

**Research article**

# Policy Innovation to Support City Food Security

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**Abstract.**

Food security has become a global issue and has raised concerns for both government and non-government parties. Gaps in meeting food needs are often found in various parts of the world. On the one hand, we find people who die of hunger due to limited access to food, but on the other hand, we find people who have too much food. The United Nations has included food issues as part of its global agenda (Sustainable Development Goal #2: Zero Hunger). This confirms the seriousness of problems related to food. The Indonesian Government continues to strive to promote the strength of its food sector through various policy innovations. The food estate launched by the Government basically seeks to create food centers in several regions with the hope of encouraging increased production to be able to meet the food needs of the community. Innovation is also carried out at the city level with Government policies and support from the non-governmental sector to create urban farming. One example is a program carried out in the city of Bandung and which has spread throughout other sub-districts and urban villages (kelurahan). Urban farming, which is given the name *Buruan Sae*, is a movement to supplement city food, and it is mostly carried out by communities or community groups and is adapted based on local cultural conditions and practices. The urban farming system can provide economic, social, health, environmental and educational benefits. This was qualitative research and data were collected through a literature review and in-depth interviews. This paper found that this innovation in the food policy system can encourage the production side to meet food needs, thereby promoting the sustainability of the food system in urban areas.

**Keywords:** food security, innovation, food estate, urban farming, sustainability

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## 1. Introduction

The world's population is increasing from time to time. By 2050, the world's population will reach 9 billion. The increase is about 15% from the current amount of 7.1 billion. However, the need for food to fulfill the needs of increasing population is projected to increase by up to 70%. Food is a basic element of human needs. Food is defined as materials produced by nature intended for human consumption [1]. Every human being needs food intake as a source of nutrition for activities. For this reason, starting from

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the household scale to the state, it is necessary to have sufficient food availability so that the life processes of both community members and families can take place.

In the most ideal form, everyone can meet their personal food and nutritional needs whenever needed, as stated by FAO [1]. But in reality, between one household and another household has different opportunities to meet these basic needs, as well as at the country level. In Indonesia, this is determined by various factors such as the availability of food which directly affects prices. Indonesia is a major importer of basic commodities. Meanwhile, production capacity can be said to have decreased because there are more and more housing needs, and urban areas are expanding.

Towards food fulfillment is also a global agenda, as in the second point of the Sustainable Development Goals with the goal of “No Hunger” [3]. The vision of this second goal is “Eliminating hunger, achieving food security and good nutrition, and promoting sustainable agriculture”. Several targets translated in the Indonesian context that are relevant to the condition of food security, among others;

1. (a) **Target 2.1:** By 2030, eliminate hunger and ensure access for all, in particular the poor and those in vulnerable situations, including infants, to safe, nutritious and sufficient food throughout the year;
- (b) **Target 2.3:** By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, farming families, herders and fishermen, including through secure and equal access to land, productive resources and other inputs, knowledge, financial services, markets and value added opportunities, and non-agricultural employment;
- (c) **Target 2.4:** By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase production and productivity, help protect ecosystems, strengthen adaptive capacity to climate change, extreme weather, drought, flooding and other disasters, and progressively improve soil and land quality

Based on the global vision and the state’s obligation to meet the food needs of the community, this paper attempts to describe the challenges faced by the Indonesian state to achieve food security in terms of policy innovations to encourage food production.

## 1.1. Food Security and National Food Security

The study of food security was codified for the first time at a global meeting at the *World Summit on Food Security* in 1996. At the meeting of stakeholders around food,

a generally accepted definition of food security was agreed upon. Food security is a condition when every human being has physical, social and economic access to safe, sufficient and nutritious food that is needed for activities [2]. This definition is currently used in studies to understand the topic of food [4]. The concept of *food security* developed with the concept of *self-sufficiency* and *food sovereignty*. *Self-sufficiency* is defined as the state's ability to meet the needs of its domestic economy. *Food sovereignty*— although its use has been interchangeably used together with *self-sufficiency*—is defined as the ability of a country to meet its own domestic food needs without being dependent on other countries. The second approach is often associated with import protection and illiberal policies. [5].

The term food security has also been re-adapted into the Indonesian context in Law no. 18 of 2012 concerning Food. In the 2012 Food Law, at least 4 (four) concepts are introduced which are almost said to be similar to one another, namely; *Kedaulatan Pangan*, *Kemandirian Pangan*, *Ketahanan Pangan*, and *Keamanan Pangan* (Fig. 1). *Kedaulatan pangan* can be said to be closely related to the concept of food sovereignty— and an almost illiberal approach to food, which emphasizes the obligation of the state to independently determine food policy. *Kemandirian pangan* is related to self-sufficiency, which emphasizes the domestic ability to produce food so that it can guarantee individual needs. *Ketahanan pangan* is related to food security, which emphasizes the acceptance side, security until food reaches the individual level in terms of quantity, quality, nutrition.

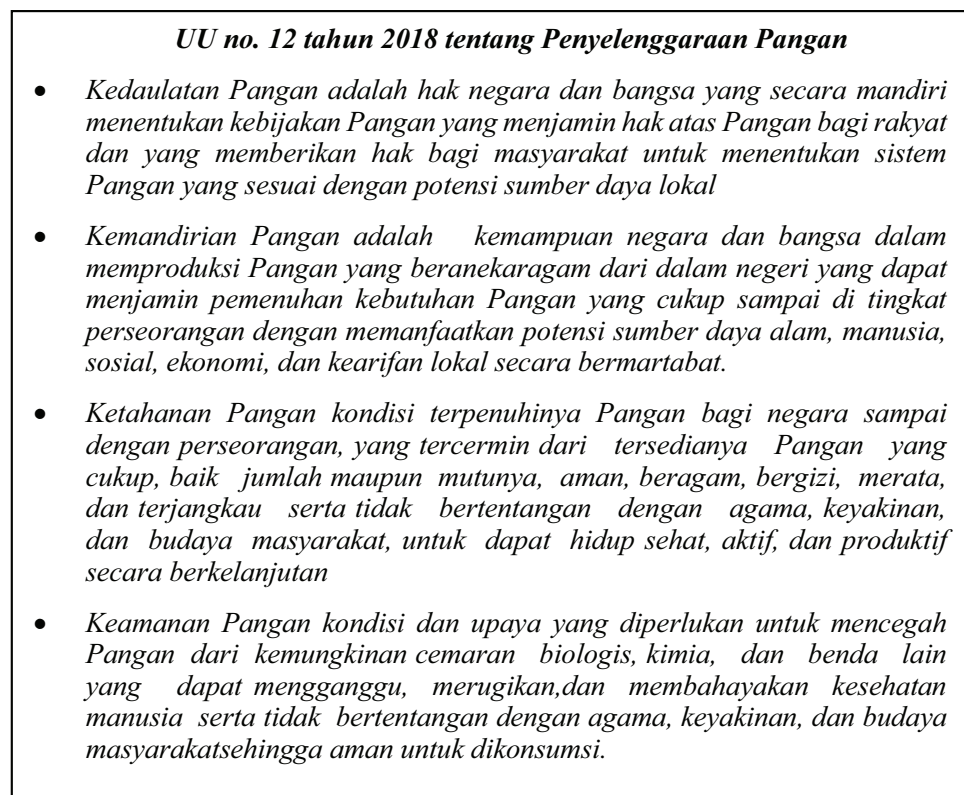
FAO divides the discussion about food security into 4 (four) dimensions, namely; *Availability*, *Access*, *Choice & Utilization*, and *Stability* [6]. *Availability* is related to the supply of food which depends on the level of production, stock availability, and trade. *Access* is related to an adequate amount of food at the national and international levels. The discussion about access is how each household is able to obtain food, related to prices. *Choice & Utilization* is related to choices in food processing, nutritional diversity. *Stability* is related to long-term intake, how a household or individual can obtain food in the long term.

## 1.2. Quintuple-helix Model of Sustainable Development

As a framework to describe or map the development of certain sectors in society, scholar or practitioners often use *Triple Helix Model of Development*. It was initially a work of Etzkowitz and Leydesdorff in 2000.

However, in recent times, the disruption came across different sectors, and thus requires different, comprehensive approach to address. Not all model applies for all, after all; models are linked with the issues. Thus, the previous work of Triple-helix developed with the recent idea of knowledge generation, Mode 3', or Quintuple-helix [7].

Mode 3' or Quintuple-helix is a development model based on five entities, depict as a 3-1-1 diagram consist of; university, government, business, civil society, and natural environment (Fig. 2). The model tries to depict that today production of knowledge or innovation is carried out democratically within society, and thus represent unique background as well as solution for each problems. The presence of *university*, *government*, and *businesses* are located within the *society* helix; meaning that the relevance of that three aspects should assist the needs of society.



**Figure 1:** Food policy description under Indonesian Law no. 18 of 2012 [1].

This current approach of development also requires trans-, inter-diciplinary approach, compared to the past where it was only the authority of academic institution.

1. The quintuple-helix model, as cited from Rosenlund [7]

Environment dimesion is also recognized as the disruption of knowledge and society also affect the environment. Another reason is, these days knowledgeable society

widely accepts that natural environment is the sole dimension that support all the activity aforementioned in other helix and the problems in the natural environment required a collaborative approach of various part of society [7].

### 1.3. Food Production Support Instrument

In intervening in the food production sector, according to Michelsen, 2002 in Stolze, 2009 the government/state uses several types of instruments, as follows;

1. **Legal instruments** based on state authorities, through the making of regulations;
2. **Financial Instruments** based on intervention in market mechanisms; the form can be positive in the form of an injection of funds, or negative through taxes;
3. **Communicative Instruments** based on relations and community relations, involving interactions between government and civil society;

Adding a framework of thought that is increasingly reflected in the phenomena of policy interaction, Stolze also mentions that another form of instrument has emerged, namely the **Integrative Instrument**. The Integrative Instruments approach combines the three aspects of the previous instruments.

## 2. Method

This research incorporates a qualitative approach to asses policy innovation made by Indonesian central as well as local government. Data collected from this research is obtained through literature review and in-depth interview. From literature review, researchers gained data about Indonesia general situation of food, as shown in the following section and tables.

In-depth interview was conducted together with government party, on this matter is with sub-division of Food Security and Agricultural Department (*Dinas Ketahanan Pangan dan Pertanian – DKPP*) of city of Bandung and with Urban Farming ‘Buruan Sae’ groups.

Researchers also gained some insight dan data along with the course of collaboration UNPAR with DKPP in *Bandung Food Smart City Campaign*. Not only gaining access to the ‘Buruan Sae’ groups, researchers also are able to conduct an in-depth interview with DKPP.

All the data collected is therefore assessed through theoretical framework of collaboration: Quintuple helix, that emphasizes collaboration between government, civil society, and to some extent; university.

### 3. Result and Discussion

#### 3.1. Indonesia Consumption Level

Indonesia is one of the most densely populated countries in the world. The implication is that the consumption level of the Indonesian people is also high. With the current level of welfare, the percentage of Indonesian people's spending on food items tends to be high compared to other materials, although this trend is decreasing from year to year (Fig. 1). Meanwhile, with a high level of public consumption, not all of Indonesia's food needs are met domestically. Some materials, such as wheat and soybeans, are obtained with high export rates (Fig. 2). This implies that the level of dependence of Indonesian food on meeting the needs of soybeans and wheat is still high on availability from abroad. In fact, at certain times, Indonesia still needs to import rice from abroad to meet its daily needs.

One of the staple foods that is a source of Indonesia's dependence on imports is wheat and soybeans. Wheat is used to make processed foods instead of rice, while soybeans are processed into side dishes such as tofu and *tempeh*. Increased consumption of wheat is high if import restrictions are imposed on rice; Wheat acts as a substitute for rice [9]. The high level of consumption of the Indonesian people also causes the availability of food to determine inflation.

#### 3.2. Production

In the Indonesian economy, the agricultural sector is one of the major sectors that contributes to GDP. In 2020, the agricultural sector contributed 13.5% of GDP [10]. Agriculture is also a labor-intensive employment sector. After the reform, more than half of the workforce returned to the agricultural sector. However, with a labor absorption rate of 34%, 50.84% of the farming profession is dominated by poor households.

Indonesia is a major producer of agricultural and agricultural products. These agricultural and agricultural products are divided into 2 (two), namely; 1) food ingredients, and 2) non-food ingredients. Most producers of produce intended for import and commercial use are large agribusiness and non-food companies. Since the Soeharto era, these

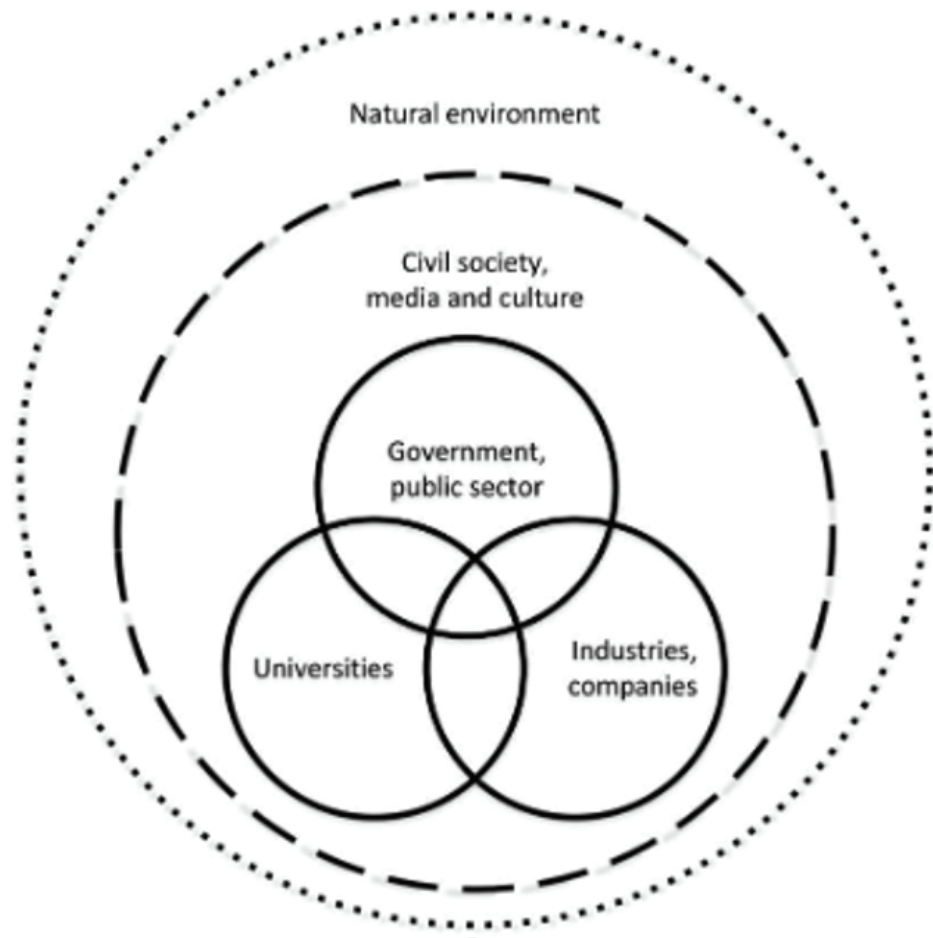


Figure 2: The quintuple-helix model, as cited from Rosenlund [7].

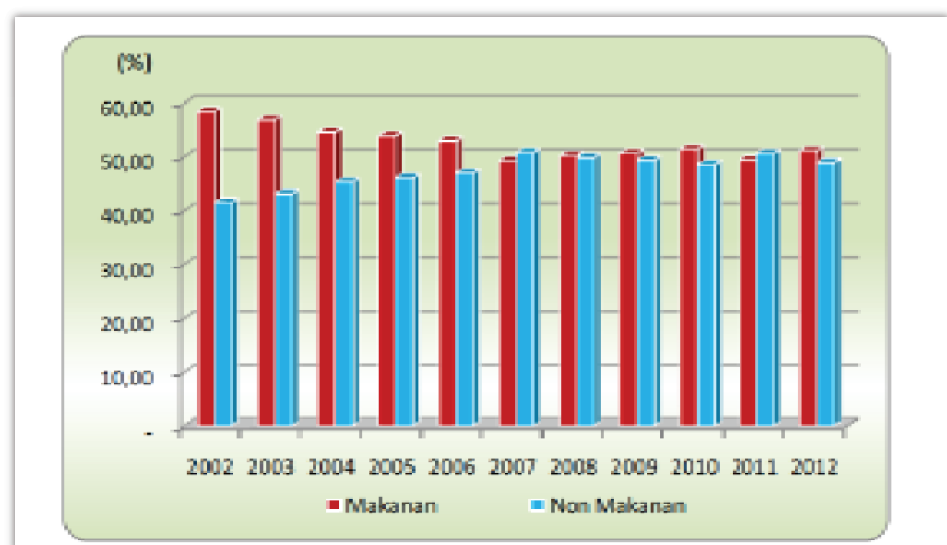
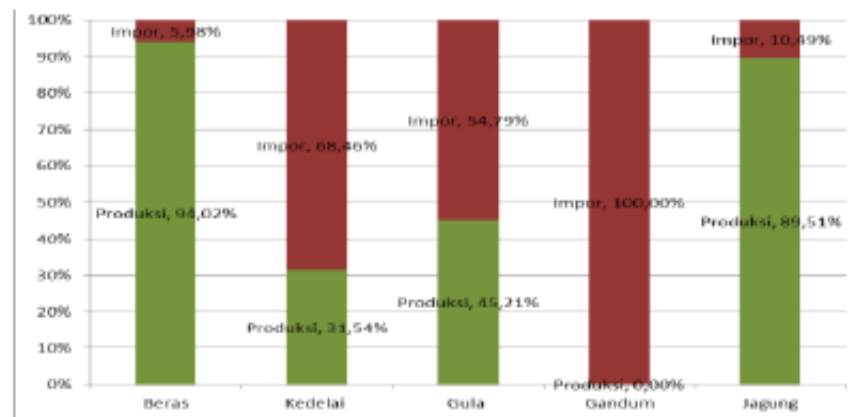


Figure 3: Indonesia population spending percentage of food and non-food (*makanan* and *non-makanan*), according to Nurhemi et. al, 2012 [8].

large companies have played an important role in the economy. Ownership of these companies is generally in the form of conglomerates, and has cross-, multi-sectoral



**Figure 4:** Proportion of Imports vs. Local production of Indonesia staple food [8].

business branches. The role of this conglomerate is also related to the political elite. Most of these companies' commodities are export-oriented (and non-food). In 2013, the total land for oil palm managed by the company was 4,000 hectares. The amount of oil palm land managed by the private sector thus decreased from 58% in 2000 to 50% in 2012, and then increased in 2016 to 55%. Such agribusiness conglomerate companies are strongly associated with bribery and collusion, and their activities do not consider environmental and social impacts. However, agribusiness companies that have such land management permits—with such large revenues—do not benefit much from government policies that encourage land productivity or intensification. This is because the taxes paid for companies like this to operate tend to be high.

Of the various government policies that encourage increased production, the greatest benefit is obtained by certain groups. This is related to grouping in agriculture. According to Hart-Hamilton, there are 3 (three) major groups of producers, namely; agribusiness corporate groups—which manage large lands and act as private parties; farm labor groups, and; the “medium farmer” group [11]. The group of middle farmers in question are farmer entrepreneurs; owns land, capital, and is actively consolidated through organization. This group of medium-sized farmers has a strong position, not only because of their consolidation activities, but also because of their land ownership [11]. Farmers in this group tend to represent diverse interests, unlike conglomerate agribusiness companies, which only represent one interest [11]. The position of farmers in this group is also strong because farmers in this group also mostly produce staple foods, which are usually intended for domestic consumption.



### 3.3. Policies related to Increased Food Production

Meeting the needs of such large consumers, fulfilling food needs has become one of the vital and strategic policies for the Indonesian state [9]. There are at least two approaches to food production, namely extensification and intensification. *Extensification* refers to the expansion of planting land, while *intensification* is to increase production in existing land with technology and methods. Since the reign of Susilo Bambang Yudhoyono for the 2nd period (2009-2014) to the administration of Joko Widodo (2014-2019, 2019-present) the government has an agenda to maintain Indonesia's food availability. One of the intensification policies carried out by the government is through the fertilizer subsidy policy. Almost all farmers benefit from this fertilizer subsidy policy, although 40% of farmers who receive this subsidy are medium or large scale farmers [9]. Fertilizer subsidies help farmers increase productivity, but in a not-too-large level, due to the very low cost of fertilizers [9].

It is important to ensure food availability to maintain prices, especially for the vulnerable and poor. This can be controlled through policies. However, appropriate policies are needed that do not produce too large a social impact [9]. Entering the reformation period in 2004, the Indonesian government had imposed a policy of banning rice imports. This is actually intended to protect consumers from large increases in world rice prices. However, the implication of the import ban is the increase in domestic rice prices relative to the increase in international prices. The biggest impact of this policy is beneficial for rice sellers, but it hits poor households the most, namely households with a high proportion of the household budget to buy food [9].

#### 3.3.1. Food Estate Program for Extension.

The Food Estate or national food barn is a government program carried out in collaboration with the private sector to open agricultural lands in various regions. The purpose of Food Estate is to fulfill national food reserves, and although it is for local consumption, it is also intended for export commodities. This land clearing program is managed by the Ministry of Defense, Ministry of Agriculture, and Ministry of PUPR. The goal is that all provinces have this food barn [12].

*Febrian & Sulaiman in Lasminingrat & Efriza, 2020; President Joko Widodo's statement in Laksana, 2021 [16]*

\*) “-“ data has not been found whether it is included in the planning or development process.

TABLE 1: Location of current established food estate.

Food Estate	Location	Year built	Large
MIFEE	Animha District, Kaptel District, Merauke Regency, Papua	2010	2,500,000 ha
Central Kalimantan	Dadaup District and Pulang Pisau District, Kapuas Regency, Central Kalimantan	2020-present	20,000 ha
Humbang Hasundutan	Humbang Hasundutan Regency, North Sumatra	2020-present	30,000 ha

Irawan, 2021; Sutrisno, 2021; Bhwana, 2021 [15,17,14]

TABLE 2: Food estate construction plan location

Food Estate	Location	Year built	Large
MIFEE	Animha District, Kaptel District, Merauke Regency, Papua	2010	1,900,000 ha
Central Kalimantan	Dadaup District and Pulang Pisau District, Kapuas Regency, Central Kalimantan	2020-2022	190,000 ha
West Kalimantan	West Kalimantan	- *)	120,000 ha
East Kalimantan	East Kalimantan	- *)	10,000 ha
Maluku	Maluku	-*)	190,000 ha
East Nusa Tenggara	Central Sumba Reg.	-	10,000 ha
Humbang Hasundutan	Humbang Hasundutan Regency, North Sumatra	2020-2022	30,000 ha

*\*) East Nusa Tenggara data is based on media information from the President's visit to East Nusa Tenggara in order to review the location of the food estate*

The current Food Estate is currently available in Merauke, Papua Province. In the last two years, the construction of this Food Estate has been carried out in several areas; North Sumatra and Central Kalimantan. Food Estate development was also launched in 4 (four) other province.

### 3.4. Food Estate Program for Extension.

Land availability is the most important factor in securing production capability, thereby securing food supply. Meanwhile, in Indonesia there are several problems faced related to the availability of land; 1) Land for agriculture is getting smaller and smaller. This can be projected from the expanding settlements and urban areas, while the areas with rural characteristics are decreasing. In numerical terms, this is indicated by the level of Urban-Rural Growth Difference (UGRD) which indicates the difference in growth

rates in urban and rural areas. Every year, the development gap between these two regions is widening [13]. It means; a) the village is developing into a city, or; b) more and more villagers are moving to cities. Meanwhile, regarding the availability of land, the next point is the second point; 2) land desertification. Land desertification is defined as an agricultural land that is continuously and continuously exposed to chemicals from fertilizers and pesticides and experiences continuous drought, which in the end the quality of the soil decreases, cannot be used productively, because over time it becomes sand. For example, in Brebes, 50% of the rice fields were damaged due to the influence of pesticides. As a result, the use of fertilizers needs to be increased to balance out pesticides, namely increasing production costs. In fact, conventional agriculture in the long term has the potential to reduce land fertility, and therefore threatens the availability and production capacity in the future. It emphasizes the function of the fifth boundaries within the quintuple helix, namely the *Nature Environment*, that supports the presence of agriculture civilization, where society totally depends on it.

### 3.5. "Urban Farming" as an Innovation Step for City Food Security

Efforts to build food security are carried out at various levels at the global, national and local levels. This confirms that the issue of food has become a widespread awareness both geographically and the stakeholders involved. Bandung as a city that has declared a Food Smart City and is a member of the Milan Pact, a forum that accommodates cities in the world that has a concern for food issues, also pays very strong attention to efforts to achieve food security. Bandung as a metropolitan city currently still has a very large food dependence from the surrounding areas. Therefore, innovative steps continue to be taken to continue to realize the city's food security.

One of the steps taken is to encourage the movement to create "urban farming" (*Buruan Sae* – which means a healthy, natural, and economical yard). A movement carried out by families, communities, or institutions to carry out "urban agriculture" carried out on land owned. This agriculture is done by planting various vegetables and fruits that are needed to meet their daily needs such as chilies, cabbage, mustard greens, spinach, bananas, papaya and others. Currently in Bandung, there are around 234 "Buruan Sae" spots managed by the community, and there are also several managed by the Bandung City government. This number has been spread in 151 urban villages in the city of Bandung.

The practice of urban farming has brought many benefits to the community. Economically, urban farming can provide income for its managers which is obtained from the

sale of the products produced. Although the products have not yet entered the larger market, both traditional and modern markets. However, marketing is done by selling it to community members or to the surrounding community. Basically, urban farming harvested products can also reduce some of the expenditure on food consumption such as vegetables, especially for members of the managing community. In terms of health, urban farming products can support the fulfillment of good nutrition, especially by consuming vegetables that will increase the intake of fibrous foods. With the existence of urban farming, which is better known as “*Buruan Sae*”, it makes it easier for members of the community to meet the needs of healthy and cheap food. In terms of the environment, the existence of urban farming will of course provide a beautiful environment and will greatly affect the improvement of air quality around the urban farming location. Even at a certain level, urban farming locations can be arranged to meet recreational needs so that they can become tourist sites. This is like what is done by urban farming named SEIN Farm which is owned and managed by the Bandung City government. In addition, urban farming can provide educational benefits for all groups related to information on food crop problems and the planting process.

The movement for making urban farming which is strongly supported by both the government and the people of Bandung is also supported by government policies related to waste management using the term KangPisMan, namely Reduce, Separate, Utilize which is actually another name for the 3R steps, namely Reduce, Reuse, Recycle. This step is expected to be able to support and be integrated with urban farming which requires fertilizer from waste processing in urban farming locations. This movement was then carried out by various circles of society, including in educational institutions in the city of Bandung.

To show products from various urban farming in Bandung City, every year Bandung City organizes a kind of urban farming product exhibition festival which is manifested in the *Bandung Agri Market* – BAM activity. This activity, in addition to displaying products, also sells processed products in the form of healthy food or drinks with basic ingredients derived from urban farming. In addition, in the *Bandung Agri Market* event, various plant seeds were also distributed for visitors to be planted and cultivated on their land.

In order to emphasize its commitment to food issues, the government of Bandung City has declared itself a Food Smart City, in this case the City of Bandung has joined as a member of the Milan Pact or often referred to as the Milan Urban Food Policy Pact (MUFPP). This pact is a forum for cities in the world that care about food problems in the world that are committed to carrying out various activities in realizing food smart cities. The activities carried out by the city of Bandung in the context of the MUFPP finally

placed the Bandung City Government as a member of the steering committee for the Asia-Pacific Region.

Another step taken by the City of Bandung is an effort to create applications to facilitate the *Food Sharing Movement* that carried by various food producers such as hotels, restaurants, catering. The purpose of this activity is to overcome the amount of food that is nearing the expiration date so that with this application an opportunity can be opened for the citizens of Bandung City to access healthy food and at a price that is cheaper than the normal price.

These activities by the Government of Bandung has shown an **integrative policy** approach carried out by local government. The *Buruan Sae* projects incorporate policy planning conducted in line with the Medium Term Development Plan of Bandung 2018-2024. On its implementation, the government also support procurements on several agricultural needs (e.g. seeds) through collaboration with private company. The Government of Bandung through its sub-division DKPP also encourages active communication with *Buruan Sae* groups through monthly visit and regular counseling.

## 4. Conclusion

Food as a vital necessity of life for the Indonesian people faces challenges in its fulfillment. In an ideal situation all levels or groups of people are able to obtain food and are free from price threats, free from hunger, and ensured that in the long term they are always able to obtain food. For this reason, the fulfillment of domestic needs is prioritized first.

Efforts to build food security are carried out at various levels at the global, national and local levels. This confirms that the issue of food has become a widespread awareness both geographically and the stakeholders involved. Bandung as a city that has declared a Food Smart City and is a member of the Milan Pact, a forum that accommodates cities in the world that has a concern for food issues, also pays very strong attention to efforts to achieve food security. Bandung as a metropolitan city currently still has a very large food dependence from the surrounding areas. Therefore, innovative steps continue to be taken to continue to realize the city's food security.

Government policies regarding food often still cause debate. Currently, the Food Estate is still prioritized not for consumption, but for export. The policy of restricting rice imports also resulted in higher rice prices, with poor households having the greatest impact. The social cost of this policy is too great.

Agricultural land is a natural resource. Its use is full of conflict because the longer the land is getting narrower. Agricultural land is a fixed cost to produce food. If today's agricultural practices cannot manage the soil and maintain soil fertility, it will accelerate the decline in land use. This then threatens food availability in the future due to agricultural practices that are not in line with the ecological cycle. Meanwhile, the current economic system and government system provide support for fertilizer subsidies—which encourage the use of factory/chemical fertilizers. This is counterproductive to the ecological cycle of the land.

Innovative policies to realize urban food security can also be carried out with the "urban farming" movement which involves many parties, both the city government and the community. Integrative approach must be taken by local government. Many benefits can be obtained from this movement such as aspects of the economy, health, environment, and education. This innovation is expected to be able to maintain the availability of food for the urban community, encouraging harmonious production and in line with the capabilities of the community, which is supported by other potentials.

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