

IMPLEMENTATION OF SUSTAINABLE DEVELOPMENT GOALS ON FOOD SECURITY IN FACING GLOBAL CLIMATE CHANGES

(Descriptive Analysis Study at the Dinas Ketahanan Pangan, Pertanian dan Perikanan Kota Bekasi)

Author By:

Muhammad Farrel Aryaputra Amri

SMA Labschool Jakarta , mfarrel051@gmail.com¹

Dra. Tetet Heryati, M.Si

Dinas Ketahanan Pangan, Pertanian dan Perikanan Kota Bekasi , tetetheryati2010@gmail.com²

Academic Adviser : Fetty Budi Arifani

Reviewer Journal: Prof. Dr. Mohammad Soleh Ridwan, Ph.D

ABSTRACT

Food security is one of the global issues outlined in the 2030 Sustainable Development Goals (SDGs) agenda. Namely, ending hunger, achieving food security and better nutrition, and supporting sustainable agriculture. According to the 2018 Food Security Agency, food security is a state condition to provide food for individuals, with sufficient food availability, both in quantity and quality, safe, diverse and diverse. and affordability. We can live healthy, active and productive lives. Food problems are also directly affected by climate and meteorological anomalies that have become increasingly prevalent over the last 10 years. A few decades ago the moon could be a parameter to know the changing seasons, but nowadays it's almost completely changed. The purpose of the study was to determine the implementation of Sustainable Development Goals in Food Security in Facing Global Climates Changes in Bekasi City. This research is a study that explores, discloses, and finds information about the implementation of Sustainable Development Goals in Food Security in Facing Global Climates Changes, so to describe this in this study using field research (field research). Data analysis in qualitative research takes place in cycles and is carried out throughout the research process. Data and information in the form of field notes, interviews with respondents and analysis of documents related to the implementation of the SDGs on food security in the face of global climate change.

Keywords : Food security, global climate change, implementation.

I. INTRODUCTION

Food security is one of the global issues outlined in the 2030 Sustainable Development Goals (SDGs) agenda. Namely, ending hunger, achieving food security and better nutrition, and supporting sustainable agriculture. According to the 2018 Food Security Agency, food security is a state condition to provide food for individuals, with sufficient food availability, both in quantity and quality, safe, diverse and diverse. and affordability. We can live healthy, active and productive lives. Food problems are also directly affected by climate and meteorological anomalies that have become increasingly prevalent over the last 10 years. A few decades ago the moon could be a parameter to know the changing seasons, but nowadays it is almost completely changed. The impact of climate change can be felt in all fields, but the most critical is in the agricultural sector. The decline in soil quality, fertility, carrying capacity also means a decrease in agricultural productivity. The decline in water quality results in a decrease in agricultural productivity.

Concerns about agriculture and the food crisis were expressed by representatives of FAO Indonesia and Timor Leste at a meeting with the ministry of agriculture in Jakarta. Indonesia's crisis is not as severe as in other countries such as the Philippines and the Caribbean, but Indonesia is an archipelagic country that covers a very wide area and has different climatic and meteorological characteristics. According to several FAO surveys, Indonesia, which has the largest economy in Southeast Asia, is at risk of suffering the most from climate change, especially drought and flooding. This is because this phenomenon reduces the production capacity of food and agriculture.

Agriculture that does not pay attention to environmental aspects causes a decrease in the quality of nutrients from the soil. Another factor is climate change that affects rainfall patterns, rising temperatures and shifts in seasons that cause disasters that farmers must face. This condition occurs in the city of Bekasi, which is a buffer zone for the province of DKI Jakarta. The Bekasi City area had met the demand for rice in its surrounding areas, such as DKI Jakarta, Central Java, East Java, but now rice production has decreased due to the shift in land use and climate change.

II. RESEARCH METHOD

This research is a study that explores, discloses, and finds information about the implementation of Sustainable Development Goals in Food Security in Facing Global Climates Changes, so to describe this in this study using field research (field research). Data analysis in qualitative research takes place in cycles and is carried out throughout the research process. Data and information in the form of study literature, field notes, interviews with respondents and analysis of documents related to the implementation of the SDGs on food security in the face of global climate change.

III. RESULT AND DISCUSSION

3.1 Profile and Geographical Condition of Bekasi City

Bekasi City is part of the Jabodetabek Metropolitan and is a satellite city with the largest population in Indonesia. Currently, Bekasi City has developed into a residence for urbanites and an industrial center. In 2021, the population of Bekasi City is 2,464,719 people. Topographic conditions of Bekasi City with a slope of 0-2% and located at an altitude of 11-81 m above sea level. Areas with low elevations and slopes that cause areas in Bekasi City to inundate a lot, especially during the rainy season, namely: Jati Asih, East Bekasi, Rawalumbu, South Bekasi, West Bekasi and Pondok Melati.

The Bekasi City area is generally classified in a tropical monsoon climate with a high humidity level of 78%. The daily environmental conditions are very hot. This is especially influenced by increased land use, especially industry or trade and settlements. The daily air temperature is estimated to be between 24-33 degrees Celsius. Bekasi City is often hit by hydrometeorological disasters due to low altitude and climate change.

3.2 Implementation of Sustainable Development Goals on Food Security in Facing Global Climate Change in Bekasi City

Fulfilling food needs and maintaining food security are becoming increasingly important for the City of Bekasi because the population is very large with a wide and spread geographical coverage. It is hoped that with food independence, which is an effort by the Government, it can be realized by utilizing the potential of natural, human, economic and local wisdom resources in a dignified manner. All Indonesian people must support all the Government's efforts in realizing food security so that national food security can be realized. Law Number 23 of 2014 concerning Regional Government makes food affairs one of the mandatory government affairs that are not related to basic services.

General Policy Direction for Food Sovereignty in the Bekasi City RPJMD 2018-2023: Following up on the Bekasi City RPJMD through strengthening food security towards food self-sufficiency which can be implemented in the main tasks and functions of Bekasi City, namely: Food Security in the agricultural, fishery and livestock sectors. Efforts to increase food security/food reserves in the community through Community Food Barn Empowerment (LPM), which is a community movement to utilize the yard/yard or vacant land in an area that is managed individually or in groups and can meet the availability and need for food in the form of carbohydrates (tubers, corn, etc.), vegetables, fruits, family medicinal plants, fulfilling protein in this case are livestock and fisheries. The development of community food reserves has two sides of relevance, namely:

- a. Consolidating the existence of food reserves to ensure the availability and affordability of food for the community. For this reason, there needs to be synergy between members of the beneficiary group, agricultural extension workers, central and regional food security officials.
- b. Develop community participation optimally to develop community food reserve institutions. This leads to efforts to realize the welfare of the community through the development of productive economic business activities in the food sector whose management is carried out synergistically by the community food barn institution.

3.3 Implementation of Sustainable Development Goals on Food Security in Facing Global Climate Change in Bekasi City

3.3.1 Food Security in the Agricultural Sector

3.3.1.1 Urban Farming

Urban Farming is a form of agricultural cultivation activity in a broad sense that combines agriculture, fishery and or animal husbandry (*integrated farming*) or agricultural activities in the narrow sense (*agriculture farming*). This activity can be one solution in meeting food needs. On unutilized lands in the Jatirasa Village, Bekasi City, such as marginal land, median roads, houses vacated by residents due to flooding or residents' yards, they can be used for activities. *urban farming*. Activity *Urban Farming* can be done with the concept of land use is not too broad by using polybags or with verticulture.

People's preferences for this Urban Farming activity may vary. There are people who want the results of *Urban Farming* this can be sold (economic function) to help household economic needs, for personal consumption, or as an ornamental plant. Urban farming activities can be carried out on privately owned or shared land, with cultivated types of plants such as food crops or vegetables or herbal plants using hydroponic, polybag, or verticulture techniques (Wijaya et al., 2020).

Urban Farming Bekasi City needs to be developed because of land conversion from agricultural land to industrial, trade and settlement, limited human resources in agriculture has decreased, agricultural technology utilization has not been optimal, limited capital, low productivity so that the production of Bekasi City food does not meet the needs and the City of Bekasi. Bekasi is a City of Food Consumers, causing 95% of food to be supplied from outside the City of Bekasi.

For example, the Jatirasa Villa Housing, Jatirasa Village, Bekasi City which has implemented the following activities: *Urban Farming* This is expected to help the daily household food availability. Thus the availability of family food can always be maintained and can be easily

accessed by households because the location is around the house or not too far from the house, or on shared land by utilizing unused or uncultivated land (Wijaya et al., 2020) .

The benefits that can be taken from this Urban Farming activity in addition to meeting the needs of the family can also support the economy when sold and add to the beauty of the city. Other perceived benefits of activities *Urban Farming* can help overcome the problem of poverty due to unemployment that occurs from urbanization carried out by people from villages who come to Bekasi City with the aim of getting better jobs (Junainah et al., 2016). The four Urban Farming methods applied in Bekasi City are as follows:

1. Aquaponics

Aquaponics is a cultivation process that combines the concept of crop cultivation with symbiotic fish cultivation at the same time. Plants that are suitable for using this method include kale, pakcoy, lettuce and also types of fish such as catfish, tilapia, and carp as shown in Figure 3.1 below:



Figure 3.1 Aquaponics in Jatirasa and Jati Raden Villages, Bekasi City

2. Vertiminaponics

In the city of Bekasi, vacant land is decreasing due to the conversion of functions. Even if it is available the price is already very high so that the desire of its citizens to do the hobby of farming is hindered. Meanwhile, the desire to use the yard to produce fresh, healthy and cheap vegetables is getting bigger due to the demand to bring healthy food for household consumption.

The fish that are kept in this technology are all freshwater fish, especially those that do not require high oxygen availability in the water such as catfish, pomfret, catfish, and tilapia. In this portable form, quite a lot of vegetables and fish are produced. One water tank can be filled with up to 200 tilapia or pomfret, while about 300 catfish with a final production of about 17 kg. On the top of the tank can be stored 8 gutters that are planted with four different types of vegetables. For every one gutter (1 m long) can produce 0.6 kg of mustard; 0.6 kg Lettuce;

1 kg Kale or 0.8 kg Spinach. Vertiminaponics is an environmentally friendly, pesticide-free organic farming method. Users do not need to fertilize and apply chemicals to produce healthy and ready-to-eat plants, and have high economic value.

The Department of Agriculture, Food and Fisheries of Bekasi City has introduced Vertiminaponics technology to the wider community, and has received public attention. The yields in Jatirasa Village from the use of the vertiminaponic system are kale and red spinach. Two bunches of kale and red spinach from the harvest each were then sold to residents who visited the Villa Jatirasa Housing at a price of three thousand rupiah per bunch.



Figure 3.2. Vertiminaponics using a plastic tank

Advantages of Vertiminaponics:

- a. The results of fish and vegetables can be obtained at the same time. Optimization of the yard so as to produce vegetables and protein on a household scale. Vegetables are fresh because they are picked right away and must be clean because conditions can be controlled by themselves. The fish produced is also in fresh condition.
- b. Save space and do not require a large area to grow crops.
- c. Guaranteed Organic. The living vegetables consume the feces of the fish that swim beneath them. This condition ensures that the vegetable products grown are organic. If pesticides or fertilizers are added, of course it will affect the life of the fish that are kept. So, mini-ecosystem balance is needed in this system.

- d. Plants do not need to be watered every day. The pumped water will continuously flow through this Vertiminaponic ornamental plant or vegetable plant. We just need to make sure that the water pump is on so that the water circulation can continue.

3. Hydroponics

Hydroponics itself is basically growing without soil, but using 100 percent water and a nutrient mix that only vegetables need in planting. Hydroponics is basically quite easy to do on a household scale. Harvesting the vegetables yourself is easy, especially if the results are good. Quite a lot of vegetables and fruits that can be grown with a hydroponic system. The most common types of vegetables such as pakcoy, kale, basil, oregano and many more.

Bekasi Mayor Tri Adhianto hopes that Bekasi City residents will continue to develop hydroponic plants in their respective areas. Through farming without soil media, it is believed that it can help and strengthen family food security. Farming with a hydroponic system is not just about earning money. But it can improve the family's economy. And most importantly can reduce global warming, and protect the environment. Through hydroponic plants, people can also get hygienic, fresh and green vegetables. Bekasi City Government, currently has facilitated buyers of hydroponic vegetable plants.

The use of hydroponics in Bekasi City at the Villa Jaka Setia Housing, South Bekasi can be seen in the image below:



Figure 3.3 Hydroponics at the Villa Jaka Setia Residence, South Bekasi and a Hydroponic Harvest Review by the Mayor of Bekasi Tri Adhianto.

4. Vertical Farming



Figure 3.4 Vertical farming in Harapan Jaya, North Bekasi

Basically vertical farming is almost the same as the vertical farming method. It's just that, the difference is only on the wall as a planting medium. Plants that are suitable for using this method include tomatoes, chilies, tubers and various types of ornamental plants. This method is very easy, because it can be applied to the walls of our homes or backyards that are exposed to sunlight.

3.3.1.2 Community Food Barns

The food barn began to develop as a food institution in the Bekasi City area. Food barns have a social function in accommodating food production and overcoming food shortages during famine. As we know that barns have been able to overcome community food problems when there is a food shortage in order to support community food security.



Figure 3.5 Mayor of Bekasi Tri Adhianto Tjahjono (third from right) inaugurated a vineyard on social and public facilities land Grand Prima Bintara

Figure 3.5 shows that the Bekasi government is encouraging people to stay productive in the midst of the pandemic. The government helps in terms of capital to the formation of business cooperatives as long as people are willing to put in the effort. Citizens' productivity through new

businesses is considered to help the government in efforts to recover the economy in the midst of the downturn due to the COVID-19 pandemic.

The Bekasi City Government appreciates residents for their brilliant ideas so that they are able to develop new alternative businesses that can improve the economic level of the community, especially in Bekasi City. Food barns in the region can also overcome food insecurity conditions of marginal areas/land so that there is a shortage of crop yields. The food barn functions as a community food reserve to anticipate disasters due to climate change so that it has an impact on rising food prices and decreasing people's purchasing power and the level of community welfare. The realization of community food barns in Bekasi City has been centered in 7 food barn units located at the Al Barkah Grand Mosque, Bekasi Square, Pondok Cipta Bintara Housing, Bumi Dirgantara Permai Jatiasih Housing, Hamlet Zamrud Housing, Jatimulya Grand Mosque, Baitul Ma' Mosque and Housing Grand Prima NCO.

Community food barns can move people to carry out social activities so that they can lighten the burden of other communities who have not experienced economic recovery. The collection of food barns can be pioneered from individuals, communities, even mosque congregations to corporations. The community can also initiate food barns at home, mosques, offices, and others as a medium for collecting food. This movement can be a stimulus to restore the uncertain economy after the pandemic. The Mayor of Bekasi fully supports this movement by inviting Bekasi residents to be philanthropists starting from their own neighborhood by providing the best food aid.

3.3.2 Food Security in the Fisheries and Livestock Sector

The direction of fisheries and livestock development in Bekasi City has 2 main objectives.

1. Increasing people's purchasing power which includes:
 - Improving the quality of the labor force of breeders and fish farmers
 - Increased access to capital for farmers and fish farmers
 - Increased business partnerships for farmers and fish farmers
 - Increased market access for farmers and fish farmers
 - Increased added value of post-harvest fish products
 - Increasing the role of economic institutions
 - Increased job and business opportunities
 - Increased meat production
 - Increased egg production
 - Increased milk production
 - Increased consumption fish production
 - Increased animal protein from livestock

- Handling zoonotic diseases
 - Monitoring of food and PAH and fish yields
2. Efforts of the Department of Fisheries and Livestock in Fulfilling Minimum Service Standards for Food Security
 - a. Availability and food supply
 - Increasing the business capacity of fish and livestock cultivators through the assistance of fish and livestock
 - Facilitating investors and banks in investing in fishery and animal husbandry
 - development of fish hatchery areas and livestock nurseries
 - b. Food Distribution and Access
 - Monitoring information on prices of fishery and livestock products on a regular basis
 - Facilitate the marketing and promotion of fishery and livestock products for the community
 - c. Diversity and Food Safety
 - Increasing the diversification of processed fish and livestock products through the assistance of processing facilities and infrastructure
 - Supervision and development of Parenting PAHs and HPAHs (Safe, Whole, Healthy and Halal)
 - Vaccination and treatment of animal and fish diseases
 - d. Handling food insecurity
 - Livestock and fish assistance as well as aquaculture training for RTSM to overcome food insecurity and nutrition in poor communities

IV. CONCLUSION

Based on the results of research in the field regarding the implementation of the Sustainable Development Goals on Food Security in Facing Global Climate Change in Bekasi City, it can be concluded:

1. Bekasi City is the third largest metropolitan city in Indonesia which is also the most densely populated city in Indonesia. The Bekasi area which is in the form of low land plus land conversion causes the city of Bekasi to be hit by hydrometeorological disasters every year

in the form of annual floods in many areas, this is also influenced by global climate change. Bekasi City has become a food consumer city because 95% of food production does not meet the needs of the community due to land conversion, limited human resources in agriculture, and the use of modern agricultural technology that is not optimal.

2. In implementing the SDGs on food security in the face of global climate change, Bekasi City seeks to:
 - a. Carry out food diversification based on local resources
 - b. Carry out Urban Farming efforts for agricultural, livestock and fishery cultivation on narrow urban areas
 - c. Application of hydroponic, aquaponic, vertiminaponic, and vertical garden farming technologies.
 - d. Always provide stimulus, counseling and assistance to farmers
3. The strategic role of Urban Farming that has been implemented can increase the amount of food available to the people of Bekasi City and allow vegetables, fruits and other products to be safe, healthy and fresh for urban consumers.
4. Community food barns in Bekasi City are the use of yards or vacant land in an area that is managed individually or in groups and can meet the availability and need for food in the form of carbohydrates, vegetables, protein in this case fish or livestock.
5. The direction of fishery and livestock development in Bekasi City has two main objectives, namely Increasing people's purchasing power and Fulfilling Minimum Service Standards for Food Security

REFERENCES

- Ahdiat, A. (2022, maret 22). *Ketahanan Pangan Indonesia Masih Kalah dari Singapura*. Retrieved from databoks: <https://databoks.katadata.co.id/datapublish/2022/03/22>
- Ahdiat, A. (2022, maret 3). *Ketahanan Pangan Indonesia Melemah pada 2021*. Retrieved from databoks: <https://databoks.katadata.co.id/datapublish/2022/03/22/ketahanan-pangan-indonesia-melemah-pada-2021>
- Bapennas. (2020). Tujuan Pembangunan Berkelanjutan (Tpb)/Sustainable Development Goals (SDGs). *Pedoman Teknis Penyusunan Rencana Aksi*.
- European Comission. (n.d.). *sustainable land use (greening)*. Retrieved from Agriculture and Rural Development: <https://agriculture.ec.europa.eu>

- Gayatri, N. F. (2017). *Analisis Faktor-Faktor Yang Mempengaruhi Ketersediaan Beras Di Kota Malang*. Malang.
- Gunawan, C. I. (n.d.). *Pengaruh Luas Panen, Produktivitas, Konsumsi Beras, Dan Nilai Tukar Petani Terhadap Ketahanan Pangan Kota Brebes*. Semarang.
- Hapsari, G. D. (2019). Upaya Indonesia Dalam Pengendalian Tembakau Untuk Mencapai Target 3.A Sustainable Development Goals. *Social Polites*.
- Haryanto, H. C., & Prahara, S. A. (2019). *Perubahan Iklim, Siapa Yang Bertanggung Jawab*. Yogyakarta.
- Indah, N., & Setyaningsih, A. (2020). Kebijakan Food Security : Arah Kebijakan dan Strategi Ketahanan Pangan Pemerintah Indonesia. *Journal of Governance Innovation*.
- Irhamasyah, F. (2019). Sustainable Development Goals (SDGs) dan. *Jurnal Kajian Lemhannas RI*.
- Jayani, D. H. (2020, september 4). *Rata-Rata Konsumsi Kalori dan Protein Masyarakat Indonesia di Atas Standar Kecukupan Gizi*. Retrieved from databoks: <https://databoks.katadata.co.id/datapublish/2020/11/04>
- kontributor. (2016, oktober 25). *Perwakilan FAO Indonesia dan Timor Leste, Mark Smulders: Pemerintah Indonesia Harus Bersiap Diri*. Retrieved from Tabloid Sinar Tani: <https://tablroidsintartani.com/detail/indeks/komoditi>
- Nadya, B.-B. (2016). *Analisis Tingkat Ketahanan Pangan Rumah Tangga Tani*. Medan.
- Nurkhayani, E., & Setyowati, E. (2015). Ketahanan Pangan di Indonesia. *Buletin Jendela Data dan Informasi Kesehatan*.
- Nursholihien, M. (2021). *Pengaruh Pola Ruang Dan Perubahan Iklim Terhadap Hasil Air Di Daerah Aliran Sungai Bialo*. Makassar.
- PEMERINTAH KOTA BEKASI. (n.d.). *Sejarah Kota Bekasi*. Retrieved from <https://bekasikota.go.id/>: <https://bekasikota.go.id/pages/sejarah-kota-bekasi>
- Pratama, N. B., Purnomo, E. P., & Agustiyara. (2020, Juli 19). *Sustainable Development Goals (SDGs) dan Pengentasan Kemiskinan Di Daerah Istimewa Yogyakarta*. Retrieved from Sosiohumaniora: <https://jurnal.ustjogja.ac.id/index.php/sosio>
- Pratiwi, N., SANTOSA, d. B., & Ashar, K. (2018). Analisis Implementasi Pembangunan Berkelanjutan Di Jawa Timur. *Jiep-Vol. 18*.
- Priasmoro, M. R. (2021, agustus 26). *BMKG Jelaskan Penyebab Kemarau di Indonesia yang Disertai Bencana Hidrometeorologi*. Retrieved from Liputan6:

<https://www.liputan6.com/news/read/4641621/bmkg-jelaskan-penyebab-kemarau-di-indonesia-yang-disertai-bencana-hidrometeorologi>

Putri, F. A. (2012). *strategi adaptasi dampak perubahan iklim (climatechange) terhadap sektor pertanian tembakau*. Surakarta.

Rahardjo, M. (2011, Juni 10). *Metode Pengumpulan Data Penelitian Kualitatif*. Retrieved from UIN Maulana Malik Ibrahim Malang: <https://uin-malang.ac.id/r/110601/metode-pengumpulan-data-penelitian-kualitatif.html>

Selvitri, S., Haliza, N., & Ismail, K. (2021). *Pembangunan Berkelanjutan Tujuan 2: Mencapai Nol Kelaparan*. Retrieved from ResearchGate: <https://www.researchgate.net/publication/352568494>

Strategi Ketahanan Pangan Nasional Guna Meningkatkan Kemandirian dan Daya Saing Ekonomi dalam Rangka Ketahanan Nasional. (2014). *Edisi 17*.

Suryawan, A. (n.d.). *Mewujudkan Zero Hunger (Ketahanan Pangan) di Kabupaten Kepulauan Talaud*.

Syah, P. K. (2021, maret 6). *Pemkot Bekasi tingkatkan ketahanan pangan selama pandemi*. Retrieved from Antara Jabar: <https://jabar.antaranews.com/berita/248318/pemkot-bekasi-tingkatkan-ketahanan-pangan-selama-pandemi>

Wolff, E., Fung, I., & Hoskins, B. (2020). *Climate Change Evidence and Causes*. *royalsociety*.

