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Fertilizer Subsidy and Retail Price Policies to Support Food and Nutrition Security in Indonesia

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ABSTRACT

To achieve sustainable food and nutrition security, the government of Indonesia has set up a national policy which states that the main source of food to meet consumption needs should be from domestic production. This policy has been implemented through food production program with high growth rate target. One component of the program is providing and distributing subsidized fertilizers to food farmers. The government also has issued a ceiling retail price policy for subsidized fertilizers. This article aims to discuss the implementation of the fertilizer policy, potential problem generated from this policy, and its alternative solution. The main problem generated from this policy was that government expenditure for fertilizer subsidy had increased significantly, among others mainly due to the annual increase in unit cost of fertilizers. To lessen the budget burden, while subsidized fertilizer policy is continuously implemented, alternative policies are conducted to increase the ceiling retail price of fertilizers gradually, encourage the fertilizer producer to increase production efficiency, and empower food farmers to be able to apply better and more efficient fertilizers use.

INTRODUCTION

Sustainable food and nutrition security has been the core national food policy in Indonesia. To achieve the goal, the Ministry of Agriculture has implemented a program called special effort to increase production of staple crops (rice, maize, and soybeans) with high growth rate targets. This program was implemented to balance the ever increasing food demand due to the high growth rate in population, increase in income per capita, and dynamics of food consumption preferences. To support the high food production growth rate through yield increase, one of the important activities is applying fertilizers as recommended technology in accordance to land characteristics, agro ecosystems, and crops cultivated.

Proportion of fertilizer component to total costs of food farming was relatively small. In wet season of 2016, proportion of fertilizer cost to the total costs of rice, maize, and soybeans farming were 8.4%, 15.6%, and 7.0%, respectively (Suryani *et al*, 2017). Statistics of Indonesia (2018) confirmed that average proportion of fertilizer cost in rice farming was 9.43%, while cost for land (valued by market land rent) and labor (hired and imputed) were 25.61% and 48.79%, respectively. Even though fertilizer cost was relatively small, this production factor was an essential component, and if applied properly, it will ensure high yield.

The government of Indonesia has fully understood that fertilizer is one of the essential production factors in farming practices to increase food production, even more so since high yielding varieties (HYVs) of rice from International Rice Research Institute (IRRI) was introduced in late 1960s. These HYVs have high yield potential, but need more nutrient supply in the soil. Fertilizer should be applied in accordance to soil fertility and plant needs, and applied at the right time (Balai Besar Penelitian Tanaman Padi, 2015).

Two main components of the government fertilizer policy in providing incentive for farmers to use fertilizers as recommended technology were (1) budget allocation for fertilizer subsidy and (2) regulation of ceiling retail prices for subsidized fertilizers. The government has provided fertilizer

subsidy for food farmers since 1969, or about 50 years ago (Deputi Koordinator Bidang Pangan dan Pertanian, Kementerian Koordinator Bidang Perekonomian, 2019). The government also administered ceiling retail price policy for subsidized fertilizers at the assigned kiosks in agricultural villages. For those fifty years, general objectives of the fertilizer policy have been about the same, namely: (1) to provide relatively cheap fertilizers for food farmers, (2) to increase farm yield/hectare (ha) and food production, and (3) to increase food farmers' income.

To ensure fertilizers distributed properly to farmers, the government has issued several regulations. One of those important regulations was issued in 2011 through President Regulation No. 15 in 2011 that assigned subsidized fertilizers as goods under government control. Scope of government control includes procurement and distribution consist of type, volume, quality, marketing areas and ceiling retail prices of subsidized fertilizes, and time of procurement and distribution. Fertilizers under government control are inorganic or chemical fertilizers consisting of Urea (Nitrogen 46%), SP 36 (Phosphate 35%), ZA (Nitrogen 21% and Sulfate 24%), NPK (Nitrogen 15%, Phosphate 15%, and Potassium 15%).

The government through the Indonesian Ministry of Trade issued a regulation (No. 15 in 2013) pertaining Procurement and Distribution of Subsidized Fertilizers for Agriculture Sector. This regulation directed that procurement and distribution of subsidized fertilizers for agriculture sector was a 'close system', starting from producers up to farmer groups or farmers as consumers. PT Pupuk Indonesia (Persero), a holding company and a state-owned enterprise in fertilizer industry was given responsibility to implement this task.

Subsidized fertilizers should be procured and distributed with the six-right principle that consists of right in type, volume, price, place, time, and quality. Farmer who is eligible for subsidized fertilizers should be a member of a farmer group. The farmer group collectively proposes the fertilizer needs of its members that is calculated and arranged based on the recommended technology. Farmers who are eligible to buy subsidized fertilizers are small-scale farmers with land holding size less than two hectares. This article aims to discuss implementation of the fertilizer policy, potential problem generated from this policy, and its alternative solution.

IMPLEMENTATION OF FERTILIZER SUBSIDY DAN PRICE POLICY

Fertilizers use in food farming

The number of household farmers in Indonesia with land holding size less than 2.0 hectares was 22.9 million. Out of this number, 63.9% cultivated less than 0.5 hectare (Statistics Indonesia, 2013). In 2017, rice production was 77.37 million tons dried paddy and maize was 52.27 million tons kernels. This food production was resulted from harvested acreage of 14.56 million hectares of rice field and 5.53 million hectares of corn farming. Soybeans production was relatively low, only 356,000 tons (Kementerian Pertanian, 2019).

Indonesian food crop farmers have been already familiar with fertilizers and fertilization. Chemical fertilizers were intensively introduced to food crops farmers in the mid of 1960s. At present, in some instances, food farmers used inorganic or chemical fertilizers excessively. Total inorganic fertilizers (Urea, NPK, SP 36, ZA, and KCl) used in rice and maize farming in Indonesia's main food producing provinces were quite high, more than 615 kg/ha. Rice was cultivated in irrigated rice field and maize was grown in dry land (wet season) and rice field (dry season). Meanwhile application of chemical fertilizers in soybeans farming was relatively low, about 300 kg/ha.

The use of Urea fertilizer in food farming was the highest among chemical fertilizers, on the average 239 kg/ha in rice farming and 289 kg/ha in maize farming. NPK fertilizer came second with 224 kg/ha and 239 kg/ha in rice and maize cultivation, respectively. Meanwhile for SP-36 fertilizer, average application per hectare was 119 kg in rice farming and 69.2 kg in maize farming. The use of organic fertilizer was relatively low, far less than 50% of the technical dosage recommendation (Suryani, *et al.*, 2017). For comparison, recommended fertilizers application per ha on rice field with low P and K nutrient content was 150 kg Urea and 250 kg NPK, and on rice field with medium P and K content was 175 kg Urea and 200 kg NPK (Ministry of Agriculture Regulation No. 40/2007).

Participation rate of food farmers in applying chemical and organic fertilizers were different by type of fertilizer (Suryani *et al.* 2017). Participation rate of the use of Urea fertilizer in rice and maize farming was 100% and in soybeans farming was 80%. Participation rate of NPK fertilizer application were 100%, 90%, and 82% in rice, maize, and soybeans farming, respectively. Meanwhile the participation rate for ZA fertilizer used was relatively low, less than 30% both in rice and maize farming. None of soybeans farmer applied ZA fertilizer. Organic fertilizer was used by less than half of food farmers with very low dosage/ha compare to its recommendation (Figure 1).

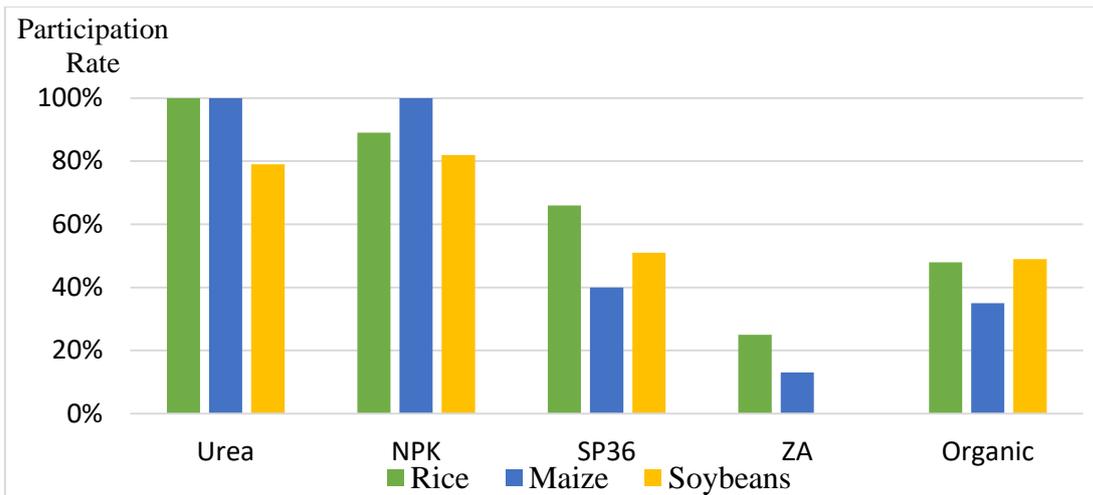
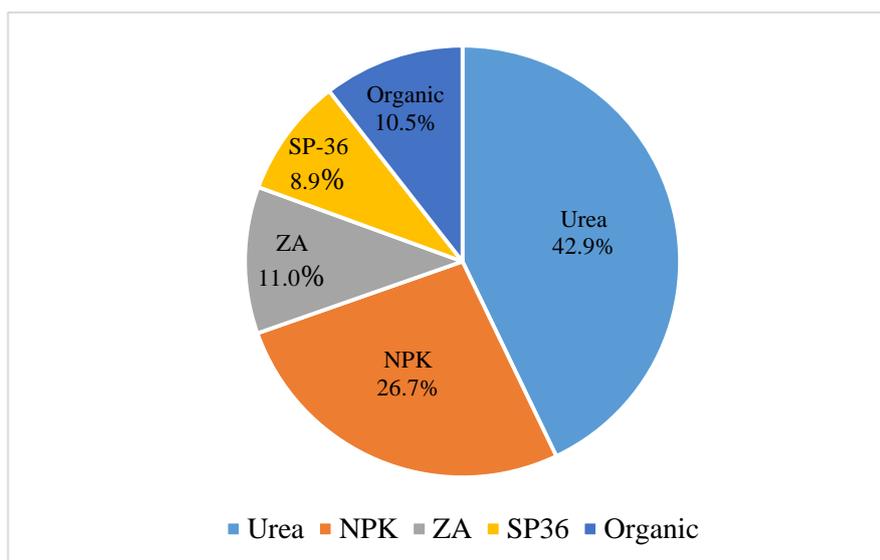


Figure 1. Participation rate of food farmers in fertilizers use in Indonesia, 2017. Suryani *et al.* (2017)

Fertilizer subsidy scheme

Because of planted acreage of main food crops (rice maize, soybeans) being quite extensive, more than 20 million hectares/year in total, fertilizer used in food crops farming in this country was also quite sizeable. Since most of food crops farming was eligible as beneficiaries of subsidized fertilizer, the need for subsidized fertilizer was also huge. Based on the data from the Directorate General of Agriculture Infrastructure and Facilities, Ministry of Agriculture (Ditjen PSP, 2019), in 2007 the volume of subsidized fertilizer distributed to farmers was 6.1 million tons, in 2009 jumped to 7.9 million tons, then rose to 8.6 million tons in 2011. During the last three years (2016-2018) the government allocated budget for 9.55 million tons of subsidized fertilizer per year, and the amount that was actually distributed to food farmers, on the average 9.25 million tons/year.

In 2019, the same as last three years, the government allocated budget for procurement of 9.55 million tons of subsidized fertilizers. Types and proportion of subsidized chemical fertilizers were 42.9% Urea, 26.7% NPK, 11.0% ZA, and 8.9% SP-36; and 10.5% organic fertilizer, as presented in Figure 2 (Ditjen PSP, 2019).



Note: Total volume of subsidized chemical and organic fertilizers in 2019 was 9.55 million tons

Source: Ditjen PSP (2019)

On the average, realization of the government expenditure for fertilizer subsidy during 2015-2018 was Rp.29.4 trillion/year or US\$ 2.2 billion/year. Budget allocation for fertilizer subsidy in 2019 was

about the same as the last four years, about Rp.29.5 trillion (US\$ 2.1 billion). However real expenditure will depend on how much the amount of subsidized fertilizers were actually distributed and how much subsidy should be covered for each type of fertilizer. In 2017, the total government budget was Rp.2,081 trillion (US\$ 156.5 billion), and proportion of the budget for fertilizer subsidy was 1.43%. In the 2019 government budget plan, allocation for fertilizer subsidy slightly decreased to 1.20% (Kementerian Keuangan, 2019).

The amount of the government subsidy for each kg of fertilizer is the difference between unit cost of a specific fertilizer produced by PT Pupuk Indonesia and the predetermined ceiling retail price of fertilizer. Unit cost for all type of fertilizers increases every year because of the increase in exchange rate of US\$ in rupiah (Rp), inflation, and price of natural gases feedstock for Urea. Natural gas accounted for about 70% of Urea unit cost. On the other hand, the ceiling retail prices of fertilizers have been pegged by the government. The ceiling price for ZA and SP 36 fertilizers were not increased since 2010 at Rp.1,400 (US\$ 0.10) /kg and SP-36 at Rp.2,000 (US\$ 14.9)/kg, respectively. The ceiling price for NPK fertilizer was the same at Rp.2,300 (US\$ 0.17)/kg since 2011, and for Urea fertilizer was Rp.1,800 (US\$ 13.4) /kg since 2012.

Relative prices of fertilizers to paddy and foodstuff had declined during the period of 2011-2019. Statistics in Indonesia (2019) reported that indices of price received by farmers for paddy and price paid by farmers for food stuff in 2019 (average January – June, base year 2012 = 100) was 140.5 and 151.6 respectively. Other set of data showed that while fertilizers prices were pegged since 2012, government procurement price for dried paddy increased periodically. In 2017, the paddy procurement price was 40.1% higher than that in 2012. For medium rice, during the same period, market price rose by 46.4% (Table 1). This price dynamics may give incentive to farmers for using more fertilizers than recommended dose and may create interest for some actors in fertilizer business to take advantage by selling subsidized fertilizers to non beneficiaries program at higher prices than subsidized prices but a bit lower than market prices.

Table 1. Ceiling retail price of subsidized fertilizers, paddy and rice prices, in Indonesia, 2011-2017

Item	Unit	2011	2013	2015	2017
Urea ceiling retail price	Rp/kg	1,600	1,800	1,800	1,800
Dried paddy government procurement price	Rp/kg	2,640	3,300	3,700	3,700 40.1%**
Rice market price (medium)	Rp/kg	7,890	8,941	10,915	11,552 46.4%**
Price ratio: Paddy/Urea**	-	1.65	1.83	2.06	2.06
Price ratio: Rice/Urea**	-	4.93	4.97	6.06	6.41

Notes:

*) In 2017 National Logistic Agency (BULOG) was allowed to buy dried paddy 10% higher than the procurement price.

**) Number in the brackets showed the percentage increase from 2011 to 2017 of paddy price, and rice price, respectively.

Source: Suryana 2018.

The amount of fertilizer subsidy per kg varied by type of fertilizer. For example, proportion of expenditure subsidy per kg Urea fertilizer was 34.9% of its unit cost in 2011, then rose to 50.0% in 2014 (Suryana *et al.*, 2016), and more than 60% in 2018 (Ikhsan, 2019). Compared to the market prices for non-subsidized fertilizers, subsidized NPK, Urea, and SP36 fertilizers prices were cheaper, which are 28%, 36%, and 40%, respectively (market prices for fertilizers from harga.web.id. 2019). Again, these huge differences in prices of subsidized and non-subsidized fertilizers in the same markets can create a moral hazard of some actors related to fertilizer business for taking advantage of this situation.

Policy to provide subsidized fertilizers for small holder food crop farmers with price pegged for around seven years created some problems. First, the government expenditure for fertilizer subsidy increased every year given volume of subsidized fertilizers was about the same. Second, most of food farmers cultivated small piece of land. Around 14.6 million household farmers depend on less than 0.5 hectare to earn income or food. Therefore, they tended to get maximum benefit from the main owned endowment. Because fertilizer prices were very cheap, farmers tended to overuse this production factor with the hope to get additional yield from their farms. As discussed earlier, on the average total use of chemical fertilizers in food crops farming was more than 600 kg/ha, meanwhile organic fertilizers application was still very small, on the average 375 kg/ha.

As discussed earlier, the government continues to implement policy to provide incentives for food farmers with enough supply of subsidized fertilizers. The government takes steps to improve distribution of subsidized fertilizers, among others by introducing KartuTani (Farmer Card). At present, the government has run a pilot project of Farmer Card use in several provinces. The objective of Farmer Card policy is to improve subsidized fertilizers distribution in accordance to the six-right principle, increase the effectiveness of supervision of fertilizers distribution, and introduce banking services to farmers and villages. The government is also implementing a pilot project to provide subsidized fertilizers with its composition based on crop needs. This year the pilot project is exercised for small holder cocoa farming (Ditjen PSP, 2019).

CONCLUSION AND POLICY IMPLICATION

Indonesia is a country with huge population (in 2018 about 265 million people) and is still growing with around 1% annually. Demand for food is quite large in term of quantity and increases in term of diversity, quality and safety. To achieve sustainable food and nutrition security, this country has set up a national food policy that the main source of food to meet consumption needs should come from domestic production. In the above context, incentive for farmers to produce more food is still needed. Providing farmers with subsidized fertilizers is a viable mean to increase yield and food production.

Problem generated from this policy is that the government expenditure for fertilizer subsidy had increased significantly. Given the same amount of subsidized fertilizers distributed every year, the value of the government subsidy increased annually due to the annual increase in unit cost of fertilizers. Other problems were generated from the government policy that have not increased the ceiling retail prices for subsidized fertilizers for more than seven years. Food farmers tended to overuse the amount of fertilizers and some actors in fertilizers business tended to take advantage of this situation by smuggling subsidized fertilizers to non-beneficiaries.

To lessen the budget burden and moral hazard activities, while subsidized fertilizers policy is implemented continuously, some alternative steps are as follows:

1. Increase the ceiling retail price policy gradually that is acceptable to farmers can reduce moral hazard potential of selling or smuggling subsidized fertilizers for non-food production activities.
2. Increase the percentage of the ceiling retail prices (reduction in subsidy) for each type of fertilizer. This should be different according to the importance of each type of fertilizer for maintaining high yield.
3. Package of subsidized fertilizers should be varied according to the recommended balance of fertilizers dosages based on local specific land characteristics and crop needs.
4. Encourage and facilitate PT Pupuk Indonesia as assigned fertilizers producer should be to increase production efficiency, among others by using production technology with natural gas efficient.
5. Do continuous farmer empowerment in food farming practices should include dissemination of balance fertilizer technology, precision farming, and organic fertilizer application to improve soil structure and fertility.

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