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Analysis of rice paddy farmers' perceptions of subsidized fertilizer policy on tidal and irrigated land

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Abstract

This study aims to analyze farmers' perceptions of subsidized fertilizer policies. on tidal and irrigated land. The research was conducted on 2 types of paddy fields, namely tidal land in Tanjung Lago District, Banyuasin Regency and irrigated land in Buay Madang District, East Ogan Komering Ulu Regency, South Sumatra Province, Indonesia. The sampling technique was Simple Random Sampling, which obtained a sample of 50 respondents in each type of tidal and irrigated land, so that the total sample was 100. Then the respondents were interviewed using a questionnaire. The data were analyzed descriptively quantitatively using 4 indicators of the effectiveness of subsidized fertilizer policies, namely the right price, right place, right amount, and right time. The results showed that the right place and right time indicators were effective in tidal land, but the right price and right amount indicators were not effective. On irrigated land, the right price and right place indicators are effective, but the right amount and right time indicators are not effective.

Keywords: Right Price; Right Place; Right Amount; Right Time; Subsidized Fertilizer

1. Introduction

Subsidized fertilizer policy is one of the Government of Indonesia's policies in the agricultural sector. The provision of subsidized fertilizers will increase the efficiency and effectiveness of farming because it has implications for increasing rice productivity (1). Subsidized fertilizers can improve the welfare of Indonesian farmers (2). Most farmers in Indonesia need subsidized fertilizers because prices are more affordable with subsidies provided by the government, reducing production costs (3).

Regulation of the Minister of Trade No. 04 of 2023 regulates the distribution of subsidized fertilizers, which is carried out according to 4 principles: right price, right place, right amount, and right time. This needs to be done so that the need for fertilizer for farmers can be fulfilled. However, the implementation of the subsidized fertilizer policy is still not effective because there are still many problems at the farm level. Many farmers buy fertilizer at a price higher than the price ceiling, there are no official kiosks in the village so that farmers find it difficult to buy fertilizer due to long distances, fertilization is not carried out according to the recommended dosage due to insufficient amount of fertilizer, and fertilizer purchases are made not at officially registered kiosks (4).

Rice is the main food commodity in Indonesia, so rice production is carried out in all provinces in Indonesia. On the island of Sumatra, of the 10 provinces, South Sumatra is the highest rice producer compared to other provinces with production reaching 2,775,069 tons, which is cultivated on an area of 513,378 ha according to data from Indonesia's Central Bureau of Statistics in 2023. Rice crops in South Sumatra are spread across several districts, with rice production centers in Banyuasin, East Ogan Komering Ulu, Ogan Komering Ilir, Musi Banyuasin, and Musi Rawas. Of the five producers, Banyuasin and East Ogan Homering Ulu were recorded as the districts with the highest production of

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514,108 tons and 396,051 tons. Therefore, Banyuasin and East Ogan Komering Ulu were selected as samples for research on the topic of Farmer Perception Analysis of subsidized fertilizer policy in South Sumatra.

2. Material and methods

This research was conducted on tidal land in Mulya Sari Village, Tanjung Lago Sub-district, Banyuasin District and on irrigated land in Ganjar Agung Village, Buay Madang Sub-district, East Ogan Komering Ulu District, South Sumatra Province. The research object is paddy farmers who receive subsidized fertilizer from the government. The research method used in this study is the survey method, with a simple random sampling technique. The number of paddy farmers who use subsidized fertilizer in Mulya Sari Village is 62 people and in Ganjar Agung Village is 68 people. In each village 50 respondents were taken so that the total respondents were 100 people.

To analyze respondents' perceptions of subsidized fertilizer policies were analyzed using quantitative descriptive analysis. There are 4 variables of perception indicators, and each variable consists of 3 statements. So that the total perception statement is 12 which is measured using a Likert scale. Perceptions of the right price, right place, right amount, and right time each consist of 3 statements with a minimum value of 3 and a maximum value of 15. After being totaled, the scores of the right price, right place, right amount, and right time statements will be transformed into an index that ranges from 0-100. The scale used to measure farmers' perceptions is with 4 Likert scale options with the format of scores and categories:

- Score 1: Strongly Disagree (SDA)
- Score 2: Disagree (DA)
- Score 4: Agree (A)
- Score 5: Strongly Agree (SA)

Then the total score is categorized into 4 categories with the class interval formula. The results of the class interval value of the perception indicator variable are presented in Table 1:

Table 1 Class Interval Value of Effectiveness Indicator

Effectiveness Categories	Interval Score	Percentage Interval
Very Low	12,00 < x ≤ 24,00	20,00% < x ≤ 40,00%
Low	25,00 < x ≤ 36,00	41,00% < x ≤ 60,00%
High	37,00 < x ≤ 48,00	61,00% < x ≤ 80,00%
Very High	49,00 < x ≤ 60,00	81,00% < x ≤ 100,00%

Source: Results of Primary Data Processing, 2024

3. Results and discussion

3.1 Respondent Characteristics

3.1.1 Farmer Age

Farmers' age affects their physical ability and thinking ability in cultivating their land (5). Farming activities generally rely on physical strength, so that if the farmer's age is getting older, the physical ability has decreased and has an impact on reducing work productivity. Conversely, the younger the age of the farmer, the better the physical and thinking abilities. The following is a graph of the age of respondents.

Figure 1 Farmer Age

Figure 1 shows that mostly of respondents in tidal land and irrigated land are aged 15-65 years, 84% and 86% respectively. This shows that mostly of farmers are at a productive age for farming which tends to rely on physical abilities. Farmers with an unproductive age of more than 64 years still carry out farming activities because it is the main source of livelihood.

3.1.2 Farming Experience

Farmers who have longer farming experience tend to have higher capacity (attitudes, knowledge, and skills) in managing their farms than those with less experience. This has an impact on farmers' ability to manage farms and the ability to allocate resources to achieve production efficiency (6).

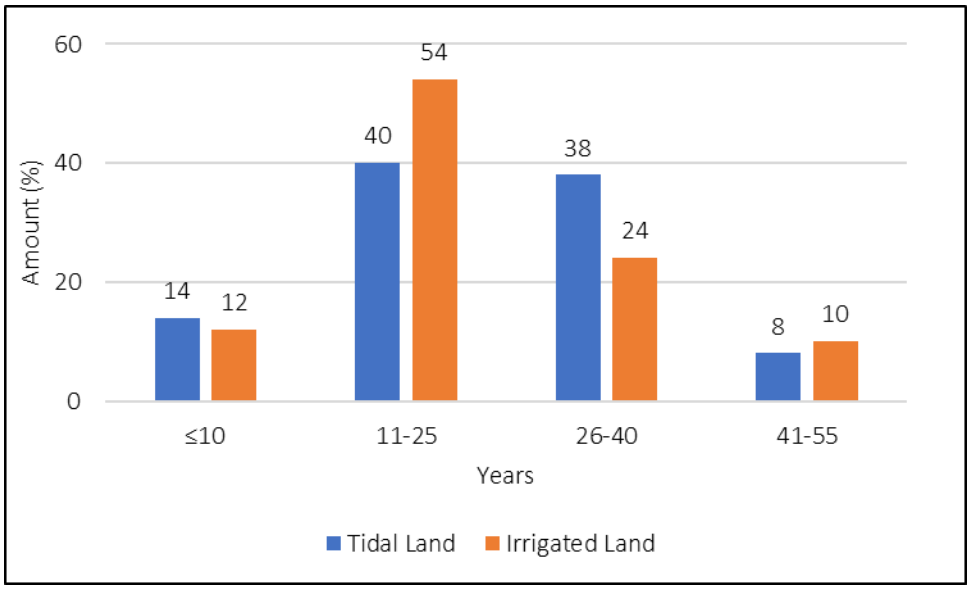

Figure 2 Farming Experience

Figure 2 shows that respondents have 11-25 years of farming experience, namely 40% in tidal land and 54% in irrigated land. This shows that respondent farmers in each land have good farming skills based on their experience.

3.1.3 Education Level of Respondents

The level of education will affect the mindset of farmers in absorbing information and applying it to farming activities. Information such as agricultural innovations, the use of the latest technology, financial management, decision making, etc. will affect the development of farming. The following is the education level of respondent farmers (7).

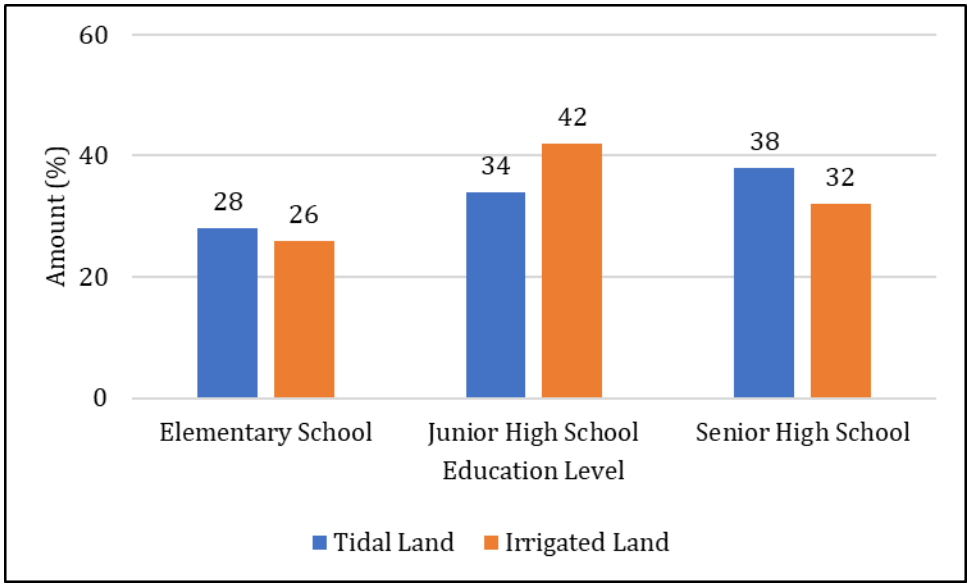

Figure 3 Education Level

Figure 3 shows that the education level in tidal land is higher than in irrigated land. Mostly of respondents in irrigated land have a junior high school education level with a percentage of 42%. In contrast to tidal land, respondents had a higher level of education, namely senior high school at 38%. Most respondents have a level of education that is not high enough, so attention from the local government is needed in the form of counseling and assistance, especially agricultural agencies to provide knowledge in agriculture so that farmers know how to manage land and increase their agricultural production.

3.1.4 Respondent's Land Area

Land is a fixed input in rice production. The larger the land area, the greater the opportunity to increase rice production. Farmers can be divided into several types based on land area, namely: narrow land farmers have a land area below 0.5 hectare (ha), medium land farmers have a land area of 0.5-1 ha, and large land farmers have a land area above 1 ha (8).

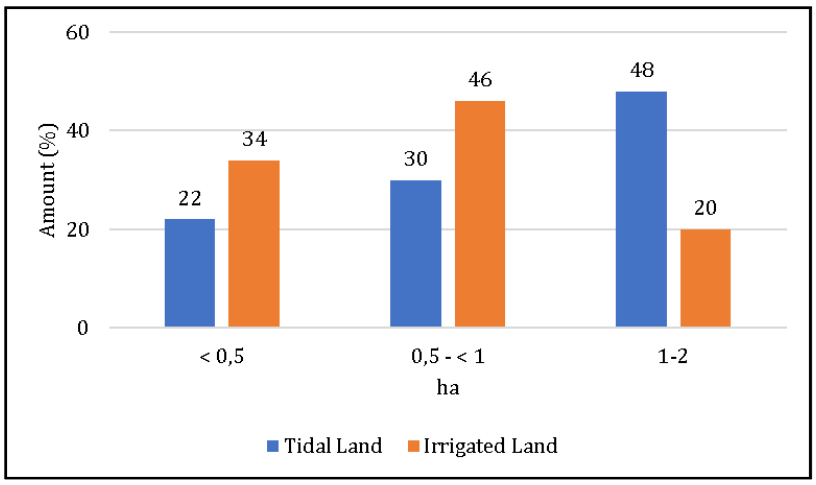

Figure 4 Land Area

Figure 4 shows that 48% of respondent farmers on tidal land have a land area above 1 ha, so it can be categorized that farmers in this sub-district have a large land area. In contrast to irrigated land, 46% of respondent farmers have a land area of 0.5-1 ha, so it can be categorized that farmers in this sub-district have a medium land area.

3.1.5 Perceived Effectiveness of Subsidized Fertilizer Policy

Right Price

The right price obtained is based on the difference between the price received by respondents and the price they should have received. The average price of each type of subsidized fertilizer received by respondents will be explained in the table 2:

Table 2 Right Price Perception in Tidal Land and Irrigated Land

Right Price	**Respondent's Answer**				**Score**		**Index (%)**	**Category**
	1	2	4	5	Total	Average		
Affordable subsidized fertilizer price:								
Tidal land	11	28	11	0	250	2.20	44.40	Low
Irrigated land	2	21	22	5	250	3.10	62.80	High
I can afford to buy subsidized fertilizer:								
Tidal land	17	23	8	2	250	2.10	42.00	Low
Irrigated land	3	11	30	6	250	3.50	70.00	High
Subsidized fertilizer prices are the same at every retail kiosk:								
Tidal land	2	17	24	7	250	3.20	64.40	High
Irrigated land	1	11	29	4	250	3.30	67.60	High

Table 2 shows the perception of the effectiveness of subsidized fertilizer policies based on the right price. The first right price is the affordability of subsidized fertilizer prices. On tidal land is at an index of 44.40% (low), where 39 respondents consider subsidized fertilizers expensive and hope that the government will reduce the price of subsidized fertilizers. In irrigated land had an index of 62.80% (high). A total of 27 respondents considered the price of subsidized fertilizer to be inexpensive and appropriate. The second right price is the ability to buy subsidized fertilizer. In tidal land, the index was 42.00% (low), where 40 respondents felt could not afford subsidized fertilizer because it was expensive. In irrigated land had an index of 70.00% (high), where 36 respondents said they could afford subsidized fertilizer because the price was appropriate. Even some farmers still buy fertilizers that are no longer subsidized by the government such as KCL and SP-36 at high prices (non-subsidized) because they think that the use of these types of fertilizers increases the production of their farms. The third right price is that the price of subsidized fertilizer is the same at every retail kiosk. In tidal land, the index was 64.40% (high), where 31 respondents said that there was no difference in the price of fertilizer at each retail kiosk. In irrigated land was at an index of 67.60% (high), where 33 respondents said the price of subsidized fertilizer was the same. This is because mostly respondent farmers buy fertilizer from their group, so the price is the same.

Based on Table 3, it is found that the effectiveness of the right price in tidal land is 50.20 (low) and in irrigated land is 66.80 (high). It can be concluded that the effectiveness of subsidized fertilizer policy based on the right price indicator in tidal land is not effective, while in irrigated land it is effective. This research is in line with research conducted (9) found that subsidized fertilizer policy based on the right price has not been effective. The price of subsidized fertilizer received by respondents is higher than the highest retail price set by the government. Details of the actual price and highest retail price can be seen in the table below.

Table 3 Right Price Perception

No	Right Price	Tidal Land (%)	Irrigated Land (%)
1	Subsidized fertilizer price affordable	44.40	62.80
2	I can afford the fertilizer subsidized	42.00	70.00
3	The price of subsidized fertilizer is the same at every retailer kiosk	64.40	67.60
Average		50.20	66.80
Category		Low	High

Tabel 4 Average Price of Subsidized Fertilizer Received by Respondents

Description	Urea		NPK	
	Tidal Land	Irrigated Land	Tidal Land	Irrigated Land
Average Purchase Price (IDR/kg)	2700	3000	3000	3400
Highest Retail Price (IDR/kg)	2250	2250	2300	2300
Absolute Deviation (IDR/kg)	450	750	700	1100
Relative Deviation (%)	20	33	30	48

Table 4 shows the average purchase price of fertilizer and the highest retail price. The types of subsidized fertilizer used by respondents are urea and NPK. The highest retail price of urea fertilizer set by the government is IDR2250/kg. But the reality, the average price of urea fertilizer obtained by respondents was IDR2700/kg on tidal land and IDR3000/kg on irrigated land, resulting in a difference of IDR450/kg and IDR750/kg respectively from the actual price. Respondents had purchased urea fertilizer at 20% and 33% more for each kilogram of fertilizer than the actual price.

In addition to urea fertilizer, the government also subsidizes NPK fertilizer. NPK fertilizer has a highest retail price of IDR 2300/kg. However, the average price received by respondents was IDR3000/kg on tidal land and IDR3400/kg on irrigated land, resulting in a difference of IDR700/kg and IDR1100/kg respectively from the actual price. From the prices obtained, respondents have purchased NPK fertilizer at 30% and 48% more expensive for each kilogram of fertilizer than the actual price.

It can be said that both types of fertilizers have a higher purchase price than the highest retail price. The margin between the actual price and the highest retail price is due to the costs incurred during the fertilizer distribution process from the warehouse to the retailer. These costs consist of transportation costs from the warehouse to retailers, and from retailers to farmer groups. The process of distributing fertilizer from retailers to farmer groups also requires loading and unloading costs. In addition, the farmer group also has the cost of guarding the fertilizer to avoid loss due to fertilizer theft.

Right Place

The right place means that farmers as recipients of fertilizer subsidies can obtain fertilizer at officially registered kiosks that are close to the farmer's house or land and the kiosks are located within the village.

Table 5 shows the perception of the effectiveness of subsidized fertilizer policies based on the right place. The first right place is the purchase of subsidized fertilizers at official kiosks. In tidal land is at an index of 79.20% (high), where 44 respondents always buy subsidized fertilizer at official kiosks. In irrigated land is at an index of 74.80% (high), where 38 respondents always buy fertilizer at official kiosks. The second right price is purchasing fertilizer within the village. In tidal land, the index is 85.60% (high), where 48 always buy fertilizer within the village and never buy fertilizer outside the village. In irrigated land is at an index of 82.00% (high), where 46 respondents always buy fertilizer in the village.

The third right place is the ease of obtaining subsidized fertilizer because it is close to the farmer's house/land. In tidal land, the index was 85.20% (very high), where 47 respondents said it was very easy to get subsidized fertilizer because the location was close to the farmer's land. In irrigated land is at an index of 82.80 (high), where 31 respondents also said that the collection of subsidized fertilizer is very close to the farmer's land.

Table 5 Right Place Perception in Tidal Land and Irrigation Land

Right Place	**Respondent's Answer**				**Score**		**Index (%)**	**Category**
	1	2	4	5	Total	Average		
I bought fertilizer at an official kiosk:								
Tidal Land	0	6	34	10	250	3.96	79.20	High
Irrigated Land	1	11	26	12	250	3.74	74.80	High
I bought fertilizer in a village:								
Tidal Land	1	1	29	19	250	4.28	85.60	Very High
Irrigated Land	2	2	31	15	250	4.10	82.00	Very High
It is easy for me getting subsidized fertilizer because the place is close to my house/land:								
Tidal Land	1	2	27	20	250	4.26	85.20	Very High
Irrigated Land	2	7	14	27	250	4.14	82.80	Very High

Table 6 Right Place Perception

No	**Right Place**	**Tidal Land (%)**	**Irrigated Land (%)**
1	I bought fertilizer at an official kiosk	79.20	74.80
2	I bought fertilizer in a village	85.60	82.00
3	It is easy for me to get subsidized fertilizer because the place is close to my house/land	85.20	82.80
Average		83.33	79.86
Category		Very High	High

Based on table 6, it is found that the effectiveness of the right place in tidal land is 83.33 (very high) and in irrigated land is 79.86% (high). So, it can be concluded that the effectiveness of subsidized fertilizer policies based on the right place is effective in both places. Mostly of respondents buy fertilizer through their respective farmer groups who are responsible for taking fertilizer to official kiosks. In addition, only farmers who are registered with the farmer group get subsidized fertilizer, so farmers cannot buy from other farmer groups. The division of farmers into farmer groups is also based on land area. Farmers with close are in the same farmer group, so farmers are easy to get fertilizer and do not need to travel long distances. This research is in line with research conducted (10), namely that the subsidized fertilizer policy based on the right place indicator is effective.

Right Amount

The third indicator that is the scope of this research is the right amount indicator. The right amount indicator means that the amount of fertilizer received is in accordance with the proposal and fertilization is carried out in accordance with the right dose. The recommended amount of inorganic fertilizer based on nutrient status and crop needs is a

combination of 200kg/ha of urea and 300kg/ha of NPK according to the Indonesian Ministry of Agriculture. The results of the research on the accuracy of the amount will be shown in the following table.

Table 7 Right Amount Perception in Tidal Land and Irrigated Land

Right Amount	Respondent's Answer				Score		Index (%)	Category
	1	2	4	5	Total	Average		
The amount of fertilizer I receive always enough:								
Tidal Land	15	30	5	0	250	1.90	38.00	Low
Irrigated Land	16	25	9	0	250	2.04	40.80	Low
I fertilize according to government recommended dose:								
Tidal Land	12	25	13	0	250	2.34	46.80	Low
Irrigated Land	3	18	29	0	250	3.10	62.00	High
Subsidized fertilizer increases my rice production:								
Tidal Land	7	25	18	0	250	2.58	51.60	Low
Irrigated Land	1	22	16	11	250	3.28	65.60	High

Table 7 shows the perception of the effectiveness of subsidized fertilizer policies based on the right amount. The first right amount is the amount of fertilizer received is sufficient. In tidal land, the index is 38.00% (low), where 45 respondents said that the fertilizer received was not enough and sometimes did not match the amount proposed. Likewise, irrigated land was at an index of 40.80% (low), where 41 respondents said the amount of subsidized fertilizer received was not enough, so some respondents also bought non-subsidized fertilizer at a higher price. The second right price is fertilization done according to the government's recommended dose. In tidal land, the index was 46.40% (low), where 37 respondents did not fertilize according to the government's recommended dose because the amount of fertilizer received was insufficient. While in irrigated land the index was 62.00% (high), where 21 respondents fertilized according to the government's recommended dose. Exactly the third amount of subsidized fertilizer helps increase rice production. On tidal land, the index was 51.60% (low), where 32 respondents said that subsidized fertilizer was less helpful in increasing their rice production because the amount was insufficient. While on irrigated land it was at an index of 65.60%, where 27 respondents said that subsidized fertilizer was very helpful to increase their rice production.

Table 8 Perception of The Right Amount

No	Right Amount	Tidal Land (%)	Irrigated Land (%)
1	The amount of fertilizer I receive is always sufficient	38.00	40.80
2	I fertilize according to government recommended dose	46.80	62.00
3	Subsidized fertilizer increased my rice production	51.60	65.60
Average		45.46	56.13
Category		Low	Low

Based on Table 8, it is found that the effectiveness of the right amount in tidal land is 45.46 (low) and in irrigated land is 56.13 (low). So, it can be concluded that the effectiveness of subsidized fertilizer policies based on the right amount indicator is not effective. This is the impact of the government's reduction in the fertilizer subsidy budget. Currently, the types of fertilizers subsidized by the government are only 2, namely urea and NPK. Previously the government

subsidized urea, KCL, TSP and NPK. Farmers said that they had been using all types of subsidized fertilizers because they made rice production better. After the reduction in subsidized fertilizers, some farmers still buy the unsubsidized fertilizers at high prices such as KCL and TSP. However, some farmers who cannot afford unsubsidized fertilizers only use urea and NPK which are subsidized by the government. In addition, the amount of subsidized fertilizer that respondents received was never enough because it depended on the limited amount of fertilizer allocated to each village. This led farmer groups to equally distribute the available fertilizer to farmers. Below is the average amount of subsidized fertilizer received by respondents.

Table 9 Amount of Subsidized Fertilizer

Amount of Fertilizer/hectare	**Fertilizer Type**	
	Urea	NPK
Average amount of fertilizer received (IDR/kg)	150	150
Amount of fertilizer at recommended dose (IDR/kg)	200	300
Absolute Deviation (IDR/kg)	50	150
Relative Deviation (%)	25	50

Table 9 above shows the average amount of fertilizer received by farmers and the amount of fertilizer as recommended by the government. The types of fertilizer used by respondents were urea and NPK. The dose of urea fertilizer set by the government is 200kg/ha. However, the average amount of fertilizer received by respondents was 150kg/ha in tidal land and irrigated land, resulting in a difference of 50kg/ha. Respondent farmers still lack 25% of urea fertilizer to match the government recommended dose. Similarly, the NPK fertilizer dosage set by the government is 300kg/ha. However, the average amount of fertilizer received by respondents was 150kg/ha in tidal land and irrigated land so there was a difference of 150kg/ha. Respondents still lack 50% of NPK fertilizer to match the government's recommended dose. So, it can be concluded that the subsidized fertilizer policy based on the right amount has not been effective. This research is in line with research conducted (11), namely that the subsidized fertilizer policy based on the right amount is not effective. According to research (12), this happens because the Group Needs Definitive Plan (GNDP) has no effect on the government's decision to set the fertilizer budget.

Right Time

Right Time means that subsidized fertilizer is always available when needed by farmers, in other words that there is no scarcity of subsidized fertilizer when farmers start the planting season. The results of the timely research based on the opinions of the respondents will be shown in the following table.

Table 10 Perception of Right Time in Tidal Land and Irrigated Land

Right Time	**Respondent's Answer**				**Score**		**Index (%)**	**Category**
	1	2	4	5	Total	Average		
Subsidized fertilizer is always there when needed:								
Tidal land	0	16	29	5	250	3.46	69.20	High
Irrigated land	1	30	11	8	250	2.90	58.00	Low
I buy subsidized fertilizer during the planting season:								
Tidal land	1	6	40	3	250	3.76	75.20	High
Irrigated land	3	5	38	4	250	3.70	74.00	High
I have never experienced a scarcity of subsidized fertilizer:								

Tidal land	4	40	6	0	250	2.16	43.20	Low
Irrigated land	17	29	4	0	250	1.82	36.40	Very Low

In table 10 above, it can be seen the perception of the effectiveness of subsidized fertilizer policies based on the right time. The first on time is subsidized fertilizer is always there when needed. In tidal land is at an index of 69.20% (high), where 34 respondents said that subsidized fertilizer is always there when needed. In contrast, irrigated land was at an index of 58.00% (low), where 31 respondents said that they had been late in obtaining subsidized fertilizer. The second time is when subsidized fertilizer is purchased during the planting season. In tidal land, the index was 75.20% (high), where 43 respondents said they always bought subsidized fertilizer during the planting season. Likewise, irrigated land was at an index of 74.00% (high), where 42 respondents bought fertilizer during the planting season. The third right time is that there has never been a scarcity of subsidized fertilizer. In tidal land, the index was 43.20% (low), where 44 respondents said that they had experienced a scarcity of subsidized fertilizer. Likewise, irrigated land was at an index of 36.40%, where 46 respondents said that they had also experienced a scarcity of subsidized fertilizer.

Table 11 Perception of Right Time

No	Right Time	Tidal Land (%)	Irrigated Land (%)
1	Subsidized fertilizer is always available when needed	69.20	58.00
2	I buy subsidized fertilizer during the planting season	75.20	74.00
3	I have never experienced a shortage of subsidized fertilizer	43.20	36.40
Average		62.53	56.13
Category		High	Low

Based on table 11 above, it is found that the effectiveness of on-time in tidal land is 62.53% (high) and in irrigated land 56.13% (low). So, it can be concluded that the effectiveness of subsidized fertilizer policy based on timely indicators in tidal land is effective, while in irrigated land it is not effective. Respondent farmers buy fertilizer 1-2 weeks before the planting season starts and at that time fertilizer is already available in their respective farmer groups. Respondents said that they had experienced a shortage of subsidized fertilizer in 2020-2022. This was because there was a worldwide Covid-19 pandemic, so the government cut the budget for fertilizer subsidies. The factor causing the scarcity of subsidized fertilizers is also because the realization is always lower than the proposal. This research is in line with research conducted (13), namely that subsidized fertilizer policies based on timely indicators have not been effective.

4. Conclusion

The subsidized fertilizer policy on tidal land has not been effective because only 2 indicators (right place and right time) are met, while the right price and right amount indicators are not met. Likewise, on irrigated land, the subsidized fertilizer policy is also not effective because only 2 indicators (right price and right place) are met, while the right amount and right time indicators are not met.

Compliance with ethical standards

Disclosure of Conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

A statement of informed consent was obtained from all participants included in the study.

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