Policy Brief

INDEPENDENCE OF FERTILIZER THROUGH ORGANIC BRIQUETTES

EXECUTIVE SUMMARY

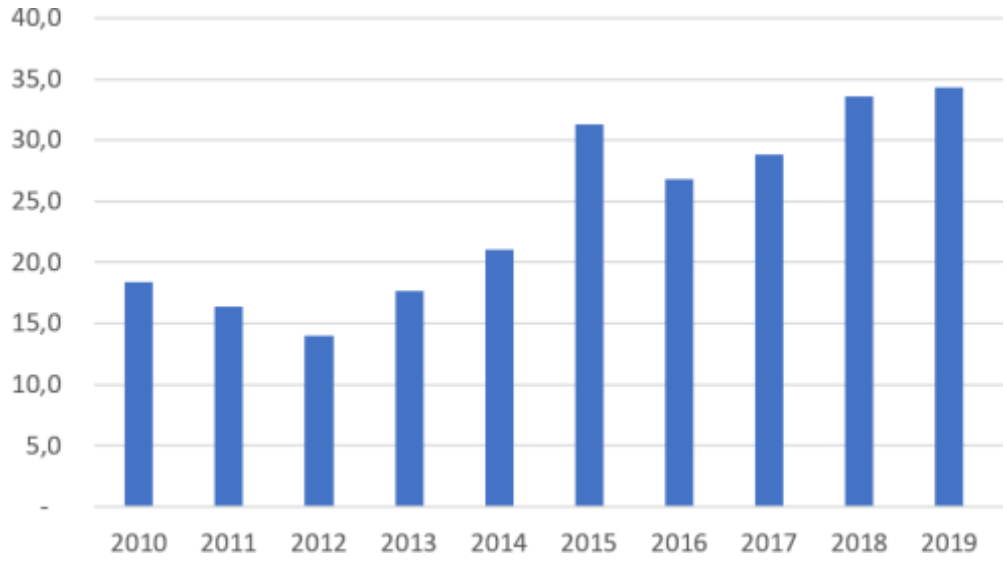
The allocation of fertilizer costs is 26% of the total cost of food crop production. In the general understanding of farmers that the application of inorganic fertilizers can fertilize the soil, but the fact is that the use of inorganic fertilizers from year to year is increasing, on the other hand the increase in crop production does not show significant results. The inorganic fertilizer subsidy policy has so far reached Rp. 34.23 trillion throughout 2019. This figure is 139.59 percent of the ceiling of the Presidential Budget Number 72 of 2020. In fact, the benefits are not felt directly by farmers. In the long term, negative impacts due to the continuous use of inorganic fertilizers cause damage to soil ecology, including farmers' dependence on external inputs.

In relation to the large value of government subsidies from year to year which is not comparable to the expectations of both increasing crop production and farmers' welfare coupled with ecological damage, there is a need for more pro policies on environmental sustainability, utilization of local resources, empowerment of farmers, improvement of rural economy **led by rural communities**. Therefore, it is considered necessary to make efforts to realize fertilizer independence, one of which is through the provision of organic briquette fertilizer. **Briquette fertilizer is an effective solution to increase rice productivity in flood-prone areas and encourage climate-resilient agriculture**

BACKGROUND

The agricultural sector has been the leading sector since the establishment of the Indonesian government. In its history, it has proven to have been able to escape the pressure of both the economic crisis in 1998 to the COVID-19 pandemic in 2020-2021. In terms of policy, the government rolls out various types of regulations and assistance to encourage the realization of a strong agricultural sector. As an implementation of Indonesia's Food Security Vision in 2018, the government provided fertilizer subsidies of 9.55 million tons worth Rp. 31.2 trillion (Financial Memorandum, 2018). Because the amount and portion of costs incurred by the government for fertilizer subsidies is quite large, the government is also trying to encourage the distribution of fertilizer subsidies that are more targeted.

Fertilizer Subsidy Graph (Trillion Rp)



Source : Realization of food security budget of the Ministry of Finance (2019)

Fertilizer subsidies during the period 2013-2019 increased by an average of 15.1 percent per year, originally amounting to Rp. 17.6 trillion in 2013 to Rp. 34.23 trillion in 2019 (Financial Memorandum, 2019). In fact, the amount of fertilizer subsidies is not comparable to expectations related to fertilizer availability at the farmer level, especially during the planting season, the scarcity and high price of fertilizer that is not in accordance with the Highest Retail Price (HET) results in farmers as the main target group not getting real benefits from the policy. Indirect subsidies have been directed to fertilizer companies / producers (not directly to farmers) and the existence of practices by the mafia / fertilizer elements are allegedly one of the inhibiting factors. The livelihood of poor families amounting to 49.89% are farmers (BPS, 2016) or 13.81 million farmers and their families are in poor conditions.

POLICY OBJECTIVES

1. Law of the Republic of Indonesia Number 19 of 2013 concerning the Protection and Empowerment of Farmers.
2. Law of the Republic of Indonesia Number 22 of 2019 concerning Sustainable Agricultural Cultivation System.
3. Presidential Regulation Number 14 of 2011 concerning Direct Assistance for Superior Seeds and Fertilizers.
4. Regulation of the Minister of Agriculture of the Republic of Indonesia Number 01 of 2019 concerning Registration of Organic Fertilizers, Biofertilizers and Soil Improvers.
5. Rules Minister Agriculture Number 64/Permentan/OT.140/5/2013 About Organic Farming System.
6. Regulation of the Minister of Agriculture of the Republic of Indonesia Number 01 of 2020 concerning the Allocation and Highest Retail Price of Subsidized Fertilizers in the Agricultural Sector.

7. The commitment of the Government of the Republic of Indonesia to reduce GHG emissions by 29 - 41% by 2030. This mitigation action plan is presented in the *Nationally Determined Contribution* (NDC) document submitted to the UNFCCC in 2016.
8. Regional Regulation of West Java Province Number 4 of 2018 concerning Guidelines for the Protection and Empowerment of Farmers
9. Pangandaran Regent Regulation Number 16.A of 2017 concerning Allocation of Needs, Distribution and Determination of the Highest Retail Price (HET) of Subsidized Fertilizers for the Agricultural Needs of Food Crops, Plantations, Livestock and Fisheries in Pangandaran Regency in 2017.

NEGATIVE IMPACT OF THE USE OF INORGANIC FERTILIZERS

- Dependence of farmers on outside inputs. The use of inorganic fertilizers from year to year is increasing, even though around farmers there are local resources that can be used as fertilizer, from an economic point of view production costs are getting higher which is not in line with production results.
- Soil conditions are getting harder, it is difficult to store water and soil pH decreases. This is because the inorganic fertilizers provided are not all absorbed by plants will leave residues, so it will disrupt the balance of nutrients and soil ecosystems that cause dependence.
- The use of inorganic fertilizers has a fast reaction for plants, but in the long run with excessive doses will harden the soil (soil *crusting*) due to the use of hygroscopic Urea fertilizer, accumulate heavy metal pollutants Cd in the soil which is a follow-up material in SP-36 fertilizer, and can pollute groundwater and enrichment of water bodies due to inorganic fertilizers that are easily leached because they are monovalent ions (Setyorini *et al*., 2003; Dermiyati, 2015).
- Microorganisms in the soil do not work optimally or will die due to chemical fertilizer residues that do not decompose, so the decay of organic matter in the soil will take longer.
- The change in farmer culture in the utilization of local resources such as the increasingly widespread burning of straw.

ADVANTAGES OF ORGANIC FERTILIZERS

- Table Nutrient content of straw and its potential as a substitute for chemical fertilizers

Nutrients	Contain (%)	kg/ton straw	Equivalent in 5 t straw kg/ha	
C-Org	40	400	2000,0	
N	0,65	6,5	72,2	Urea
P	0,1	1	13,9	SP-36
Towards	1,45	14,5	161,1	KCL
Ca	0,6	6	30,0	
Mg	0,2	2	10,0	
Yes	5,5	55	275,0	
S	0,10	1	5,0	

Rice production in 2010 = about 60 million ton or 90 million ton of straw

Based on the table above, the reuse of straw as organic fertilizer can replace inorganic chemical fertilizers up to 50% of the main nutrients, such as N, P and K., besides that other nutrients (Ca, Mg, Si, S) and micronutrients (Cu, B, Zn), Fe) can be met. The application of straw is also the act of replenishing or replenishing fuel or energy into the soil ecosystem, every 5 tons of straw will supply about 2000 kg of organic carbon into the soil. Thus, the activity of soil organisms is highly correlated with the supply of straw which acts as a source of energy (fuel).

According to Musnamar (2003) and Suriawiria (2002) organic fertilizers have various benefits, including the following:

1. Increase soil fertility

Organic fertilizers contain macro (N, P, K) and micro (Ca, Mg, Fe, Mn, Bo, S, Zn and Co) nutrients that can improve soil structure and porosity. The use of organic fertilizer on clay soils will reduce stickiness so that it is easy to process, while on sandy soils can increase the binding of the soil to water and air. Organic matter can react with metal ions to form complex compounds so that metal ions that are toxic to plants or inhibit the supply of nutrients such as Al, Fe and Mn can be reduced (Setyorini, 2005).

2. Improve the chemical, physical and biological conditions of the soil

The presence of organic fertilizers will cause a system of binding and releasing ions in the soil so that it can support plant growth. The ability of organic fertilizers to bind water can increase soil porosity thereby improving respiration and plant root growth. Organic fertilizers stimulate beneficial soil microorganisms, e.g. rhizobium, mycorrhiza and bacteria.

3. Safe for humans and the environment

The use of organic fertilizers does not cause residues on crops so that they do not endanger humans and the environment

4. Increase agricultural production

Various studies show the positive influence of compost on agricultural growth and production. Compost can increase the production of corn, cucumbers, cabbage, carrots, chillies and watermelons (Roe, 1998). Composting empty oil palm bunches increases orange and tomato production (Anonim, 2003). Basri (2008) reported that solid organic fertilizer increased rice production from 3-3.6 tons GKG/ha to 9.6 tons GKG/ha. Applying liquid sludge of biogas waste from cow dung can also increase the dry weight of piled corn by more than 50% compared to the use of chemical fertilizers (Febrisiantosa et al., 2009). Organic fertilizers also increase peanut and mustard production by 25 and 21% respectively (Nurhikmat et al., 2009).

5. Controlling certain diseases

Root rot disease in flower plants caused by Phytophthora sp can be controlled with compost that has a high C/N ratio as effectively as the use of fungicides (Hoitink et al., 1991). Compost also inhibits Fusarium sp. (Hoitink et al., 1997). Compost extract at a concentration of 5-15% can inhibit the growth of pathogenic fungi (R. lignosus, S. rolfsii, C.

gloeosporioides and F. oxysporum). B. subtilis bacteria added to the composting process can also control mace root disease in cabbage (Tombe, 2003).

Content Freet Daun-daunan Link: http://e-journal.unmul.ac.id/index.php/agro/article/download/3870/pdf

The composition of the material can be adjusted to the conditions of plants that require nutrients or also adjusted to the nutrient content in the soil so that it will be more effective.

6. Organic briquette fertilizer is a slow release agent (SRA) or releases nutrients slowly so as to minimize washing or evaporation.

7. Facilitate in the giving and placement of fertilizer until can save the use of labor, time and cost.

8. Use in large and continuous doses does not damage the soil or ecosystems as well as the environment because it is made from natural ingredients.

DISCUSSION

President Joko Widodo in the opening of the National Development Working Meeting (11/01/2021) mentioned the ineffectiveness of fertilizer subsidies on food production in Indonesia. He considered that fertilizer subsidies, which reached trillions of rupiah in the state budget, did not provide benefits comparable to the allocated subsidies. The Ministry of Agriculture itself for 2021 has stated that the need for subsidized fertilizers (Urea, SP-36, ZA, NPK, and organic) is estimated at 23.2 million tons or worth Rp. 67.18 trillion, up from the allocation in 2019 which was only Rp. 34.23 trillion.

In the implementation of subsidized fertilizers in the field, there are many problems such as *marking up* Group Definitive Plan data or Group Needs Definitive Plan (RDK / RDKK), not right on target for subsidized fertilizer allocation, there is misappropriation of subsidized fertilizer into non-food crop plantation crops, the quality of subsidized fertilizer that does not match the specifications written and the problem of invalid farmer card data still exists. Even until now, there are still many farmers who have not received farmer cards so they cannot access fertilizer. In addition, the distribution of subsidized fertilizers is also problematic. Subsidized fertilizers are also often late and often do not even reach farmers. This is because the bureaucracy is too layered. For example, distribution is handed over to companies and kiosks selling fertilizers and farmers who must be registered with farmer groups so that their names are listed in the RDKK electronic system.

RECOMMENDATIONS

Therefore recommendations as policy alternatives can be offered. When referring to the concept of environmental sustainability, utilization of local resources, empowerment of farmers, improvement of rural economy led by rural communities. One of the policies that can be offered is the reallocation of shopping to shopping posts that can produce greater output. Policies that can be rolled out include fertilizer **independence, one of which is through the provision of organic briquette fertilizer.** The briquette fertilizer is a fertilization solution in flood-prone areas to increase production. Applying conventional fertilizer (powder) to flooded land is not effective and becomes a problem because the fertilizer will be washed away or lost. Briquette fertilizer with a size of 25-50 grams per briquette is an effective solution because fertilizer can be easily immersed with a dose of 1-2

briquettes per 4 plants. The results of the MT 2021 DEMOPLOT in the flood season in Paledah Village, Padaherang District, Pangandaran Regency, the application of brikut fertilizer was able to produce 6.2 tons of grain / ha (an increase of 27 %) which usually only harvested 3-4 tons / ha. Therefore, the use of organic briquette fertilizers made from local raw materials (compost, Azolla, husk charcoal, kohe, dolomite and other agricultural wastes) is expected to be a solution for providing fertilizers independently, developing rural fertilizer industries, encouraging climate-resilient agriculture and increasing productivity and income of farmers in flood-prone areas.

Alternative organic fertilizers offered to farmers must have values that consider aspects such as efficient in application, prices that are not more expensive than inorganic fertilizers, have complete nutrient content according to plant needs and effective by making a real contribution to increasing production.

The mechanism for producing organic briquette fertilizer can be through a rural fertilizer factory managed by the Association of Farmer Groups (GAPOKTAN), Agricultural Production Facility Cooperatives (KOPTAN) or Village-Owned Enterprises (BUMDes). From the local government side, it can issue policies/instructions that encourage smooth achievement of goals, such as stopping straw burning, communally managed livestock assistance, organic farming, assistance for organic fertilizer production facilities and encouraging the realization of equitable marketing of organic products.

News Link Coverage :

1. Organic Fertilizer Similar to Compost Briquettes is the Solution for Farmers in Pangandaran by Tribun News West Java on yutube link: https://www.youtube.com/watch?v=TeMEM4yH6Jg or on the Tribun web link: https://jabar.tribunnews.com/2021/01/30/video-pupuk-organik-sejenis-briket-compost-so-solution-para-petanidi-pangandaran (vidio-shaped)
2. News on the Tribun website : Inculcate Paddy and Soil Clumps, Cultivate Organic A Type of Compost Briquette so Farmers' Solutions Link: https://jabar.tribunnews.com/2021/01/30/untuk- fertilize-clumps-rice-and-soil-fertilizer-organic-kind-briquettes-compost-so-solution-para- farmer

REFERENCE

Richard, A., & Musgrave, P. B. (1989). *Public Finance in Theory and Practice Fifth Edition.* Harvard University. Suriawiria, U. (2002). *Pupuk Organik Kompos dari Sampah.* Bandung: Humaniora.

Musnamar, E. I. (2003). *Solid Organic Fertilizer: Its Manufacture and Application.* Jakarta: Self-help Spreaders.

Setyorini, S. D., & Sulaeman. (2003). *Heavy Metal Levels in Fertilizers.* Bogor: Soil Research Institute, Balai Besa Research and Development of Agricultural Land Resources, Agricultural Research and Development Agency, Ministry of Agriculture.

Hilman, A. L. (2009). *Public Finance and Public Policy Second Edition.* Cambridge. Dermiyati.

(2015). *Sistem Pertanian Organik Berkelanjutan.* Yogyakarta: Plantaxia.

Simarmata, T., M.R, S., D, H., & Fitriatin, B. N. (2018). *Managing of Organic Bioferilizers Nutritient Based and Water Saving Technology for Restoring the Soil Health and Enhacing the Sustainbility of Rice Production in Indonesia IOP Conf.* Earth and Environmental Science.

Suria, D., &; et al. (2020). Investigation of Organic C Content of N, P, K and C / N Ratio of Fruit Plant Leaves to Organic Fertilizer Ingredients. *Journal of Humid Tropical Agrotechnology, 3,* 12-18.

Simarmata, T., Prayoga, M. K., & Setiawati, M. R. (2020). Promoting Climate Smart Sustainable Agriculture for Enhacing the Resilient of Soil Health, Rice Productivity ana Food Security in Indonesia . *IOP Conference.* Series: Earth and Environmental Science.

Filho, W. L., Nagy, G., Borga, M., Chavez, M. D., & A., M. (2020). *Climate Change, Hazards and Adaptation option: Handling the impact of a changing climate springer.* Cham, Switzerland: Springer.

Prayoga, M. K., N, R., Simarmata, T., Stoeber, S., & Adinata, K. (2020). *Is Green Manure (Azolla Pinnata and Sesbania Rostrata) a climate-Resilient Strategy for Rice Farming.* Switzerland: Springer.

Setyorini, D. (2007). Organic fertilizers increase crop production. *Research News*.

Susila, W. R. (2007, November). Organic Farming: Opportunities exist, tough challenges. *Agro Observer*, 13-15.

More info CP ; Kustiwa Adinata 08122398953, kustiwa.adinata@gmail.com