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Research Article

The Effect Of Access To Digital-Based Market Information On Sustainable Agriculture Decisions

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ABSTRACT
This study aims to analyze the effect of digital market information access on sustainable agricultural decision-making among farmers in West Surabaya. A quantitative approach was employed using multiple linear regression analysis on three independent variables: frequency of digital information access (X_1), types of digital platforms used (X_2), and level of digital information comprehension (X_3), with one dependent variable: sustainable agricultural decision (Y). The F-test results indicated that the independent variables simultaneously had a significant effect on the dependent variable (F = 120.330; sig. = 0.000). Furthermore, the t-test results showed that each independent variable—X_1 (sig. = 0.025), X_2 (sig. = 0.001), and X_3 (sig. = 0.003)—had a partial and significant influence on sustainable agricultural decisions. The coefficient of determination (R^2) value of 0.933 suggests that 93.3% of the variation in sustainable agricultural decisions can be explained by the three independent variables. These findings suggest that enhancing access to and comprehension of digital information plays a crucial role in promoting sustainable agricultural practices. The study recommends strengthening digital literacy and expanding digital infrastructure in urban-agricultural areas as part of a strategic effort to support sustainable agriculture development.
Keywords: *sustainable agriculture, digital information, agribusiness, farmer decision-making*

ABSTRAK
Penelitian ini bertujuan untuk menganalisis pengaruh akses informasi pasar berbasis digital terhadap keputusan pertanian berkelanjutan pada petani di wilayah Surabaya Barat. Pendekatan kuantitatif digunakan dengan teknik analisis regresi linier berganda terhadap tiga variabel independen: frekuensi akses informasi digital (X_1), jenis platform digital yang digunakan (X_2), dan tingkat pemahaman informasi digital (X_3), serta satu variabel dependen yaitu keputusan pertanian berkelanjutan (Y). Hasil uji F menunjukkan bahwa ketiga variabel independen secara simultan berpengaruh signifikan terhadap keputusan pertanian berkelanjutan (F = 120,330; sig. = 0,000). Sementara itu, hasil uji t menunjukkan bahwa masing-masing variabel X_1 (sig. = 0,025), X_2 (sig. = 0,001), dan X_3 (sig. = 0,003) berpengaruh secara parsial dan signifikan terhadap variabel dependen. Nilai koefisien determinasi (R^2) sebesar 0,933 menunjukkan bahwa 93,3% variasi keputusan pertanian berkelanjutan dapat dijelaskan oleh ketiga variabel independen tersebut. Temuan ini menunjukkan bahwa peningkatan akses dan pemahaman terhadap informasi digital memainkan peran penting dalam mendorong praktik pertanian berkelanjutan. Studi ini merekomendasikan pentingnya penguatan literasi digital dan perluasan infrastruktur informasi digital di wilayah urban-agricultural sebagai bagian dari strategi pembangunan pertanian berkelanjutan.
Kata Kunci: pertanian berkelanjutan, informasi digital, agribisnis, keputusan petani, Surabaya Barat

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1. Introduction

Sustainable agriculture has become a major focus in efforts to maintain food security, environmental sustainability, and farmers' welfare in the modern era. This concept

emphasizes the importance of an agricultural production system that is environmentally friendly, economically efficient, and socially just. In the midst of the challenges of climate change, land limitations, and fluctuations in market prices, farmers are required to make decisions that are not only profitable in the short term but also support the sustainability of their farming business in the long term (Anggraini et al., 2024).

Sustainable agriculture requires the right decisions from farmers in various aspects of production, such as commodity selection, input use, and marketing strategies. In the digital era, information technology-based market information is one of the important sources in supporting such decision-making. However, the extent to which digital market information has been accessed and utilized by farmers in the West Surabaya area is still a question that needs to be studied. In addition, it is not known exactly what the form and characteristics of sustainable agricultural decisions are made by farmers in the region. Therefore, this study is designed to answer several main problems: the extent to which the level of access to digital-based market information is utilized by farmers in West Surabaya, what are the characteristics of the sustainable agricultural decisions they take, whether there is a significant influence between access to digital market information on sustainable agricultural decisions, and what digital factors contribute the most to these decision-making (Wibowo, 2020).

This research aims to understand the role of digital-based market information access in supporting sustainable agricultural decisions in the West Surabaya region. In particular, the aim of this study is to analyze the extent to which farmers utilize digital market information in their farming activities. In addition, this study aims to identify the forms of sustainable agricultural decisions that have been implemented by farmers. Through a quantitative approach with regression analysis, this study also intends to test whether there is a significant influence between access to digital market information and sustainable agricultural decisions. Furthermore, this research is expected to be able to reveal which information technology factors play the most role in encouraging farmers to carry out sustainable agricultural practices.

In this context, access to market information is one of the key factors that influence farmers' decision-making. Information on commodity prices, market demand, consumer trends, and distribution logistics are vital data needed by farmers to determine planting time, commodity types, and marketing strategies (Wijaya et al., 2024). Along with the development of information technology, various digital platforms such as agricultural

applications, social media, and agribusiness websites have become the main source of market information that can be accessed in real-time by farmers, including in urban and peri-urban areas such as West Surabaya.

However, not all farmers are able to make optimal use of digital technology. Diverse levels of digital literacy, limited infrastructure, and old habits of traditional transactions are challenges in themselves. Therefore, it is important to examine the extent to which access to digital-based market information really influences farmers' decisions in implementing sustainable agricultural practices, especially in the West Surabaya area which is starting to experience urbanization pressure but still has pockets of active agricultural activities.

This study uses a regression analysis approach to determine the relationship between access to digital market information and sustainable agricultural decisions taken by farmers. This study is expected to provide a strong empirical picture of the role of information technology in environmentally friendly and long-term oriented agribusiness decision-making, as well as provide relevant policy recommendations for the development of urban and peri-urban agriculture in Indonesia.

The novelty of this research lies in the integration of quantitative analysis between digital-based market information access and sustainable agricultural decisions, which are still rarely done empirically, especially in urban-peri-urban areas such as West Surabaya. This study specifically measures the digital dimension which includes the frequency of access, type of platform, and level of understanding of information by farmers, and then directly relates it to sustainability decisions in farming practices. In contrast to previous studies that were generally descriptive or focused on technology or sustainability aspects separately, this study offers a regression analysis approach to uncover the causal relationship between information digitization and sustainable agribusiness behavior, so that it can be an innovative basis for the development of data-driven smart agriculture policies.

2. Method

This study uses a quantitative approach with a survey method to collect primary data from respondents who are active farmers in the West Surabaya area. The main objective of this study is to analyze the influence of digital-based market information access on sustainable agricultural decisions using multiple linear regression analysis techniques.

The population in this study is all farmers who are still actively carrying out farming activities in the West Surabaya area. The sampling technique was carried out by purposive

sampling with the criteria of farmers who have used digital devices (such as smartphones, agricultural applications, or commodity price information platforms) in their farming activities. The number of samples used was 30 respondents, which was considered sufficient to represent field conditions and meet the requirements of regression analysis.

The research instrument is in the form of a structured questionnaire consisting of two main parts: (1) independent variables in the form of access to digital-based market information measured through indicators of frequency of use, type of platform accessed, and level of information understanding; and (2) dependent variables in the form of sustainable agricultural decisions which are measured through indicators of environmentally friendly input selection, resource use efficiency, and long-term orientation to farming sustainability.

Data analysis was carried out with the help of IBM SPSS 21 statistical software to test the influence of independent variables on dependent variables simultaneously or partially (Al Banjari, 2020). In this study, multiple **linear regression** analysis is used, because there is more than one indicator (sub-variable) used to measure **access to digital market information**. The general equation is:

$$Y=\beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+\varepsilon$$

Information:

Y = Sustainable Agriculture Decision (dependent variable)

X_1 = Frequency of Access to Digital Market Information

X_2 = Type of Digital Platform Used

X_3 = Level of Understanding of Digital Information

β_0 = Constant

β_1,β_2,β_3 = The regression coefficient of each independent variable

ε = Error (residual)

3. Result and Discussion

a. Coefficient of Determination

This study aims to examine the extent to which access to digital-based market information influences farmers' decisions in implementing sustainable farming practices. The three independent variables analyzed include the frequency of access to digital information, the type of digital platform used, and the level of understanding of the information accessed. The use of regression models was chosen to measure the

contribution of each variable simultaneously to the dependent variable, i.e. sustainable agricultural decisions. The results of the following statistical analysis show the strength of the model in explaining the relationship empirically and significantly.

Table 1. Coefficient of Determination

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.966[a]	.933	.925	.34924
a. Predictors: (Constant), X_3, X_1, X_2				
b. Dependent Variable: Y				

The results of multiple linear regression analysis showed that the model built had an excellent performance in explaining the relationship between independent variables (frequency of access to digital information, type of digital platform used, and level of digital information understanding) and dependent variables, namely sustainable agricultural decisions (Y). A determination coefficient value (R Square) of 0.933 indicates that 93.3% of the variation in sustainable farming decisions can be explained by these three independent variables, while the remaining 6.7% is explained by factors outside the model. The Adjusted R Square value of 0.925 further confirms that the model remains stable and accurate despite the number of variables and samples used. Overall, this regression model is very feasible to explain the influence of access to digital-based market information on agricultural sustainability-oriented decision-making by farmers in the West Surabaya area.

b.Test F

To find out whether the independent variables together have a significant effect on sustainable farming decisions, the analysis of the F Test was used. This test aims to test the significance of the regression model simultaneously, namely whether the frequency of access to digital information, the type of digital platform used, and the level of understanding of digital information collectively have a significant influence on farmers' decision-making in implementing sustainable agriculture. Thus, the F Test is an important first step in determining whether the regression model used is feasible and can be used for further analysis, before looking at the influence of each variable partially through the t-test. From this study, table 2 can be seen.

Table 2. F Test Results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	44.029	3	14.676	120.330	.000[b]
	Residual	3.171	26	.122		
	Total	47.200	29			
a. Dependent Variable: Y						
b. Predictors: (Constant), X_3, X_1, X_2						

The results of the F test obtained from the ANOVA table showed that the F value was calculated as 120.330 with a significance value (Sig.) of 0.000. This value is well below the critical limit of 0.05, which means that the overall regression model is statistically significant. Thus, it can be concluded that the three independent variables, namely the frequency of access to digital information (X_1), the type of digital platform used (X_2), and the level of understanding of digital information (X_3) simultaneously have a real effect on sustainable agriculture decisions (Y). This is reinforced by the Sum of Squares value for the considerable regression of 44.029, compared to the residual of 3.171, suggesting that most of the variation in dependent variables can be explained by the model. Therefore, the regression model built can be said to be feasible and valid to be used to predict the influence of digital information access on sustainable agricultural decision-making among West Surabaya farmers.

c. T test

Once it is known that the regression model is simultaneously significant through the F test, the next step is to conduct a t-test to determine the influence of each partially independent variable on sustainable agricultural decisions. The t-test is used to evaluate whether each independent variable—frequency of access to digital information (X_1), type of digital platform used (X_2), and level of understanding of digital information (X_3)—has a significant influence individually on the dependent variable (Y). In other words, the test aims to look at the contribution of each digital factor separately in influencing farmers' decisions to adopt sustainable farming practices. The results of this test are important in determining which factors are the most dominant and relevant to be used as a basis in the formulation of policies to strengthen access to digital information for farmers. The results of the t-test can be seen from table 3.

Table 3. Test Results t

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.335	.188		1.777	.087
	X_1	.261	.110	.261	2.380	.025
	X_2	.379	.105	.396	3.606	.001
	X_3	.386	.119	.358	3.230	.003
a. Dependent Variable: Y						

Digital Information Access Frequency (X_1)

The results of the t-test showed that the variable frequency of digital information access (X_1) had a significant effect on sustainable agricultural decisions. The regression coefficient obtained was 0.261 with a significance value of 0.025 ($p < 0.05$), indicating that the more often a farmer accesses digital information, the more likely they are to make decisions that support sustainability principles. These findings imply that the habit of searching for information through digital media such as agricultural articles, educational videos, and online discussion forums can help farmers to adopt more environmentally friendly and efficient practices.

Type of Digital Platform Used (X_2)

The digital platform type variable (X_2) showed the most statistically strong influence on sustainable farming decisions. The regression coefficient was recorded at 0.379 with a significance value of 0.001, which shows that the types of digital media used by farmers, such as agricultural applications, marketplaces, agribusiness social media, or price information systems, play a large role in supporting decision-making. The right platform provides not only access to market information, but also professional social networks, education on sustainable agricultural techniques, and ease in agricultural input and output transactions. This shows the importance of selecting relevant and trusted digital channels in encouraging the transformation of agricultural practices.

Digital Information Comprehension Level (X_3)

The level of digital information understanding (X_3) has also been shown to have a significant influence on sustainable farming decisions. With a coefficient of 0.386 and a significance value of 0.003, this variable shows that the higher the digital literacy of farmers, the greater their ability to filter, assess, and apply information strategically in their agricultural practices. Farmers with a good digital understanding are able to distinguish valid information from non-essential information, and can adopt innovations that suit their needs and

environmental conditions. Therefore, increasing the capacity of digital understanding is a key factor in ensuring the effectiveness of information technology in supporting sustainable agricultural development.

d. Discussion

The results showed that three independent variables—frequency of digital information access (X_1), type of digital platform used (X_2), and level of digital information understanding (X_3)—had a significant effect on sustainable agricultural decisions (Y). A determination coefficient (R^2) of 0.933 indicates that 93.3% of the variation in sustainable farming decisions can be explained by this model, while the remaining 6.7% is influenced by factors outside the research model. This value reflects the very high strength of the model and indicates that the use of digital information technology by farmers has a real influence on their orientation in adopting environmentally friendly and sustainable agricultural systems. These findings corroborate a study by (Raysharie et al., 2025) which states that the integration of digital information is able to improve the efficiency of farmers' decision-making in facing environmental and economic challenges. In addition, digitalization has also been proven to accelerate the adoption of sustainable agriculture at the local level by expanding the reach of information and strengthening networks between farmers and market participants.

The X_1 variable, i.e. the frequency of access to digital information, shows a positive and significant influence on sustainable agricultural decisions. This suggests that the more often farmers access digital information through various media—such as agricultural portals, market price apps, or online education channels—the more likely they are to obtain useful information in support of environmentally friendly, economically efficient, and long-term oriented practices. With regular access, farmers become more responsive to market dynamics, climate change, and the latest agricultural technology developments. This result is in accordance with the research of (Bakhriansyah et al., 2025) which found that the intensity of farmers' access to online-based information plays a role in the selection of agricultural technology that is more adaptive to climate change and the market. The knowledge gained continuously allows farmers to plan more precise cultivation, use appropriate inputs, and reduce dependence on conventional patterns that tend to be exploitative.

The type of digital platform used (X_2) also has a significant impact on sustainable farming decisions. Platforms such as agricultural marketplaces, discussion groups on social media, digital farmer forums, or commodity price information apps provide an interactive space for farmers to compare information, discuss best practices, and decide on more efficient and environmentally friendly cultivation strategies. The diversity of platform types affects the quality and variety of information received, where farmers who are active on more than one platform tend to have more comprehensive knowledge. Research by (Ilham, 2023) shows that the use of digital platforms such as Agribusiness, TaniHub, and AgriSmart not only helps farmers reach a wider market, but also provides educational features, data-driven cultivation recommendations, and information on organic and sustainable farming practices. Therefore, access to relevant platforms is crucial in shaping sustainability-oriented decisions.

The level of understanding of digital information (X_3) has also been shown to be significant in influencing farmers' decisions. Farmers who have high digital literacy are not only able to access various digital information, but also can assess the validity and relevance of content, filter accurate information, and apply it strategically in their agricultural activities. Good digital literacy allows farmers not to be easily influenced by false or biased information, and is able to use agricultural data practically for production planning. This result is strengthened by the findings of (Aulia et al., 2024) which affirm that a good understanding of digital content supports farmers' capacity to implement green technology innovations, integrated agricultural systems, and natural resource conservation methods. In the context of sustainable agriculture, a deep digital understanding drives a change in mindset and behavior towards a wiser direction in resource management and marketing of produce.

Overall, this study shows that effective access to and use of digital information plays an important role in strengthening sustainable agricultural decisions. Agricultural digitalization is a strategic instrument in facing the challenges of the era of globalization and climate change, where information technology is not only a means of communication, but also a tool for transforming behavior, risk management, and farmers' economic decisions. This is in line with the opinion of (Irawan, 2023) that the development of digital technology contributes to accelerating the growth of the agribusiness sector with a data- and knowledge-based approach. Therefore, targeted policy interventions, such as strengthening rural digital infrastructure, digital literacy training, and integration of national agribusiness platforms, are needed so that the potential of digital technology can be used equally by

farmers at various levels. These steps are a strategic priority to expand sustainable agricultural practices, especially in urban-agricultural areas such as West Surabaya which face spatial and economic pressures at the same time.

4. Conlusion

This study aims to analyze the influence of the frequency of access to digital information, the type of digital platform used, and the level of understanding of digital information on sustainable agricultural decisions. Based on the results of regression analysis, all of these variables were proven to have a significant effect simultaneously or partially on farmers' decisions in implementing sustainable agricultural practices in the West Surabaya area. Frequency of access (X_1) contributes positively to increasing farmer engagement with information that supports environmentally friendly practices. The type of digital platform (X_2) proved to be the most dominant variable influencing farmers' decisions, demonstrating the importance of providing an appropriate platform. Meanwhile, the level of digital information understanding (X_3) also strengthens the quality of decision-making based on knowledge and awareness of sustainability. Thus, it can be concluded that access to digital-based market information is a strategic factor in shaping farmer behavior towards a more sustainable agricultural system.

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