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# Optimizing Fertilizer Distribution Performance, In Supporting Food Security Programs

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***Abstract***

*The research aims to obtain empirical evidence and clarify the phenomenon and conclusions regarding optimizing the performance of fertilizer distribution in supporting food security. It is hoped that this research can contribute to the development of economics in particular; as a scientific library in the field of marketing management science related to distribution, as reference material in scientific writing on marketing management, as information material, both for the government, producers and distributors and fertilizer users to make decisions and determine the direction of fertilizer policy. The research was conducted using descriptive and verification methods: collecting, presenting, analyzing, measuring models and testing hypotheses, and making conclusions and suggestions. The results of research and data analysis show that fertilizer distribution optimization has not been optimal. The performance indicators for fertilizer marketing distribution essentially contribute to food security, so optimal distribution performance needs to be optimized. Fertilizer distribution models that support food security need to be carefully considered.*

***Keywords:*** *Optimization, Distribution Performance, Food Security.*

## INTRODUCTION

Food security is one of the determining factors in a country's national stability in the economic, security, political, and social fields. Therefore, food security, especially sustainable rice self-sufficiency, is the main program in current and future agricultural development. The success of Indonesia's rice self-sufficiency can now be achieved again as in 1984 through a food crop development program so that Indonesia can avoid a food crisis. One of the successes of this program is determined by the provision of agricultural production facilities, especially fertilizer. Fertiliser is the main means of production that farmers need for their farming activities (Jamil, 2022).

Food is a basic need for humans to maintain life, and therefore, sufficient Food for everyone at all times is a human right that deserves to be fulfilled (Yusuf et al., 2022). Food is also a human need that is considered strategic and often includes emotional and even political aspects. Fulfilling food needs in quantity and quality is very important as a foundation for the complete development of Indonesian people in the long term.

Sufficient food supplies nationally do not guarantee regional, household, or individual food security. Even though national food supplies are sufficient, the emergence of cases of food insecurity in Indonesia cannot be denied. Indonesia is committed to creating a good food security system. This can be seen from the publication (Law No.7 of 2012, 2012) concerning Food, which was then followed up with the publication (Government of the Republic of Indonesia, 2015) concerning Food Security and Nutrition. To carry out this national commitment, efforts, and cooperation from various parties, including the central government, regional government, and the community, are certainly needed. However, more synergy in its functions and roles is often needed. So that the policies set and the activities carried out become less effective (Study of Food Security Management in Regions.pdf)

According to Law No.7 of 2012 (2012), concerning Food, food security is defined as the condition of meeting household food needs as reflected in the availability of sufficient Food, both in quantity and quality, safe, equitable, and affordable. Food originates from biological sources and water, whether processed or unprocessed, intended as Food or drink for human consumption, including food additives, raw materials, and other materials used to prepare, process, and make Food or drink.

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One of the government's efforts to realize food security is carried out through (Government of the Republic of Indonesia, 2015) concerning Food Security and Nutrition which is held to meet household food consumption needs which continue to grow from time to time (a) Development of a food production system that relies on resources local institutions and culture, (b) Development of food business system efficiency, (c) Development of food production technology, (d) Development of food production facilities and infrastructure, and (e) Maintaining and developing productive land.

Based on information from the West Java Provincial Food Security Agency, the food insecurity map of West Java Province in 2014 can be summarized by several criteria: priority 1 (very vulnerable), priority 2 (prone), priority 3 (somewhat vulnerable), priority 4 (quite vulnerable), priority 5 (resistant), and priority 6 (very resistant). The success of government policies and programs on food security include price fixing, import control, fertilizer and seed subsidies, free seed assistance, provision of capital, and accelerated implementation of technological innovation and education. This motivates farmers/agricultural business actors to increase their production (Food Security Council, 2012).

However, changes are now occurring as globalization and economic liberalization progress. To further encourage and accelerate the achievement of food security, the government has now issued a number of policies for fertilizer distribution. This policy decision is deemed necessary to facilitate the availability of fertilizer at farmers' locations and its use at affordable prices, as well as the procurement of grain/rice that guarantees domestic supplies.

Based on the research results of Syakhroza (2004), published by Gadjah Mada *International Journal of Business*, research title *The Effect of Political Power on Budget Monitoring: A Studi of Fertilizer Industry in* Indonesia, UGM International Journal stated that *"The results provide substantial evidence that interaction between budget monitoring and politics affect managerial roles; and that the departmental power plays a significant role on such interactions"*. There is a relationship between political power and the budget and managerial patterns of fertilizer handling in the fertilizer industry in Indonesia. The results of this study provide strong evidence that the interaction between budget monitoring and politics in the fertilizer industry influences managerial roles and that the power of government organizations plays an important role in this interaction.

Fertilizer producers in implementing distribution are committed to protecting consumers regarding fertilizer availability according to the 6 (six) right principles, namely right price, right quantity, right time, right purpose, right type and right quality. Fertilizer producers also prepare line III warehouses as warehouse *supply point*s and *buffer stock* in some regions as a form of responsibility in distribution. Fertilizer manufacturers have assigned distribution monitors to ensure that they are always *mobile*, monitor fertilizer distribution, and detect various possibilities. Apart from that, it also monitors problems that will arise in fertilizer distribution, supervises and provides protection so that fertilizer distribution runs smoothly, HET is achieved, the type and quality are appropriate, and distribution is right on target.

PT Pupuk Indonesia (Persero) is one of the largest fertilizer producers in Asia. Our group comprises fertilizer and pesticide companies, chemical products, industrial support, and logistics and trading companies. We have a production capacity of 22 million tons per year consisting of 14 million tons of fertilizer per year and 8.6 million tons of ammonia and other products. Pupuk Indonesia also plays an active role by focusing on five strategic pillars: customer focus, research and innovation, operational excellence and supply chain optimization and safety of raw materials, and corporate sustainability and circular economy (www.pupuk-indonesia.com).

Pupuk Indonesia is a producer of Urea, ZA, SP-36, NPK and organic fertilizers as well as marketing these fertilizers to food farmers as a *public service obligation* (PSO), which is known as subsidized fertilizer and other customers for non-subsidized fertilizer (plantations, industry and so on) with total fertilizer sales from 2010 to 2012, can be seen in detail in Table 1.1 below.

**Table 1Subsidized Fertilizer Sales**

| No | Fertilizer Type | The year 2010 (Ton) | The year 2011 (Ton) | In 2012 (Ton) |
|---|---|---|---|---|
| 1 | Urea | 4.278.926 | 4.584.986 | 4.155.567 |
| 2 | FOR | 706.810 | 942.698 | 1.028.907 |

| | | | | |
|---|---|---|---|---|
| 3 | SP-36 | 633.950 | 721.179 | 855.808 |
| 4 | NPK | 1.458.588 | 1.761.909 | 2.170.861 |
| 5 | Organic | 232.959 | 375.341 | 742.173 |
| | **Total** | **7.311.233** | **8.386.113** | **8.953.316** |

Source: www.pupuk-indonesia.com/id

## Distribution

One of the equipment elements *of the marketing mix* is a place whose operational activities are better known as distribution. Basu (2010: 17) suggests that the definition of distribution is that which is used to distribute goods from producers to consumers. David in Basu (2010: 17) says that distribution is a channel through which goods flow from producers to intermediaries and finally reach the user. Meanwhile, Glen in Irawan (2010: 23) states that distribution channels are a group of traders and company agents who combine a product's physical transfer and name to create uses for a particular market.

So distribution channels are institutions that collaborate to move products from the production environment to the consumption environment so as to achieve marketing objectives, namely providing satisfaction to the market or final consumers at a certain price level. Basu (2010; 20) defines distribution as a channel producers use to distribute goods from producers to consumers or industrial users.

Distribution is an additional use of time, place and ownership of goods, including transportation from the place of origin or continued production to the place of sale. Distribution covers various areas of management. The role of distribution channels in marketing is reflected in distribution costs, the amount of which can exceed production costs, promotional costs, marketing administration costs and other marketing costs. A large role can be demonstrated by the good performance of marketing functions carried out in each channel (Wijaya, 2022).

Distribution is the most important part of the company. Most companies focus more on producing goods than selling them profitably or distributing these goods to consumers. Every goods and services company will not be separated from the problem of distributing the goods it produces or the goods it will sell to the public. Producers have the right to determine the distribution policy that will be chosen and adjusted to the type of goods and the size of the sales fleet that will be used (Suriadikarta and Setyorini, 2005).

Distribution is a path through which goods flow from producers to intermediaries and finally to consumers (users) (Boestami S et al., 2012). To facilitate the flow of goods and services from producers to consumers, one important factor that must be considered is the path the product takes, from production to the final consumer through the goods and services produced by the company (Jokolelono, 2011).

According to Walter in Angipora (2002:296), a distribution channel is a group of traders or company agents who combine a product's physical transfer and name to create a particular market use. Producers or end customers are part of each channel, which will use the number of intermediate-level channels to determine the length of a channel. According to Kotler (2011), there are several types of distribution channels, namely:

The vertical marketing system consists of manufacturers, wholesalers, and retailers who act as one unified system and build joint strength to achieve goals.

The conventional marketing system consists of independent producers, wholesalers, and retailers, which are separate business entities aiming to maximize their profits.

A horizontal marketing system in which two or more unrelated companies combine resources or programs to take advantage of emerging marketing opportunities.

A multi-channel marketing system occurs when a company uses one or more channels to reach customer segments.

According to Nitisemito (2010: 102), Distribution Channels are distributor institutions or distribution institutions that have activities to distribute or deliver goods or services from producer to consumer. According to Keegan (2011), Distribution channels are channels used by producers to distribute goods from producers to consumers or industrial users. According to Assauri (2010: 3), Distribution channels are institutions that market

products in the form of goods or services from producers to consumers. *Marketing channels are sets of interdependent organizations participating in the process of making a product or service available for use or consumption* (Kotler and Keller, 2012: 437). According to Kotler (2011), a distribution channel is a group of companies or individuals who have ownership rights to products or help transfer ownership rights to products or services when they are transferred from producers to consumers.

The factors that encourage companies to use distributors are:

Manufacturers or small companies with limited financial resources cannot develop direct sales organizations.

Distributors are more effective in wholesale sales because of the scale of their operations with retailers and their specialized expertise.

Factory entrepreneurs who are quite models prefer using their funds for expansion rather than promotional activities.

Retailers who sell a lot often prefer to buy a variety of goods from a wholesaler rather than buying directly from each manufacturer.

The main function of distribution channels is to distribute goods from producers to consumers, so companies implementing and determining distribution channels must take good consideration. The functions of distribution channels, according to Kotler (2011: 531-532) are:

*Information*, namely gathering important information about consumers and competitors to plan and assist exchanges.

*Promotion*, namely, the development and deployment of persuasive communication about the products offered.

*Negotiation*, namely trying to agree on a price and other terms, thereby allowing the transfer of ownership rights.

*Ordering*, namely the distributor orders goods from the company.

Payment, namely, the buyer pays the bill to the seller via a bank or other financial institution.

*Title*, namely the transfer of ownership of goods from one organization or person to another organization/person.

*Physical Posses*sion: transporting and storing goods from raw materials to finished goods and finally to the consumer end.

*Financing*, namely requesting and utilizing funds for costs in distribution channel work.

*Risk-taking*, namely bearing the risks associated with implementing distribution channel work.

There are various distribution channels for consumer goods, including:

## Producer – Consumer

This distribution channel is the shortest and simplest because it does not use intermediaries. Producers can sell the goods they produce by post or directly to consumers' homes (from house to house). Therefore this channel is called a direct distribution channel.

## Producer – Retailer – Consumer

Manufacturers sell only large quantities to wholesalers; they do not sell to retailers. Wholesalers serve retailers' purchases, and retailers serve consumers' purchases only.

## Producers – Wholesalers – Retailers – Consumers

This distribution channel is widely used by producers and is called a traditional distribution channel. Here, manufacturers only sell large quantities to wholesalers, not sell to retailers. Wholesalers serve purchases by retailers, and purchases by consumers are served by retailers only.

### Producer – Agent – Retailer – Consumer

Here, the producer chooses an agent as the distributor. It carries out large trading activities within existing distribution channels. The sales target is mainly aimed at large retailers.

### Producer – Agent – Wholesaler – Retailer – Consumer

In distribution channels, producers often use agents as intermediaries to distribute their goods to large traders, who then sell them to small shops. The agents seen in this distribution channel are mainly agents of sales (Swastha and Irawan, 2010: 295-297)

Basu Swastha, 2010 stated that there are five types of activities in physical distribution or logistics, namely:

1. Determining inventory location and storage system
2. Determining the goods handling system
3. Use of goods monitoring system
4. Deposit procedures for processing orders
5. Selection of transportation method

Minister of Trade Regulation No.07/M-DAG/PER/2/2009 effective March 1 2009, where the area of responsibility for distributing subsidized urea producers is reduced. As a result, the potential for fertilizer distribution decreases. Fertilizer producers in implementing distribution are committed to protecting consumers regarding fertilizer availability according to the 6 (six) right principles, namely right price, quantity, time, purpose, type and quality.

Distributors are obliged to guarantee the smooth distribution of subsidized fertilizer based on the 6 (six) correct principles, namely the correct type, quantity, price, place, time and quality starting from Line III to Line IV in their area of responsibility (stated in article 10 paragraph 2 of the Republic of Indonesia Minister of Trade Regulation No. 17/M-DAG/PER/6/2011). Furthermore, the duties and responsibilities of distributors are to be responsible for the smooth distribution of subsidized fertilizer from Line III to Line IV in their area of responsibility in accordance with the 6 (six) right principles, namely the right type, quantity, price, place, time and quality (Permendag RI No. 17/M-DAG/PER/6/2011 Article 10 Paragraph 2).

Food security, which is a translation of *food security,* covers many aspects and is broad so that each person tries to translate according to the conditions and situations that developed in their era. Food security is interpreted in many ways, so using the term food security itself has caused debate. (Food Security Council, 2010: 20). The limitations of understanding food security as food availability at the national and global levels as above were enlightened when the food crisis occurred, which occurred again in Africa in the mid-1980s, where global food availability was sufficient to meet the entire world's population. This shows that conditions of adequate food availability at the national and global levels only sometimes indicate conditions of food security at the individual or household level. Development experts and practitioners then realized that food insecurity could occur where food availability is sufficient, but the ability to obtain Food needs to be improved. Sen's theory of *food entitlement* gained a vast influence and changed the understanding of the concept of food security. *Food entitlement* households obtain either from their own production, the income they receive, or collecting Food from existing natural resources, support and assistance from the community, their own assets, or when they migrate to obtain better Food. Thus, social conditions and household economic variables greatly influence households' ability to obtain Food. The worsening of food insecurity can be seen as a long-term process of change where the victims do not simply accept the situation, but it is indeed the situation that causes them to experience increasingly worse conditions. Anthropologists argue that populations vulnerable to food insecurity show efforts to overcome economic disruption problems, thus providing an understanding of behavior (*behavioral*) households in responding to these problems and how they deal with (*coping mechanism*) a state of food crisis. In the late 1990s, donor agencies, governments, and NGOs began collecting information and socio-economic variables to analyze food insecurity. The household food security approach that began to develop in the 1980s emphasizes both the availability and stable access to Food. Thus, understanding food security in this period

began to emphasize two important aspects of food security, namely food security in the sense of food availability at the national (and regional) level and stable access at the local level. Other matters of concern are related to understanding Food as a system (*food system*), production systems, and other factors that can influence the composition of food availability and household access to continuous food availability. Once again, changes in the understanding of food security by emphasizing aspects of accessibility at the household level gained legitimacy at the 1996 High-Level Food Conference, organized by FAO, by providing a new understanding regarding food security, namely *food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious Food to meet their dietary needs and food preferences for an active and healthy life* (Food Security Council, 2012).

The success of development in the agricultural sector in a country must be reflected in the country's ability to be self-sufficient in Food, or at least Food security (Tulus Tambunan, 2010: 64). Food security is seen as very important in the context of national development to create quality, independent and prosperous Indonesian people. To achieve this goal, it is necessary to realize the availability of sufficient, safe, quality, nutritious and diverse Food that is evenly distributed throughout Indonesia and affordable by people's purchasing power (Food Security Council, 2012).

According to Law Number 7 of 1996, food security is defined as the condition of meeting household food needs as reflected in the availability of sufficient Food, both in quantity and quality, safe, equitable and affordable. Food originates from biological sources and water, whether processed or unprocessed, and is intended as Food or drink for human consumption. It includes food additives, raw materials, and other materials used in preparing, processing, and/or making Food or drink.

Furthermore, Law Number 41 of 2009 concerning the Protection of Sustainable Food Agricultural Land, it states that food sovereignty is the right of states and nations who can independently determine their food policies that guarantee the right to Food for their people, as well as giving their people the right to determine an appropriate food farming system. with local resource potential. Food independence is the capability of domestic food production supported by food security institutions that are able to guarantee the fulfilment of adequate food needs at the household level, both in quantity, quality, safety and affordable prices, supported by diverse food sources in accordance with local diversity (Food Security Council, 2012).

For example, fertilizer distribution policies need to be implemented effectively. If effective fertilizer distribution does not occur, fertilizer availability for farmers will be disrupted in the short term. Lack of fertilizer availability will disrupt farmers' grain production. The lack of fertilizer availability and the decline in grain production are two interrelated aspects. Therefore, a fertilizer shortage indeed threatens farmers' production and then a rice shortage threatens food security, which will continue to result in social insecurity. A decrease in farmer production also means a decrease in income and shows that the level of farmer welfare is decreasing. The consequences of policy changes that disrupt the fertilizer distribution system can be seen in the irregularities in fertilizer distribution. Giving freedom to various parties to distribute fertilizer on the one hand, while fertilizer itself is an input/public good, is detrimental to farmers who use it. This is real and felt by farmers who have difficulty getting fertilizer at prices above the HET.

Indonesia, as an agricultural country, is experiencing food security problems, which, according to Yustika in Eko Jokolelono (2011), is related to problems with rural development and the agricultural sector. At this point, the reality was discovered that institutions in rural areas were supported by at least three pillars, namely land tenure institutions, work relations institutions, and credit institutions. Land or land is still the most important asset for rural residents in driving production activities. Meanwhile, employment relations determine the proportion of the economic ratio shared among economic actors in rural areas. Finally, the credit aspect of financing plays an important role as a trigger for rural economic activity. These three pillars or institutions (or) changes determine farmers' decisions and thus influence the degree of food security.

Furthermore, Jokolelono (2011) said that food security cannot be separated from the problem of scarcity (*scarcity*) of resources. The scarcity of resources lies in the management and decisions to make exchanges (*trade-offs*) between efficiency and equity. Efficiency is a condition in society where maximum benefit can be obtained

from using all scarce resources. Medium equality (*equity*) means that the benefits of those resources are distributed fairly among members of society.

Food security has become the focus of attention since *the World Food Conference: Universal Declaration on the Eradication of Hunger and Malnutrition* in 1991. The journey of the concept of food security changes according to developments. This can be seen from the change in definition. In Table 2.2, the definitions of food security have changed and complement each other.

**Table 2Understanding Food Security from Several Institutions**

| Institution | Definition |
|---|---|
| World Food Conference 1974, UN 1975 | Food security is a condition in which humans have full physical, and economic access to sufficient food nutrition and security in provide, which provides for a healthy life per local values and culture. |
| Life Sciences Research Office (LSRO)1 1990 | Food security is everyone's ability to easily obtain Food for a healthy life, including the availability of safe Food and the ability to obtain it |
| Food Agriculture Organization (FAO) 1992 | Food security is a situation in which all people always have sufficient, safe, nutritious Food for a healthy and active life. |
| *Food Agriculture Organization* (FAO) 1996 | Food security is where everyone can access it at any time, is physically and economically affordable, has sufficient nutrition and variety, and is safe to consume and healthy for life and activities. |
| *Rome Declaration on World Food Security (World food Summit)* 1996 | Food security is a condition where all people have access, at all times physically and economically, to sufficient nutritional Food that is safe for consumption to live a healthy life in accordance with local values and culture. |
| *World Bank* 1996 | Food security means that everyone has access to sufficient Food at all times to live an active and healthy life. |
| UU No.7/1996 Indonesia | Food security is a condition in which sufficient Food is available for households in quantity and quality, is safe, well distributed, and affordable economically and locally. |
| Oxfam 2001 | Food security means that everyone can access (economically and locally), control over sufficient quantities of Food, and guaranteed quality for a healthy life. |
| *Public Health Association of British Columbia* (PHABC) 2004 | Food security is food availability to all people safely, both individually, through a sustainable and diverse food system. |
| *Food Insecurity and Vulnerability Information and Mapping Systems* (FIVIMS, 2005) | Food security means that everyone at all times has physical, social and economic access to sufficient, safe and nutritious Food with various choices to live a healthy life. |
| *Fisheries and Food Security: The Case of the Sultanate of Oman (Ministry of Fisheries Wealth)* 2010 | Food security in the fisheries sector is a socio-economic activity with a key and strategic role that can be managed effectively and sustainably to support Food nationally and regionally. |

Source: (Jokolelono, 2011)

## Research Methodology

This research is explanatory (*explanatory or confirmatory research*), in accordance with the aim of this research to explain the causal relationship between research concepts and hypothesis testing to make decisions inductively or generalize. Bearing in mind the aim, this research wants to obtain an overview or description of product quality, pricing policy, distribution, and customer satisfaction on fertilizer marketing performance and its impact on strengthening food security.

The main function of distribution channels is to distribute goods from producers to consumers, so companies must make good considerations in determining distribution channels. The function of distribution channels, according to Kotler (2011) is: (1) *Information*, (2) *Promotion*, (2) *Negotiation*, (3) *Ordering*, (4) *Payment*, (5) *Title*, (6) *Physical Possession*, (7) *Financing*, and (8) *Risk Taking*.

According to Law Number 7 of 1996, food security is defined as the condition of meeting household food needs as reflected in the availability of sufficient Food, both in quantity and quality, safe, equitable and affordable. Food is anything originating from biological sources and water, whether processed or unprocessed, which is intended as Food or drink for human consumption, including food additives, raw materials and other materials used in preparing, processing and making Food or drink.

Food security, according to *the World Food Summit* 1996*: "Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that needs their dietary needs and food preferences for on active and healthy life*" (Dillon and Hardaker, 1993). Regarding the food security concept mentioned above, three important things are integrated and related, namely (1). Availability (*food availability*), (2). Reach or access (*access to sufficient food*) is stable (*stability of food stock*). (3). Utilization (*utility of Food, which is related to cultur*e).

## Distribution

Based on the descriptive results of the distribution variable ($X_3$) they obtained, an average score of 4.243. Ideally, the expected average score value is 5. Thus the distribution variable ($X_3$) is in the high - very high category. This shows that fertilizer distribution in a system has been carried out by implementing an organized distribution pattern. However, there is still a scarcity of fertilizer and shortages at the farmer level, caused mainly by certain individuals playing to make a profit from the sale of their fertilizer. Frequent fertilizer shortages force farmers to incur higher costs because they have to buy fertilizer from other regions. This is done for the sake of continued crop production.

In accordance with the results of the descriptive analysis of distribution variables, the lowest indicator was obtained, namely the guarantee of return from the manufacturer for the quality of the packaging and fertilizer purchased (X3_25) with an average value of respondents' answers of 4.074. This shows that distributors do not have full guarantees if there is damage to the quality of the packaging and fertilizer purchased so if the fertilizer received by farmers is damaged, it is also difficult to return or replace it. Considering that the current problems facing national fertilizer are increasingly serious, there is an imbalance between the real demand for fertilizer, which is increasing, and production, which is limited; distorted distribution systems lead to fertilizer shortages in the market. Fertilizer producers must anticipate damage to fertilizer quality and try to replace or return damaged fertilizer.

The distribution system is carried out using a rayonization system so that there is potential for distortion. So far, the Ministry of Trade has the authority to determine the fertilizer trade system regarding the distribution or marketing zoning of subsidized fertilizer to maintain price certainty, demand and marketing areas for subsidized fertilizer. However, this zoning system can also lead to complicated bureaucratic channels if there are areas that experience supply shortages that other producers cannot directly handle because fertilizer is an item under state supervision. Diverting the allocation of subsidized fertilizer to non-marketing areas determined by the government can result in criminal charges. Apart from that, the implementation of a closed distribution system for subsidized fertilizer, which was implemented in 2009, is considered to have successfully reduced the occurrence of fraud. However, there is still the potential for shortages. This shortage is because the revenue system at the line 4 level still needs to be optimal (Department of Agriculture, 2010).

The current fertilizer subsidy pattern follows the gas subsidy pattern. The amount of the fertilizer subsidy is calculated based on the gas price according to the contract/world gas price (US Dollar/MMBtu) minus the gas price at the expense of the fertilizer producer (US Dollar/MMBtu) multiplied by the volume of gas utilization. Fertilizer producers still pay for gas at the contract price, while the APBN covers the difference. The problem is that the price of raw materials (gas) is increasing following international currency exchange rates. At the same time, the budget allocation for fertilizer subsidies has decreased from IDR 18.4 trillion in the 2009 APBN to IDR 11.3 trillion in the 2010 APBN (Munawar, 2013).

The fertilizer subsidy model currently applied is an indirect subsidy, namely a subsidy given to fertilizer producers. Even though it is provided indirectly, farmers benefit from the subsidy through cheaper fertilizer prices. Even though things are better these days, they still have some downsides. There are at least four important problems in the fertilizer subsidy program, namely:

Irregularities in the distribution of subsidized fertilizers and price disparities between subsidized fertilizers and non-subsidized fertilizers cause a flow of fertilizer from sectors that receive subsidies to sectors that are not subsidized, which then creates problems of scarce supplies in sectors that receive subsidies. Subsidized fertilizer is not only diverted to plantation crops but also to industries such as the plywood, glue, livestock, and batik industries (Lakitan 2008).

The gap between availability and need and difficulty in generating accurate data regarding the need for subsidized fertilizer. Estimates of fertilizer requirements are often made in aggregate, considering planting area and general fertilizer rates. In reality, fertilizer use rates vary due to differences in land area and farmers' level of awareness of the benefits of fertilizer. As a result, the real need and the availability of fertilizer often differ significantly, so some areas have excesses and others have shortages.

Target or target bias: this problem is related to the principle of justice. Rich farmers or those with large land areas receive more subsidized fertilizer than poor farmers or those with small land areas. This is because farmers with large areas of land or more affluent tend to use more fertilizer. In 2007, for urea subsidies, 20% of farmers belonging to the rich category enjoyed 45% of the total subsidy (World Bank 2009a).

Only SP and ZA fertilizer types have experienced absorption reaching 100% since 2006-2012. Unoptimal fertilizer distribution can be caused by technical problems in the field, such as the incompatibility of RDKK data as a database for collecting subsidized fertilizer or problems with distribution delays in remote areas.

The scarcity of fertilizer, especially urea, is a phenomenon that occurs repeatedly almost every year. This phenomenon is characterized by soaring fertilizer prices at the farmer level, far above the Highest Retail Price (HET) set by the government. In fact, urea fertilizer production from 5 State-Owned Enterprise (BUMN) fertilizer factories is always above domestic needs. So without reducing supply for the domestic subsidized market, there is still an excess fertilizer supply of around 1.3 million tonnes to meet the domestic non-subsidized fertilizer market which is estimated to be relatively small and for the export market. However, facts on the ground show that scarce supply and price spikes above the HET still often occur.

Based on the policy pattern above, the cause of the imbalance in the implementation of the comprehensive fertilizer policy is the alleged increase in illegal fertilizer exports both through the fertilizer producers themselves and through smugglers, along with the increase in the margin between the price of Urea fertilizer on the world market and the price of fertilizer on the domestic market. Fertilizer producers are no longer prioritizing supplies for the domestic market, and what is even more worrying is that the Urea fertilizer that is exported illegally is subsidized fertilizer, which is the right of farmers who are a group of poor people. Exports of subsidized fertilizer mainly occur through small ports owned by individuals.

Another factor causing the scarcity of subsidized fertilizer in the domestic market is the seepage of fertilizer from the subsidized market to the non-subsidized market. This seepage occurs mainly in areas close to large plantations. Since the fertilizer price policy was established, the domestic fertilizer market has become dualistic, namely the subsidized and non-subsidized markets. This phenomenon occurs allegedly due to the government's weak implementation of the fertilizer monitoring system. Scarcity of supply and soaring prices also occur due to the seepage of fertilizer from one region to another in the same market (subsidized market).

Several factors are thought to cause fertilizer distribution not to be according to plan. First, the use of urea fertilizer at the farmer level exceeds the recommended dose. In calculating fertilizer subsidies, the dose of urea fertilizer recommended by the government is only 250 kg/ha; however, in practice, many farmers use this type of fertilizer in the range of 350-500 kg/ha.

Excessive use of fertilizer occurs because farmers still think urea fertilizer is the main and necessary fertilizer, while other fertilizers such as SP36 and KCl are only complementary fertilizers (Adnyana and Kariyasa, 2000). So it is often found that many farmers do not use KCl fertilizer because the price is relatively expensive. Second, small land ownership (< 0.3 ha) also causes fertilizer use when converted to one hectare to be very high. Third, there is no accuracy in calculating the area planted for food commodities (rice).

The planned amount of fertilizer requirements determined by the Department of Agriculture, a proposal from the Provincial and Regency Agricultural Services, is generally lower than the actual planting area, so the amount of fertilizer requested always exceeds that allocated. Fourth, farmers are indisciplined in determining planting patterns. For example, in certain areas that usually plant rice twice, when there is still sufficient water supply in the second row, farmers generally plant rice again, resulting in a spike in demand for fertilizer. The need for fertilizer for horticultural crops is also tough to calculate, considering that the types of commodities grown by farmers are uncertain and constantly change according to market demand. Fifth, fertilizer is used at the farmer level for non-subsidized needs.

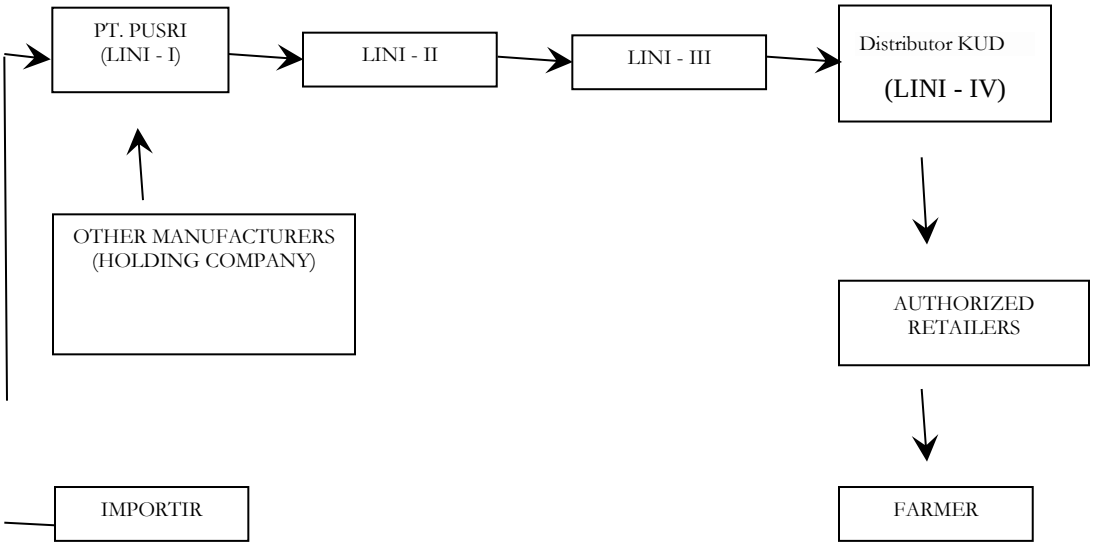
The aim of the fertilizer subsidy policy, which is essentially for the welfare of farmers and the sustainability of their farming businesses, is still hampered by the inaccuracy of the six right principles in the field and a fertilizer distribution system that is still not regular and consistent. So, it is necessary to improve the fertilizer subsidy policy based on the six obstacle variables and problem maps found in the field so far.

## RESEARCH RESULTS AND DISCUSSION

So the better the marketing performance, the more effective it will be to strengthen food security in West Java Province. Testing the hypothesis of marketing performance on food security, marketing performance significantly influences food security, both directly and indirectly. Thus, marketing performance has a significant effect on food security. These results indicate that fertilizer marketing performance with product quality, pricing policy, distribution and high customer satisfaction can strengthen food security.

The flow of implementation of the fertilizer distribution system before the free market policy can be seen in the following picture:

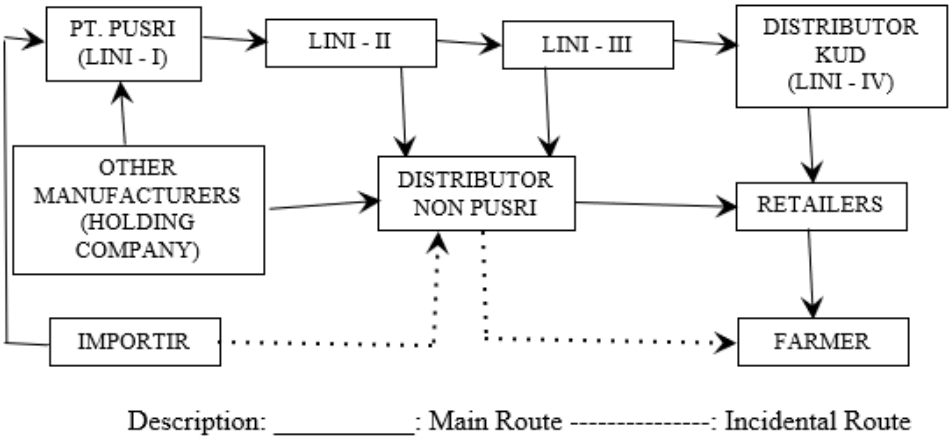
**Figure 1.1** Fertilizer Distribution Channels Before Free Market Policies




Source: www.pusri.co.id

The flow of implementation of fertilizer distribution after the free market policy is as follows:

**Figure 1.2** Fertilizer Distribution Channels After Free Market Policies

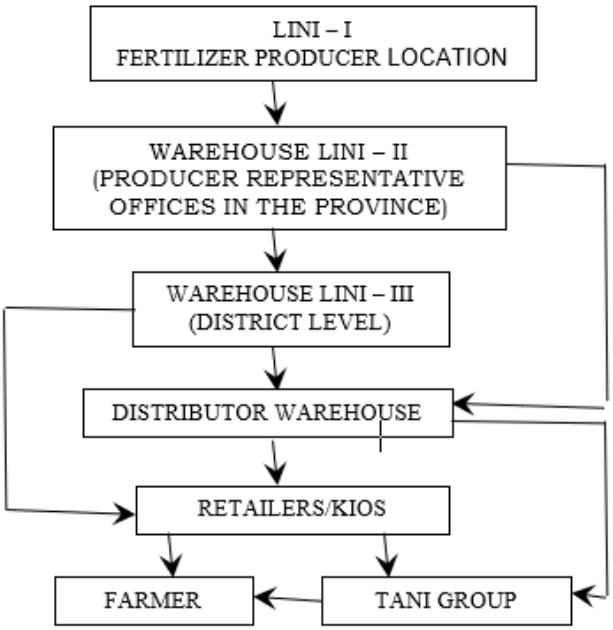



Source: www.pusri.co.id

After the free market policy was implemented, the fertilizer distribution implementation system was no longer PT Pusri's monopoly. Every free market player is directly involved in fertilizer import and distribution activities. However, PT Pusri continues prioritizing servicing fertilizer needs for the food crop subsector. Distribution via line IV can be shortened through private distributor channels. PT Pupuk Kujang and PT Petro Kimia Gresik have fertilizer distributors to distributor PT Pusri. This policy requires further policies to maintain farmers' fertilizer distribution businesses in their working areas.

The implementation path for fertilizer distribution to farmers can be visualized as follows:

**Figure 1.3**Line I Fertilizer Distribution Route to Farmers

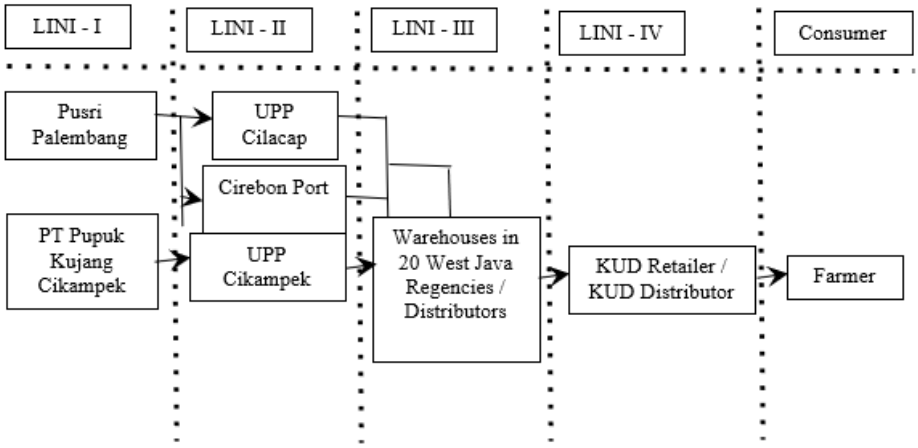



Source: www.pusri.co.id

The implementation of fertilizer distribution to farmers starts from line 1 of the fertilizer producer, then to the line 2 warehouse of the producer's representative office in the province, then to the line 3 warehouse at district level and to the distributor's warehouse, then sent to retailers/kiosks. From the line 3 warehouse, it can also be sent directly to the retailer/the kiosk. Distributors can also send it directly to farmer groups without going through retailers/kiosks. Then, from the retailer/kiosk, it is sent to farmers or farmer groups.

The implementation route for fertilizer distribution in West Java Province can be seen in the scheme below:

**Figure 1.4**Fertilizer Distribution Scheme in West Java



Source: www.pusri.co.id

Implementing fertilizer distribution in West Java Province starts from line 1, including Pusri Palembang and PT Pupuk Kujang Cikampek, then to line 2 via UPP Cilacap and Cirebon Port and UPP Cikampek. Up to line 3, fertilizer distribution through warehouses in 20 West Java districts/distributors down to line 4, namely retailer KUDs / distributor KUDs up to consumers and farmers.

The mechanism for planning, implementing and supervising the implementation of fertilizer distribution can be described as follows:

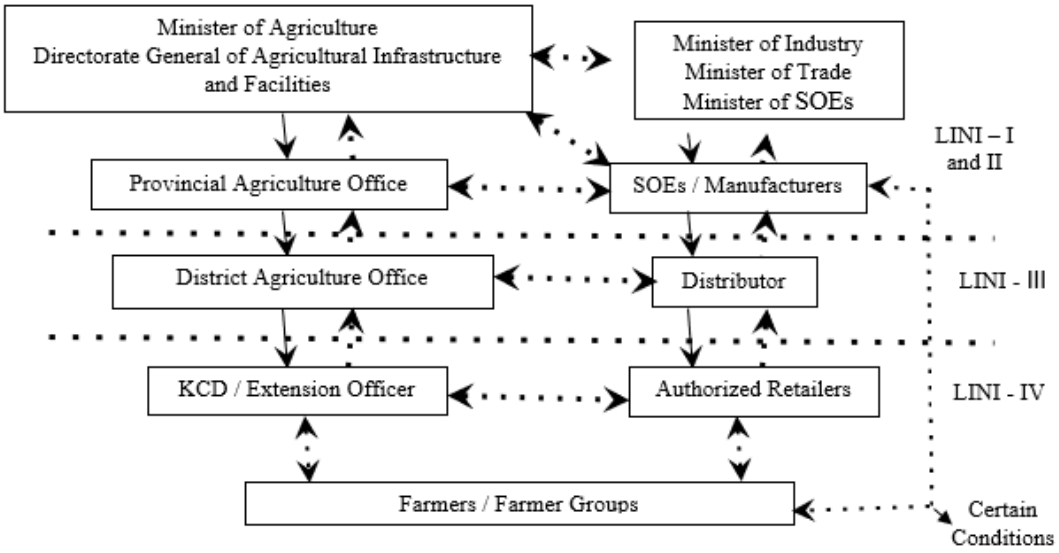



**Figure 1.5** Mechanism for Planning, Implementation and Supervision of Fertilizer Distribution

Information:

→ Instructions

⋯→ Coordination

Source: www.pusri.co.id

The planning mechanism for implementing fertilizer distribution starts from the Ministry of Agriculture in coordination with the Ministry of Industry and the Ministry of Trade as well as the Minister of State for State-Owned Enterprises, through the Provincial agricultural services and BUMN/Producers, agricultural services at the district level and fertilizer distributors. Next, through KCD / extension workers and official retailers to farmers or farmer groups. Under certain conditions, distribution can be done directly from the provincial Agriculture Service to farmers or farmer groups.

The essence of the fertilizer distribution mechanism based on Minister of Agriculture Regulation No. 69/Permentan/SR.130/11/2012 and Minister of Trade Regulation no. 15/M-DAG/PER/4/2013 and West Java Governor Decree No. 521.33/ Kep. 1495-Binprod/2012 can be described according to the following picture:

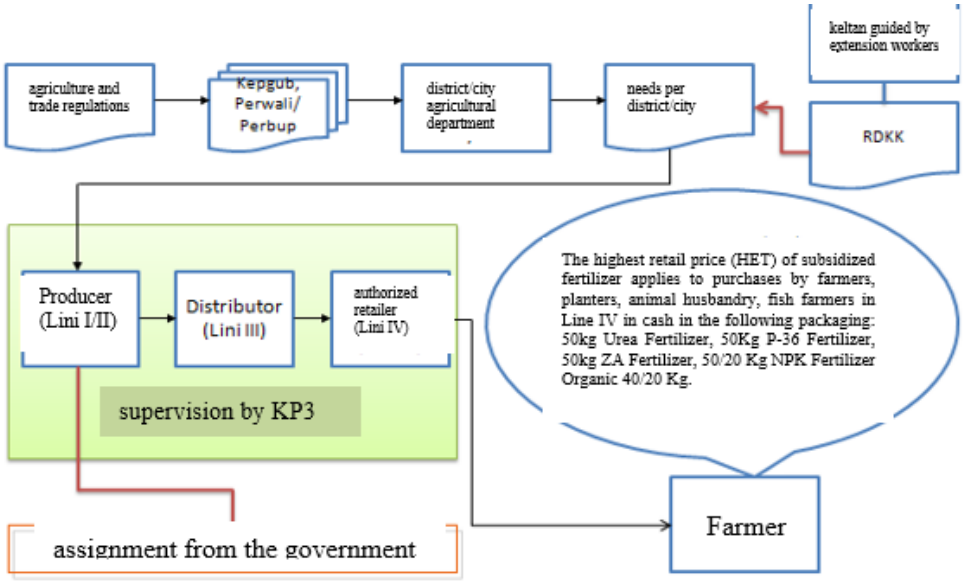



**Figure 1.6** The essence of fertilizer distribution mechanisms

Based on the essence of the fertilizer distribution mechanism in Figure 1.6 above, it can be explained that the producer is PT Pupuk Indonesia (Persero) and its subsidiaries, which the government assigns to carry out the procurement and distribution of subsidized fertilizer. Distributors are individual companies or business entities appointed by producers based on sales and purchase agreements (SPJB) to purchase, store, distribute and sell subsidized fertilizers in large quantities. Retailers are individual companies or business entities domiciled in sub-districts/villages appointed by distributors based on a sales and purchase agreement (SPJB) with the main activity of making direct sales to farmer groups and farmers in their area of responsibility.

The current 2014 fertilizer distribution mechanism is based on the above regulations, adhering to the concept *single responsibility* (SR), namely the management of marketing and distribution areas by one hand (producer = person in charge of distribution / SR), where other producers hand over their goods to be marketed and distributed by SR through joint operations (KSO), so that it will make it easier to control & account for each child PT Pupuk Indonesia company. The aim of implementing the single responsibility (SR) concept is to focus on marketing (operational and administrative), ease of control and accountability, distribution asset synergy, reducing costs and optimizing human resources. Based on the application of the single responsibility (SR) concept, some consequences must be synergized in its management, namely the need to revise government regulations (Permendag & Permentan) and the need to increase working capital for single responsibility (SR).

## CONCLUSION

### Suggestion

The quality of fertilizer through fertilizer colouring programs carried out by fertilizer producers has not optimally reduced deviations in fertilizer scarcity because, in reality, fertilizer can still be manipulated again. Therefore, it is best to replace the fertilizer colouring system with a fertilizer material that can only be replaced with reducing the quality of the fertilizer product.

Fertilizer shortages often occur caused by fertiliser infiltration outside the responsibility of its distribution area to make a profit. In order to avoid infiltration of fertilizer distribution, fertilizer producers must strengthen marketing areas by placing people who supervise fertilizer distribution channels. The people assigned must be given full authority to take action and report any fertilizer seepage to the police. Furthermore, if the fertilizer distributor is proven to have violated the regulations, the fertilizer producer must provide strict sanctions up to the termination of the contract.

Implementation *of Single Responsibility* (SR) for fertilizer distributors must be carried out to focus on operations and administration, ease of control and accountability, synergy of distribution assets and reduced costs for optimizing human resources. Single Responsibility management of this fertilizer is carried out in the marketing and distribution area by 1 hand (producer = person responsible for distribution), where other producers hand over their goods to be marketed and distributed by *Single Responsibility* through joint operations (KSO), so that it will make it easier to control and account for each fertilizer producer. As a consequence, it is necessary to revise Government Regulations (Permendag & Permentan) and increase working capital for *Single Responsibility* (SR).

Fertilizer producers and related regional governments must provide more intensive guidance and outreach to distributors, retailers, and farmer groups regarding the guidelines and conditions for implementing the subsidized fertilizer program.

The Definitive Group Needs Plan (RDKK) data collection system should not be based on assumptions but rather adjusted to actual conditions and verification results in each district/city so that fertilizer demand can be met appropriately. Stakeholders need to intensively deploy officers to evaluate weaknesses in the RDKK data collection system, distribution, and supervision of the subsidized fertilizer program.

There needs to be regulations regarding cost components that cannot be charged in calculating HPP for subsidized fertilizers so that HET fertilizers are in accordance with conditions in the field. The fertilizer price subsidy policy shows that implementing a closed subsidized fertilizer distribution system has proven ineffective in preventing fertilizer shortages and guaranteeing fertilizer HET. The government needs to be firm in imposing sanctions on producers if they are proven to have failed to carry out their obligations to provide sufficient fertilizer supplies at distributor and retailer kiosks, according to the HET. The current difficulties in fertilizer subsidies can be overcome with alternative subsidies for fertilizer transportation to reduce transportation and distribution costs, which are the biggest factors in the fertilizer component itself. An alternative fertilizer subsidy policy regarding the distribution system is implementing a closed and active system.

Fertilizer distribution supervisory institutions must improve their supervisory performance by supporting professional staff with an adequate budget. The community, especially farmer groups, must be involved in the monitoring process to increase access to information and public involvement in implementing the subsidized fertilizer program.

The mechanism for implementing the subsidized fertilizer program needs to develop an accountability model that is more participatory, transparent and accessible to the public.

It needs to be believed that the fertilizer problem is not just a technical problem. Therefore, fertilizer production and distribution can only partially be left to market mechanisms. These steps can provide recommendations for improvements to Indonesia's current fertilizer subsidy policy to encourage strong food security further, provide prosperity to farmers, and subsidize fertilizer for farmers.

It is necessary to combine gas subsidy policies and the imposition of export taxes so that fertilizer prices for farmers will be lower. In contrast, fertilizer producers are not disadvantaged because the gas subsidy value is set to be the same as the export tax value.

## Suggestions for Further Researchers

Suggestions that can be presented in this research are:

This research discusses product quality, pricing, distribution, and customer satisfaction as variables that influence fertilizer marketing performance. Therefore, future research can combine other marketing mixes or research variables.

This research also discusses the implications of fertilizer marketing performance on food security, using a fertilizer distributor analysis unit. Future research can add other variables with different analysis units, such as retailers/farmers, which could affect food security.

Future research can use the same variables but with a different research locus or different analytical tools, such as qualitative methods.

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