

# IMPACTS AND FUTURE PERSPECTIVES OF FERTILIZER POLICY IN INDONESIA

## *Dampak dan Perspektif Kebijakan Pupuk di Indonesia*

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### ABSTRAK

Pelaksanaan kebijakan subsidi pupuk telah diterapkan secara komprehensif mulai dari tahap perencanaan, pengaturan harga eceran tertinggi, jumlah subsidi dan sistem distribusi pupuk. Namun, kebijakan tersebut belum mampu menjamin ketersediaan pupuk yang memadai di tingkat petani. Perencanaan jumlah kebutuhan pupuk tidak sepenuhnya akurat, dan pengawasan belum optimal yang menyebabkan distribusi pupuk bersubsidi tidak memenuhi target. Petani yang mengelola lahan kurang dari 0,5 hektar hanya menerima 40 persen dari total subsidi dan sebagian besar petani (90%) membeli pupuk bersubsidi dengan harga lebih tinggi dari harga eceran tertinggi. Untuk mengatasi masalah ini, pemerintah merencanakan merubah mekanisme distribusi subsidi dari subsidi tidak langsung menjadi subsidi langsung kepada petani/kelompok tani. Dampak yang diharapkan dari kebijakan tersebut adalah: (1) manfaat dari subsidi pupuk diterima langsung oleh petani, (2) menghindari disparitas antara harga pupuk bersubsidi dan non-subsidi, (3) mengurangi kemungkinan kelangkaan pasokan pupuk bersubsidi, (4) memperbaiki teknik budidaya, khususnya pada pemupukan tanaman pangan, (5) meningkatkan efisiensi penggunaan subsidi pemerintah, dan (6) meningkatkan pendapatan dan kesejahteraan petani.

**Kata kunci:** *kebijakan pupuk, subsidi langsung, dan dampak kebijakan*

### ABSTRACT

The implementation of fertilizer subsidy policies have been applied comprehensively starting from the planning stage to fertilizer distribution system, including setting the highest retail price and the amount of subsidy. However, the policy has not been able to ensure adequate availability of fertilizers at the farm level. Planning on the amount of fertilizer demand is not fully accurate and supervision has not optimally implemented causing the distribution of subsidized fertilizer below the target. It is reported that farmers who manage less than 0.5 hectares of land received only 40 percent of the total subsidy and most farmers (90%) purchase subsidized fertilizer at prices higher than the highest retail prices. To overcome this problem, the government plan to change the distribution mechanism of subsidy from indirect subsidy to direct subsidy to farmers/farmer groups. The expected impacts of that policy are: (1) farmers obtain direct benefits from fertilizer subsidies, (2) avoid disparity between the prices of subsidized and non-subsidized fertilizers at the market, (3) reduce the possibility of scarcity of subsidized fertilizer supply, (4) improve cultural practices, especially in crops fertilizing, (5) increase the efficiency of using government subsidies, and (6) increase farmers income and welfare.

**Key words :** *fertilizer policy, direct-subsidy, and policy's impact*

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## **INTRODUCTION**

Fertilizer has a significant role in increasing agricultural production, productivity, farmers' income, and its contributions to national food security. Therefore, the government highly concerns in managing the procurement and distribution of fertilizer to the farmers. To encourage farmers to use adequate amount of fertilizer, the government has provided subsidies as one of the main policy instruments. The implementation of fertilizer subsidy is motivated by the fact that most Indonesian farmers are small farmers with limited capital. In such conditions, fertilizer subsidy is one of important public policy instruments for improving farmers' production capacity.

The fertilizer subsidy policy have been applied comprehensively that starts from planning stage, setting the highest retail price, amount of subsidy, and distribution system to farmers (targeted group). However, the policy has not been able to ensure the adequate availability of fertilizer at the farm level (ICASEPS, 2006 and 2008). Planning the amount of fertilizer need is still inaccurate, and supervision has not been optimal yet which causes distribution of subsidized fertilizer do not meet the target. It is reported that farmers who operate less than 0.5 hectares of land received only 40 percent of total subsidies and most farmers (90%) buy subsidized fertilizer at prices higher than the highest retail prices. In accordance with Presidential Decree No 1/ 2010 on the Acceleration of Strategic Programs and to overcome this problem, the government plans to change the mechanism of subsidy delivery from indirect subsidy to direct subsidy to farmers.

The focus of this paper is to review the development of production and fertilizer demand, fertilizer procurement and distribution systems, the impact and future perspectives of fertilizer policy.

## **PRODUCTION AND UTILIZATION OF FERTILIZER**

### **Anorganic Fertilizer Development**

Fertilizer industry has a strategic role in supporting Indonesian economic development programs. Its contribution not only to the development of agricultural sector, particularly food crops, but also to chemical industry and other services. The history of the fertilizer industry in Indonesia began with the establishment of PT. PUSRI in 1963. Since 1974 the fertilizer industry has been expanding rapidly with the construction of three Urea factories in East Kalimantan, West Java and Aceh. At the same period, SP-36 and ZA fertilizer factory were also built in East Java. During 1974-1986 nine Urea factories, three ZA factories and two SP-36 factories were built. Subsequently, during 1986-1994

two Urea factories were built. Procurement of fertilizers for food crops was organized by PT. PUSRI with other factories in a single holding company.

Indonesia's fertilizer production is dominated by five state-owned companies (PUSRI, PKG, Kaltim, PIM, Kujang), but the level of their production tend to be stagnant. Potential production of Urea in Indonesia is around 8.57 million tons, however actual production of Urea is only 20-30 percent below capacity, or about 6.12 million tons. This is caused by old age of the factories (75% factories > 20 years old), and diminishing in its efficiency. SP-36 fertilizer production is currently about 693 thousand tons (70% of potential production), while the production capacity of ZA is around 670 thousand tons, and NPK fertilizer production reached 982 thousand tons (Table 1).

Table 1. Trend of Fertilizer Production in Indonesia, 2006-2009 ('000 ton)

Description	2006	2007	2008	2009
Urea	5,663	5,866	6,133	6,731
SP-36	649	658	693	900
NPK	413	633	952	1,316
ZA	636	670	670	666
Organik	0.53	1.62	86	450

Source : Ministry of Agriculture (2009)

To increase production, marketing and distribution of fertilizer, the government set up a holding company parent, called PT. Agro Kimia Indonesia (as a substitute PT.PUSRI Holding) in 2008. The funds invested were Rp.2,8 trillion (U.S.\$ 307 billion), primarily allocated to the rehabilitation of four factories of more than 30 years old (three owned by PT PUSRI and one owned by PT Kaltim Fertilizer). The policy has shown a positive impact to the distribution system of subsidized fertilizer, and increasing availability of fertilizer.

Domestic fertilizer demand has increased by 4.6 percent per year, along with the intensification of rice, corn, and soybean. Meanwhile, national fertilizer production tends to be stagnant at an average of 75 percent utilization of capacity. Fertilizer needs in agriculture sector which include food crops of about 70-80 percent of the total national fertilizer needs, and around 20-30 percent for large estates and industry (Table 2). Demand for Urea, SP-36, ZA and NPK for the agriculture sector has exceeded national fertilizer production. Demand and production of chemical fertilizers in 2006 were 6.890 million tons and 5.663 million tons respectively, then in 2009 fertilizer demand increased to 8.003 million tons, while production was only 6.731 million tons. The shortages of fertilizer supply are met by imports of Urea, SP-36, ZA, KCl and NPK. Fertilizer imports are mostly for private estates and industrial subsectors.

Table 2. Past and Future Fertilizer Demand in Indonesia, 2006-2014 ('000 ton)

Year/ Fertilizer	2006	2007	2008	2009	2010	2011	2012	2013	2014
Urea	6,890	6,986	7,451	8,003	7,300	7,200	7,100	7,000	7,000
SP-36	3,021	3,073	3,107	4,010	4,500	4,500	4,400	4,400	4,300
NPK	660	1,591	1,263	3,650	8,100	8,600	9,200	9,700	10,800
ZA	1,189	1,725	1,497	2,150	1,200	1,200	1,300	1,300	1,300
Organik	-	-	-	-	11,9	12,2	12,2	12,7	13,0

Source: Ministry of Agriculture, 2009

The gap between demand and supply of chemical fertilizers is due to the limited budget of subsidy and production capacity of fertilizer, especially Urea and SP-36. Efforts to increase production capacity have been done through rehabilitation of Urea factory in order to operate more efficiently. Besides fertilizer produced by the State Owned Companies, small and medium industries also produce some types of fertilizer. Up to now, the Ministry of Agriculture have listed 976 brands of fertilizer that consist of 296 brands of NPK fertilizer, and 407 brands of mix fertilizer.

### Organic Fertilizer Development

Organic fertilizer has an important role in maintaining soil fertility. The content of organic matter, particularly in paddy fields, is currently very low. Meanwhile, potential organic material could be obtained among others from crop residues, palm oil waste, natural soil, dolomite, and zeolite. In the last couple of years, fertilizer factories and Small-Medium enterprises have produced organic fertilizer. In 2008, there were 17 brands of microbial fertilizer, and 174 organic fertilizer brands.

According to the Indonesian Agency for Agricultural Research and Development (AARD), fresh rice straw of 5-6 tons of hay or compost of 2 tons per hectare can provide nutrients of 25 to 30 kg Urea, 5 to 10 kg SP-36, and 50 to 60 kg KCl. The use of straw compost of 2 tons per hectare, paddy planting acreage of about 12 million hectares, is expected to reduce the consumption of Urea fertilizer of about 300,000 tons, or reduce fertilizer subsidy budget of about Rp 810 billion. If the saving of fertilizer subsidy funds are used to assist farmers, there will be available 20,250 units of organic fertilizer equipment, that can produce organic fertilizer/compost at least 3,159,000 tons of hay equivalent to organic fertilizing of 1,579,500 hectares. With total paddy acreage of about 12 million hectares, the need of organic fertilizer is about 24 million tons, and organic fertilizer equipment (134,615 units) at a total cost of around Rp 5.3 trillion.

To accelerate the development of organic fertilizer, the government has provided Organic Fertilizer equipment as many as 1,411 units in 2008. Provision of these equipments aimed to help self-reliance of farmers/ farmer groups in producing organic fertilizer. Organic fertilizer produced by the farmers reached 157,000 tons. In addition to improve farmers' skills, they are also supported by training on a local decomposers manufacturing technology. Future development of organic fertilizers is expected to offset the lack of availability of fertilizer, particularly Urea fertilizer.

Currently the use of organic fertilizer by farmers is still low of about 21 percent (Rachman *et al.*, 2008). This is due to the highest retail price of organic fertilizer which is almost equal to the highest retail price of Urea fertilizer. Therefore, farmers tend to buy Urea (Rp 1,200/kg) instead of organic fertilizer (Rp 1,000/kg). To further encourage the use of organic fertilizer, the government has lowered the highest retail price of organic fertilizer from Rp 1000/kg to Rp 500/kg in 2009.

## **CURRENT FERTILIZER SUBSIDY POLICY**

### **a. Legal Aspect**

Implementation of fertilizer subsidy is based on Regulation of the Minister of Agriculture (Permentan) and Regulation of the Minister of Trade (Permendag). Permentan Decree No. 05/2009 regulates the allocation and the Highest Retail Price of subsidized fertilizers for agricultural sector, while Permendag Decree No. 07/2009 regulates the procurement and distribution of subsidized fertilizers.

### **b. Proposed Amount of Subsidized Fertilizers**

Subsidized fertilizer consist of Urea, ZA and SP-36, compound fertilizer (NPK) and organic fertilizer. The proposal of fertilizer needs by farmers uses RDKK (Definitive Plan of Group Needs). The farmers as a member of the farmers' group propose fertilizer need based on operated land size.

### **c. Distribution of Subsidized Fertilizer**

Fertilizer belongs to the groups of commodity and controlled by the government. Therefore, the distribution system is arranged to prevent leakage of fertilizer from one market to another (Figure 1). Line-I is a fertilizer warehouse located in the territory of their respective factories or producers in the territory of the port of destination for imported fertilizers. Meanwhile, Lini-II is a warehouse located in the provincial capital region and packing Fertilizer Unit (UPP) or

outside the port area. Line-III is a warehouse located in the territory of a district. Line-IV is the location of a warehouse or retail kiosks on sub district and / or village designated or established by the distributor.

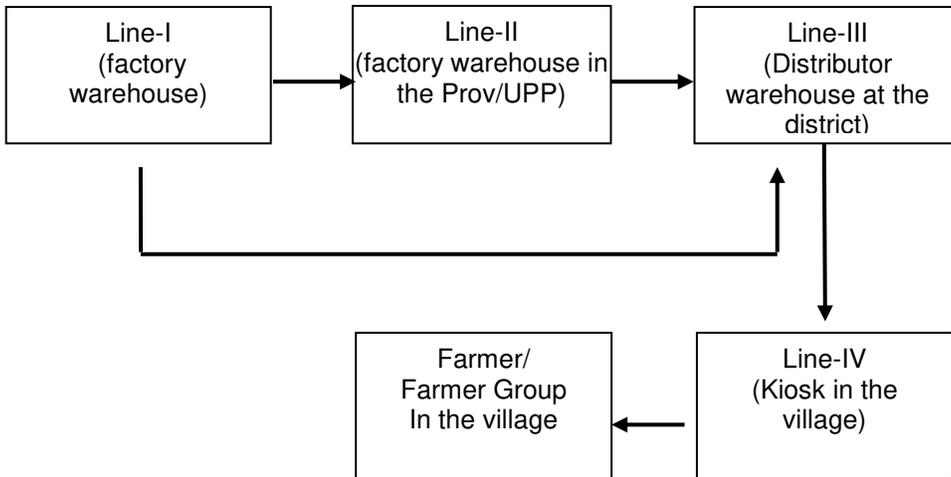


Figure 1. Subsidized Fertilizer Distribution Channels in Indonesia

In the district, if the location of distributor warehouse (line-III) near a factory warehouse (line-I), then the Line-III distributor can redeem fertilizer directly at the Line-I warehouse. Meanwhile, the Line-II warehouse in the province / UPP (packing Fertilizer Unit) provides the fertilizer for Line-III dealer in their area only. Similarly, the Line-III dealer only provide fertilizer to Line IV retailer (kiosks) in its territory. Furthermore, Line-IV only provide fertilizers to farmers/ farmer groups in their area.

With RDKK, the subsidized fertilizer distribution system is closed at the end of the distribution channels (kiosks). It means that the sale of subsidized fertilizer by kiosk is limited only to farmers being its responsibilities in accordance with RDKK. Similarly, farmers can only buy subsidized fertilizer at a specified kiosk. Payments systems from kiosk to distributors and from distributors to factories is made in cash basis.

**d. Subsidized Fertilizer Prices**

Fertilizer prices paid by farmers is the Highest Retail Price (HET). HET is the highest price for fertilizer sales in cash as stated at the Minister of Agriculture Decree which covers Urea, SP-36, ZA, NPK and organic fertilizers. HET of subsidized fertilizer remained unchanged during 2006-2009, while the

Government Procurement Price (HPP) for paddy has been increasing from Rp 2,000/kg in 2007 to Rp 2,200/kg in 2008, then Rp 2,400/kg in 2009, and Rp 2,640/kg in 2010, or increase around 10 percent a year. This means that the ratio of HET to HPP continuously declines (Table 3), or subsidized fertilizer prices relatively cheaper than the HPP.

Table 3. Ratio of Fertilizer Prices (HET) to HPP Paddy (unhusk of rice) in Indonesia, 2006-2010

Year	HPP Paddy (Rp/kg)	HET Fertilizer (Rp/kg)				Ratio HET Fertilizer/HPP Paddy			
		Urea	ZA	SP36/SP18	NPK	Urea	ZA	SP36/SP18	NPK
2006	1,730	1,200	1,050	1,550	1,750	0.69	0.61	0.89	1.01
2007	2,000	1,200	1,050	1,550	1,750	0.60	0.53	0.78	0.88
2008	2,200	1,200	1,050	1,550	1,750	0.55	0.48	0.70	0.80
2009	2,400	1,200	1,050	1,550	1,750	0.50	0.44	0.65	0.73
2010	2,640	1,600	1,400	2,000	2,300	0.60	0.76	0.53	0.87

#### e. Supervision of Subsidized Fertilizer

Surveillance has been conducted integratedly between the farmers/ farmer groups, government and other stakeholders. Supervision of subsidized fertilizer is carried out by Supervisory Team (TP2B) and Supervisory Commission (KP3). TP2B located at the central government, whose members are appointed by the Minister of Agriculture. Meanwhile, the KP3 is formed by the Governor for the provincial level and by the Mayor for the district level.

## THE EFFECTIVENESS OF FERTILIZER SUBSIDY

#### a. Impact of Fertilizer Subsidies on Production, Value Added and Household Income

Fertilizer subsidies have positive impacts on the demand and use of Urea fertilizer in rice farming. Furthermore, the use of Urea fertilizer had positive effects on rice productivity. The World Bank study (2009b) showed that the increase of Urea use by 1 percent can increase the productivity of paddy from 0.31 to 0.49 percent in Java and 0.15 percent in Off-Java. Meanwhile, the results of the study conducted by IPB (2010) reported that the fertilizer subsidy in 2008 could increase the value added at national level of about Rp 5.2 trillion. The increased value added is still smaller than the subsidy cost of about Rp 17.5 trillion. The

World Bank (2009a) also reported that increase in the value of rice production in 2008 was only Rp 8.3 trillion, or lower than the value of fertilizer subsidy of about Rp 15.2 trillion. This means that the fertilizer subsidy policy is economically inefficient.

#### **b. The Beneficiaries of Subsidized Fertilizer**

Results of the World Bank study (2009) revealed that based on rice farming data in 2007, large farmers received more benefit of fertilizer subsidies than small farmers. Large farmers (40%) obtained 60% of the total fertilizer subsidy. IPB (2010) also showed that the fertilizer subsidy policy in 2008 provided larger impact to middle-upper income groups by about Rp 223.9 billion, while the low income group received only Rp 167.9 billion.

#### **c. Implications for the Allocation of Development Funds**

If recipients of fertilizer subsidy are limited to small farmers only (60% of total), then there is fertilizer subsidy cost savings amounting to Rp 9 trillion (World Bank, 2009). The funds can be reallocated to finance seeds subsidy and the rehabilitation of agricultural infrastructure as well as research and development.

### **MAJOR PROBLEMS OF FERTILIZER SUBSIDY POLICY**

#### **a. Inaccurate RDKK**

The formulation of RDKK by Farmers Group is not based on actual farm size data. According to the regulations, recipients of subsidized fertilizer are farmer who operates land maximum of 2 hectares. However, in reality many farmers who operate land of above 2 hectares also receive subsidy by splitting land into several plots on behalf of their family members (Rachman and Sudaryanto, 2009).

#### **b. Price Disparity between Subsidized and non-Subsidized Fertilizer**

There is price disparity between subsidized fertilizer for crops and non-subsidized fertilizer for estate crops. It is reported that price disparity of Urea, SP-36, and NPK-Phonska, are Rp 1580, Rp 1630, and Rp 2300, respectively. This causes subsidized fertilizer to move from subsidy to non-subsidy market which finally results in scarcity of subsidized fertilizer.

### **c. Unrealistic Marketing Margin**

Marketing margin which consists of fee for distribution and marketing costs unrealistic, in both Line III and Line IV. Therefore, distributors of fertilizer increase fees and adjust marketing costs illegally. This leads to the increase in marketing margin and the price of fertilizer at the farm level, which is higher than the highest retail price (Syafa'at *et al.*, 2006; Rachman and Sudaryanto, 2009).

### **d. Limited Budget**

The budget for fertilizer subsidies were limited. In 2009, the budget for fertilizer subsidy was Rp 17.5 trillion, which declined to Rp 11.3 trillion in 2010. The budget for fertilizer supervision also limited, that is only Rp 20 billion for the whole region of Indonesia, or an average of around Rp 50 million per district/city per year, or Rp 4 million per month.

### **e. Control and Supervision Lacking**

Monitoring of the distribution of subsidized fertilizer was still very weak because it is done partially. Supervision is only in the form of reporting system, without any field monitoring. Weak supervision and delay in the issuance of Permentan Government Decree has caused shortages of fertilizer, or delays in distribution of fertilizer around 1 to 2 weeks (Syafa'at *et al.*, 2006; Rachman, 2009)

## **PROPOSED IMPROVEMENT OF FERTILIZER SUBSIDY POLICY**

Based on the above problems, the improvement of fertilizer subsidy policy is intended to: (a) eliminate the disparity between the price of subsidized and non-subsidized fertilizer; (b) improve the efficiency of fertilizer use at the farm level; (c) increase the efficiency of subsidy budget, and (d) empower farmer institution. There is a proposal to improve the subsidy scheme is to change the indirect subsidy scheme to direct subsidy to the farmers.

Understanding and definition of direct subsidy are as follow : (a) Direct fertilizer subsidy to farmers is the price received by farmers directly from the government, (b) Farmers buy fertilizer at non-subsidized price (market retail price), but farmers receive a direct subsidy is the difference in price between non-subsidized and subsidized fertilizer multiplied by the volume of purchase of fertilizer, (c) Market Retail Price is the retail price of fertilizer in Zone-4 (kiosks or farmer group) imposed on the whole of territory of Indonesia, (d) This price

subsidy will be paid to the farmer after redeem fertilizer, and (e) The amount of the price subsidy is depend on the ability of the government budget.

#### **a. Fertilizer Distribution**

The distribution of fertilizer uses current system (Regulation of the Minister of Trade Number 07/M-DAG/PER/2/2009). The objective is to supply fertilizer to the targeted farmer. Currently, subsidized fertilizer distribution in the Line-IV is retailer (kiosks). However, if there is farmer group who is qualified as fertilizer dealer or retailer, they can do so. Fertilizer distribution mechanism is as follows:

Line-1(Producer) → Line-2(Producer) → Line-3(Distributor) → Line-4 (Kiosks/Farmer groups) → Farmers

#### **b. Formulation of Fertilizer Needs**

- (i). Preparation of fertilizer need is based on Definitive Plan Group Need (RDKK) produced by farmer groups assisted by the Agricultural Extension Worker.
- (ii). RDKK is sent to the District Technical Team.
- (iii). RDKK is verified by the District Technical Team, and then submitted to Central Executive Secretariat

#### **c. Subsidy Disbursement**

- (i). The proposed direct fertilizer subsidy funds is based on RDKK, and verified by Central Executive Secretariat
- (ii). District Technical Team in coordination with Central Executive Secretariat appoints Executing Bank for disbursing the subsidy.
- (iii). Farmer group opens bank account at the specified bank and submit it to the District Technical Team.
- (iv). District Technical Team verify the account number and submit it to Central Executive Secretariat.
- (v). Disbursement of subsidy funds to the farmer group is based on regulation of the Minister of Agriculture.
- (vi). Central Executive Secretariat submit allocation of subsidy funds and account number of each farmer group to Executing Bank.
- (vii). Subsidy funds are transferred directly to the account of farmer group

through Executing Bank.

- (viii). Disbursement of subsidy to the farmer group accounts regulated by the Ministry of Finance.
- (ix). Farmers buy fertilizer in line-IV at non-subsidized price, and then claim the subsidy funds to farmer groups based on valid proof.

Table 3. Current Subsidy Mechanism vs Direct Subsidies to Farmer in Indonesia

Subsidy	Strenght	Weakness
Current subsidy mechanism	<ol style="list-style-type: none"> <li>1. Disbursement of subsidies is simple.</li> <li>2. Lower administrative costs.</li> </ol>	<ol style="list-style-type: none"> <li>1. There is price disparity between subsidized and non-subsidized market.</li> <li>2. Farmers do not benefit from subsidy directly.</li> </ol>
Direct subsidies to farmer	<ol style="list-style-type: none"> <li>1. No more disparity of fertilizers price in all lines.</li> <li>2. Farmers benefit from subsidy directly.</li> <li>3. Strengthen capacity of farmer groups.</li> </ol>	<ol style="list-style-type: none"> <li>1. The government should make the subsidies funds available before planting period.</li> <li>2. There is possibility of subsidy funds to be distributed equally to all farmers.</li> <li>3. Not all of farmer groups are capable to manage the subsidy fund.</li> <li>4. Higher administrative costs</li> </ol>

## CONCLUDING REMARKS

The government plan to change the mechanism of disbursing fertilizer subsidy from indirect subsidy to direct subsidy to farmers/farmer groups. The potential positive impact of direct subsidy scheme are: (a) the benefits of fertilizer subsidies is received directly by the farmers; (b) avoid disparity between the subsidized and non-subsidized fertilizer price; (c) reduce the possibility of scarcity of subsidized fertilizer; (d) increase the efficiency of government subsidy use, and (e) strengthen farmer institution.

Future perspective of the policy is to reduce chemical fertilizer subsidies gradually, while subsidies for organic fertilizer and compound fertilizer (NPK) will continue to be increased. Part of fertilizer subsidy fund will be allocated : (a) to finance the development of rehabilitation of agricultural infrastructure (irrigation, farm roads, and farm institution); (b) encourage the development of small-medium scale organic fertilizer industry; and (c) increase fertilizer use efficiency through intensive agriculture extension about dosage and the recommended of fertilizing.

Improving the effectiveness of subsidized fertilizer distribution policy through: (a) Socialization of location specific balanced fertilization system, and (b) Accelerating of the development of organic fertilizer use through training of farmers/ farmer groups in producing organic fertilizers and decomposers.

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