Indonesian food security during the Covid-19 pandemic

Suwardi*
Department of Soil and Land Resources, Faculty of Agriculture, IPB University
Jl. Meranti, Dramaga Campus of IPB, Bogor-Indonesia

*Email: suwardi-soil@apps.ipb.ac.id

Abstract. The World Food Organization (FAO) has warned of a potential food crisis during the Coronavirus Disease 2019 (Covid-19) pandemic. In response to this problem, the Indonesian government has implemented various strategies to maintain food security in order to avoid a food crisis. Even though the national food stock is still considered safe, anticipation needs to be done for maintaining food security. Efforts have been made in the form of increasing food security at the household, local, and national levels. At the household level, the movement of homestead land use in villages with integrated farming and urban areas with urban farming has helped to increase food security. At the local level, local food development movements such as maize, cassava, sago, and tubers were carried out to reduce dependence on food supplies from other areas that were disrupted by distribution during the Covid-19 pandemic. At the national level, the government continues to develop food security through the development of Food Estate in Kalimantan and Sumatra. The strategy for achieving food security is carried out through massive short-, medium- and long-term movements. The impact of Covid-19 is not only on food security but also on community innovation and creations.

1. Introduction
One year the Coronavirus Disease 2019 (Covid-19) pandemic has hit the world and it is not certain when the pandemic will end. Since the first case of Covid-19 in Indonesia was announced in early March 2020 [1]. By the end of January 2021, it has infected more than 1 million and has killed more than 29,000 people. With a very fast spread, Indonesia implemented a Large-Scale Social Restriction (PSBB) starting April 2020 for 14 days and continued to be extended according to the needs of each province. The PSBB has the potential to disrupt food security in terms of food availability and access. The most worrying thing if this condition continues for longer is the potential for a world food crisis to occur. Therefore, maintaining food security during the Covid-19 pandemic is one of the priority programs of every country [2], including the Indonesian government.

Behind the problem of food security, Covid-19 also provides lessons for the emergence of various innovations in various fields including the field of food security. In the field of food supply, there is an urban farming movement in cities and the use of yards in villages. Several creations emerged, such as planting rice in the yard, planting rice integrated with fish farming, producing horticultural crops with a hydroponic system, etc. In addition, rural residents are more active in raising domesticated animals such as chickens, goats, sheeps, cows, and buffalos in their yards.

Food security has three important keywords, namely adequate and equitable food availability, distribution of food, and population access to food, both physically and economically. If identified from these points, Indonesia's food security in general can be said to be being disrupted. During this
pandemic, the government has implemented PSBB policy in many areas. People are also asked to work and study from home, and reducing physical contact. This can affect the reducing food production, disrupting the distribution and also change in people's food consumption (Figure 1).

The Ministry of Agriculture as a technical agency in charge of agriculture (food) has also prepared various strategies to face the challenges of food security during a pandemic. Although according to data published by the Central Bureau of Statistics, the Ministry of Agriculture, the national food stock is predicted to experience a surplus until June 2020. This does not mean that Indonesia is immediately free from the threat of a food crisis that could occur in the future. In addition, the uncertain period of the Covid-19 pandemic will end when it will have a very pronounced impact on agriculture.

This paper will discuss the impact of the Covid-19 pandemic on food security, community innovation and creations, government strategies and programs to maintain food security at the family and national levels.

2. The impact of Covid-19 pandemic on national food security and community innovation

2.1. Impact of Covid-19 on food security

There are three indicators of food security, namely physical availability of food, economic and physical access to food, and the price stability of food. Therefore, effective food security depends on availability, distribution and consumption. However, the Covid-19 pandemic changed all that by disrupting the food logistics system due to limited activities during the pandemic, as well as the food supply chain so that people will lose access to food which threatens their lives.

With the PSBB, the community did not move freely and economic activities almost stopped at the start of the pandemic. The means for production food are very limited, resulting in an imbalance in the distribution of food. In addition, with the changing lifestyle of society, the demand for people as food consumers has also changed. The closure of restaurants and cafes so that the demand for food has decreased. Foodstuffs that have already been produced in large quantities have decreased their selling value. Many small and medium enterprises ended up going out of business in the midst of a pandemic situation and the number of laid off workers affected people's economic access to food because people's purchasing power had decreased. The food security during the pandemic can be described as Figure 1, where food production decreases, disruption of food distribution and changing in food consumption.

In fact, food-producing rural areas are not much affected by Covid-19. However, because the distribution and marketing of foodstuffs are disrupted, the result is that farmers' profits decrease and their enthusiasm for producing foodstuffs decreases. This is where the impact of Covid-19 began to undermine production in addition to distribution that was already experiencing difficulties. After almost a year the Covid-19 pandemic has not subsided, bright spots began to appear in mid-January 2021, Covid-19 vaccination in Indonesia began. The economy seems to be starting to grow, marked by the growing crowd of economic centers such as markets, shops, malls, and others.
communities have also started to grow to produce food. One thing that is good about palm oil is the very good price of palm oil, even though many European countries refuse to import palm oil from Indonesia. About 16 million people who work directly and indirectly, the economy is improving.

2.2. Impact of Covid-19 on community innovation during the pandemic
Efforts to deal with the economic impact during the Covid-19 pandemic have created opportunities and creativity for the community and government to come up with ideas and real work movements to support food security. One of the many voiced ideas was to develop and process sago for food and industrial materials, which are commonly found in Papua, Maluku and Sumatra. Many webinars and focus group discussions (FGD) were held specifically to discuss sago. Sago-producing local governments also welcome to further empower this local food source.

Urban farming is one of the spontaneous creations and movements of urban communities that arise as a result of working from home and at the same time in order to survive in the uncertainty of a pandemic. One of the innovations that are widely carried out and considered good for protecting families from the impact of the food crisis, at least for the household scale, is to use the narrow land for growing vegetables in pots, growing vegetables using a hydroponic system and raising fish. Agricultural shops that sell seeds, seeds, fertilizers, and planting media are full of buyers [3].

During the Covid-19 pandemic, many people who usually worked in offices worked from home. At least one week there are several days working from home. While filling the boredom at home, many people, in the village community, the movement of communities to utilize empty land with integrated agricultural activities is growing rapidly. Many farmers combine root crops and vegetables with livestock. The remainder of the crop is given to livestock and manure is given to the plants. There are farmers who combine livestock and fisheries.

3. Effort of government to increase food security
Efforts to develop food initiated by the community need to be balanced with government steps so that community initiatives can develop into a national movement. Government assistance and facilities can be in the form of credit relaxation assistance to farmers. Farmers should also be introduced to technology to assist them in distributing and maintaining the stability of food product prices during a pandemic. Local agriculture and food storage in each region must be revived to build food security and nationalism. Apart from that, the government is also deemed necessary to map existing agricultural potentials, stabilize food prices, carry out consolidation related to agricultural land, and also make regulations related to existing food problems. Government efforts to improve food security are carried out through various levels, community, local government and national levels (Table 1).

| Table 1. Effort of government to increase national food security. |
|---------------------------------------------------------------|
| Community level | Local government level | National level |
| Encouraging rural farmers to use their homeland for integrated farming: integrating of crops, fish, and livestock. |
| Encourage urban people by urban farming: utilizing home gardens with growing vegetables in pots, hydroponic system, etc. |
| Developing local food massively as alternative foods such as cassava, maize, sago, banana, potato, and sorghum. |
| Each province is accustomed to consuming certain non-rice carbohydrate commodities. |
| Food Estate program with the expansion of new food crop area at Central Kalimantan Province. |
| Developing new foodland area from forest area. |
| Developing facilities for food reserves in various regions. |

3.1. Increasing food security in community level
Communities have the opportunity to build food sovereignty and self-sufficiency through the use of the surrounding land. During a pandemic, people tend to be more creative in overcoming problems
such as maintaining access to food close to where they live. Farming communities have the awareness to carry out at least independent planting to meet their own food needs. There are many ways to do independent plantings, such as utilizing home gardens with integrated farming.

Many households that have large yards, usually in rural areas, plant rice in the house yard, plant short-lived rice, or rice plants with fish farming and at the same time livestock. Activities in these areas are used to raise domestic animals such as chickens, goats, sheep, cows and buffalo. To protect people's needs from the food security crisis, the Ministry of Agriculture as a technical institution responsible for agriculture (food) has also prepared various strategies to face the challenges of food security during a pandemic [4].

3.2. Increasing food security in local government level

There is a sense of surprise from the public to reduce food consumption, especially in non-food producing areas. In response to these conditions, the local government is making efforts to use local food massively. Many areas have local food and people are accustomed to alternative foods such as cassava, maize, sago, banana, potato, and sorghum. Each province is accustomed to consuming certain non-rice carbohydrate commodities. We just need to encourage how to increase the production of this commodity and process it so that it can be consumed massively. The manufacture of analog rice from flour needs to be intensified to overcome food security. IPB University has made analogous rice from various tuber flours [5].

Meanwhile, the development of local food diversification based on local wisdom that focuses on one main commodity in one region or province needs to be done. With the use of yard and marginal land through the Sustainable Food Yard program. The program has received support from universities by sending students to assist the farmers. With a combination of information technology and modern agriculture, agricultural development in the regions is carried out with the concept of smart farming, development and utilization of screen houses and corporate development. In the short term, it is necessary to expand access of farmers, ranchers and fishermen to online marketing nets, special economic stimulus for agriculture and rural areas and social protection and safety net schemes. This is very important to ensure the effectiveness of increasing productivity in the field.

The government also introduced a smart farming center in each region for the training of millennial farmers. Smart farming is built based on the use of drones, sensors, and computer technology. The technologies used drones for spraying pesticides and liquid fertilizers, surveillance drones for land mapping and soil and weather sensors to regulate crop water needs. With smart farming, modern farmers can control plant growth factors such as fertilizer and water more accurately and quickly with the help of computers.

3.3. Development food security in national level

Apart from encouraging communities and local government for food development through various programs, the central government has taken several efforts such as the Food Estate program with the expansion of new rice planting areas covering nearly 165,000 hectares in Central Kalimantan Province to increase food availability. Besides Food Estate, the government diversifies food production and consumption, facilitates food reserves in various regions, facilitates the marketing of agricultural commodities through Indonesian Farmers Shops, and- several social safety network packages. Experts remind that maintaining food security in the midst of a crisis due to the Covid-19 pandemic cannot only be done by policy-makers, but the community must also be involved so that at least they can maintain the food welfare of individuals and their own families. Therefore, making innovations and new ideas that can be adopted for the food needs of individuals and those around them is a sustainable food defense system [6].

Swampland development in Central Kalimantan is an example of the addition of new planting areas. The new planting area can be used for rice, corn, shallots and chilies. As a concrete step, the
Ministry of Agriculture through the Agricultural Human Resources Extension and Development Agency has formulated 4 methods to achieve food security. (1) Increasing production capacity by accelerating the second planting season of rice by 2020 covering an area of 6.1 million ha, developing 164,598 ha of swamps in Central Kalimantan, including the intensification of 85,456 ha of swamps and extensification of agricultural land 79,142 ha. (2) Diversification of local food by developing food diversification based on local wisdom that focuses on one main commodity. (3) Strengthening food reserves and logistics systems by strengthening provincial government rice reserves and strengthening district/city government rice reserves. (4) Development of modern agriculture through the development of smart farming, the development and utilization of screen houses to increase the production of horticultural commodities outside the planting season and the development of farmer corporations.

4. Strategies for achieving food security during the pandemic and beyond

4.1. Short-term
The government's strategies to maintain food security during the Covid-19 pandemic were carried out in the short, medium and long term (Table 2). The short-term agenda includes maintaining food price stability and building a buffer stock. In the short term, it is necessary to expand access of farmers, ranchers and fishermen to online marketing nets, special economic stimulus for agriculture and rural areas and social protection and safety net schemes. This is very important to ensure the effectiveness of increasing productivity in the field.

| Short-term | Medium-term | Long-term |
|------------|-------------|-----------|
| Maintaining food price stability. | Labor-intensive post-Covid-19. | Encouraging an increase in production by 7% per year and reducing losses to 5%. |
| Building a buffer stock. | Diversifying local food. | Developing agricultural area by converting forest land into agricultural land. |
| Expand access of farmers. | Helping food availability in deficit areas. | |
| Special economic stimulus. | Encouraging family farming. | |
| Social protection and safety net schemes. | Helping smooth food distribution. | |

4.2. Medium-term
The medium-term agenda is realized by continuing labor-intensive post-Covid-19, diversifying local food, helping food availability in deficit areas, anticipating drought, maintaining agricultural work spirit through input and agricultural machinery assistance, encouraging family farming, helping smooth food distribution, increasing agricultural exports. In the medium term, the household scale production movement can maintain our food security. Then the need for import substitution products, such as changing the raw material for noodles from flour to corn, for example. Improving data and information systems at the field level is also important so that data received by the government can be accurate for decision making.

4.3. Long-term
Meanwhile, the long-term or permanent agenda is carried out, among others, by encouraging an increase in production by 7% per year and reducing losses to 5%. Developing food by conducting national spatial planning to convert forest land into agricultural land. Currently there are still many forest lands in Papua in the Mamberamo Valley and Merauke area which are suitable for the
development of food crop agriculture, especially rice. Social engineering is necessary for the success of this program.

5. Conclusion
The Covid-19 pandemic that has disrupted Indonesia's food security has also provided lessons for the emergence of various innovations in various fields of food security. In the field of food supply, there is an urban farming movement in cities and the use of yards in villages. In order to maintain food security, the local government carried out local food development movements such as maize, cassava, sago, and tubers to reduce dependence on food supplies from other areas whose distribution was disrupted during the Covid-19 Pandemic. At the national level, the government continues to develop food security through the development of Food Estate in Kalimantan and Sumatra. The strategy for achieving food security is carried out through massive short-, medium-, and long-term movement

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