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# Rice Farmers Responses to the Reduction of Subsidized Fertilizer Quotas in Rawamerta District, Karawang Regency

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**Abstract.** The reduction of subsidized fertilizer quotas by the government in 2024 has raised concerns among rice farmers due to the potential decline in productivity. This study aims to analyze farmers' responses to the policy and the factors influencing them. The research was conducted in Purwamekar Village, Rawamerta District, Karawang Regency, using a survey method involving 40 respondents selected through proportional random sampling. Farmers' responses were measured across three dimensions cognitive, affective, and conative using a Likert-scale questionnaire, and the data were analyzed descriptively and with Spearman's rank correlation. The results show that farmers' responses to the fertilizer quota reduction policy fall into the high category, with a total score of 47.48. Factors significantly related to farmers' responses include education level and access to non-subsidized fertilizers, while age, farming experience, land area, income, and access to information were not significantly correlated. The findings imply that the government should strengthen agricultural extension programs and improve access to alternative fertilizers for farmers with lower education and limited experience, to ensure that subsidy reduction policies do not lower rice production and continue to support national food security.

## 1 Introduction

Indonesia, as an agrarian country where the majority of the population works in agriculture, places great importance on agricultural development to improve the welfare of its people. In addition to playing a key role in strengthening national food security and increasing farmers' production and income, fertilizer is considered a strategic asset in agriculture [1]. A farmer is defined as someone who works in the agricultural sector, primarily by cultivating land and

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tending to crop such as rice, fruits, flowers, and others, with the aim of producing food for personal consumption or for sale [2]. Farmer institutions support the social and economic development of farmers by facilitating their access to agricultural information, capital, infrastructure, and markets [3].

Rice is a strategic and politically important food commodity [4]. The government continuously monitors and regulates the quality, availability, and price fluctuations of rice, as demand continues to grow in line with population increases [5]. High rice prices may be driven by rising agricultural production costs or difficulties farmers face in accessing fertilizers [6]. To address this issue, the government has implemented a subsidized fertilizer policy [7]. Subsidized fertilizer refers to fertilizer whose cost is partially covered by the government to meet the needs of farmers in each region [8]. It is provided through specific mechanisms and regulatory oversight, with the aim of making fertilizer more affordable particularly for small and medium scale farmers [9].

In 2024, the Department of Agriculture and Food Security of Karawang Regency reported a significant reduction up to 50% in the allocation of subsidized fertilizer for farmers compared to 2023. This reduction is expected to have a considerable impact on farmers, as fertilizer is a key factor in increasing agricultural yields. Farmers in the region have expressed concern, especially since they rely on fertilizers to optimize their harvests. There is growing worry that farmers will struggle to access or will be unable to sufficiently use subsidized fertilizer. The allocation of subsidized urea fertilizer in Karawang Regency has seen notable changes between 2022 and April 2024.

According to the Food Security Agency, food security refers to a condition in which the availability and accessibility of food in a region are considered safe. This means that people in the area do not face difficulties in obtaining food and are able to live healthy, active, and productive lives. The benchmark used to measure food security known as the Food Security Index includes several indicators beyond accessibility. These indicators cover aspects such as food quality, safety, adequacy, and utilization. Therefore, this issue may lead to a decline in productivity, which could ultimately affect the food security index in Karawang Regency.

According to Statistics Indonesia, Karawang ranked second in West Java in terms of rice production in 2023, reaching 1.09 million tons. This figure is slightly lower than the production levels in 2021 and 2022, which reached 1.23 million tons. Only Indramayu outperformed Karawang, with 1.42 million tons of rice produced in 2024. These figures indicate that rice productivity in Karawang Regency has not been consistent. Fluctuations in productivity are influenced by several factors, one of which is the changing allocation of subsidized fertilizer.

According to Dadan Sugardan, Chairman of the Karawang branch of the Indonesian Farmers and Fishers Contact Group, farmers have become anxious upon learning that the amount of subsidized fertilizer will be reduced. In addition, farmers in several subdistricts are currently in the planting season and will begin harvesting soon. In other areas, such as South Karawang and surrounding regions, rice was planted at the same time. Farmers are concerned that subsidized fertilizer may not be available when needed due to varying planting periods across Karawang. Mr. Dadan stated, as quoted on Sunday (January 28, 2024), "There is concern among farmers about the difficulty or insufficiency in using subsidized fertilizer. I need to prepare non-subsidized fertilizer stocks in case there is a delay in the distribution of subsidized fertilizer, whose quota has been reduced."

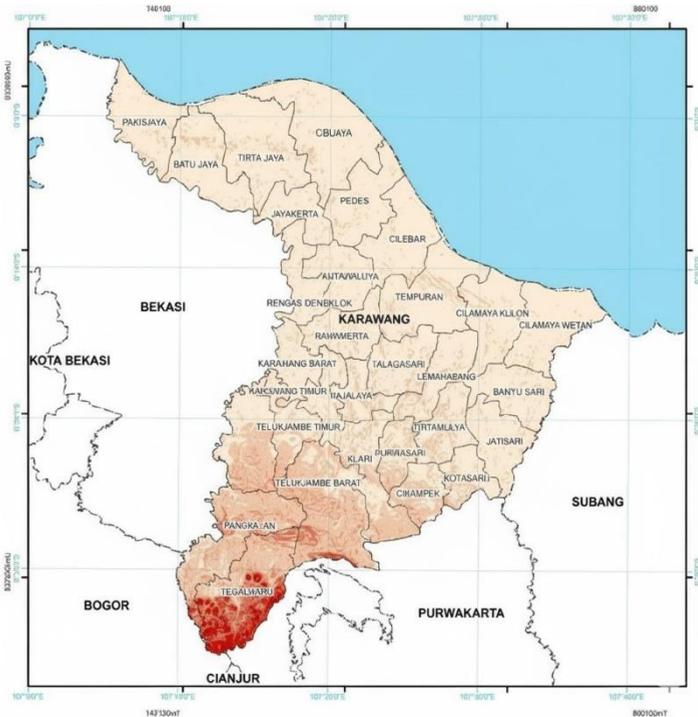
Fertilizer allocation in those years may affect harvest outcomes and the sustainability of agriculture. The government must ensure that fertilizer subsidies are used more efficiently and are well-targeted to maintain food security and support farmers in agricultural production. Any reduction in fertilizer quotas should be carefully considered, given its impact on rice farm productivity and food security. A balanced approach is needed, one that considers both agricultural productivity and environmental sustainability.

The agricultural sector deserves attention due to its close relationship with national food security. In challenging times like these, food security must be safeguarded to prevent the kind of food crisis currently affecting Indonesia. Farmers, as the backbone of food production, are among those most impacted. This includes meeting high demand, ensuring product quality, maintaining distribution channels, and addressing various other aspects that require strategic adjustments to secure the population's food needs and food security during the pandemic in Indonesia [10].

Given the urgency of this issue, it is important to understand how farmers are responding to the reduction in fertilizer subsidies. Their responses ranging from changes in input use, shifts in planting practices, to reliance on non-subsidized alternatives provide insight into the resilience and adaptability of the agricultural sector. This study aims to examine the responses of rice farmers in Rawamerta District to the reduced fertilizer quotas, and to assess the broader implications for food security and agricultural sustainability in the region.

## 2 Research method

This study employed a descriptive quantitative method, carried out through a survey approach by directly engaging farmer groups using structured questionnaires and field observations. The aim was to collect numerical data that could be statistically analyzed to describe the farmers' responses. Respondents were selected using a proportional random sampling technique to ensure a representative sample from each farmer group in Purwamekar Village, Rawamerta District, Karawang Regency (Figure 1). The sample consisted of 40 active farmer group members. Data was collected through observations, interviews, and questionnaires.



**Fig. 1.** Map of Karawang Regency

The farmers' responses to the reduction in subsidized fertilizer quotas were analyzed based on three dimensions: cognitive response (knowledge and understanding), affective

response (attitude), and conative response (action). To examine the relationship between various factors and farmers' responses, Spearman's rank correlation analysis was used. Descriptive quantitative analysis was also applied to provide an overview of the farmers' profiles and the main variables related to their responses to the reduction in subsidized fertilizer allocation.

### 3 Results and discussion

#### 3.1 Farmers' response to the reduction of subsidized fertilizer quotas

A response is a behavior influenced by environmental stimuli or triggers. Stimulus and response are interconnected, where a response tends to follow the occurrence of a stimulus [11]. The response of rice farmers to the reduction of subsidized fertilizer quotas refers to the reactions, attitudes, or actions taken by farmers in response to the policy of reduced fertilizer allocation in Karawang Regency in 2024. These responses are examined through three components: cognitive (knowledge and understanding), affective (attitudes and feelings), and conative (actions or behavior), as well as their overall response (Table 1).

**Table 1.** Rice farmers' response to the reduction of subsidized fertilizer quotas

Response	Response Indicator	Score	Category
Cognitive	Knowledge of subsidized fertilizer policy	3.95	Knowledgeable
	The benefits of subsidized fertilizer for rice farming	4.18	Knowledgeable
	Subsidized fertilizer application techniques	4.20	Very knowledgeable
	Knowledge of the differences in farming yields with and without subsidized fertilizer	3.68	Knowledgeable
Affective	Concerns about the impact of subsidized fertilizer reductions	4.13	Agree
	Disappointment with the reduction in subsidized fertilizer	4.28	Strongly agree
	Confidence in the impact of reducing subsidized fertilizer on crop quality	3.63	Agree
	Concerns about farmers' welfare	3.85	Agree
Conative	Adapting to fertilizer availability	3.50	Trying
	Efforts to increase land management efficiency	3.90	Trying
	Participation in farmer groups and social networks	4.03	Trying
	Farmer involvement in government policy aspirations	4.18	Trying
<b>Total score</b>		<b>47.48</b>	<b>High</b>

*Description: Very Low: 12.00–21.59; Low: 21.60–31.19; Moderate: 31.20–40.79; High: 40.80–50.39; Very High: 50.40–60.00*

The responses of rice farmers to the reduction of subsidized fertilizer quotas in Rawamerta District, Karawang Regency, were generally rated as high, with an overall score of 47.48. Farmers' reactions to this policy can be analyzed through three main aspects: cognitive, affective, and conative.

In the cognitive aspect, farmers demonstrated a relatively high level of knowledge regarding the subsidized fertilizer policy, its benefits for rice cultivation, and its application techniques. The average score in this aspect indicates that farmers are aware of the potential impacts of reduced fertilizer quotas on their crops. However, there are still variations in their understanding of the difference in agricultural yields with and without subsidized fertilizer.

In the affective aspect, most farmers expressed concern and disappointment about the policy. This is reflected in the high scores on indicators related to their concern for farmers'

welfare and the potential effect on crop quality. Farmers felt significantly affected by the policy, particularly regarding fertilizer availability, which influences their agricultural productivity.

In the conative aspect, farmers showed their efforts to adapt to changes related to subsidized fertilizer and took practical actions in response. They began adjusting to current conditions, despite ongoing challenges. Efforts to improve land management efficiency were also observed as a way to maintain productivity. Furthermore, their involvement in farmer associations and social networks indicates active information exchange and collaboration in finding solutions. Their participation in government policy initiatives was also relatively high, suggesting that farmers are not only adapting but also seeking to represent their interests in agricultural policymaking.

Farmers frequently face scarcity of subsidized fertilizers, particularly nitrogen and phosphorus, which are crucial for rice production. This scarcity often forces them to purchase more expensive non-subsidized fertilizers, impacting their overall production costs and profitability [12]. Many farmers resort to purchasing non-subsidized fertilizers despite the higher costs. This is a direct response to the unavailability of subsidized options [13]. The reduction of subsidized fertilizer quotas presents significant challenges for rice farmers, leading to adaptations that include the use of non-subsidized and organic fertilizers, and illegal practices. Addressing these issues requires improved distribution systems, increased budget allocations, and support for sustainable farming practices. These measures can help stabilize rice production and support farmers' livelihoods in the face of reduced subsidies.

### 3.2 The relationship between various factors and rice farmers' response to the reduction of subsidized fertilizer quotas

This study examined several factors considered to be associated with rice farmers' responses to the reduction of subsidized fertilizer quotas. These factors include age, education, land size, farming experience, income, the price of non-subsidized fertilizer, access to information, and government support. The correlation coefficients were calculated using Spearman's rank correlation test to analyze the relationship between these factors and the farmers' responses to the policy. The results of the Spearman rank correlation analysis are presented in Table 2.

**Table 2.** Spearman rank correlation between contributing factors and farmers' responses

Factors	Correlation (Rs)	Significance
(p-value)		
Age	-0.032	0.047 *
Education	0.718	0.000 **
Land Area	-0.107	0.510
Farming Experience	-0.037	0.018 *
Income	-0.045	0.781
Limited Access to Non-Subsidized Fertilizer	0.441	0.004 *
Access to Information	0.253	0.115

Note: \*: significant at 0.05 level (2-tailed); \*\*: significant at 0.01 level (2-tailed)

Based on Table 5, which presents the results of the Spearman rank correlation test between various factors and rice farmers' responses to the reduction of subsidized fertilizer quotas, it can be observed that some factors show significant relationships with farmers' responses, while others do not. The test was conducted at a significant level of  $\alpha = 0.05$ . A p-value less than 0.05 indicates that the null hypothesis ( $H_0$ ) is rejected and the alternative hypothesis ( $H_1$ ) is accepted, meaning there is a statistically significant relationship between

the factor and the response. Conversely, if the p-value is greater than 0.05,  $H_0$  is accepted and  $H_1$  is rejected, indicating no significant relationship.

The first factor showing a significant relationship is age ( $R_s = -0.0317$ ,  $p = 0.047$ ), with  $p < 0.05$ . Thus,  $H_0$  is rejected and  $H_1$  is accepted. The negative correlation suggests that as farmers age, their tendency to respond adaptively to the policy decreases. This may be due to differences in the ability to receive information and adopt agricultural innovations. Younger farmers are likely more flexible and open to alternative solutions, while older farmers tend to adhere to familiar practices.

The next factor is education ( $R_s = 0.718$ ,  $p = 0.000$ ), with  $p < 0.01$ , indicating a highly significant positive correlation. This means that higher levels of education among farmers are associated with a better understanding of the policy and stronger responses to it. Educated farmers are more likely to understand government policies and actively seek solutions, whether through technological innovation or alternative fertilizer use.

Farming experience also shows a significant relationship ( $R_s = -0.0373$ ,  $p = 0.018$ ), with  $p < 0.05$ . The negative correlation suggests that more experienced farmers tend to respond less actively to the policy change. This could be because experienced farmers have already encountered various policy changes in the past and have developed alternative strategies. Rather than being indifferent, they may be more conservative and view such changes as being manageable within their existing practices.

Another significant factor is limited access to non-subsidized fertilizer ( $R_s = 0.441$ ,  $p = 0.004$ ). The positive correlation indicates that the more difficult it is for farmers to access non-subsidized fertilizer, the stronger their response to the reduction in subsidized quotas. In response, farmers may reduce fertilizer doses, seek organic or alternative fertilizers, or cut production costs in other areas to compensate.

Finally, government support is also significantly related ( $R_s = 0.422$ ,  $p = 0.007$ ), with  $p < 0.05$ . The positive correlation suggests that the greater the level of government support such as outreach, training, and alternative assistance the more positive the farmers' response to the policy. This finding underscores the important role of government in helping farmers understand the policy and in providing solutions to mitigate the impact of reduced fertilizer subsidies.

On the other hand, several factors were found to have no significant relationship with farmers' responses. These include land size ( $R_s = -0.107$ ,  $p = 0.510$ ), income ( $R_s = -0.045$ ,  $p = 0.781$ ), and access to information ( $R_s = 0.253$ ,  $p = 0.115$ ), with p-values greater than 0.05. Therefore, the null hypothesis ( $H_0$ ) is accepted, and the alternative hypothesis ( $H_1$ ) is rejected for these variables.

The absence of a significant relationship between land size and farmers' responses suggests that both small- and large-scale farmers are similarly affected by the subsidy reduction, indicating that land ownership is not a primary factor in shaping attitudes toward the policy. Likewise, the lack of correlation between income and response implies that farmers' wealth levels do not directly influence their reactions to the reduction in fertilizer subsidies. This could be due to other considerations, such as access to alternative fertilizers or reliance on government policy support.

Similarly, the lack of a significant relationship between access to information and farmers' responses may be due to the limited effectiveness of the information disseminated or farmers' limited ability to access or interpret information related to the policy. Farmers with higher education levels and larger land holdings have better access to agricultural information. Additionally, factors like farm size, income, and participation in social groups positively influence the adoption of modern agricultural technologies [14]. Customizing information to local contexts and specific farming practices can enhance the effectiveness of information dissemination and influence farmers' responses positively [15].

## 4 Conclusion and recommendation

Overall, rice farmers in Rawamerta District demonstrated a high level of response, both cognitively, affectively, and conatively. This indicates that farmers are well aware of the subsidized fertilizer reduction policy and its impact on their agricultural activities. While many farmers expressed concern and disappointment over the policy, they did not respond passively. Instead, they sought ways to cope with the challenges by improving fertilizer use efficiency, joining farmer groups, and voicing their concerns to the government. The factors significantly associated with farmers' responses to the reduction in subsidized fertilizer quotas in Rawamerta District include age, education, farming experience, limited access to non-subsidized fertilizers, and government support.

Based on the findings, several recommendations can be made. The government and agricultural extension workers should intensify the dissemination of information regarding fertilizer subsidy policies, particularly targeting farmers with limited experience and education, to better prepare them for these changes. Efforts should also focus on promoting and facilitating access to alternative fertilizers and supporting the adoption of more efficient farming technologies to reduce dependency on subsidized fertilizers. Government support needs to be strengthened through alternative subsidies, training programs, and broader access to relevant information. In addition, farmer groups should be optimized as platforms for discussion and collective problem-solving in response to the policy changes.

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