Food Sovereignty in Indonesia: Challenges and Strategic Responses in the Agricultural Sector

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Abstract. Indonesia faces significant food security challenges, stemming from a complex interplay of socio-economic and environmental factors. This article examines Indonesia's food security challenges and the multifaceted strategies required to address them. Despite its agricultural potential, Indonesia grapples with issues such as dependence on food imports and the impact of climate change. The government's role in ensuring access to quality food and the socio-cultural aspects of food consumption are discussed. Strategies include improving agricultural infrastructure and policies, promoting technological adoption among farmers, and fostering collaboration between government, private sector, and academics. The article emphasizes the need for integrated efforts to enhance Indonesia's food sustainability and secure the well-being of its population.

Keywords: agriculture, food security, Indonesia

1. Introduction

Food holds an essential role in human life. As the primary source of energy and nutrition, food functions not only to meet basic physiological needs but also plays a significant role in various aspects of life. Quality and nutritious food supports healthy growth and development, enabling individuals to maintain good physical and mental health. On the other hand, limited access or unbalanced food consumption can lead to various health issues, including malnutrition, obesity, and chronic diseases. Additionally, food has a notable social and cultural role, forming the core of many traditions and celebrations, and serving as a means to strengthen social and family ties. In a broader context, food security is closely related to the economic and political stability of a country, as well as sustainable development. The relationship between food sufficiency and political stability is reinforced by Maxwell (2013), who posits that food sufficiency is related to the political stability of a country. Political instability in a country can be caused by a lack of food, and conversely, a lack of food can also be caused by political instability.

The government has a significant role and responsibility in fulfilling the food needs of every resident within its territory. This responsibility goes beyond merely providing a sufficient amount of food; it also demands the quality and diversity of food, sustainable accessibility, and affordable prices for all layers of society. This requires the government to adopt policies that support domestic food production, regulate food safety standards, and ensure that efficient and fair distribution mechanisms are accessible to all. In times of crisis or shortage, the government must be prepared with emergency strategies to avoid starvation and nutritional deficiencies. Moreover, the government's role in nutrition education and public awareness cannot be

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overlooked, as it forms the basis for healthy food choices and a sustainable lifestyle. Therefore, meeting food needs becomes the foundation of national welfare and an important indicator of effective and responsive government governance.

Indonesia, with its biodiversity and tropical climate, has great agricultural potential in creating food security. This archipelagic nation is blessed with fertile lands that support the production of a variety of commodities. However, challenges such as climate change, land conversion, and urban expansion have put pressure on the agricultural sector. This writing aims to describe and analyze the concept and policies of food security, the condition of food security in Indonesia, the challenges faced in realizing food security, and various alternative solutions that can be taken to achieve food security in Indonesia, especially in the agricultural sector.

2. The Concept of Food Security and National Food Security Policy

The concept of food security is remarkably versatile, as evidenced by the numerous interpretations that have emerged from scholarly research and policy deliberations. Initially postulated nearly half a century ago amidst the global alimentary crises of the early 1970s, the notion of food security has since undergone significant evolution. Approximately two decades ago, the literature boasted nearly 200 varied definitions of food security (Maxwell and Smith, 1992 as cited in Peng and Berry, 2018), underscoring its highly contextual nature. By the mid-1990s, food security had emerged as a critical concern, with its implications spanning from individual needs to global ramifications.

The World Food Summit of 1996, convened at the headquarters of the Food and Agriculture Organization (FAO) in Rome, Italy, reached a consensus that food security is achieved when all people, at all times, have both physical and economic access to sufficient, safe, and nutritious food that satisfies their dietary requirements and preferences for an active and healthy lifestyle. This delineation emphasizes four core dimensions of food security: the physical availability of food, the economic and physical accessibility to food, the proper utilization of food, and the stability of the aforementioned dimensions over time (FAO, 2008). This definition was further refined in "The State of Food Insecurity 2001" to articulate food security as a condition wherein all individuals consistently have physical, social, and economic access to adequate, safe, and nutritious food that aligns with their dietary needs and preferences for a vigorous and wholesome life (FAO, 2002).

The outcomes of the 1996 World Food Summit, also known as the Rome Declaration, have provided a foundational framework for the Government of the Republic of Indonesia in formulating the Food Act No. 7 of 1996. In this legislation, food security is defined as a state in which food needs for households are met, reflected in the availability of an adequate quantity and quality of food that is safe, evenly distributed, and affordable. However, with the evolving dynamics of the country's internal and external environments, the legislation was deemed no longer suitable, prompting the Indonesian government to enact Food Act No. 18 of 2012, superseding the previous statute. The new law characterizes food security as a state in which the food needs of the country down to the individual are fulfilled, mirrored by the provision of food that is ample in quantity and quality, safe, diverse, nutritious, evenly distributed, affordable, and in harmony with religious beliefs and cultural practices, thus supporting a healthy, active, and sustainable way of life. This updated definition enriches and expands upon the scope of the 1996 definition by incorporating individual needs and aligning with religious and cultural beliefs of the nation. Substantively, the definition of food security in Act No. 18 of 2012 is in concert with the FAO's definition, which posits food security as a condition where every person at all times

has the physical and economic means to access sufficient, safe, and nutritious food to meet their daily nutritional requirements in accordance with their preferences.

In line with Food Act No. 18 of 2012, the Government of The Republic of Indonesia also issued The Government Regulation of The Republic of Indonesia No. 17 of 2015 concerning Food Security and Nutrition. In this regulation, food security is defined the same as in the Food Act no. 18 of 2012. In Government Regulation No.17 of 2015, it is stated that the Food Security System includes three subsystems, namely:

a. Food Availability with the main source of provision being production domestic and food reserves;
b. Food affordability for the entire community, both physically as well as economics;
c. Utilisation of Food to improve the quality of Food consumption and Nutrition, including the development of Food safety.

When comparing the food security system in Government Regulation No. 17 of 2015 to the definition of food security in the 1996 Rome Declaration and Act No. 18 of 2012, it found that the two legal bases have different components. While government regulation No. 17 of 2015 states that the food security component includes the food availability, affordability, and utilization, the Rome Declaration and Law No. 18 of 2012 define food security as including the food availability, affordability, utilization, and sustainability component. Even though those two legal bases has the same definition related food security, however, they have different determined component.

3. Food Security Condition

Indonesia, as an agrarian nation with a large population, currently faces significant challenges in the realm of food security. The national food agency reports that the eastern regions of Indonesia generally exhibit a lower Food Security Index in comparison to the western parts of the country. Factors contributing to this lower index include insufficient regional food production relative to demand, high prevalence of stunting among toddlers, limited access to clean water, and a high percentage of the population living in poverty. A comprehensive approach to addressing food vulnerability is essential and must be prioritized in these areas, taking into account the specific causes (National Food Agency, 2022).

Amid fluctuating global dynamics and pressing environmental issues, the state of food security in Indonesia warrants special attention. In 2022, Indonesia's food security status ranked 63rd out of 113 countries with the score 60,20, falling below the global average with the score 62,16. Within the ASEAN nations, Indonesia holds the 4th position after the Global Food Security Index, which comprises four main components: affordability, availability, quality and safety, as well as sustainability and adaptation. Of the four components, the highest score is in the food affordability component with a score of 81.4. The lowest score is in the food sustainability and adaptation components. Meanwhile, the food availability component has a score of 50.9 and the food quality and safety component have a score of 56.2 (Central Bureau of Statistics of Indonesia, 2023).

Food security index measurements are also carried out by the National Food Agency to determine the food security index in each province and district/city. The Food Security Index by the National Food Agency uses food security pillar indicators which include food availability, food accessibility and food utilization. Based on the results of measuring the Food Security Index in 2022, the five provinces with the highest food security are Bali, Central Java, Special Region of Yogyakarta, South Sulawesi and Gorontalo (Central Bureau of Statistics of Indonesia, 2023). Meanwhile, the province with the lowest food security index is Papua,

followed by West Papua, North Maluku, Maluku, and Riau Islands (Food Security Agency, 2022).

Indonesia remains heavily reliant on the import of agricultural products. The nation's dependency on rice imports, a staple food commodity, reached 3.06 million tons throughout 2023. This figure represents an increase of 613.61% compared to 2022. These imports originated from Thailand, Vietnam, Pakistan, and Myanmar. The largest portion of rice imports in 2023 came from Thailand, with a volume of 1.38 million tons, accounting for 45.12% of the total rice imports. Meanwhile, imports from Vietnam totaled 1.15 million tons (37.47%), Pakistan 309 thousand tons (10.1%), Myanmar 141 thousand tons (4.61%), and other countries combined for 83 thousand tons (2.7%) (Annur, 2023). Besides rice, Indonesia also imports soybean, vegetables, corn, and tobacco (Nurawan, et al; 2024).

4. Challenges in Realizing Food Security

Food security in Indonesia is a complex challenge that continues to be a primary focus in national development efforts. This large archipelagic nation faces various challenges, including fluctuations in agricultural production due to climate change, uneven access to food across regions, and issues with nutritional quality in food consumption. Additionally, increasing population growth, urbanization, and socio-economic transformation also contribute to the dynamics of food security. Broadly, the challenges of food security in Indonesia can be categorized into supply and demand sides. On the supply side, these are divided into production and distribution processes.

4.1. Supply

From the supply side of food provision, there are serious challenges due to various factors affecting, among the most important, the production and distribution aspects.

4.1.1. From the Production Side:

a. Small-Scale Agricultural Enterprises

One issue in realizing food security is the prevalence of small-scale agricultural operations, as reflected by the large number of individual agricultural businesses and household farming operations compared to legally incorporated agricultural companies. There are as many as 29.342.202 Individual Agricultural Enterprises, 28.419.398 Agricultural Household Enterprises, and 5.705 Agricultural Companies with Legal Entity (Indonesian Central Bureau of Statistics, 2023). These small-scale farming operations have low productivity and weak access to good agricultural practices, cultivation systems, and modern technology. They also face problems with efficiency and a low capacity of human resources (Arifin, 2013 in Silfia, et al., 2018).

b. High Rate of Land Conversion

Land conversion in Indonesia is closely related to the high number of productive-age population, the high demand for housing, and national infrastructure development. According to Indonesian National Representative Council (2023), the conversion of agricultural land reaches 90.000 to 100.000 hectares per year.

c. Uneven Agricultural Facilities and Infrastructure

Generally, agricultural facilities and infrastructure refer to seeds, fertilizers, equipment and machinery, irrigation systems, market access, and other supporting infrastructure. Individual

farmers and household farmers are groups that face many problems related to access to agricultural facilities and infrastructure, especially fertilizer and seeds.

d. Climate Change

Climate change causes increased temperatures and drought periods, fluctuations in rainfall, changes in pest and disease patterns, and changes in water availability (Hidayat, 2022). These conditions pose challenges to the agricultural sector and require innovation in agricultural production engineering.

e. Innovation and Technology Dissemination Not Yet Widely Applied

The use of agricultural technology is still a challenge of its own. The use of digital technology in agricultural cultivation reaches 46,84% of all farmers and is dominated by farmers over the age of 39 (Indonesian Central Bureau of Statistics, 2023). The majority of farmers view agricultural technology as expensive and unaffordable. Some even disregard the use of technology, preferring manual agricultural practices.

f. Slow Farmer Regeneration

The number of farmers in 2019 reached 34,58 million and in 2018 was 35,70 million. Of this number, young farmers aged 20-39 years only make up 8% or about 2,7 million people. Approximately 30,4 million or 91% are over the age of 40 (Taufiqurrohman and Jayanti, 2022). In 2023, the number of farmers in Indonesia is 27.799.280. Of this number, 42,39% are aged 43-58 years, 27,61% are aged 59-77 years, 25,61% are aged 27-42 years, and 2,24% are over 78 years old (BPS, 2023).

g. High Levels of Food Loss and Waste

This occurs during the harvest, post-harvest, and distribution processes due to not yet optimal post-harvest technology in preventing food loss and issues related to agro-logistics (road infrastructure, cooling facilities, geographic conditions as an implication of an archipelagic nation and extensive territory, etc.) (Food Security Agency, Ministry of Agriculture, 2019).

4.1.2. From the Distribution Side:

a. Uneven Food Access

Uneven food access refers to economic and physical factors. Economic factors are closely related to the community's purchasing power, while physical factors are related to geographical conditions in remote areas.

b. Inadequate Infrastructure

This refers to infrastructure related to connectivity between regions, especially roads. Road conditions in Indonesia are 42,6% in good condition, 25,49% in moderate condition, 16,01% damaged, and 15,9% severely damaged (Hakim, 2023). Poor road conditions lead to an increase in goods depreciation.

c. Concentrated Regional Production Distribution

Food crop cultivation in Indonesia is concentrated in certain regions according to their geographical conditions. For example, in Java Island, the majority is used for food crop agriculture, especially rice, while in Sumatra Island for plantation commodities like palm oil (Indonesian Central Bureau of Statistics, 2023). This leads to high costs and risks in transporting from cultivation centers to markets spread across Indonesia.

d. Lengthy Distribution Chains

Generally, small-scale agricultural enterprises distribute their agricultural produce to middlemen, who then sell it to central markets, and then to markets closest to residential areas. In contrast, legally incorporated agricultural enterprises can directly target their produce to partners such as hotels and hospitals.

4.2. Demand

a. High Population Growth

The population of Indonesia is around 278 million people in 2023. This number is up 1,05% from the previous year (Annur, 2023). High population growth impacts the increase in the amount of food needed and the conversion of agricultural land for housing, which can threaten national food security.

b. High Rate of Urbanization

The rate of urbanization in Indonesia is between 1 – 1,5% per year in 2008 (Ministry of Public Works and Public Housing, 2008). The Central Bureau of Statistics predicts that by 2025, the number of residents living in cities will reach 60% of the total population of Indonesia (Safitri and Pradipta, 2023). This condition results in a shortage of human resources in the agricultural sector, which in turn will reduce agricultural productivity and threaten food security.

5. Alternative Strategies in Realizing Food Security

Considering the various challenges faced by Indonesia in realizing food security, there are several alternative solutions that can be undertaken. Solutions for achieving food security do not just revolve around increasing production but also involve the management of sustainable natural resources, the application of modern agricultural technologies, and the renewal of policies that support the welfare of farmers.

5.1. Alternative Strategies Implemented by the Government

a. Strengthening Land Conversion and Regional Spatial Planning Policies

Land conversion policy is closely related to regional spatial planning policy. In Indonesia, land can be owned by individuals who have full rights over its use. This has caused difficulties for the government in reducing the rate of land conversion and regulating land use. The government can implement affordable tax levies for the agricultural sector.

b. Equitable Distribution of Agricultural Facilities and Infrastructure

The government can adopt a community-based approach by involving local communities in the planning and management of agricultural facilities and infrastructure to ensure that their specific needs are met.

c. Policies to Reduce Population Growth

Policies to reduce population growth can decrease the rate of agricultural land conversion and help provide sufficient food for the community. In Indonesia, the concept of "Two children are enough" was advocated by the government during the New Order era, supported by the implementation of the "Family Planning" program. However, both were ineffective in reducing population growth due to weak government regulation. The government can impose sanctions such as higher Education and Health costs for the third child and subsequent children while providing free Education and Health for the first and second children.

d. Strengthening Rural Economic Development Policies

Well-implemented rural economic development policies can optimize the management of village potential, which in turn will expose the village's appeal and create employment opportunities for local communities, increasing the income of the community and local government. Further, this will also suppress the rate of urbanization and attract youth to remain in the village and manage the agricultural sector.

e. Campaign on the Importance of Agriculture in Food Sovereignty

The government has a great ability to campaign for the importance of the agricultural sector at various levels of society so that the profession of farmers and rural areas are not looked down upon. Government officials can create and participate in various agricultural activities, even if only ceremonially, such as harvest ceremonies, large-scale harvest activities, and others.

f. Development of Agricultural Insurance

Crop failure is a condition often faced by farmers in the era of climate change with uncertain weather. The development of agricultural insurance is a progressive step that provides a safety net for farmers against the risk of crop failure due to factors such as extreme weather, pests, and plant diseases. Through agricultural insurance, farmers can minimize financial losses and maintain the continuity of their farming businesses in the face of climatic uncertainty and natural challenges. The government and financial institutions can collaborate to provide affordable insurance schemes with reasonable premiums, so that the agricultural insurance program can be accessed by small and medium-scale farmers, supporting the economic stability of the agricultural sector and its contribution to national food security.

g. Enhancing International Cooperation

International cooperation can be conducted in terms of technology exchange and best practices that ultimately can strengthen the country's position in facing global challenges such as climate change and food market instability. These activities must also involve farmer representatives where the government selects qualified farmers to participate in the program with a guarantee that they will disseminate the knowledge and skills obtained to the farming groups.

h. Increasing Education and Training for Farmers

The increase in education and training for farmers must be mandatory to ensure all farmers follow and gain knowledge. Therefore, these activities can be linked to ease in obtaining various needs for agricultural production.

5.2. Alternative Strategies Implemented by the Farmers

a. Strengthening Farmer Group Networks

Strengthening farmer group networks is very beneficial in various ways, such as enabling farmers to get fertilizer and seeds at cheaper and uniform prices. Through this network, farmers can determine the selling price of their products and have strong bargaining power in determining prices and marketing products.

b. Use of Modern Agricultural Technology

Adoption of modern agricultural technology is an important step towards increasing efficiency and productivity in the agricultural sector. The use of more sophisticated agricultural tools and machinery allows farmers to increase the scale and efficiency of their operations, while the application of Geographic Information Systems (GIS) and information technology facilitates more accurate decision-making based on data, such as land mapping and soil condition analysis. These innovations not only contribute to increased crop yields and reduced labor costs but also support more sustainable and environmentally friendly farming practices.

c. Good Post-Harvest Processing

Good post-harvest processing plays a crucial role in improving the quality and shelf life of agricultural products, which directly contributes to the reduction of harvest loss and waste. Techniques such as proper drying, appropriate storage, and effective packaging ensure that harvests remain fresh and retain their nutritional value while minimizing damage during distribution. Through the implementation of efficient post-harvest processing practices, farmers

and distributors can enhance food supply stability and optimize the economic gains from each harvest.

d. Enhancing Knowledge and Skills

Farmers should participate in training and education programs to improve their knowledge and skills in the latest agricultural techniques and effective farm management.

e. Utilizing Integrated Farming Systems

Utilizing Integrated Farming Systems, such as combined agriculture-livestock or agriculture-fisheries, is a holistic approach that optimizes the use of resources on a single land. Through this system, the by-products of one sector can be used as inputs for another, such as using agricultural waste for animal feed or using animal manure as organic fertilizer for crops.

5.3. Alternative Strategies Implemented by Other Parties

Other parties, in this case, are academics and the private sector. Academics can do several things, including research and innovation in agriculture to develop new technologies, better crop varieties, and more efficient and environmentally friendly farming methods. In addition, academics can also build cooperation with farmers and the agricultural industry to implement research findings and ensure that new technologies and methods are accessible and widely used. Furthermore, they can also provide education and training for students and the public about sustainable farming practices, nutrition, and natural resource management, as well as actively participate in the development and advocacy of public policies that support food security, based on scientific evidence and research.

The private sector can contribute to the development of sustainable agricultural technology, strengthening partnerships with farmers, and marketing local agricultural products. The private sector and farmers can create partnerships based on medium and long-term contracts to support farmer stability. The private sector can also play a role in marketing local agricultural products to increase consumer awareness and preference for local products.

6. Conclusion

Food security in Indonesia is a multifaceted problem that requires an integrated approach and strong collaboration between all sectors to achieve sustainable food security for all residents. Food security is an important challenge as the country faces issues such as dependence on rice imports, land conversion, and challenges due to climate change. To overcome these challenges, a comprehensive and collaborative strategy is needed. The government needs to strengthen agricultural infrastructure and policies, as well as offer support through insurance and education programs for farmers. Farmers are expected to adopt more advanced agricultural technologies and practice effective post-harvest management. Meanwhile, contributions from academics and the private sector are very important to encourage innovation and implementation of sustainable technology as well as building strong partnerships with farming communities. Through this synergy, Indonesia aims to create strong and sustainable food security for its entire population, furthermore, community welfare can be achieved which ultimately contributes to economic and political stability.

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