Re-visiting Government of Indonesia Strategies on Food Crisis and Farmers' Resilience

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- *Problems leading to the threat of a food crisis have been prevalent in Indonesia, such as climate change impact, pests, fertilizer shortages, and farmers' access to financial capital.*
- *Some strategies implemented by the Government of Indonesia to deal with these problems are integrated pest control, open access for capital, and strengthening agriculture insurance.*
- *Regulations related to these three strategies must continue to be improved since they have the opportunity to reduce the farmers' vulnerability in facing food crises.*

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"Food prices can make the difference between life and death for millions of people around the world"

Maximo Torero Cullon, FAO Chief Economist (Edward, 2022)

Farmers, agriculture, and the threat of food crisis in Indonesia

Food and Agriculture Organization (FAO) (1996) defines food security as "when all people, at all times, have physical, social and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life." Based on this definition, food security is categorized into four pillars: availability, access, stability, and utilization. In contrast, when food prices increase, food contamination and shortages also start to emerge, meaning that signals of a global food crisis are being detected. The food crisis is not only threatening the consumers' well being but also the lives of farmers as the prime actor in food production.

Especially in Indonesia, nearly half of the poor households are working class related to the agriculture sector **(Figure 1)**.

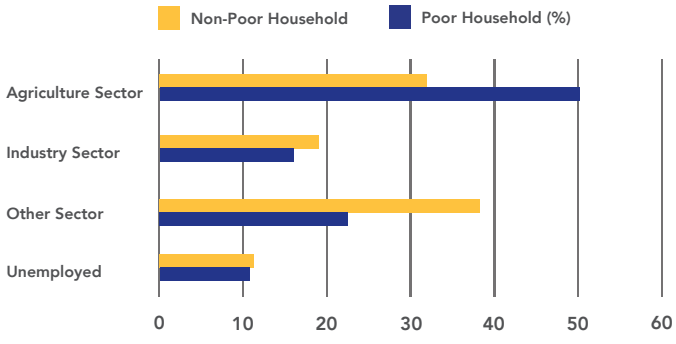

Figure 1.
Numbers of Poor and Non-Poor Household in Indonesia
Source: BPS (2022)

Aside from food insecurity, disrupted food systems could result in environmental-related problems. The effort to increase production without careful consideration of the environment induces deforestation, loss of biodiversity, and large amounts of emissions. During the IPCC 2014 event, it was reported that the agricultural sector, including forestry and land uses (AFOLU), has contributed to almost a quarter of the total direct greenhouse gas (GHG) emissions **(Figure 2).**

The percentage is just a tad below the electricity and heat production (25%). Apart from the direct carbon dioxide emission, the emission from agriculture also comes in methane and nitrous oxide. This condition, therefore, induces global warming and raises the earth's temperature. The increase in temperature will affect the cultivation process as it depends on the crop's ability to adapt to the climate. In addition, the declining level of soil quality and water scarcities have made it even more difficult for farmers to produce food crops.

The next challenge is limited stock and soaring fertilizer prices, making it difficult for Indonesian farmers to get good nutrients for their plants. In 2022, a research finding from Satrio (2022) showed that the price of non-subsidized fertilizers has increased by almost 100% compared to the previous year. On the other hand, the Indonesian Government, through the Regulation of the Minister of Agriculture No. 10 of 2022 concerning Procedure for Determining the Allocation and Highest Retail Price of Subsidized Fertilizers in the Agricultural Sector, has agreed to limit the types of subsidized fertilizers.

Agriculture expert from Universitas Gadjah Mada (UGM), Jaka Widada, urged the government to anticipate the climate change and other factors that may lead to food scarcity and food crisis. In line with Widada, the President of the World Farmers' Organization, Theo de Jager, also said that we cannot avoid the food crisis. "The question is how wide and how deep. Most importantly, farmers need peace and peace needs farmers." (Bourne, 2022). Therefore, the Government must show stronger political will and act more quickly in implementing policies related to farmers and agriculture amid climate change.

Government's actions and responses

The 20-year's national planning document, Long-Term National Development Plan, (Rencana Pembangunan Jangka Panjang / RPJP) has aspirations for the agricultural sector to create a competitive and more equitable nation. The Medium-Term National Development Plan (Rencana Pembangunan Jangka Menengah Nasional / RPJMN) also has aspirations for developing the agricultural sector to realize national competitiveness and food security through various more detailed aspects. In supporting these two Development Plans, the Ministry of Agriculture as a technical implementer, designed different related policies starting from the Goals, Strategic Goals, Policy Directions, Strategies, and Operational Steps. The relationship between all levels of policy is shown in **Figure 2**.

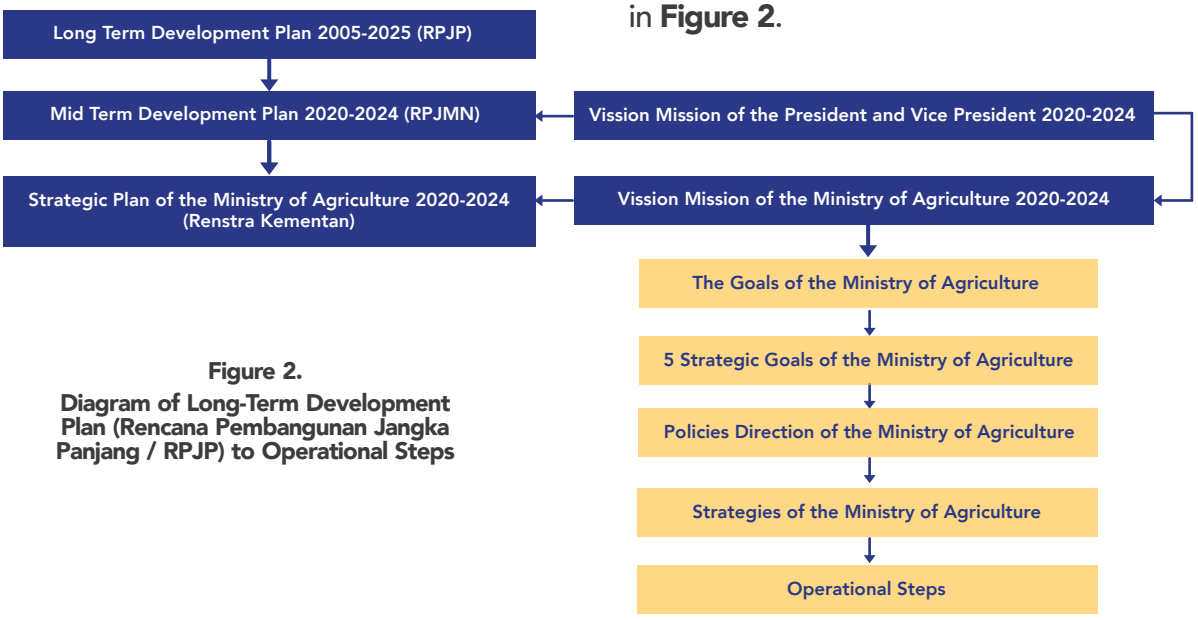

Figure 2.
Diagram of Long-Term Development Plan (Rencana Pembangunan Jangka Panjang / RPJP) to Operational Steps

Strategic Goals (SG) are integral to achieving the desired performance. SG is important because it has indicators that can be measured directly in practice. Two Strategic Goals directly related to farmers' welfare are SG-1: Increasing Availability, Access, and Consumption of Quality Food and SG-2: Increasing Value Added and Competitiveness of Agricultural Commodities **(Figure 3)**.

The two SGs changed from "Increasing Domestic Strategic Food Availability" (originally SG-1) to "Increasing National Agricultural Commodity Competitiveness" (originally SG-2). This change was carried out at the end of 2021 to respond to global dynamics and anticipate the impact of the COVID-19 Pandemic. These changes indicate an expansion of the target from the previous one. In the original SG-1, the expected increase was only food availability without considering food access and quality. The changes that have occurred are almost similar to the FAO concept of food security, which does not only discuss availability but also access and quality of food (FAO, 2006).

The most significant change in SG-2 is the attention given to exports of processed agricultural commodities to increase the competitiveness of Indonesian agricultural commodities. This change indicates that Indonesia continues to strive to export raw commodities and processed ones.

The 2 SGs are further elaborated more practically in Operational Steps. Operational Steps are expected to be able to answer the various challenges facing Indonesian agriculture today: climate change which causes the emergence of pests, limited quantity and price volatility of agricultural fertilizer, and limited access to farmers' financial instruments.

Integrated Pest Management Strategy as a form of climate change adaptation and mitigation

The Operational Steps of Integrated Pest Management (Pengelolaan Hama Terpadu / PHT) are included in the strategy to increase the production and productivity of the agricultural sector. Law No. 22 Year 2019 on Sustainable Agricultural Cultivation System, which replaces Law No. 12 Year 1992 on Plant Cultivation System, obligates the agricultural protection to be carried out with a PHT system that is aligned with handling the impacts of climate change. Several regulations from year to year governing the implementation of plant protection are shown in **Figure 4.**

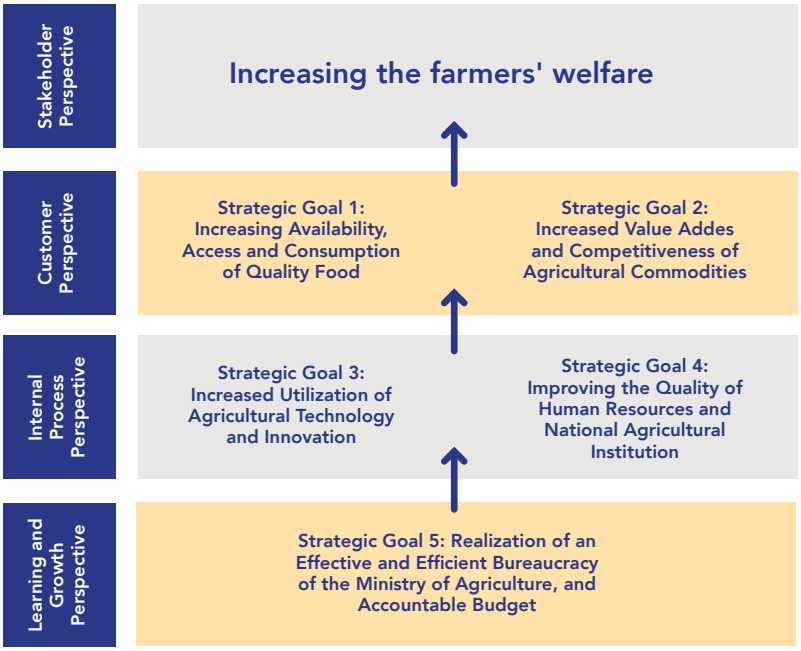

Figure 3. Strategic Targets (SG) of the Ministry of Agriculture Strategic Plan 2020-2024

Source: Indonesian Ministry of Agriculture (2020)

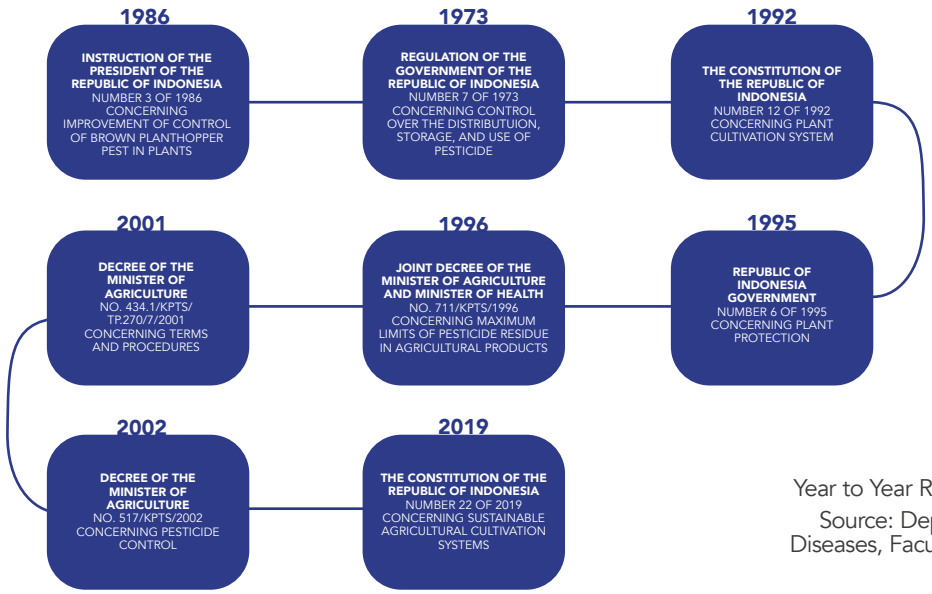

Figure 4.
Year to Year Regulations on Plant Protection
Source: Department of Plant Pests and Diseases, Faculty of Agriculture, UGM (2019)

A review of all the regulations above (except the 2019 regulation) shows that climate change has not been considered as a problem that causes Plant Destruction Organisms (Organisme Pengganggu Tanaman / OPT) and leads to massive use of pesticides. In Law No. 12 Year 1992, climate change is only considered in terms of weather and climate forecasts for the development of plant cultivation. An improvement appeared later in Law No. 22 Year 2019, where climate change has been further elaborated as a real problem and disrupts agricultural activities.

Basically, the efforts set for OPT control are intended to maintain the health of living things and environmental surroundings, so chemical PHT (through pesticides) is determined as the last step. Prior to that, other steps need to be carried out such as physical control, mechanics, technical culture, resistant varieties, and biology and quarantine (Retnowati & Retno, 2021). In line with what has been mandated by Law No. 22 Year 2019, various research results also show a positive correlation between the increase in OPT, the use of pesticides, and the release of greenhouse gasses (Cech et al., 2022; Heimpel et al., 2013).

The Ministry of Agriculture, through the Directorate of Food Crop Protection, in collaboration with the Agriculture Service, both at the Provincial and Regency/City levels, continues to intensively develop, socialize, and apply PHT principles (Rianto, 2020).

However, in practice, PHT experiences various dynamics. The basic problem is farmers' knowledge of pest control and climate change (Katsaruware-Chapoto, 2017; Durroh & Dawud, 2022; Indiati & Marwoto, 2017). Aprianthina (2019) explains that in several areas in Bali Province, PHT faces various obstacles, such as the limited quantity of human resources from related agencies. Hence, farmers often have a dual role as controllers, observers, and farmers. As a result, PHT does not run according to the steps it should. Local wisdom and the ability to absorb technology also determine how PHT can deal with pests (Hartono, 2017; Merdana & Watiniasih, 2019).

Proper management of PHT can be an effective solution in reducing OPT due to climate change. The results are far more effective than pesticides alone (Setiawati, 2013). The complexity of other aspects and PHT steps require serious participation from all stakeholders if PHT want to be a solution for pest control and climate change adaptation. The first step that can be taken is to make PHT familiar among farmers by way of outreach, considering farmers' uneven understanding regarding the relationship between pests and climate change. The next step is supervision from all parties when the program is running. Strong resource support is needed, both material and managerial resources from each local government layer, considering that PHT is not a simple step, although it is possible to initiate it.

Fertilizer Management Strategy to maintain the sustainability of agricultural resources

Operational Steps to facilitate the provision of subsidized fertilizers are included in the strategy of maintaining the sustainability of agricultural resources. Fertilizer is essential to produce agricultural output that needs to increase by at least 56% to accommodate population growth in 2050 (Ranganathan et al., 2018). The gap between the actual and obtained yield can be reached by various means, including nutrient management and fertilization technology (Gouve et al., 2022).

However, in 2022, the soaring fertilizer prices or disrupted fertilizer supplies have negatively impacted the global food system (Klein, 2022). The shocks that affect the supply stability and fertilizer price are caused by many things. First, climate change makes fertilizer use less optimal (Hoffmann et al., 2020). Second, the war between Russia and Ukraine in which these two countries are the leading exporters of fertilizer materials. When the conflict caused them to reduce the import, the fertilizers became a scarce commodity (Benton et al., 2022; Voegele, 2022). Simultaneously, the war came at the wrong time for the global food market, as food prices were already high due to COVID-19 pandemic and crop failures in many countries (Ben Hassen & El Bilali, 2022).

Indonesia is also affected by the changing global fertilizer supply. Through the Regulation of the Minister of Agriculture No. 10 Year 2022, the government limits the amount of subsidized fertilizer and the number of commodities that can receive subsidized fertilizer. Previously, there were five types of subsidized fertilizers, now it is only two, namely Urea and NPK. The number of commodities that could receive subsidized fertilizers was also drastically reduced from around 70 to just 9.

> *"Fertilizer scarcity has definitely put farmers in suffering. We need 25 tons of subsidized fertilizer while only 9 tons are available in the farmers subsidy system"*
>
> *– Barkir Pasaman, Main Director of PT Pupuk Indonesia (Yanwhardhana, 2022).*

Member of Commission IV House of the Representatives Republic of Indonesia (Dewan Perwakilan Rakyat Republik Indonesia / DPR RI), Andi Akmal Pasluddin, said the government's primary goal of limiting fertilizer subsidies is also to widen the scope of beneficiaries by restricting the number of commodities eligible for fertilizer. The government hopes that when the restrictions are imposed, only farmers who really need fertilizer will get it. (Republic of Indonesia House of Representatives, 2022).

Although many local governments claim that fertilizer stocks are safe, at least in the short term, the next question is whether farmers can purchase the current non-subsidized fertilizers. Let alone the farmers of non-subsidized commodities face even bigger challenges since the quantity of non-subsidized fertilizers in some areas is still limited and expensive (Marwanti, 2022). Hermawan (2014)'s research results also indicated subsidized fertilizer policies are required to achieve sustainable food self-sufficiency. This means that the newly imposed fertilizer subsidy restriction may decrease food production in the future if preventive actions are not applied.

The existing fertilizer subsidy system also needs to be improved. In addition to obstacles due to the dynamics of global fertilizers, Indonesia also faces another challenge. The delinquency of irresponsible individuals or sellers makes subsidized fertilizers often end up in the wrong hands of farmers. The research result by Saimul (2013) shows that the fertilizer subsidies distribution system has not worked well at the farmer level. The contributing factors are pretty diverse, ranging from ineffective supply chains from distributors to farmers because there are irresponsible retailers, smallholder farmers who do not get priority to obtain fertilizer because they are inferior to farmers with larger land, the informal farmer groups that buy fertilizer in bulk, and some official distributors that sell fertilizer above the Highest Retail Price (Harga Eceran Tertinggi / HET) (Husdinariyanto, 2022; Deli et al., 2018). The supply and fertilizer affordability must be well maintained to sustain agricultural resources. The transaction often uses unofficial retailers, which causes prices to increase many times over.

Therefore, the supervisory function must be tightened by imposing sanctions on irresponsible traders.

Opening complaint channels at the Regency/ District level is also an effective solution if the local government can manage it properly (as in Klaten Regency, in Fadillah, 2020) compared to the fertilizer complaint reporting mechanism directly to the state-owned fertilizer company, which is located too far for farmers in villages. Another basic solution that should be maintained is improving the basic electronic system for the nations' subsidiary system called the Definitive Plan for Farmer Group Needs (Sistem Elektronik Rencana Kebutuhan Kelompok Tani / E-RDKK). Its database does not match the number of actual farmers that should receive the aid. This basic data is very influential in improving the planning system for planning the allocation of fertilizer needs (Deli et al., 2018).

Story from the Field

Mr. Rizal has been working as a coconut farmer in Pulau Burung District, Riau Province. He admitted that it was not easy to get fertilizer because he was not part of a farmers association (kelompok tani). The association's membership is required by the E-RDKK system. Only members can apply for subsidized fertilizer. Farmer groups can also become a medium for lending credit when farmers do not have the capital to buy inputs for the next planting season.

Mr. Rizal
Coconut Farmer in Pulau Burung

"I never buy fertilizer. I don't know where to get information about fertilizers. I am confused because there is no farmer group here. If there is one, I think everything will be easier because someone will help manage it. If there is a farmer group, I can also borrow some capital."

KUR and AUTP Strategies to strengthen farmers' financial institutions

Agricultural funding is vital in supporting the improvement of production and farmers welfare. It is also considered as a "lubricant" for carrying out agricultural activities (Burhansyah, 2021). One of the main channels to distribute capital to farmers is through the People's Business Credit (Kredit Usaha Rakyat / KUR). The operational steps to optimize this scheme and agricultural insurance are included in the revitalization strategy for farmer financing and its institutions. KUR is also expected to boost the competitiveness of export-oriented commodities (Regulation of the Minister of Agriculture No. 10 Year 2022). KUR regulations have continued to develop starting from 2008 **(Figure 5)**.

Figure 5.
Several regulations regarding KUR
Source: Burhansyah, 2021

Various studies have outlined the effectiveness of KUR in increasing agricultural production and productivity. For example, KUR can increase marginal profits by 11.75% for agribusiness SMEs in Bogor City (Sebayang & Sitepu, 2020). Further, a study conducted in 27 provinces in Indonesia found that KUR has contributed to a 10% rise in credit allocated for the agricultural sector that equals to around 1.2 tons of extra rice per hectare (Wicaksono, 2014).

For the past 15 years, the KUR system has not always run smoothly. There are several problems faced in managing KUR. First, the conditions tend to be strict because they depend on each credit provider, coupled with differences in terms between regions. Many farmers are considered unbankable due to the absence of collateral (Burhansyah, 2020). Second, the limited number of financial institutions extending credit to the agricultural sector in some remote areas makes farmers travel long distances if they want to obtain credit (Herliana et al., 2018). Third, the result of Hafsah et al. (2019) shows that farmers do not fully utilize KUR for farming, so there is no difference in production and productivity between recipients and non-recipients of KUR.

Another effort related to protecting farmers through a financial institution is the Rice Farming Business Insurance (Analisis Usaha Tani Padi / AUTP). AUTP is a mitigation effort to reduce farmers' risk of crop failure. If a failure occurs during the planting period, they will get insurance. This will provide them with capital to replant in the next planting period (Dewi et al., 2019). The AUTP program, in collaboration with Indonesian Insurance Services Company (PT. Asuransi Jasa Indonesia / Jasindo) is based on Law No. 19 Year 2013 on the Protection and Empowerment of Farmers (Kaban & Kusno, 2019).

AUTP is crucial because it allows the formation of risk-sharing between farmers that is synergistic with the principle of strengthening social cohesion within the farming community. The participation of farmers in large numbers will also generate large amounts of funds for compensation payments for farmers affected by the disaster, so indirectly, through AUTP, farmers help each other (Erviyanto, 2021; Sulaiman et al., 2018).

The Government of the Republic of Indonesia, in collaboration with various parties, continues to conduct studies on this program to make these programs more sustainable in the future. In 2019, one of the study results by the National Development Planning Agency (Badan Perencanaan Pembangunan Nasional / Bappenas) and the Japan International Cooperation Agency indicated that the ongoing AUTP program would be better if the premium rate were revised annually according to the actual rice production areas, which is continuously updated (Shynkarenko, 2019). This will avoid discrepancies between the premiums paid (especially by farmers) and the area of productive land insured.

The notion above aligns with the National Research and Innovation Agency (Lembaga Ilmu Pengetahuan Indonesia / LIPI) study in **Figure 6**. The good news is that the number of farmers involved in AUTP is more than the amount of land claimed, but this also indicates that there is a threat of unsustainable farmer participation in the AUTP program, especially farmers who have not experienced crop failure. They do not feel benefited from AUTP while they keep paying for it. Another strong reason for the possibility of farmers withdrawing from the AUTP program is that the damage standard for land to receive insurance is considered too high (75%) (Elhusna et al., 2019). In fact, even if the damage is below 75%, the farmers would still need a new capital to replant.

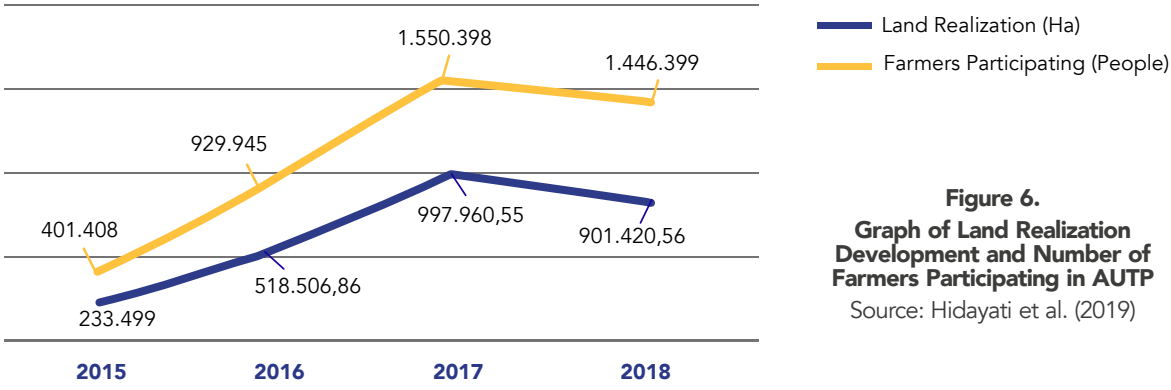

Figure 6.
Graph of Land Realization Development and Number of Farmers Participating in AUTP
Source: Hidayati et al. (2019)

KUR and AUTP have been proven to be the hope for stronger farmer institutions. Various previous studies have revealed that these two programs continue to improve so they can become sustainable solutions. Both KUR and AUTP have their advantages and disadvantages. First, KUR is considered more familiar than the AUTP requirements. This is because KUR has been running longer (2008) compared to AUTP (2013), so more intensive outreach is needed to disseminate information about AUTP to attract farmers' interest (Suindah et al., 2019). Second, KUR is also more dominant because it is provided by several providers, unlike AUTP, which is only offered by Jasindo.

Therefore, the LIPI study suggested strengthening the AUTP institution because the risk is that the limited number of insurance service providers will limit the reach to get insurance participants. Jasindo's relatively remote location often becomes an obstacle to premium payments and claim processes (Sayugyaningsih, 2022). Third, renewal of the agricultural and basic population data must also be continuously carried out, bearing in mind that data is basic access to financial facilities. Fourth, program strengthening can also be done by strengthening cooperation with the village government because the village government can assist in implementing both programs. The traditional leadership style has also attracted farmers' interest in participating in AUTP (Suindah et al., 2019).

Conclusion

The massive emergence of pests, fertilizer supply instability, and fluctuations in fertilizer prices show how climate change and international conflict add to the food system's disruption, which can potentially cause a food crisis. Apart from having a bad effect on the broader community, the food crisis has also brought misery to Indonesian farmers because it can reduce the quality of their livelihood.

While farmers are the crucial actors in maintaining the stability of the food system, the Government of Indonesia continues to make various efforts to adapt and mitigate climate change to protect the food system; one of them is institutional strengthening through KUR and AUTP. In addition, pest eradication has also been regulated through PHT management. These two efforts are considered beneficial even though, in their implementation, there are still various challenges. In terms of fertilizers, the Regulation of the Minister of Agriculture No. 10 of 2022 limits the amount of subsidized fertilizer that farmers are entitled to receive. If the goal of the Indonesian Government is to expand the scope of recipients of subsidized fertilizers, then they have to ensure the subsidies are targeted at the right people. A more rigorous assessment is needed to determine the eligible subsidized fertilizer recipients which can be done in three ways: supporting the management of continuous farmers' data update, enhancing the institutional management of farmer organizations, and improving the supervisory control of the fertilizer supplies in the market and ensuring they sold within the fair price.

Legislative Instruments

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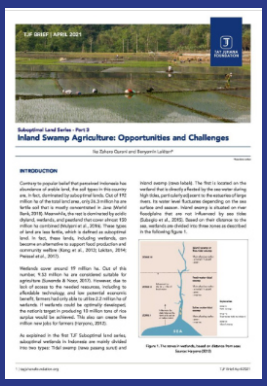

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