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Exploring the Relationship between Agricultural Extension and Farmers' Responses to the Kartu Tani Program: A Case of Karya Bhakti I Farmer Group in Gegesik Kidul Village, Cirebon Regency

Mengkaji Hubungan Penyuluhan Pertanian dengan Respon Petani terhadap Program Kartu Tani: Kasus Kelompok Tani Karya Bhakti I Desa Gegesik Kidul Kabupaten Cirebon

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ABSTRACT
The government launched the Kartu Tani program to ensure a more accurate distribution of subsidised fertiliser. However, its implementation has faced several challenges, including low uptake of subsidised fertilisers by farmers. Previous studies indicate that farmers' responses to the Kartu Tani program have been less favorable. This study aims to analyse the relationship between agricultural extension activities and farmers' cognitive, affective, and conative responses in using the Kartu Tani. The research was conducted in Karya Bhakti I farmers' group in Gegesik Kidul village, Cirebon Regency, using a quantitative design. The respondents were 55 members of the Karya Bhakti I farmers group. Data were analysed descriptively and using Spearman rank correlation analysis. The results indicated a positive relationship between various indicators of agricultural extension activities and farmers' responses to the Kartu Tani program. These results highlight the crucial role of extension services in improving farmers' ability to effectively adopt the program. A more participatory approach to extension, in which farmers are actively involved in learning, identifying problems, and making decisions, has the potential to strengthen their understanding of, acceptance of, and perceived benefits from the Kartu Tani program. Improving this participatory dimension is essential for enhancing the program's long-term effectiveness and sustainability.
Keywords: Kartu Tani, Extension, Farmers, Response

ABSTRAK
Pemerintah meluncurkan program Kartu Tani untuk memastikan penyaluran pupuk bersubsidi yang lebih akurat. Namun, pelaksanaannya menghadapi beberapa tantangan, termasuk rendahnya penyerapan pupuk bersubsidi oleh petani. Penelitian sebelumnya menunjukkan bahwa respons petani terhadap program Kartu Tani kurang baik. Penelitian ini bertujuan untuk menganalisis hubungan antara kegiatan penyuluhan pertanian dan respons kognitif, afektif, dan konatif petani dalam penggunaan Kartu Tani. Penelitian ini dilakukan di kelompok tani Karya

Bhakti I di desa Gegesik Kidul, Kabupaten Cirebon, dengan menggunakan desain kuantitatif. Responden adalah 55 orang anggota kelompok tani Karya Bhakti I. Data dianalisis secara deskriptif dan menggunakan analisis korelasi peringkat Spearman. Hasil penelitian menunjukkan adanya hubungan positif antara berbagai indikator kegiatan penyuluhan pertanian dan respons petani terhadap program Kartu Tani. Hasil ini menyoroti peran penting layanan penyuluhan dalam meningkatkan kemampuan petani untuk mengadopsi program secara efektif. Pendekatan penyuluhan yang lebih partisipatif, di mana petani terlibat aktif dalam pembelajaran, mengidentifikasi masalah, dan membuat keputusan, berpotensi memperkuat pemahaman, penerimaan, dan manfaat yang dirasakan dari program Kartu Tani. Meningkatkan dimensi partisipatif ini sangat penting untuk meningkatkan efektivitas dan keberlanjutan program dalam jangka panjang.
Kata kunci: Kartu Tani, Penyuluhan, Petani, Respons

INTRODUCTION

The agricultural sector plays an important role in the Indonesian economy. In 2023, it contributed 12.53 percent to the national gross domestic product (GDP) (BPS, 2024). The food crop subsector significantly contributes to the GDP of the agricultural sector. Additionally, this sector employs a large number of people, particularly in rural areas. The food crop sector, particularly rice production, is essential to national food security. Ensuring sufficient food availability is a top priority for maintaining social stability and preventing food insecurity.

Fertilizer is one of the key production factors essential for supporting crop production and productivity. One of the long-standing agricultural development policies implemented by the government is the provision of fertilizer subsidies for farmers. The objective of these subsidies is to enable farmers to purchase fertilizers at lower prices, thereby reducing production costs and increasing crop yields (Sujai, 2011). The distribution of subsidized fertilizers has undergone several changes, including the use of control cards and direct subsidies to farmers (Sudjono, 2011).

Fertilizer subsidy policy in Indonesia has evolved dynamically over time. The policy was first introduced in the 1970s, with subsidized fertilizers being supplied through both imports and domestic production. This system remained in place for approximately 25 years until, in 1999, the government began implementing the Domestic Gas Incentive (*Insentif Domestik Gas*/IDG) to subsidize fertilizer provision for farmers at low cost (Ashari & Hariani, 2019). In its implementation, however, the distribution of subsidized fertilizers continues to

face numerous challenges. The main issues lie in planning, distribution, and monitoring processes (Rachman, 2012). Since 2020, the government has initiated a gradual reduction of fertilizer subsidies by shifting them toward more effective and better-targeted mechanisms. In response to these challenges, the government through the Ministry of Agriculture, has sought to introduce innovative solutions by launching the *Kartu Tani* (Farmer's Card) program. This initiative was based on recommendations from the Research and Development Agency of the Corruption Eradication Commission (KPK) and the Audit Board of Indonesia (BPK), aiming to enhance transparency and accountability in the distribution process by adhering to the six accuracy principles—namely, the right type, quantity, price, location, time, and quality (Mahendra et al., 2021).

Technically, *Kartu Tani* is a debit card that can only be used for fertilizer payment transactions, supported by Electronic Data Capture (EDC) machines placed at registered fertilizer retailers who have partnered with the program. The use of this card for subsidized fertilizer purchases not only directly reduces the allocated subsidy budget but also deducts the corresponding amount from the farmer's savings account balance. The *Kartu Tani* program has been implemented gradually since 2016 (Utami et al., 2023). The program involves collaboration with three state-owned banks under the Association of State-Owned Banks (*Himpunan Bank Negara*/HIMBARA) to facilitate the issuance and operationalization of the card system. The designated banks are: Bank Rakyat Indonesia (BRI)**,** which operates in Central Java, Banten, and the Special Region of Yogyakarta; Bank Negara Indonesia (BNI)**,** which covers East Java; and Bank Mandiri, which is responsible for implementation in West Java (Rosyid & Nuraeni, 2021).

However, in practice, the Kartu Tani program continues to encounter various challenges, particularly in terms of socialization and farmers' comprehension of the program. The information delivered during outreach activities is not always fully understood by the intended beneficiaries. This situation warrants serious evaluation, especially if farmers in the study area have not yet gained a clear understanding of how to optimally use the *Kartu Tani* for accessing subsidized inputs and related services. (Halim, 2023; Rigi et al., 2019).

As a major agricultural region, particularly for food crops, in West Java Province, the *Kartu Tani* program in Cirebon has also encountered challenges**.** any farmers who already possess the *Kartu Tani* have reported being unable to access subsidized fertilizers during the planting season (Islahudin, 2023). Gegesik district, the area with the highest level of rice production in Cirebon district, is also affected by this issue. According to data from the Cirebon District Agriculture Office, Gegesik is among the areas in Cirebon Regency with the lowest absorption rate of subsidized fertilizer through *Kartu Tani* (around 33%). Amid this low absorption rate, the Karya Bhakti I farmer group in Gegesik District stands out for having a relatively high level of fertilizer uptake. Nevertheless, farmers' responses to the *Kartu Tani* program remain less than favorable, particularly in terms of their knowledge and attitudes toward the program (Ghifari & Kusumo, 2024).

Farmers' responses to *Kartu Tani* program can be analyzed through three main dimensions: cognitive**,** affective**,** and **c**onative (Liu & Zhou, 2018; Rogers, 2003; Zhang et al., 2023)**.** The cognitive dimension refers to the farmer's level of knowledge and understanding about the *Kartu Tani* program. The affective dimension relates to farmers' acceptance toward the program, including their trust in its benefits. The conative dimension reflects behavioral intentions to use the *Kartu Tani*.

Extension programs play a role in helping farmers understand and overcome various agricultural challenges. Through effective extension, farmers gain new knowledge and are encouraged to adopt attitudes and behaviors that promote the sustainability of the agricultural sector Azuz et al. (2024). This demonstrates the important role of extension as a means of education and communication. In this case, extension services provide accessible and relevant information, extension agents help farmers develop a proper understanding of the program (cognitive), shape their perceptions and attitudes (affective), and ultimately support behavior change (conative).

The objective of this study is to analyze the relationship between agricultural extension services and farmers' responses to the *Kartu Tani* program. The findings of this study are expected to provide practical benefits for

policymakers and agricultural extension institutions by identifying which aspects of extension services most strongly influence farmers' responses. This can inform the design of more targeted, and participatory extension strategies to improve the implementation and acceptance of the *Kartu Tani* program in rural areas.

METHODS

This research was conducted at the Karya Bhakti I Farmer Group in Gegesik Kidul Village, Gegesik District, Cirebon Regency, West Java, from September to December of 2023. The selection of this research site was based on interviews and discussions with the Agricultural Extension Center (*Balai Penyuluhan Pertanian*/BPP) and the Cirebon Regency Department of Agriculture. These discussions revealed that fertilizer subsidy absorption through the *Kartu Tani* was relatively low in Gegesik District compared to other rice-producing areas in Cirebon Regency. However, within Gegesik District, the Karya Bhakti I Farmer Group demonstrated a relatively high level of *Kartu Tani* utilization compared to other farmer groups.

The study employed a quantitative design. In general, quantitative research uses an approach that focuses on collecting, analyzing, and interpreting data based on measurable criteria (Neuman, 2014). The technique used was a survey with a questionnaire.

The variables analyzed in this study include: (1) Farmers' perceptions of agricultural extension related to the *Kartu Tani* (Farmer's Card) program, measured through the farmers' proximity to extension agents, the intensity of information-seeking and information delivery regarding the *Kartu Tani*, and the media used by farmers as sources of information about the program; and (2) Farmers' responses to the *Kartu Tani*, which comprise three dimensions: the cognitive dimension, referring to farmers' knowledge of the purpose, benefits, and usage of the card; the affective dimension, reflecting farmers' attitudes in terms of ease of use, service quality, and experiences with card distributors; and the conative dimension, indicating farmers' behavior in using the *Kartu Tani*. All variables were measured using a likert scale from 1 to 5.

The respondents in this study were selected using a census technique, in which all members of the Karya Bhakti I Farmer Group in Gegesik Kidul Village, Gegesik District, Cirebon Regency were included. A total of 55 farmers participated as respondents in this research. To analyze the farmers' perceptions of extension activities related to the Farmer Card Program, as well as their responses to it, the data were analyzed using descriptive statistics. Descriptive statistical analysis presents the characteristics or basic description of the collected data without making inferences or generalizations about the wider population (Digdowiseiso, 2017). To explain the relationship between the extension activities and the farmers' responses to the *Kartu Tani* Program, the data were analyzed using Spearman rank correlation analysis. The Spearman rank correlation coefficient (r_s) is calculated using the following formula:

$$r_s = 1 - \frac{6 \sum d_i^2}{n(n^2 - 1)}$$

Note :

r_s : Spearman rank correlation coefficient

d_i : the difference between the ranks of each pair of observations

n : number of observation pairs

A positive value of r_s indicates a direct (positive) relationship, while a negative value indicates an inverse (negative) relationship. According to Nikitina & Chernukha, (2023), the strength of the relationship can be categorized as follows:

Very strong: $\rho > 0.8$ atau $\rho < -0.8$
Strong: $0.6 < \rho \leq 0.8$ atau $-0.8 \leq \rho < -0.6$
Moderate: $0.4 < \rho \leq 0.6$ atau $-0.6 \leq \rho < -0.4$
Weak: $0.2 < \rho \leq 0.4$ atau $-0.4 \leq \rho < -0.2$
Very weak: $\rho \leq 0.2$ atau $\rho \geq -0.2$

RESULTS AND DISCUSSION

Farmers' Response to Kartu Tani Program

The study by Ghifari & Kusumo (2024) shows that, in general, farmers' responses to the *Kartu Tani* program within the Karya Bhakti I farmer group were relatively poor. The weak cognitive responses indicate that farmers' knowledge of the *Kartu Tani*, including its purpose, benefits, and how to use it, remains limited.

These findings are consistent with those of Marindang et al. (2023) who reported that the electronic-based *Kartu Tani* is difficult for farmers to understand and has not been effectively implemented in practice.

Table 1. Cognitive Responses to the *Kartu Tani* Program

No	Statement	Response (%)				
		SD	D	N	A	SA
1.	Farmers understand the benefits and objectives of the *Kartu Tani*	18,2	47,3	30,9	3,6	0
2.	Farmers are aware of the *Kartu Tani* updating procedure	1,8	80	16,4	1,8	0
3.	Farmers understand how to use the *Kartu Tani*	0	58,2	40	1,8	0
4.	Farmers are aware of the types and quotas of subsidized fertilizers received	0	0	0	60	40
5.	Farmers know the subsidy amount, maximum retail price, and non-subsidized price of each fertilizer	0	0	49,1	47,3	3,6
6.	Farmers know the procedure for replacing a lost or damaged *Kartu Tani*	36,4	61,8	1,8	0	0
Total		9,4	41,2	23	19,1	7,3

Source: Primary data, processed (2023)
Notes: SD (Strongly Disagree) D (Disagree) N (Neutral) A (Agree) SA(Strongly Agree)

The farmers' affective responses indicated generally positive outcomes. The affective dimension encompasses farmers' emotions and attitudes toward a program or technology (Liu & Zhou, 2018; Zhang et al., 2023). Overall, farmers tend to have positive attitudes towards the subsidized fertilizer quota, the type of fertilizer, and the *Kartu Tani* distributor (Bank). Overall, farmers are satisfied with the *Kartu Tani*'s facilities and infrastructure. However, they are still dissatisfied with the mechanism for distributing subsidized fertilizer through the card (Table 2). Several studies have similarly reported that the primary challenges experienced by farmers in utilizing the *Kartu Tani* relate to the lack of adequate socialization regarding the card's usage mechanism, as well as limited physical access to fertilizer kiosks (Ashari & Hariani, 2019; Hendrita et al., 2024).

Table 2. Affective Responses to the *Kartu Tani* Program

No	Statement	Response (%)				
		SD	D	N	A	SA
1.	I am satisfied with the dissemination of information about the *Kartu Tani* program.	20	69,1	10,9	0	0

No	Statement	Response (%)				
		SD	D	N	A	SA
2.	I am satisfied with the services provided by the bank facilitating the *Kartu Tani* program.	0	1,8	41,8	45,5	10,9
3.	I am satisfied with the services and performance of the kiosks facilitating the provision of subsidized fertilizer.	0	16,4	61,8	21,8	0
4.	I am satisfied with the fertilizer quota allocated to me.	0	5,5	45,5	40,0	9,1
5.	I am satisfied with the types of fertilizer subsidized this year (NPK and urea).	0	0	7,3	58,2	34,5
6.	I am satisfied with the subsidized fertilizer price allocated through the *Kartu Tani*.	0	0	9,1	50,9	40,0
7.	The *Farmer Card* makes it easier for farmers to obtain subsidized fertilizer.	27,3	45,5	16,4	7,3	3,6
8.	I prefer to use the *Farmer Card* as a method of distributing subsidized fertilizer compared to previous methods.	27,3	47,3	16,4	3,6	5,5
Total		9,3	23,2	26,1	28,4	13

Source: Primary data, processed (2023)
Notes: SD (Strongly Disagree) D (Disagree) N (Neutral) A (Agree) SA(Strongly Agree)

In the conative aspect, farmers' responses also generally indicated unfavorable results. This suggests that the use of the *Kartu Tani* by farmers does not fully comply with the mechanisms established by the government. Many farmers are still unable to use the card independently and instead entrust it to other parties. This practice can be detrimental to farmers, as the *Kartu Tani* is intended to be personal and non-transferable. Handing over the card to others increases the risk of fraud. Moreover, farmers sometimes face issues with the unavailability of subsidized fertilizers at authorized kiosks, forcing them to purchase non-subsidized fertilizers instead (Table 3).

Table 3. Conative **Responses to the** *Kartu Tani* **Program**

No	Statement	Response (%)				
		SD	D	N	A	SA
1.	Farmers always use the *Kartu Tani* according to the procedures	5,5	56,4	30,9	5,5	1,8
2.	Farmers update the *Kartu Tani* independently	1,8	81,8	14,5	1,8	0
3.	Farmers retain full control over their *Kartu Tani* (not entrusted to others)	78,2	14,5	0	3,6	3,6
4.	Farmers always purchase subsidized fertilizers using the *Kartu Tani*	0	0	9,1	32,7	58,2

No	Statement	Response (%)				
		SD	D	N	A	SA
5.	Farmers always use up their subsidized fertilizer quota.	3,6	25,5	36,4	27,3	7,3
6.	Farmers always purchase subsidized fertilizer in accordance with the maximum retail price (HET).	0	0	0	0,0	100,0
7.	Farmers never experience any problems when using their *Kartu Tani.*	1,8	63,6	29,1	5,5	0
Total		13,0	34,5	17,1	10,9	24,4

Source: Primary data, processed (2023)
Notes: SD (Strongly Disagree) D (Disagree) N (Neutral) A (Agree) SA(Strongly Agree)

Farmers' Perceptions of Extension Services on the *Kartu Tani* Program

In the context of innovation diffusion, agricultural extension is a form of communication that disseminates new technologies or ideas to farmers. The goal is for farmers to adopt and use these technologies to improve their quality of life (Rogers, 2003) Regarding the *Kartu Tani* program, extension services are expected to provide farmers with the necessary information so they can understand and use *Kartu Tani* to access subsidized fertilizers.

Farmers' perceptions of extension activities were measured through several indicators: the closeness of farmers with local extension agents, the intensity of communication with agricultural extension officers regarding the *Kartu Tani* program, the frequency with which farmers participated in extension activities related to the *Kartu Tani*, and the quality of information received.

Extension activities related to the *Kartu Tani* program at the research site were conducted at least once a year by the Agricultural Extension Agency, in collaboration with village officials, during the registration period for farmers eligible to receive subsidized fertilizers in the upcoming cycle. These sessions aimed to provide farmers with information on the requirements for re-registration, how to use the *Kartu Tani*, the prices of subsidized fertilizers, and the types of fertilizers covered by the subsidy, once determined by the relevant authorities. In addition to formal extension activities, farmers could also interact directly with extension agents by visiting or inviting them to inquire about matters related to the *Kartu Tani*.

This study uses an ordinal scale with a rating system of 1 to 5. The value of 1 indicates the most negative perception, while the value of 5 indicates the most positive perception. The analysis results show that the Karya Bhakti I Farmer Group has a poor perception of extension activities related to the *Kartu Tani* program (see Table 4).

Table 4. Farmers' Perceptions of Extension Services on the *Kartu Tani* Program

No	Statement	Perception (%)					Total Score
		SD	D	N	A	SA	
1.	Farmers have a close relationship with extension agents	3,6	43,6	36,4	12,7	3,6	148
2.	Farmers communicate intensively with extension agents regarding *Kartu Tani*	29,1	49,1	20	1,8	0	107
3.	Farmers always attend extension activities related to *Kartu Tani*	29,1	70,9	0	0	0	94
4.	Information about *Kartu Tani* is very clear	0	60	40	0	0	132
Total		15,5	55,9	24,1	3,6	0,9	481

Source: Primary data, processed (2023)
Notes: SD (Strongly Disagree) D (Disagree) N (Neutral) A (Agree) SA(Strongly Agree)

Based on Table 4, it is evident that most farmers do not have a close relationship with agricultural extension agents. This can be attributed to the limited interaction between farmers and extension personnel, which hinders the effective dissemination of information related to the *Kartu Tani* program. This condition is strongly associated with the **low intensity of communication** between the two parties, which, in turn, negatively impacts farmers' understanding, attitudes, and behaviors toward the program. Moreover, in addition to infrequent participation in extension activities, farmers also rarely visit the Agricultural Extension Centers for consultation or technical support.

Furthermore, many farmers are not yet proactive in seeking alternative sources of information independently. As a consequence, the majority of farmers feel that they have not received sufficient information about the *Kartu Tani*, and they continue to face various challenges, particularly in understanding the digital transaction mechanisms associated with the card.

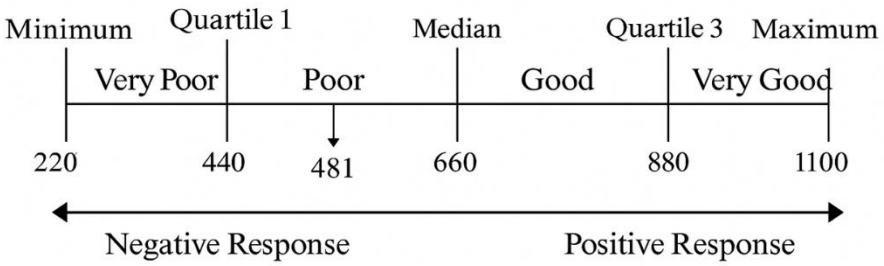

Figure 1. Farmers' Perceptions of Extension Services on the Kartu Tani Program
Source**:** Primary data, processed (2023)

The figure above shows that farmers' perceptions of extension activities are generally still poor. Based on interviews with respondents, it is evident that farmers require hands-on training to overcome the barriers they face when using *Kartu Tani*, which involve digital technology. Many farmers are unfamiliar with this technology and have limited technological literacy.

The Relationship Between Extension Services and Farmers' Responses to the *Kartu Tani* Program

The correlation test results show that there is a positive and significant relationship between all extension indicators related to *Kartu Tani* and farmers' cognitive, affective and conative responses (Table 5). Farmers' closeness to extension workers is positively and significantly related to farmers' cognitive responses ($r = 0.543$, $p = 0.023$), farmers' affective responses ($r = 0.343$, $p = 0.029$), and farmers' conative responses ($r = 0.360$, $p = 0.007$).

Interview results indicate that interpersonal closeness between farmers and extension workers plays an important role in building trust in the information conveyed by extension workers, ultimately increasing understanding and acceptance of the *Kartu Tani* program. Consistent with this finding, Yulianto et al. (2023) also demonstrated the significant impact of extension workers on increasing farmer participation and changing their behavior regarding the adoption of new technology.

Table 5. Analysis Results of the Relationship Between Agricultural Extension and Farmers' Responses to the *Kartu Tani* Program

		Cognitive	Affective	Conative
Farmers' closeness with agricultural extension officers	Correlation Coefficient	.543*	.343*	.360**
	Sig. (2-tailed)	.023	.029	.007
	N	55	55	55

		Cognitive	Affective	Conative
Intensity of communication with extension officers	Correlation Coefficient	.373**	.510*	.247**
	Sig. (2-tailed)	.007	.034	.009
	N	55	55	55
Frequency of farmers' attendance in extension activities	Correlation Coefficient	.555**	.303*	.575*
	Sig. (2-tailed)	.000	.035	.045
	N	55	55	55
Clarity of information regarding the *Kartu Tani*	Correlation Coefficient	.454**	.380**	.473**
	Sig. (2-tailed)	.000	.000	.005
	N	55	55	55

Source: Results of data processing using SPSS Statistics 25 (2024)
Notes **. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

As shown in Table 5, the intensity of communication with extension workers was significantly and positively related to farmers' cognitive (r = 0.373, p = 0.007), affective (r = 0.510, p = 0.034), and conative (r = 0.247, p = 0.009) responses. These results suggest that the intensity of communication is positively related to farmers' knowledge, attitudes, and skills regarding the use of *Kartu Tani*. These results align with those of Adha et al. (2019) and Retnowati (2007), who explain the importance of communication in driving societal change.

However, despite the statistical significance, the correlation between communication intensity and farmers' conative responses (r = 0.247) falls within the **weak** category. This implies that intensity of communication may not be sufficient to influence farmers' actual use of the Kartu Tani. Therefore, a more **targeted, practical, and participatory communication approach** is needed to strengthen farmers' skills in using *Kartu Tani*. At present, information about the *Kartu Tani* is typically delivered through a **didactic extension method**, which involves one-way communication from extension agents to farmers. These sessions are often held only once a year, making them both **infrequent and ineffective**. Farmers have noted that this approach limits their understanding of how to use the *Kartu Tani* properly, as it lacks interactive dialogue, demonstration, and feedback mechanisms. This highlights the need to a **more participatory and experiential extension approach**, such as farmer field schools, guided practice, or peer-to-peer

learning, which have proven more effective in promoting behavioral change and technology adoption in agricultural settings.

The intensity of communication between farmers and extension workers is positively and significantly related to farmers' cognitive ($r = 0.555$, $p = 0.000$), affective ($r = 0.303$, $p = 0.035$), and conative ($r = 0.575$, $p = 0.045$) responses. These results highlight the importance of extension activities as a medium for delivering information and shaping farmers' attitudes. Furthermore, clear, consistent, and relevant information is essential to improving the effectiveness of the *Kartu Tani* program. This is indicated by the positive and significant relationship between information clarity and cognitive response ($r = 0.454$, $p = 0.000$, affective response ($r = 0.473$, $p = 0.005$), and conative response ($r = 0.473$, $p = 0.005$).

In general, this study suggest that farmers with better perceptions of extension activities have better knowledge, attitudes, and skills when it comes to using farmer cards. This demonstrates the importance of extension activities in helping farmers understand how to apply subsidized fertilizers using *Kartu Tani*. This finding aligns with Rogers's (2003) assertion that extension activities can improve farmers' knowledge, attitudes, and skills. Well-received extension and socialization activities can increase farmers' understanding of and knowledge about *Kartu Tani*. Extension activities guide farmers in using *Kartu Tani*, which utilize an electronic system. This aligns with the need to improve digital literacy among farmers, particularly in rural areas. This is expected to increase the efficiency of implementing the *Kartu Tani* program.

This study also shows that a lack of assistance and supervision when using the *Kartu Tani*, as well as poor human resource capabilities among farmers in receiving information, are related to the extent to which farmers adopt the *Kartu Tani*. These findings are consistent with Gunawan & Pasaribu (2020), who identified farmers' limited awareness and technical constraints as major challenges in the effective use of the Kartu Tani. These obstacles can be further understood using the **extension role framework proposed by Mardikanto**, which outlines several key roles of agricultural extension: **education, information/innovation dissemination, facilitation, consultation, supervision, monitoring,** and

evaluation (Mardikanto, 2009). The observed gaps in farmers' capacity and program uptake indicate that some of these roles, particularly **education, supervision**, and **facilitation**, have not been optimally performed.

CONCLUTION

Agricultural extension services are one of the key factors in shaping farmers' cognitive, affective, and conative responses to the *Kartu Tani* program. The better the extension services provided, the more likely farmers are to possess accurate and comprehensive knowledge about the *Kartu Tani* (cognitive response), develop positive attitudes and trust in the program (affective response), and actively and correctly use the card in accordance with the procedures (conative response).

To improve the effectiveness of the *Kartu Tani* program, it is essential to strengthen agricultural extension services through participatory, interactive, and farmer-centered approaches. These should be supported by increased coordination among stakeholders and a consistent commitment to empowering farmers as informed users of the program.

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