



Study of Subsidized Fertilizer Distribution System in Karawang Regency, West Java-Indonesia

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<i>Article History</i>	Abstract
Received: 06 June 2023 Revised: 05 Sept 2023 Accepted: 15 Nov 2023	<p><i>Fertilizer is a crucial and strategic requirement for enhancing production, productivity, quality, and competitiveness of agricultural products across various sectors, including food crops, horticulture, smallholder plantations, livestock, and fisheries. Given its importance, it is deemed necessary to subsidize fertilizers. However, issues arise with fertilizer subsidies, such as the yearly increase in the budget allocated for these subsidies, which poses a significant burden on the government. Additionally, the low cost of urea (N) makes it susceptible to misuse in terms of excessive and unbalanced application, non-agricultural use, and leakage of subsidized fertilizer to the state. It is suggested that targeted cash transfers be implemented, and demand and supply market forces determine domestic fertilizer prices. This study aimed to identify the system of distribution, distribution channels, and aspects of equity and distribution of subsidized fertilizers in Karawang Regency. The methodology involves field research, data analysis, policy review, stakeholder consultation, and implementation monitoring. The aim is to ensure effective subsidy distribution and increased agricultural productivity. The study found that subsidized fertilizers provide several benefits to farmers, such as affordable prices, guaranteed availability even in remote areas, assured quality due to SNI standards, increased interest in sustainable farming, and contribution to national agricultural productivity improvements. However, eliminating fertilizer subsidies at the farm level could reduce productivity by up to 9.50%. The study recommends maintaining the budget for fertilizer subsidies in Karawang Regency with adjustments made to the distribution system based on the unique needs of each farmer in different locations. It also suggests assisting extension workers through local government regarding the suitability/accuracy of dosage and environmentally friendly fertilizer.</i></p>
CC License CC-BY-NC-SA 4.0	Keywords: <i>Benefits, Budget, Farmers, Government, Increasing</i>

1. Introduction

Subsidies for fertilizers are distributed via a mechanism that sets the selling price of the fertilizer. This strategy is designed to ensure that the market prices do not impose a heavy financial burden on farmers, motivating them to boost their agricultural output. The government's subsidy policy alleviates some of the financial pressures farmers face. By subsidizing fertilizers, it is anticipated that the productivity of agricultural goods will rise, leading to: Achieving self-sufficiency by increasing production in the food supply. Using fertilizer subsidies is also a polemic in Asian countries such as India. Madhur (2015) explains that farmers very much need the implementation of subsidies. Subsidy spending in India is a huge public expenditure, equivalent to 13% of total government spending. Research and education only account for 0.34% of the government budget or 6.4% of agricultural expenditure (Ahmet *et al.* 2019).

Catherine and Antony (2017) studied the financing of fertilizer subsidies by the government in Ghana. In the research conducted, it was concluded that the availability and price of fertilizers are only some of the obstacles to increasing production. However, the technology used is one of the main obstacles to achieving optimal production. Stein (2018) studied fertilizer subsidies implemented by Asian African countries since the 1960s. The main reason for implementing the fertilizer subsidy policy is not to fulfill

the need for soil fertility but for political and economic reasons. This pattern of implementing e-RDCK supports reducing inappropriate targets as recipients. The Subsidy will have a precise impact if the recipient is a small farmer with limited resources, including capital for farming. Nazaire (2017), in his study of subsidies in Ghana, concludes that the government needs to review and refine the subsidy pattern implemented so far because most of the subsidy recipients are large farmers already advanced in their agricultural businesses. The government needs to review the implementation of input subsidies so that they are right on target, namely small farmers who need it.

The issue of fertilizer subsidies is also prevalent in India. Ashok (2015) highlighted several challenges associated with these subsidies. These include a yearly increase in the budget allocated for fertilizer subsidies, which poses a significant concern for the government. The low cost of urea (N) is susceptible to misuse, including overuse, unbalanced application, and consumer exploitation. There is a need to consider the introduction of targeted cash transfers and allow the domestic fertilizer price to be dictated by demand and supply forces in the free market.

Numerous studies on the policy of fertilizer subsidies have uncovered several challenges and their execution on the ground. These include:

1. Inconsistencies between the regulation and its implementation.
2. Limited stock often results in scarcity due to high demand from local governments.
3. The presence of a moral hazard at various stages of the subsidized fertilizer supply chain.
4. Not all farmers are part of farmer groups, so the needs of these farmers are not considered in the planning process for fertilizer needs listed in the RDCK for subsidized fertilizers.
5. Some of the RDCK compiled at the farmer group level needs to be more accurate.
6. Most farmers purchase fertilizer in cash, meaning they often have to pay above the Highest Retail Price (HET) through a post-harvest payment mechanism.

The current subsidized fertilizer distribution system refers to the Regulation of the Minister of Trade No. 15/M-DAG/PER/4/2013 concerning the Procurement and Distribution of Subsidized Fertilizers for the Agricultural Sector (Permendag No. 15/2013). In the distribution of subsidized fertilizers: (1) Producers appoint authorized distributors, and (2) authorized distributors appoint authorized retailers to provide services to farmer groups and farmers who are entitled to purchase subsidized fertilizers. The preparation of the RDCK preceded the distribution of fertilizer subsidies until farmers or farmer groups received subsidized fertilizers. The stages are: (1) Preparation of the RDCK; (2) Delivery of RDCK; (3) Distribution of fertilizers; and (4) Fertilizer acceptance by farmers. Each producer receives the RDCK and a decision on the amount of allocation determined by the Governor for the allocation of each district and the Regent for the allocation of each sub-district, by their primary task in procuring certain types of fertilizers. About the distribution system, comprehensive information is needed regarding (1) The system and condition of the subsidized fertilizer distribution system in stages up to the farmer level, (2) Whether the existing fertilizer distribution system is running effectively and well, and (3) How strategy in increasing the effectiveness of the subsidized fertilizer distribution system.

Furthermore, according to research results According to Hermawan (2014), subsidies and price support are short-term policies that can increase farmers' production and income. The same thing from the research results of Ramli et al. (2012) revealed that rice production in Malaysia can only be maintained with fertilizer subsidies, and farmers are not willing to buy their fertilizer. If the government decides to slowly or drastically remove fertilizer subsidies, it will encourage farmers to buy fertilizers to increase their rice production. In the context of the efficiency of the distribution system, according to Rachman (2009), there are still areas for improvement in the fertilizer distribution policy, both technical, management, and regulatory. The results of the PSEKP study (2018) show that the use of fertilizers at the farmer level, of course, must pay attention to the existing nutrient map to achieve efficiency in using fertilizers. Therefore, improvements to existing weaknesses are expected from the results of this study; it is hoped that it will ensure the availability of fertilizer at the user/farmer level at the time, dose, and according to the set HET, as well as encourage the efficiency of fertilizer use at the farmer level.

In the context of spatial policy, the application of a policy considers the condition of the area/space/land (Tarigan, 2012). Therefore, in coordinating development activities between government agencies, they can carry out spatial planning activities to realize the development's ideals, vision, and mission. Spatial Analysis theory is a unique science concerning analyzing natural spatial phenomena, including physical and social phenomena, significantly above the earth's surface (Rustiadi, 2004). A regional development plan requires the following processes: (1) resource evaluation, (2) institutional (social) evaluation, (3) economic evaluation, and (4) location/spatial evaluation. Since land is the site of all human activities, the primary natural evaluation is land evaluation.

Fertilizer subsidy is the government's budget allocation to bear the fertilizer price subsidy, the difference between the subsidized and non-subsidized prices. What is meant by the subsidized price is the highest retail price (HET), while the non-subsidized price is the Cost of Goods Sold (HPP) of fertilizers. According to Pindyck and Rubinfeld (2005), the fertilizer subsidy is an input subsidy. The formula for the amount of price subsidy per kg of subsidized product can be written as follows: $SH_i = H - NS_i - HSi$, namely: SH_i = Subsidy for the i th product price per kg; SH_i is the price subsidy borne by the government, and HS_i is the price paid by the subsidy recipient community. Subsidies on the price of production facilities such as fertilizers aim to increase the purchasing power of poor farmers so that they can buy production facilities in sufficient quantities to increase or maintain their productivity and farm income.

The grand theory of this research is about subsidies and distribution. Subsidies are actions taken by the government or other parties to ease the spending burden on the general public. It is an act of reducing the price of certain subsidized goods so that the burden on society is lighter. Subsidies can be in the form of money, goods, or a reduction in the price of goods. The existence of subsidies that lighten the burden on society for certain goods can have positive effects, such as preventing poverty, reducing crime, facilitating consumption activities (wheel of the economy), and introducing technology more efficiently. However, it can also lead to an inefficient allocation of resources, frequent abuses in the field, in some instances, a reduction in product quality, and unhealthy competition in trade competition (OCBC NISP Editor, 2021).

In Indonesia, in the agricultural sector, which is essential for the availability of staple food sources, the government subsidizes many sectors, such as fertilizer and seed subsidies. Government efforts are made to increase agricultural production by intensifying efforts, namely adding specific resources to increase production yields (Stewart and Roberts, 2011). The government's burden in bearing the cost of subsidies, especially fertilizer, is increasing yearly in line with the price of fertilizer, which is constantly rising. In this case, the efficiency of reducing subsidies on types of fertilizers that are not the primary source of needs for rice plants, in particular, needs to be reduced (Iwan Hermawan, 2014). Distribution is an activity carried out to move production from producers to consumers. Distribution plays a role in connecting producers with consumers and plays a role. The primary function of distribution is to distribute/move goods from producers to users or consumers, directly or indirectly, through third parties, namely distributors (Populix, 2022).

The cost of distributing subsidized fertilizer varies from region to region—a separate weakness in fulfilling subsidized fertilizers as a whole. In addition, since there was a change in the government subsidy system, where previously subsidies were given to reduce the gas price as raw material, they changed to fertilizer price subsidies (PSEKP. 2006).

Subsidized fertilizer distribution is carried out in a closed system. The point is that the distribution is distributed to distributors and kiosks appointed by the manufacturer with predetermined criteria because it is not distributed freely. This supports that subsidized fertilizers are goods under government control. In this system, it will be known as line I, where the position of fertilizer is in the factory warehouse; line II, the position of fertilizer is in the manufacturer's warehouse, where the position of the warehouse is in the provincial/district city; line III the position of fertilizer is in the distributor warehouse, and line IV the position of fertilizer is in authorized retail kiosk.

Specifically, the policy of subsidizing fertilizers is rooted in the crucial role of fertilizer as a critical input that contributes to the enhancement of agricultural production. Thus, this study has set out to achieve the following objectives:

1. To examine the system of distributing subsidized fertilizer in Karawang Regency.
2. To scrutinize the existing channel for distributing subsidized fertilizer in Karawang Regency.
3. To analyze the distribution and allocation of subsidized fertilizers in Karawang Regency.

2. Materials And Methods

Location and Time

This research was conducted in West Java Province, namely Karawang Regency. Determination of the location of this research: The area was chosen because it is a center for rice production and is also based on the achievement of the realization of subsidized fertilizer based on e-RDKK with good, medium, and bad categories, where Karawang Regency represents the medium category. The research time is planned to be carried out from October 2021 to March 2022.

Population and Sample

This study selected several research samples from the central to regional levels. The sample selection was carried out purposively or purposively, considering that it could represent a sample of each actor involved in the fertilizer subsidy policy and provide the information needed to answer the research objectives. Research informants include agencies/institutions, representatives of fertilizer companies, fertilizer distributors, kiosk owners, and farmer households. The total number of research samples is as follows:

No	Name of Respondent	Number
1	Directorate of Fertilizers and Pesticides	1
2	PT. Pupuk Indonesia at the research site	6
3	Fertilizer Distributor in Karawang Regency	6
4	Fertilizer kiosk in Karawang Regency	6
5	Rice Farmers	24

Data Collection

The data collected includes primary and secondary data. Primary data from farmer households, kiosk owners, fertilizer distributors, officials at the central level, and company management leaders related to fertilizer subsidy policies were collected according to the research objectives. Primary data collection techniques were conducted through interviews and observations at the research site. Secondary data were collected from government websites/websites, literature studies, and various publications on fertilizer subsidy policies.

Data Analysis

Data analysis was carried out quantitatively and qualitatively. In this study, the data analysis used is more dominant using qualitative analysis, namely analyzing data not in numbers. Qualitative analysis was carried out in a qualitative descriptive manner, namely providing an overview or summary of events obtained from informants through interviews or field observations. As for quantitative analysis, it is added and carried out with quantitative descriptive analysis.

3. Results and Discussion

Fertilizer Distribution System in Karawang Regency

Direct distribution is the activity of distributing goods directly by producers to consumers without using the services of intermediaries (distribution companies). Small entrepreneurs and MSMEs mostly carry out the direct distribution distribution system. However, it is not uncommon for large companies to implement a direct distribution system. The advantage of implementing a direct distribution system is the savings on the budget for distribution. However, every company implementing a direct distribution system must have a competent sales force and marketing team. In addition, companies are required to provide all supporting facilities for direct distribution activities.

Companies implementing a direct distribution system control the entire process until the product reaches the consumer. The company will review consumer experience, brand image, and direct consumer interaction. The responsibility and risk the company will obtain are also more significant because the direct distribution system requires the company to bear 100% of the financial risk. For example, selling goods directly to consumers requires accurate documentation and tax records for audit purposes. In addition, companies must also have supporting facilities and infrastructure such as transportation and warehouses.

Although indirect distribution can save the budget, it may require huge capital for the initial stage. For small-scale companies, the reach or target market is still narrow, so it is still possible to handle the distribution of goods directly. There are many forms of direct distribution systems today. The following are some direct distribution systems that are often used by companies: stalls, shops, or outlets; sales force, marketplace; social media; and website. An indirect distribution system distributes goods to final consumers by cooperating or partnering with third parties. In other words, the indirect distribution system will involve specific individuals or companies who do not have the right to produce goods. This party is commonly referred to as a distributor. In practice, companies can form partnerships with various forms of distributors.

The indirect distribution system will cause the company to gain a competitive advantage. Companies will have access to a broader consumer base without having to search for them independently, so they can spend more time focusing on production activities. The indirect distribution system has the advantage that the initial cost will be lower, and the product distribution process will be more straightforward. In addition, there are several advantages that the company will get in taxation because

the company may be exempt from sales tax by the tax exemption regulations. Many forms of distribution companies can distribute products to consumers. The following are some examples of distributors in an indirect distribution system: sole distributor, supplier, agent, reseller, drop shipper, and commissioner.

Producers are responsible for distributing subsidized fertilizers from warehouses in Line II to warehouses in Line III. Distribution of subsidized fertilizers from Line III to retailers or Line IV is the responsibility of the Distributor. In contrast, distribution from Line IV or retailers to farmer groups is the responsibility of the retailers (Figure 3). The distribution to farmer groups is guided by the Definitive Plan for Group Needs (RDKK) submitted by each department of agriculture at the beginning of the year and is enforced for one year. Especially in the transportation carried out by distributors, the means of transportation must be registered with the producer by stating a unique identity as transportation of subsidized fertilizer. The regulation also stipulates that the authorized retailer appointed must sell subsidized fertilizer at the Highest Retail Price (HET). Authorized retailers must put up a signboard with a subsidized fertilizer price sign that buyers can easily see and legible. The most essential thing in the regulation is that authorized distributors and retailers are prohibited from trading subsidized fertilizers outside their intended use or area of responsibility.

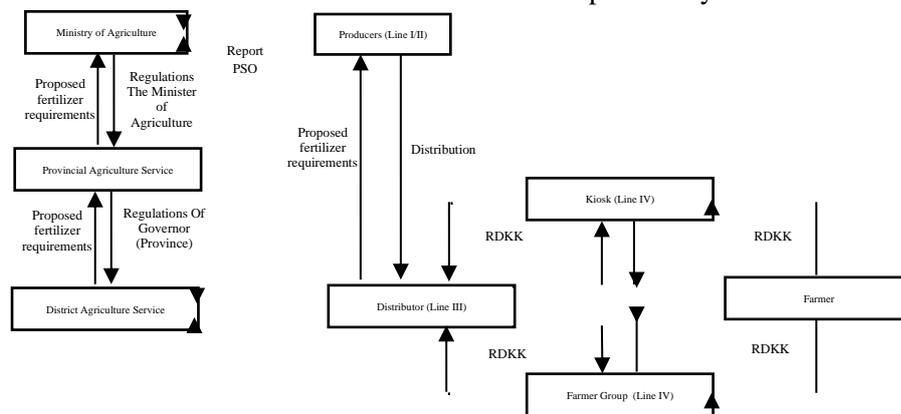


Figure 3. Mechanism of Procurement and Distribution of Subsidized Fertilizer

Subsidized Fertilizer Distribution Channel in Karawang Regency

Subsidized fertilizer distribution is based on Minister of Trade Regulation No. 15/M-DAG/Per/4/2013 concerning the Distribution of Subsidized Fertilizers for the Agricultural Sector (Figure 5). Subsidized fertilizers are distributed privately through producers (PT Pupuk Indonesia as a producer in Line I). Fertilizers are then distributed to warehouses at the provincial level (Line II). From the provincial warehouse, the subsidized fertilizer is distributed to distributors in the district (Line III). Furthermore, the distributor distributes it to retailers (distributors in Line IV) until it reaches farmers in the village. Farmers buy subsidies at the nearest authorized retailer designated in their working area based on the electronic printed data of the definitive plan for group needs (e-RDKK).

The distribution channel of subsidized fertilizer used in the current period still refers to the third period. The authority to regulate producers, distributors, and distributors is the responsibility of PT Pupuk Indonesia through production capabilities with efficient and practical principles. The producers involved in the procurement of subsidized fertilizers are PT Pupuk Sriwijaya Palembang, PT Petrokimia Gresik, PT Pupuk Kalimantan Timur, PT Pupuk Kujang, and PT Pupuk Iskandar Muda. A distributor is an individual company or business entity, whether in the form of a legal entity appointed by the producer based on the Sales Purchase Agreement (SPJB), to purchase, store, distribute, and sell subsidized fertilizer in large parties in the area of responsibility. Meanwhile, official distributors or retailers are distributors in line IV by the provisions of the Minister of Trade concerning the procurement and distribution of subsidized fertilizers in the Agricultural Sector.

The allocation of subsidized fertilizer is based on the Ministry of Agriculture regarding the highest allocation and retail price. This Permentan was then passed on to become a Governor Regulation in the province and a Regent Regulation in the Regency. The types of fertilizers included in the subsidized fertilizers include Urea, SP 36, ZA, and organic fertilizers. This type of fertilizer is given because it impacts plant cultivation. Urea, made from a mixture of ammonia gas and carbon dioxide gas, is believed to accelerate plant growth. SP 36 provides benefits in the addition of phosphorus nutrients to plants. ZA can improve crop quality and add nutritional value. NPK can strengthen root growth, making it easy to absorb soil nutrients later. Organic fertilizers are needed to reduce dependence on the use of

chemical fertilizers. Organic fertilizer is made from the remains of living things, such as weathered wood animal waste. The use of organic fertilizers can keep the soil fertile and prevent erosion.

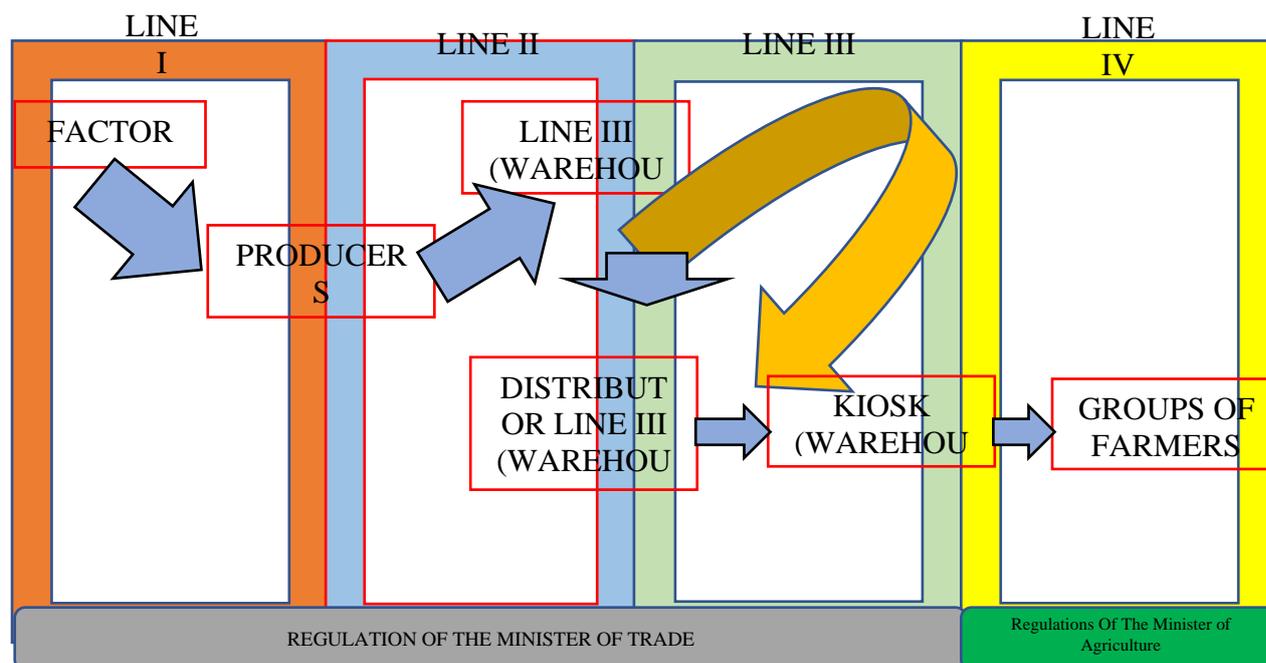


Figure 4. Mechanism of Subsidized Fertilizer Distribution Line in Karawang Regency

The decision of the Head of the Karawang Regency Agriculture Office regarding the Allocation of Subsidized Fertilizer Needs is the legal basis for fertilizer distributors and kiosks to distribute subsidized fertilizer in Karawang Regency. The types and amounts of subsidized fertilizers allocated to 30 sub-districts in 2021 are: Urea 54,501 tons, SP-36 780 tons, ZA 140 tons, NPK 31,551 tons, Organic 6,309 tons. Compared to 2020, there will be a significant increase and decrease in the allocation in 2021. This increase can be seen in allocating 2,465 tons of NPK fertilizer and 2,465 tons of organic fertilizer. Meanwhile, the allocation of Urea, SP-36, and ZA fertilizers decreased by 1,068 tons, 7,875 tons, and 85 tons, respectively (Table 1). The low realization of subsidized fertilizers in 2021 is due to several sub-districts. Many rice fields are still prone to flooding in the rainy season. The water level at the time of flooding is, on average, 50 to 80 centimeters in settlements. The flood can reach one meter in rice fields in basins and lowlands. Areas that are included in flooded areas are Telukjambe Barat District and Pakisjaya District

Table 1. Growth of Subsidized Fertilizer Alloxy in Karawang Regency

Type of Fertilizer	2017		2018		2019		2020		2021		Growth	
	Location	Realization	Location	Realization	Location	Realization	Allocation	Realization	Allocation	Realization	Location	Realization
UREA	60.040	58.662	57.001	51.845	57.679	51.174	55.569	53.498	54.501	42.456	-2,36	-7,25
SP 36	18.520	18.428	18.191	18.191	17.210	17.118	8.655	7.158	780	675	-36,97	-3,83
ZA	226	201	280	280	350	301	225	146	140	90	-6,15	-10,76
NPK	30.276	25.480	22.769	22.051	22.338	21.187	29.086	28.248	31.551	22.934	3,00	-0,23
Organic	7.342	7.193	8.779	8.136	8.146	7.946	8.565	8.251	6.309	3.513	-2,21	-10,71

Source: Department of Agriculture, Karawang Regency

The allocation of subsidized fertilizer almost every year in Karawang Regency is not all distributed (Table 2). Except for SP-36 and ZA fertilizers in 2018, all were distributed to farmers who were entitled to receive them. In terms of quantity, Urea fertilizer is the most undistributed fertilizer than other fertilizers. This can be seen in 2018, as many as 5,156 tons were not distributed; in 2019 6,505 tons were not distributed; in 2020 2,071 tons were not distributed; and in 2021, 12,045 tons were not distributed. In terms of percentage, in 2017, the most fertilizers that were not distributed were NPK (15.84%), ZA in 2019 and 2020 (14% and 35.11%), and in 2021, organic fertilizers with the highest percentage were not distributed. (44.32%). The low realization of organic fertilizers in 2021 is caused

by farmers needing to be sure of the benefits of using organic fertilizers. In addition, using organic fertilizers will increase labor costs, especially in transporting and sowing in paddy fields.

Table 2. Difference Between Allocation and Realization of Subsidized Fertilizer

Type of Fertilizer	2017		2018		2019		2020		2021	
	Tonnes	%	Tonnes	%	Tonnes	%	Tonnes	%	Tonnes	%
UREA	1.378	2,30	5.156	9,05	6.505	11,28	2.071	3,73	12.045	22,10
SP 36	92	0,50	-	0,00	92	0,53	1.497	17,30	105	13,46
ZA	25	11,06	-	0,00	49	14,00	79	35,11	50	35,71
NPK	4.796	15,84	718	3,15	1.151	5,15	838	2,88	8.617	27,31
Organik	149	2,03	643	7,32	200	2,46	314	3,67	2.796	44,32

Source: Department of Agriculture, Karawang Regency

There are 11 companies responsible for distributing subsidized fertilizer in Karawang Regency and 391 retail kiosks that will become official fertilizer kiosks distributed directly to farmers (Table 3). Producers who are directly involved in the procurement of subsidized fertilizers in Karawang Regency include:

- (1) PT Pupuk Kujang Cikampek is at Jl A.yani No. 39. This company was established in 1975 and, since December 1976 has been trusted to procure and distribute subsidized fertilizers. The fertilizers supplied and distributed include: Urea, SP 36, ZA, NPK, Phonska and Organic. The fertilizer is distributed to farmers through 427 retail kiosks.
- (2) PT Petro Kimia Gresik whose representatives are in Wadas Village, Teluk Jambe Timur District. This company has been trusted to distribute subsidized fertilizers since 1972. The fertilizers prepared for distribution are SP 36 and ZA types.

Table 3. List of Line III and Line IV 2022 in Karawang Regency.

Number	Distributor Name (Lini III)	District	Number of Fertilizer Kiosk (Lini IV)
1	PT Benteng Purwa Putra	Lemah Abang	13
		Kota Baru	9
2	PT Bumi Persada Sejati	Banyusari	18
		Cilamaya Kulon	23
		Tirta Mulya	16
		Purwasari	6
3	CV Ikthiar Sarana Pertanian	Tempuran	38
		Telaga Sari	18
		Cikampek	3
4	Mitra Desa Bersama Tempuran	Rawamerta	22
5	Puskud Jabar	Ciampel	4
		Pangkalan	12
		Tagalwaru	14
6	PT Samba Jaya	Kutawaluya	17
		Tirta Jaya	13
7	Sellini Sinar Selaras	Klari	9
		Pedes	11
		Cibuaya	9
		Jakarta	8
		Cilebar	17
		Cilamaya Wetan	25
8	TNA Cahaya Abadi	Jatisari	27
9	CV Telaga Jaya	Karawang Barat	8
		Karawang Timur	6
		Majalaya	5
		Telukjambe Barat	9
10	CV Zayyanah Tani Subur	Batu Jaya	17
		Pakis Jaya	10
11	Sinerji Anugerah Utama	Rangkasdengklok	4

Source: Department of Agriculture, Karawang Regency, 2022

Aspects of Equitable Distribution and Distribution of Subsidized Fertilizers in Karawang Regency

The government reflects the perspective of equitable distribution of subsidized fertilizer use at the user level in the form of reallocation. In the Ministry of Agriculture concerning determining the allocation and HET of subsidized fertilizers in the agricultural sector, it is stated that reallocation is carried out if there is a shortage or excess of fertilizer in one area by taking into account the available allocation and proposed fertilizer needs. Reallocation can be done by regional apparatus that carries out government affairs in the agricultural sector.

The reallocation of several subsidized fertilizers can be done between regions, times and types of fertilizers. This means that reallocation can be carried out in sub-districts and districts. Sub-district reallocation can run smoothly if it does not exceed the district-subsidized fertilizer allocation quota. If more is needed, the district will try to reallocate the need for subsidized fertilizer to the province. This has happened in Karawang Regency in 2021. In August 2021, the quota for distributing subsidized fertilizers has been wholly absorbed, and farmers still need it. The solution is that the local government has sent a letter of application to the Minister of Agriculture of the Republic of Indonesia with letter number 521.33/4747/Distan. The letter requesting the addition of the subsidized fertilizer quota has yet to be replied to. Therefore, the local government expects farmers to be patient.

Realization of subsidized fertilizers can be carried out at any time within one fiscal year. Reallocation can be done once a year, as happened in Kabupaten Karawang (Table 5). It could also be twice a year, as in Karawang Regency in 2021. There are even 8 local governments have reallocated, as happened in 2020 in Karawang Regency. In detail, the reasons why reallocation was carried out needed to be clearly visible in the Decree of the Department of Agriculture regarding reallocation. The consideration for reallocating subsidized fertilizers in the decree only reads: Anticipate the possibility of a shortage of subsidized fertilizers due to entering the 2019/2020 planting season.

The reason for reallocating fertilizers is a shift in the planting schedule recorded in the RDKK. This means that if there is a dry season or excessive rain, farmers will not plant or will shift their planting schedule. This condition causes farmers to not pay for subsidized fertilizers. One of the highlights in the three sample districts is that almost every year, there is a decree on reallocating the use of subsidized fertilizer issued in December. This means that December is the last month in one budget line (1 year). Meanwhile, next year, farmers will get another portion of subsidized fertilizer. So, realakosi becomes vital in adjusting the amount and type of subsidized fertilizer.

Table 5. Months of Issuance of Decree on the Reallocation of Subsidized Fertilizer Distribution in Karawang Regency

Period	2017	2018	2019	2020	2021
1	31 January 2017	26 November 2018	31 July 2019	26 February 2020	15 January 2021
2	18 July 2017		9 December 2019	26 March 2020	27 July 2021
3	31 October 2017		26 December 2021	29 June 2020	
4	13 December 2017			19 August 2020	
5	4 December 2017			2 October 2020	
6				12 October 2020	
7				25 November 2020	
8				17 December 2020	

Reallocation is one of the government's manifestations in optimizing the distribution of subsidized fertilizers to farmers. While optimizing the distribution of subsidized fertilizer if it can fulfill the principle 6 right. From the results of discussions with the agriculture office and farmers, it can be seen that the six principles still need to be fulfilled properly. This is illustrated by the results of the discussion, which show:

- (1) Exact Amount: Respondent farmers felt that the amount of subsidized fertilizer should have been by the weight it should have. This discrepancy is felt by 13% of farmers in Karawang (Table 6). In one zak, the average weight is 50 kg, but farmers have found the size reduced by one to 2.5 kg. There are several assumptions as to why this could happen, including a leak, because farmers often find puncture marks from sharp objects in fertilizer sacks. This could also happen because farmers rarely buy whole, but retail. When returned in the form of a sack, forget to return it to its original weight. The research locations also reflect adjustments to the amount of subsidized fertilizer distributed. Where the need for Urea fertilizer per ha is 112 kg

in Karawang. But what farmers get is only 66 kg in Karawang. The same thing happened to the distribution of NPK fertilizer, where 250 kg was needed in Karawang, but 150 kg was received.

- (2) Right Type: The subsidized fertilizers provided to farmers are Urea, NPK and organic fertilizers. However, in the research location, all farmers do not use organic fertilizers in their crop cultivation. Therefore, the stock of subsidized organic fertilizer is still piled up at the fertilizer kiosk.
- (3) On-Time: Subsidized fertilizers are only sometimes available at the fertilizer kiosk or when needed. This was found by 20% of farmers in Karawang. Two things, namely: first cause the absence of fertilizers because subsidized fertilizers arrive late. In Karawang Regency, the schedule should be for fertilizer to arrive at the end of the month. However, fertilizer distribution in February is only realized as much as 40%, and the rest is distributed in June.
- (4) The second problem is a technical problem, namely a malfunction or damage to the EDC machine, forgetting the pin or card is missing, and no signal during the transaction. Improper use of fertilizers will cause a decrease in productivity. The delay also causes additional farming costs, especially for farmers who buy non-subsidized fertilizers.
- (5) Right Price: The cost of subsidized fertilizer acquired by farmers differs from the Highest Retail Price (HET). One of the primary reasons for this discrepancy is that farmers need more funds to pay for them when required. Farmers who cannot pay at the time of redemption are still permitted to receive fertilizer, provided they pay after the harvest. The fertilizer kiosk offers a deferred payment service of IDR 20,000 per quintal.
- (6) Right on Target: While they are few, there are still wealthy farmers or landowners on Target. Although there are not many, it turns out that there are still wealthy farmers or farmers whose land gets subsidized fertilizer assistance. There is a change in the name of the recipient. This is because, when it was submitted, the farmer was still working on it, but when the fertilizer was distributed, the farmer was no longer working on it. Farmers not registered with the eRDKK can get subsidized fertilizer by going directly to the kiosk and paying more for the fertilizer than they should. For example, urea fertilizer, which is sold for Rp. 2,200 per kilo, dares to buy Rp. 3000 per kilo. Farmers who have no money when redeeming fertilizer will give it to other farmers to save it, and the farmer will get compensation of between Rp. 25,000 to 30,000 per zak
- (7) Right quality: The quality of subsidized fertilizer in the research location is okay. For farmers, the quality of fertilizer received differs from the desired quality. This condition means that the fertilizer they receive is fake. Indicators are visible to the naked eye when using fertilizers in paddy fields. The fertilizer takes a long time to dissolve or to enter the soil. It can even take up to a week. While the original fertilizer is less than two days, the fertilizer has entered the soil. Some types of fertilizers considered counterfeit by farmers include SP 36. The difference between fake SP 36 is that the packaging does not include the company's name. Phonska is a natural fertilizer, while phoska is a fake fertilizer. Real NPK fertilizer granules are dense, while fake NPK fertilizers are like sawdust.

Table 6. Fertilizer Distribution Based on Principle 6 Correct (%)

Number	Appropriate	Karawang
1	Amount	13
2	Type	100
3	Time	20
4	Price	20
5	Target	0
6	Quality	0

Source: Primary Data, processed, 2021

4. Conclusion

Subsidized fertilizer is an essential instrument for farmers to support productivity. The benefits of subsidized fertilizers that farmers need are that farmers get fertilizer at affordable prices, guarantee the availability of fertilizers to remote areas, guaranteed quality of fertilizers because they have SNI standards, increase farmers' interest in farming sustainably, and play a role in maintaining national agricultural productivity improvements. The first immediate positive effect of fertilizer subsidies is improving farmers' capital availability. With subsidized fertilizer prices, farmers can allocate a portion of their capital, which would otherwise be used for purchasing fertilizers, towards acquiring other

inputs. The cost contribution for fertilizers varies between 9–22% of the total cost, depending on the dosage and technology. If farmers initially used a lower dose of fertilizer, the Subsidy would incentivize them to increase the dosage to an optimal level.

The second positive effect is that fertilizer subsidies can address inefficiencies or market failures in the fertilizer market. The fertilizer subsidy policy can mitigate a less competitive market structure and information power asymmetry between sellers and buyers, which results in high profit margins and distribution costs. This argument holds if the fertilizer subsidy can deliver fertilizer following the six principles: correct quantity, quality, timing, price, type, and location.

The third positive effect of fertilizer subsidies is that they promote technology adoption. This is particularly relevant for farmers who have yet to become aware of the benefits of fertilizers, including the optimal balance of fertilizer doses. With the Subsidy in place, farmers are more willing to experiment with new technology (types and doses of fertilizer) as fertilizer costs are subsidized.

The fourth positive impact is an increase in productivity. By applying the concept of productivity elasticity to fertilizer prices, one can analyze the effect of fertilizer subsidies on the productivity of various food crops. Generally, elasticity is negative, implying that decreasing fertilizer prices (due to subsidies) will boost productivity. For instance, the elasticity of rice productivity to the price of urea, SP36, and ZA fertilizers are -0.0681, 0.0799, and -0.0086, respectively. This means that a 1% decrease in the price of urea fertilizer will result in a 0.0681% increase in rice productivity. However, eliminating fertilizer subsidies at the farm level could reduce productivity by up to 9.50%.

Finally, the recommendations in this study are, to keep the budget for fertilizer subsidies in Karawang Regency, with the distribution system adjusting to the different needs of each farmer in each location; it is also necessary to assist extension workers through the local government in terms of appropriateness/accuracy of dosage, and types of environmentally friendly fertilizers.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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