology commercialization capabilities, sustainable competitive advantage, and business performance. *Sustainability*, 12(19), 7913.
- Kisanjara, S., & Matimbwa, H. (2024). A Decision supporting algorithm for improving sunflower production amidst changing weather in the singida region, Tanzania. *East African Journal of Science, Technology and Innovation*, 5(2).
- Kock. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. *International Journal of e-Collaboration (ijec)*, 11(4), 1-10.
- Kom, Z., Nethengwe, N., Mpandeli, N., & Chikoore, H. (2022). Determinants of small-scale farmers' choice and adaptive strategies in response to climatic shocks in Vhembe District, South Africa. *GeoJournal*, 87(2), 677-700.
- Kori, B. W., Muathe, S., & Maina, S. M. (2020). Financial and non-financial measures in evaluating Performance: the role of strategic intelligence in the context of commercial banks in Kenya. *International Business Research*, 13(10), 130-130.

- Kusmaryono, I., Wijayanti, D., & Maharani, H. R. (2022). Number of Response Options, Reliability, Validity, and Potential Bias in the Use of the Likert Scale Education and Social Science Research: A Literature Review. *International Journal of Educational Methodology*, 8(4), 625-637.
- Lam, L., Nguyen, P., Le, N., & Tran, K. (2021). The relation among organizational culture, knowledge management, and innovation capability: Its implication for open innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, 7(1), 66.
- Li, G., & Zhang, H. (2024). The Efficiency and Challenges of E-Commerce Logistics in Enhancing Market Access for Agricultural Products in Rural China. *Law and Economy*, 3(2), 31-43.
- Lone, A. H., & Baba, I. R. (2024). Entrepreneurial intentions of progressive farmers: the influence of innovativeness, risk-taking and proactiveness. *Journal of Agribusiness in Developing and Emerging Economies*, 14(4), 769-787.
- Lyakurwa, E. P. (2021). *Improved Income for Sayuni Saccos Farmers through Production of Quality Declared Seeds of Sunflower in Galangal Village Hanang District*. The Open University of Tanzania,
- MacDonald, A., Clarke, A., & Huang, L. (2022). Multi-stakeholder partnerships for sustainability: Designing decision-making processes for partnership capacity. In *Business and the ethical implications of technology* (pp. 103-120): Springer.
- Miguel, P. M. d., De-Pablos-Heredero, C., Montes, J. L., & García, A. (2022). Impact of dynamic capabilities on customer satisfaction through digital transformation in the automotive sector. *Sustainability*, 14(8), 4772.
- Mikalef, P., Krogstie, J., Pappas, I. O., & Pavlou, P. (2020). Exploring the relationship between big data analytics capability and competitive performance: The mediating roles of dynamic and operational capabilities. *Information & Management*, 57(2), 103169.
- Moenian, M., Khamseh, A., & Ghazavi, M. (2022). Social innovation based on collaboration between government and non-governmental organizations in COVID-19 crisis: evidence from Iran. *Infectious Diseases of Poverty*, 11(1), 13.
- Monteiro, A. P., Vale, J., Leite, E., Lis, M., & Kurowska-Pysz, J. (2022). The impact of information systems and non-financial information on company success. *International journal of accounting information systems*, 45, 100557.

- Moyo, H., Litshani, N., Mashau, T., & Mohale, A. (2021). Maintaining Accurate Records in a School Environment: Less of Technical Concern and Much of a Management Imperative and Mandate. *Gender and Behaviour*, 19(1), 17426-17441.
- Mpogole, H., Dimoso, P., & Mayaya, H. (2020). Agriculture for Rural Development in Tanzania. In: TEMA Publishers Co. Limited, Dar es Salaam.
- Musungwini, S., Gavai, P. V., Munyoro, B., & Chare, A. (2023). Emerging ICT technologies for agriculture, training, and capacity building for farmers in developing countries: A case study in Zimbabwe. In *Applying Drone Technologies and Robotics for Agricultural Sustainability* (pp. 12-30): IGI Global.
- Napitu, U., Simanjuntak, W., & Amal, B. K. (2021). Anthropological Analysis in the Perspective of Ontology, Epistemology and Axiology. *Konfrontasi: Jurnal Kultural, Ekonomi dan Perubahan Sosial*, 8(4), 252-264.
- Nguyen, C. T. P., Nguyen, D. T., & Nguyen, H. T. (2023). Personality traits and firm innovation performance: the mediation effect of entrepreneurial innovativeness. *Journal of Entrepreneurship in Emerging Economies*, 15(1), 113-132.
- Pejić Bach, M., Ivančić, L., Bosilj Vukšić, V., Stjepić, A.-M., & Milanović Glavan, L. (2023). Internet usage among senior citizens: self-efficacy and social influence are more important than social support. *Journal of Theoretical and Applied Electronic Commerce Research*, 18(3), 1463-1483.
- Peltier, J. W., & Naidu, G. M. (2012). Social networks across the SME organizational lifecycle. *Journal of Small Business and Enterprise Development*, 19(1), 56-73.
- Pinho, C., Franco, M., & Mendes, L. (2021). Application of Diffusion Innovation Theory to the E-learning process: higher education context. *Education and Information Technologies*, 26(1), 421-440.
- Pramono, R., Sondakh, L., Bernarto, I., Juliana, J., & Purwanto, A. (2021). Determinants of the small and medium enterprises progress: A case study of SME entrepreneurs in Manado, Indonesia. *The Journal of Asian Finance, Economics and Business*, 8(1), 881-889.
- Purwanto, A., & Sudargini, Y. (2021). Partial least squares structural equation modeling (PLS-SEM) analysis for social and management research: a literature review. *Journal of Industrial Engineering & Management Research*, 2(4), 114-123.

- Reddy, R. (2022). Innovations in Agricultural Machinery: Assessing the Impact of Advanced Technologies on Farm Efficiency. *Journal of Artificial Intelligence and Big Data*, 2(1), 10.31586.
- Rogers, E. M. (1961). *Bibliography on the Diffusion of Innovations*.
- Russo, D., & Stol, K.-J. (2021). PLS-SEM for software engineering research: An introduction and survey. *ACM Computing Surveys (CSUR)*, 54(4), 1-38.
- Saiz-Rubio, V., & Rovira-Más, F. (2020). From smart farming towards agriculture 5.0: A review on crop data management. *Agronomy*, 10(2), 207.
- Sarkar, A. S., Hazhar, O. M., Rawa, A. M., & Rezhwan, F. O. (2024). The importance of product innovation in maintaining a competitive advantage. *Mednarodno inovativno poslovanje= Journal of Innovative Business and Management*, 16(2), 1-15.
- Sashi, C. (2021). Digital communication, value co-creation and customer engagement in business networks: a conceptual matrix and propositions. *European Journal of Marketing*, 55(6), 1643-1663.
- Selomon, T. T., Urassa, G. C., & Allan, I. S. (2016). The effects of organisational capabilities on firm success: Evidence from Eritrean wood-and-metal-manufacturing firms. *African Journal of Economic and Management Studies*, 7(3), 314-327.
- Shodiya, O. A., Akintaro, A., & Olopade, J. (2024). Service innovation and customers' satisfaction of selected micro finance banks in Ogun State, Nigeria. *Journal of International Business, Economics and Entrepreneurship (JIBE)*, 9(1), 38-51.
- Shukla, S., Kapoor, R., Gupta, N., & Arunachalam, D. (2023). Knowledge transfer, buyer-supplier relationship and supplier performance in agricultural supply chain: An agency theory perspective. *Journal of Knowledge Management*, 27(3), 738-761.
- Skaalsveen, K., Ingram, J., & Urquhart, J. (2020). The role of farmers' social networks in the implementation of no-till farming practices. *Agricultural Systems*, 181, 102824.
- Stallkamp, M., & Schotter, A. P. (2021). Platforms without borders? The international strategies of digital platform firms. *Global Strategy Journal*, 11(1), 58-80.
- Susanto, R., Rachmadtullah, R., & Rachbini, W. (2020). Technological and Pedagogical models. *Journal of Ethnic and Cultural Studies*, 7(2), 1-14.
- Wang, W.-T., & Lin, Y.-L. (2021). The relationships among students' personal innovativeness, compatibility, and learning performance. *Educational Technology & Society*, 24(2), 14-27.

Xu, Z., Meng, W., Li, S., Chen, J., & Wang, C. (2024). Driving factors of farmers' green agricultural production behaviors in the multi-ethnic region in China based on NAM-TPB models. *Global Ecology and Conservation*, 50, 28-36.

YuSheng, K., & Ibrahim, M. (2020). Innovation capabilities, innovation types, and firm performance: evidence from the banking sector of Ghana. *SAGE Open*, 10(2), 2158244020920892.