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Unleashing the Power of Digital Farming: Local Young Farmers' Perspectives on Sustainable Value Creation

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ABSTRACT

A new challenge has emerged: how to implement innovations in agriculture? The expansion of digital technology has created new opportunities within the agricultural sector, particularly for young farmers, enabling the integration of information and communication technology into digital farming. Employing innovation diffusion theory, this study seeks to ascertain how young farmers perceive the integration of digital technology into various aspects of farming and how these views influence the formation of sustainable value creation. The study area was determined purposively, and this research utilized the case study method by interviewing 80 respondents. The data were analyzed using structural equations and partial least squares models. Using the innovation diffusion theory, the results unveiled that knowledge, persuasion, decision, implementation, and confirmation from young farmers significantly and positively affected the sustainable value creation.

Keywords: Digital farming; Innovation diffusion theory; Persuasion problem; Technology adoption; Young farmer

INTRODUCTION

"Unleashing the power of digital farming" refers to the enormous benefits of incorporating digital technology in various aspects of agriculture (Barrett & Rose, 2022). Digital farming employs sensors, drones, Global Positioning System (GPS), and other technology to collect, analyze, and process data about crops, soil conditions, weather, and other factors affecting agricultural output (Mohamed et al., 2021). This technology lead agriculture more efficient and productive (Zscheischler, Brunsch, Rogga, & Scholz, 2022).

Indonesia faces challenges in implementing agricultural innovation and technology due to a lack of technology adoption, soil degradation, increasing food demand, population growth, climate change, environmental sustainability, and limited youth involvement (Sulastri, 2023). Farmers' slow adoption of technology due to a lack of knowledge and resources has emerged as one of the difficulties encountered in agriculture (Dewi, Cahyani, & Megawati, 2023). On the other hand, this issue might be solvable with the support of young farmers (Widiyanti, Karsidi, Wijaya, & Utari, 2020). They could introduce the technology to farmers and support its use (Prihadyanti & Aziz, 2023). Technological innovation in agriculture is also essential for sustainability, reducing resource use and environmental impact (Song, Fisher, & Kwoh, 2019). Young farmers involved in digital farming could support sustainable agriculture and achieve sustainable value creation (Czyżewski, Matuszczak, Grzelak, Guth, & Majchrzak, 2021).

The number of farmers in Indonesia reached 33.4 million in 2019 (Prasetyaningrum, Ruminar, & Irwandi, 2022). However, Statistics Indonesia data unveiled that only 885,077 were under 25, and 4.1 million farmers aged 25 to 34 in 2018 (Mahdi, 2022). Nevertheless, following the 2021 Statistics Indonesia, the number of youth aged 16 to 30 years working in agriculture has declined. Only 3.95 million young farmers worked in agriculture (Setiawan, 2020). Contrarily, young farmers play an essential role in developing the agricultural sector through active participation in the innovation and application of information and technology (IT) in agriculture (Khaerunnisa, Nurmayulis, & Salampessy, 2022). Young farmers have high energy and creativity by bringing new ideas to agriculture (Prihadyanti & Aziz, 2023). They are tech-savvy andutilize sensors, drones, and mobile apps to raise farming efficiency (Mendes et al., 2022). As agents of change, they influence other farmers to adopt new technology and share information through social media (Tutiasri, Rahmawati, Rahmawati, Febriyanti, & Kusumajanti, 2022). Young farmers also encourage economic growth with innovation, boost agricultural output, and create new business opportunities (Raihan & Tuspekova, 2022).

Adopting digital farming as part of agricultural innovation has become a growing trend in Indonesia (Siregar, Seminar, Wahjuni, & Santosa, 2022). Digital farming refers to using digital technology in agricultural activities to increase efficiency, productivity, and sustainability (Clapp & Ruder, 2020). In adopting digital farming, several stages must be passed, including knowledge, persuasion, decision, implementation, and confirmation (Shang, Heckelei, Gerullis, Börner, & Rasch, 2021). Despite having great potential, the adoption of digital farming encounters some difficulties, such as a lack of access to adequate technology and infrastructure (Ofori & El-Gayar, 2021), a lack of farmers' digital knowledge and skills (Prause, 2021), and financial challenges (Y. Liu, Ma, Shu, Hancke, & Abu-Mahfouz, 2021).

In response to the issue, the government has formulated the Ministry of Agriculture's Strategic Plan 2020-2024, encompassing the development of precision agriculture and digitalization within the agricultural sector (Adetama, Fauzi, Juanda, & Hakim, 2022). However, central and local governments grapple with human resources, finances, and infrastructure limitations, impeding the effective execution of agricultural digitalization programs (Ilham, Munir, Ala, & Sulaiman, 2022). Furthermore, the government faces challenges in effectively disseminating information and providing necessary training to farmers regarding the use of digital technology (Maulani et al., 2020). It is possible that agricultural digitalization programs are not entirely aligned with the specific conditions and needs at the farmer level, highlighting the importance of tailoring such initiatives to suit the unique circumstances and requirements of individual farmers (Fahmi & Arifianto, 2022).

This study aims to discover young farmers' perceptions toward integrating digital technology in various aspects of farming and their influence on the formation of sustainable value creation. This research is necessary because it explored young farmers' views on the value creation sustainability in digital farming, providing essential insights to understand the role of young people in developing sustainable agricultural practices with the support of technology. The uniqueness of this research lies in the approach to analyze young farmers' views in associating sustainable value creation with digital farming, providing a new perspective on how young people could shape the future of sustainable farming through technology.

RESEARCH METHOD

This study analyzed the impact of digital technology on agriculture through the perspective of young farmers to identify sustainable value creation using a case study approach. This research was conducted from June to July 2023. The location was determined purposely to be in Boyolali Regency, focusing on Selo, Cepogo, Ngemplak, and Mojosongo Districts. These areas represented the diversity of agricultural conditions and young farmers in rural areas of Central Java, providing representative insights into the views and experiences of young farmers regarding digital farming and the value of sustainability.

TABLE 1. DATA ON THE NUMBER OF FARMER GROUPS AND FARMER GROUPS' MEMBERS

District	Number of Farmer Youth Groups	Member
Selo	15	127
Cepogo	29	210
Ngemplak	4	43
Mojosongo	3	21

Source: Statistics of Boyolali Regency (2021) and observation results

The population of this research covered young farmers in the districts of Selo, Cepogo, Ngemplak, and Mojosongo, representing variations in agriculture and young farmers in Boyolali Regency (Table 1). Simple random sampling was employed to ensure that every member of the youth farmer population in the four districts had the same opportunity to be selected as a sample to provide results that could better represent the diverse views of the population. The sampling technique yielded a total of 80 respondents. Researchers selected and determined 20% of the sample in each district to support the sampling technique. Data were collected through several techniques: surveys to collect responses from young farmers, interviews to explore their views in more depth, and observations to understand agricultural practices carried out by young farmers to provide a comprehensive picture of the contribution of digital technology to sustainable value creation in agriculture.

The analytical method was solely based on the five stages of the adoption decision process in innovation diffusion theory (IDT) (Shang et al., 2021). IDT explains why and how quickly new ideas and technology spread through social systems (Stræte et al., 2022). Everett Rogers introduced this theory in his book "Diffusion of Innovations" in 1962 (Glover, Sumberg, Ton, Andersson, & Badstue, 2019). The five stages of the adoption decision process encompass knowledge, persuasion, decision, implementation, and confirmation (Ong, Rahim, Lim, & Nizat, 2022). Sustainable value creation involves integrating environmental, social, and economic aspects into a business or organization to create long-term value (Cosenz, Rodrigues, & Rosati, 2020). Integrating sustainability principles into the core business strategy could create long-term value and improve the welfare of stakeholders (Attanasio, Preghenella, De Toni, & Battistella, 2022). Sustainable value creation has become an unavoidable challenge for the business world and society because it requires a change in mindset and commitment to balance economic, social, and environmental aspects in the decision-making (Leder, Kumar, & Rodrigues, 2020).

TABLE 2. INDICATORS AND OPERATIONAL DEFINITION OF VARIABLES

Variable	Indicator	Operational Definition
Knowledge (KN)	KN1	Understanding the basic principles of innovation (Ayre et al., 2019)
	KN2	Knowing how innovation can improve agricultural production (Omulo & Kumeh, 2020)
	KN3	Knowing how to innovate to improve agricultural efficiency (Bronson, 2019)
Persuasion (PS)	PS1	Developing a positive attitude toward new agricultural technology (J. Liu & Sengers, 2021)
	PS2	Identifying the strengths and weaknesses of agricultural innovations (Caffaro, Micheletti Cremasco, Roccato, & Cavallo, 2020)
	PS3	Assessing the quality of innovations based on agricultural needs (Lioutas, Charatsari, & De Rosa, 2021)
Decision (DC)	DC1	Deciding on the adoption of an innovation based on its benefits in agriculture (Gangwar, Tyagi, & Soni, 2022)
	DC2	Making an adoption decision after considering the financial impact (Hrustek, 2020)
	DC3	Weighing the positive and negative impacts of adopting an innovation (Balogh et al., 2020)
Implementation (IM)	IM1	Implementing innovations in daily farming practices (Ayre et al., 2019)
	IM2	Implementing innovative steps in farming management after adoption (Giua, Materia, & Camanzi, 2022)
	IM3	Using innovation to increase agricultural output directly (Gaikwad, Vibhute, Kale, & Mehrotra, 2021)
Confirmation (CO)	CO1	Evaluating the effectiveness of innovation in increasing productivity and efficiency (DeLay, Thompson, & Mintert, 2022)
	CO2	Confirming whether innovation helps overcome constraints in agriculture (Chuang, Wang, & Liang, 2020)
	CO3	Confirming whether innovations are worth sustaining in agricultural practices (Kernecker, Knierim, Wurbs, Kraus, & Borges, 2020)
Sustainability Value Creation (SV)	SV1	Financial benefit generated by the adoption of the innovation (Gomez-Trujillo & Gonzalez-Perez, 2022)
	SV2	Improving social relations and collaboration among farmers, especially young farmers (Agyekumhene, de Vries, Paassen, Schut, & MacNaghten, 2020)
	SV3	Improving environmental conditions with eco-friendly agricultural practices (Wang, Wang, Sarkar, & Zhang, 2021)

In this research, knowledge (KN), persuasion (PS), decision (DC), implementation (IM), and confirmation (CO) were construct variables. At the same time, sustainability value creation (SV) was a latent variable. The construct variables, covering KN, PS, DC, IM, and CO, were quantifiable characteristics or components observed and evaluated directly within the scope of the study. The participants' degrees of knowledge, their capacity to persuade others, the methods used in decision-making, the efforts made in implementing strategies, and the validation or confirmation of the results obtained were all examples of the varied components included in these variables. By including these construct variables, the research endeavor intended to conduct a methodical analysis and measurement of particular aspects of the behavior and results of the participants, with the ultimate goal of offering a full understanding of the phenomenon under study.

On the other hand, the latent variable (SV) refers to a representation of an underlying and unobservable construct derived from the variables explicitly observed. It encapsulated the overarching concept of what it means to create value through sustainability—a concept that, despite the fact that it could not be directly measured, could be inferred from the complex relationships between the construct variables. A comprehensive study of the research model was made easier by this differentiation, shedding light on the interconnection and interdependencies among various variables. This differentiation was of the utmost importance. In order to contribute to a more comprehensive knowledge of the research framework, this study investigated the nuanced aspects of sustainable value creation that might not be immediately apparent from direct observation. It was accomplished through the introduction of the latent variable. Table 2 presents the variables and indicators used in this study.

This model was developed based on previous literature reviews, and then the researchers compiled it into an operational definition to provide a basis for hypothesis testing in subsequent analysis. The hypotheses helped researchers determine how the studied factors were related and how much they affected each other. By detailing the predictions to be tested, the hypotheses provided direction and structure in interpreting the results of the data analysis. The hypotheses were structured as follows.

H1: Knowledge positively and significantly effects on sustainable value creation
H2: Persuasion positively and significantly effects on sustainable value creation
H3: Decisions positively and significantly effects on sustainable value creation
H4: Implementation positively and significantly effects on sustainable value creation
H5: Confirmation positively and significantly effects on sustainable value creation

The partial least squares (PLS) method was utilized to analyze the connection between the innovation diffusion theory and sustainable value creation. It was the primary analytical tool to identify and measure the influence of innovation diffusion theory factors on creating sustainable value in the agricultural context. Through this approach, the model was designed to provide an in-depth understanding of how innovation diffusion theory could contribute to value aspects of sustainability in agricultural practices.

RESULTS AND DISCUSSION

The observations at the research location unveiled that young farmers played an essential role in the agricultural sector by carrying out various activities. They were involved in growing, tending, and harvesting crops by performing various tasks, such as preparing the land, planting seeds, applying fertilizer, watering, and controlling pests and plant diseases. In addition, young farmers also utilized modern agricultural technology, such as agricultural tools, machines, and other supporting equipment, to escalate farm productivity and efficiency. They also marketed agricultural products directly to local markets or through broader distribution channels, such as online sales or cooperation with marketing agencies. Young farmers also attended training and education related to agriculture to improve their knowledge and skills. They could become agents of innovation and development in agriculture by trying new farming techniques, adopting sustainable agricultural practices, or developing agricultural businesses with innovative approaches (utilization of digital technology and biotechnology).

Characteristics of Young Farmers

Respondent characteristics involved age, education, farming experience, and landholding. These variables provided crucial insights into participants' demographics. Respondents covered three age groups: less than or equal to 30, 31 to 35, and 36 to 40, offering diverse perspectives from different generations. Education varied from primary to tertiary levels, influencing perceptions of sustainability and digital farming. Farming experience ranged from less than two years to more than ten years, impacting insights on digital farming adoption and sustainability. Landholding distribution revealed resource disparities, affecting digital farming implementation and sustainability efforts. This comprehensive profile highlighted respondents' diverse perspectives, experiences, and resource contexts, shaping their views on sustainable practices and technology integration.

TABLE 3. CHARACTERISTICS OF YOUNG FARMERS

Characteristic	Information	Total	Percentage (%)
Age	$\leq$ 30 y.o.	17	21.25
	31-35 y.o.	26	32.50
	36-40 y.o.	37	46.25
Education	Elementary school	9	11.25
	Junior high school	26	32.50
	Senior high school	37	46.25
	University	8	10.00
Experience as a farmer	< 2 year	34	42.50
	2-5 year	26	32.50
	5-10 year	15	18.75
	> 10 year	5	6.25
Land ownership	< 2,500 m^2	38	47.50
	2,500-5,000 m^2	28	35.00
	> 5,000 m^2	14	17.50

Table 3 displays the age distribution of farmers, revealing diverse profiles in digital farming and the value of sustainability. Most farmers were between 36 and 40 years old (46.25%), reflecting experience in conventional farming. However, there was also significant involvement of young farmers under 30 (21.25%) and aged 31 to 35 (32.50%). Through a combination of diverse ages, this research could provide a rich view of how the younger and older generations contributed to incorporating digital technology and the value of sustainability in modern agriculture.

Table 3 also illustrates that most farmers had a high school education (46.25%), indicating a higher level of education and potential for innovation and understanding of digital farming technology. However, a significant proportion also came from junior high school (32.50%) and elementary school (11.25%), highlighting the inclusion of technology at various levels of education. Higher education level (10.00%) also contributed to the application of digital farming, creating opportunities for sustainable agricultural innovation involving diverse educational backgrounds.

The majority of respondents (42.50%) possessed less than two years of experience as farmers, indicating the potential for the adoption of new technology, such as digital farming, by new farmers. On the other hand, 32.50% had two to five years of experience, while a smaller proportion had more extended experience, five to ten years (18.75%) and more than ten years (6.25%). These data depicted the influence of the duration of being a farmer on the opportunities for adopting sustainable agricultural technology, with new farmers potentially being more open to digital farming.

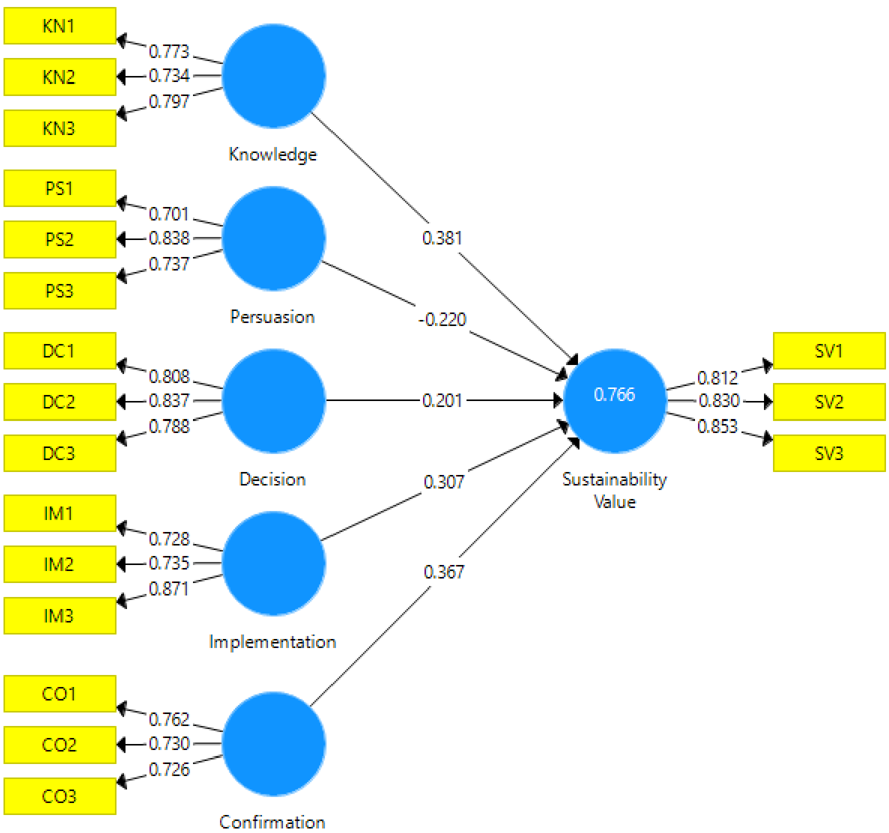

FIGURE 1. THE OUTPUT OF THE PLS ALGORITHM WAS THE RELATIONSHIP BETWEEN VARIABLES

Most farmers (47.50%) owned less than 2,500 m² of land, indicating small-scale farmers' participation in modern agricultural technology, such as digital farming. Meanwhile, 35% owned 2,500 to 5,000 m² of land, and 17.50% owned more than 5,000 m² of land. These data indicated that farmers with more land area could have a greater propensity to adopt sustainable farming technology due to the possession of a scale supporting better use of the technology.

The relationship between the innovation diffusion theory and sustainability value creation had become a pivotal area of interest in contemporary research. As the global discourse on sustainability gains momentum, understanding how innovations are diffused and adopted plays a critical role in shaping the dynamics of value creation within sustainable practices and industries. This exploration had delved into the intersection of these two domains, shedding light on how the principles of innovation diffusion theory influence and drive the creation of sustainable value, ultimately contributing to the broader dialogue on sustainable development and responsible business practices.

Based on Figure 1, if the outer loading is above 0.7 of all research indicators, the construct in the study has good credibility (Sarstedt & Cheah, 2019). Outer loading assessed the compatibility between the indicator and the variable being measured. If the outer loading value is high, the indicator is strongly related to the construct variable and can be regarded as an effective measuring tool (Hair Jr, Jr, Hult, Ringle, & Sarstedt, 2021).

Relationship Between Innovation Diffusion Theory and Sustainability Value Creation

Table 4 exhibits cross-loading values of 0.7 or higher, demonstrating a substantial degree of relationship between the variables and the proposed factors. Thus, these variables contributed significantly to explaining certain factors in this study. Furthermore, CA, rho_A, and CR acquired values above 0.7, signifying that the measurement model had good reliability. It also implied that the instruments used to collect data were reliable in measuring the construct under study, and the measurement results could be considered accurate and consistent (Arli & Bakpayev, 2023). Therefore, the results of the statistical analysis were reliable and provided sufficient confidence in the research findings. The AVE values were above 0.5, meaning the construct studied could explain more than half of the indicators' variance (Nasution, Fahmi, Jufrizen, Muslih, & Prayogi, 2020), depicting that the construct under study had good convergent validity. Hence, it was considered a valid and reliable variable for further analysis.

The R square SV value of 0.766 indicated that around 76.6% of the variation in the dependent variable could be explained by the independent or exogenous variables used in the model. In other words, this model successfully described the relationship between the independent and dependent variables with a relatively high degree of accuracy. This success rate proved the model's predictive solid power to explain most of the variations in the dependent variable based on the variables used in the analysis (Niyawanont, 2022).

TABLE 4. CROSS-LOADING, VALIDITY, AND RELIABILITY TEST RESULTS

Variable	Indicator	Cross Loading	CA	rho_A	CR	AVE	R^2
	KN1	0.773					
KN	KN2	0.734	0.713	0.721	0.835	0.623	-
	KN3	0.797					
	PS1	0.701					
PS	PS2	0.838	0.737	0.752	0.864	0.639	-
	PS3	0.737					
	DC1	0.808					
DC	DC2	0.837	0.746	0.754	0.852	0.658	-
	DC3	0.788					
	IM1	0.728					
IM	IM2	0.735	0.707	0.716	0.833	0.620	-
	IM3	0.871					
	CO1	0.762					
CO	CO2	0.730	0.718	0.727	0.844	0.628	-
	CO3	0.726					
	SV1	0.812					
SV	SV2	0.830	0.778	0.780	0.871	0.692	0.766
	SV3	0.853					

Note: KN was knowledge; PS was persuasion; DC was decision; IM was implementation; CO was confirmation; and SV was sustainability value creation

Hypothesis Testing

The subsequent stage involved testing the five hypotheses, aiming to uncover young farmers' views regarding sustainable value creation within the framework of digital farming. Tests were conducted on the five stages of IDT, influencing youth's views on sustainable value creation. The results of hypothesis testing provided in-depth insight into the factors influencing young farmers' views on the importance of sustainable value creation in digital farming practices.

Knowledge affects sustainable value creation

Table 5 portrays that knowledge positively influenced young farmers' views on the formation of sustainable value creation, with a coefficient of 0.381. Furthermore, this effect unveiled vital significance at the 99% confidence level. Increased knowledge of young farmers about digital farming contributed to their views of creating sustainable value in agricultural practices. These findings underscored the close relationship between understanding digital technology and young farmers' views about sustainable value in modern agriculture. This relationship aligns with the findings of research conducted by Qin et al. in 2022, exploring the relationship between the knowledge possessed by farmers and their way of thinking and appreciation of the importance of sustainability. This research highlighted the importance of knowledge about technology and its impact on positive views of sustainable value in an increasingly digital world of agriculture.

TABLE 5. HYPOTHESIS TESTING RESULTS

Effects	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Sig.	Result
KN → SV	0.381	0.362	0.108	3.509	0.000	***	Supported
PS → SV	-0.220	-0.208	0.119	1.848	0.065	*	Supported
DC → SV	0.201	0.208	0.077	2.609	0.009	***	Supported
IM → SV	0.307	0.322	0.079	3.889	0.000	***	Supported
CO → SV	0.367	0.358	0.099	3.720	0.000	***	Supported

Note:
***= $p < 0.01$ (99% confidence level); **= $p < 0.05$ (95% confidence level); *= $p < 0.1$ (90% confidence level); and ns= $p > 0.1$ (not significant)
KN was knowledge; PS was persuasion; DC was decision; IM was implementation; CO was confirmation; and SV was sustainability value creation

Persuasion affects sustainable value creation

Based on Table 5, the second hypothesis was accepted, as the data revealed a p-value of 0.065 (at a 90% confidence level). This result implied that persuasion influenced sustainable value creation, specifically through fostering positive attitudes toward new agricultural technology, identifying strengths and weaknesses of agricultural innovations, and assessing innovation quality according to agricultural needs. The field findings further supported a negative relationship between these variables, emphasizing the significance of the psychological component in shaping the pathway to sustainable value creation.

The field observations uncovered that assessing the quality of innovations based on agricultural needs did not achieve its full potential, primarily because young farmers had differing conceptualizations of sustainable value creation. In this context, the conventional methods of evaluating innovation quality, which could not align with young farmers' unique perspectives and priorities, appeared to fall short of effectively addressing their specific needs and objectives in sustainable agricultural practices. The observation pointed out the importance of considering and adapting to young farmers' distinct mindsets and priorities when designing strategies for assessing innovation quality in sustainable value creation.

The data analysis and field observations align with the findings of the previous research conducted by Giua et al. in 2022, disclosing a significant influence in creating sustainable value at the sufficient persuasion stage. The analysis and on-the-ground observations supported this conclusion by demonstrating a coherent connection between the level of persuasion and its impact on creating sustainable value within agriculture. These results underlined the consistency and validity of the relationship between persuasion and sustainable value creation, emphasizing the importance of persuasion as a determinant in fostering sustainable practices among young farmers, thus corroborating Giua et al.'s earlier research findings.

The decision affects sustainable value creation

Table 5 depicts a p-value of 0.009, corresponding to a 99% confidence level. Furthermore, the positive path analysis value stood at 0.201. Consequently, the perspectives held by young farmers concerning the establishment of sustainable value in digital farming exerted a positive and significant influence. This result suggested that the attitudes and beliefs of young farmers played a substantial role in shaping and promoting sustainable practices within digital farming, highlighting the importance of their outlook in driving positive outcomes in this context. This research disclosed that the decisions taken by young farmers in adopting or rejecting digital farming practices significantly influenced their views on the importance of creating sustainable value.

The decision of young farmers to support the adoption of digital farming practices could reinforce positive views of sustainable value creation while at the same time encouraging behavior change toward more sustainable practices. These findings also align with the results of research conducted by Bolfe et al. in 2020, who discovered that at the decision-making stage of digital farming technology, the impact was highly influential in creating sustainable value in agricultural practices. This relationship confirmed the vital role of individual decisions in shaping young farmers' views toward sustainable value underlying the adoption of innovative technology. Wise decision-making and support for adopting digital farming technology could strengthen positive views of sustainable value creation and encourage changes toward more sustainable agricultural practices in the digital era.

Implementation affects sustainable value creation

Table 5 also depicts a p-value of 0.000 at a 99% confidence level, with a path analysis value of 0.307, indicating a positive relationship. Therefore, the effective implementation positively and significantly affected sustainable value creation, supporting and accepting the hypothesis. These findings highlighted that the practical execution and implementation of strategies and initiatives, likely associated with digital farming, contributed positively and meaningfully to the overall creation of sustainable value within this domain. This result emphasized the importance of effective implementation in fostering sustainable practices and value within the agricultural sector. These results signified that the implementation of digital farming practices by young farmers had a positive and tangible impact on their views of the importance of sustainable value in modern agriculture.

These findings support the view that the implementation of digital technology in agricultural practices could drive understanding and commitment to aspects of sustainability, contributing to a positive transformation toward more sustainable and innovative agriculture. These findings also align with the results of research by Kolady et al. in 2020, concluding that at the implementation stage of digital farming technology, there was a significant impact on the creation of sustainable value in agricultural practices. Implementing digital farming technology was essential in increasing agricultural practices' sustainability by reducing negative environmental impacts. Digital farming technology enabled young farmers to manage agricultural resources more efficiently and sustainably by utilizing accurate information and data to make the right decisions. This implementation imposed impacts on forming positive views of the sustainable value creation in digital farming practices, as well as strengthening the transformation toward more sustainable agriculture being adaptive to future challenges.

Confirmation affects sustainable value creation

Table 5 provides compelling insights. With a p-value of 0.000 at a 99% confidence level and a positive path analysis value of 0.367, confirmation positively and significantly influenced sustainable value creation. This outcome confirmed the acceptance of the fifth hypothesis. It implied that confirming or validating results, potentially within digital farming, played a constructive and meaningful role in shaping and promoting sustainable value within this domain. The ability to confirm and solidify the outcomes of agricultural practices and innovations contributed to the overall value-creation process, emphasizing the significance of this factor in sustainable agricultural development.

These results indicated that young farmers' understanding of the benefits and results of digital farming practices strongly influenced the formation of positive views of sustainable value creation. Positive confirmation of the results of adopting digital farming technology encouraged increased confidence and commitment to sustainable practices, reinforcing the view that digital farming could have positive and sustainable impacts on young farmers and the environment. These findings are also consistent with research by Nasirahmadi and Hensel in 2022, disclosing a positive impact on creating sustainable value at the confirmation stage of digital farming technology. The implementation of digital farming technology could raise the welfare of young farmers through increased productivity and efficiency in agricultural practices. By believing more and acknowledging the benefits of digital technology, young farmers could be increasingly committed to carrying out sustainable agricultural practices, along with positive views of sustainable value. These positive impacts affected the welfare of young farmers, the environment, and society as a whole, creating sustainable value and supporting the development of the agricultural sector.

CONCLUSION

The discussion concluded that all hypotheses proposed in this study were successfully accepted, indicating a significant influence between the variables in the innovation diffusion model and the sustainable value creation in digital farming. However, one hypothesis regarding the influence of the persuasion variable was rejected. The result indicated that the persuasion variable did not significantly affect young farmers' views on creating sustainable value in digital farming. The development of economic incentive programs in agriculture and agribusiness, such as providing subsidies or assistance for digital farming technology, could raise the impact of the persuasion stage in the innovation diffusion model and sustainable value creation.

By providing tangible and economically beneficial incentives, young farmers could likely be more motivated to adopt agricultural technological innovations and understand the long-term benefits of the value of sustainability. Local governments could enhance cooperation between youth farmers, educational institutions, agroindustry, and related organizations to promote sustainable agricultural practices and raise the adoption of agricultural technology. This cooperation could help create sustainable value within the agricultural sector. By providing relevant training, mentoring, and economic incentives, the government could encourage young farmers to adopt agricultural technology innovations with more confidence, allowing the persuasion stage to become more effective in creating long-term sustainable value.

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