Strengthening Food Security in Sustainable Economic Development Efforts

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Abstract. Food security is a crucial element for sustainable economic development in Indonesia. This comprehensive article provides an in-depth analysis of the concept of food security, including the obstacles and methods for strengthening food security in the pursuit of sustainable economic development. The article employs qualitative research methods, gathering data through literature reviews from various research studies. Based on the findings of these studies, it can be deduced that Indonesia's rising population growth is the primary issue concerning food security, as it leads to an increase in food demand and consumption. Nevertheless, this issue is met with several challenges, such as unequal food distribution, climate change, agricultural land degradation, and a waning interest in the agricultural sector among younger generations. These challenges necessitate the adoption of the right strategy, which includes infrastructural development, agricultural diversification, expansion of new agricultural land, and the implementation of technology, innovative crop management techniques, and training and education for farmers to boost agricultural productivity.

Keywords: Food security; Sustainable Economic Development

1 Introduction

Food security is defined by the Food and Agriculture Organization (FAO) as a situation in which all individuals, without exception, can physically, socially, and economically access sufficient, safe, and nutritious food according to their needs and food choices, enabling a lifestyle who is active and healthy. This definition is in line with the definition of food security formulated in Law No. 18 of 2012 concerning Food which states that "food security is a condition where food is met for the country and individuals, which is reflected in the availability of sufficient food, both in quantity and quality, safe, diverse, nutritious, equitable and affordable and does not conflict with religion, beliefs and culture of society, to be able to live healthy, active and productive lives sustainably." The concept of food sovereignty and independence which is also included in the Food Law has perfected this definition because if food sovereignty and independence are not sufficient, then food fulfillment will be carried out through imports.[1]

According to FAO, the concept of food security includes four complex interrelated dimensions. First, the dimension of food availability (availability) refers to the quantity and overall availability of food, both locally produced and imported. Second, price stability is a critical aspect of maintaining food security because price fluctuations can affect food accessibility for the community. Third, the dimension of food access (access) highlights the importance of the ability of individuals and households to obtain sufficient food physically and economically. Finally, utility (utilization) refers to the human body's ability to utilize available

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food optimally, including its nutritional aspects and nutritional value. By considering these four dimensions holistically, a more comprehensive understanding of food security in society can be formed.

The definition of sustainable development is stated in Law No. 32 of 2009 concerning Environmental Protection and Management which states "sustainable development is a conscious and planned effort that combines environmental, social and economic aspects into development strategies to guarantee the needs of the environment as well as the safety, capabilities, welfare, and quality of life of future generations present and future generations." The goals of sustainable development have been formulated and agreed upon by 193 UN (United Nations) member countries, including Indonesia. These goals are called SDGs or Sustainable Development Goals which focus on environmental, economic, and social aspects. There are 17 main points highlighted in the SDGs, including people, planet, prosperity, peace, justice, and partnership.[2]

The principles of sustainable development are the basis for national economic development. The history of Indonesia's development confirms that the food security problem has a direct impact on economic stability, especially in controlling the level of inflation and the cost of living for the community.[3] Instability in food supplies can cause significant price fluctuations, resulting in inflationary pressures that harm the national economy and increase the cost of living for the people. In addition, food security also has a deep impact on national political stability.[3] Food shortages or rising prices can create social and political tensions, triggering protests or riots that can disrupt the country's political stability and security. Therefore, efforts to strengthen food security are not only important for the economic welfare of society but also for maintaining political stability and national security.

However, food security in Indonesia still often faces various problems. The most common problem is the large population and positive and increasing population growth which results in increasing consumption levels.[4] In addition, even though Indonesia has great potential in food production, such as rice, corn, and soybeans, uneven distribution and lack of logistics infrastructure can hamper people's access to food. Additionally, climate change and natural disasters often disrupt food production, resulting in supply instability and price increases. Factors such as rapid urbanization, changing consumption patterns, and land degradation also pose challenges in maintaining food security in Indonesia. Therefore, there needs to be a joint effort between the government, private sector, and society to overcome this problem using the right strategy.

Every country has a responsibility to carry out economic development to improve the standard of living and welfare of its population.[5] Food security is a crucial challenge in the context of sustainable economic development throughout the world. Not only to meet immediate food needs but also as an effort to strengthen food security, we must also pay attention to economic aspects that can encourage long-term resilience. By adopting food-focused policies and inclusive economic development strategies, communities can face food challenges while strengthening their economic foundations. Integrating food policy with economic strategy will enable the adoption of a holistic approach that not only improves access to food but also increases incomes, creates jobs, and strengthens local economic infrastructure. Thus, efforts to strengthen food security will not only provide short-term benefits in terms of food availability but will also form a strong basis for sustainable and inclusive economic growth.

2 Methods

In this article, a qualitative descriptive approach is used to explore the actual context and situation faced by the government in managing food security as a foundation for sustainable economic development. The choice of this qualitative descriptive approach was based on the need to understand in depth the challenges faced and the strategies implemented to strengthen food security. As stated by Kumastuti and Khoiron in their book, qualitative descriptive research collects data in the form of words or images and does not involve data in the form of numbers.[6]

Data was collected through a comprehensive literature review, utilizing relevant sources to explore various challenges and strategies related to sustainable economic development. The findings and analysis of the literature study are then presented in detail and descriptively, using an inductive approach to conclude the results expressed in this article. The approach allows a profound understanding of the dynamics and complexity of food security as an integral part of sustainable economic development.

3 Result and Discussion

3.1 Challenges of Strengthening Food Security in Indonesia

3.1.1 Inequality in Food Distribution

The government needs to meet people's needs by providing public services, such as building infrastructure to help mobility. Infrastructure development that connects regions and facilitates mobility can support agricultural development. Through the development of adequate infrastructure, the government can facilitate people's access to food and increase the availability of affordable food.[7] Adnan, Surjono, and Sutikno's research found that overall, using the EDA (Exploratory Data Analysis) approach, infrastructure has a positive correlation with food security. The research conducted by Adnan, Surjono, and Sutikno said that the price of rice was directly proportional to the condition of road damage in Malang Regency.[8] Another research was conducted by Tantawi in West Sumatra with the finding that road transportation infrastructure and irrigation had a significant positive influence simultaneously on food security.[9] Thus, it can be said that differences in infrastructure between one region and another can give rise to imbalances in food distribution, thereby affecting food security in the region concerned.

Even though Indonesia is an agricultural country with the majority of its population dependent on the agricultural sector, unequal food distribution results in limited access to food, especially in rural areas or places with minimal access. It results in high levels of food insecurity in remote and hard-to-reach areas and the price of certain foods becomes more expensive due to higher shipping costs, while food waste often occurs in urban areas. Food waste can reduce the economic value of food, so reducing food waste can be a strategy to strengthen food security.[10] The existence of this inequality can result in the community's demand for food not being completed.

3.1.2 Climate change

Climate change has an impact on various things, one of which is the impact on agriculture. The United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) identified that Indonesia is a country that is vulnerable to disasters due to climate change.[11] Harvian and Yuhan's research found that climate change has a strong negative influence on food security, meaning that the worse the climate change, the more food security in a region will decrease.[12] Research by Nurhaliza et al. states that climate change such as long dry seasons and excessively high rainfall will cause losses to agriculture because the quantity and quality of harvests will decrease.[13]

Climate change has become a serious threat to food security in Indonesia. Extreme weather phenomena such as floods, droughts, and heat waves, which are increasingly occurring, have damaged harvests and threatened the sustainability of food production. Farmers, especially those in disaster-prone areas, face increasing risks in managing their agricultural land.

3.1.3 Agricultural Land Degradation

Agricultural land degradation is a problem of increasing concern in Indonesia. The conversion of agricultural land to housing, industry, or infrastructure has resulted in the loss of thousands of hectares of fertile land every year. The decrease in agricultural area due to land conversion results in a decrease in food production growth.[3] Research conducted by Prasada and Rosa in the Special Region of Yogyakarta found that the conversion of agricultural land caused a significant decrease in rice production with a loss of 18,359.27 rice.[14]

Unsustainable agricultural practices also pose a serious threat to agricultural productivity in Indonesia. Excessive use of pesticides not only pollutes the environment and threatens human health, but can also disrupt the balance of natural ecosystems that support plant growth. Additionally, excessive excavation of land for agriculture can cause detrimental soil erosion. Soil erosion removes the fertile layer of soil and reduces land fertility, which in turn reduces agricultural yields and can cause poverty and economic losses for farmers. Apart from that, eroded soil can also cause water pollution and reduce water quality which harms human health and overall environmental sustainability.

3.1.4 Declining Interest of the Young Generation in the Agricultural Sector

Based on data from the Central Statistics Agency (BPS), in 2023 the age range of millennial farmers with an age range of 19 to 39 years will be 6,183,009 people or 21.93% of the total number of farmers in Indonesia and with an age range under 19 years old as many as 5,612 people or 0.02%. Farmers in Indonesia are still dominated by farmers with an age range of more than 39 years old, namely 10,595,434 or 37.58%. BPS revealed that the increasing age of farmers is a challenge for the agricultural sector.

Research by Setiani, Pratiwi, and Fitrianto revealed that the interest of Indonesia's young generation to be involved in the agricultural sector is decreasing due to the perception that the agricultural sector is less promising for the future.[15] Factors such as low incomes, lack of access to modern agricultural technology, and lack of opportunities for interesting career development have caused many young people to switch professions to other sectors. It has the

potential to result in a shortage of young workers in the agricultural sector. According to BPS, Indonesia's growth rate in 2023 is 1.13%. Population growth from year to year results in augmenting demand for food. However, at the same time, employment in the agricultural sector was decreasing. Lack of fulfillment of demand will result in Indonesia's decision to import commodities and could result in a balance deficit.[15]

3.2 Strategy for Strengthening Food Security in Sustainable Economic Development Efforts

3.2.1 Infrastructure Development

Infrastructure development is one of the key steps in increasing food security in Indonesia. Indonesia faces challenges related to inequality in food distribution, especially between rural and urban areas. Existing infrastructure gaps, especially in terms of transportation and storage, complicate the equitable distribution of food across the region. Investment in better transportation infrastructure is an important strategy to overcome food distribution challenges. By improving transportation networks, especially in rural areas that are often isolated, agricultural products can reach consumer markets more quickly and efficiently. This will help ensure adequate food availability throughout the country, as well as reduce the possibility of food shortages.

Apart from transportation infrastructure, the development of modern storage infrastructure is also important. An efficient and modern storage system can reduce post-harvest losses that often occur due to problems such as damage and rot. With good storage infrastructure, food quality can be maintained for longer, ensuring the availability of high-quality food on the market. Furthermore, infrastructure that supports food distribution and storage must also be equipped with adequate technology. The use of information and communication technology (ICT) can help monitor and manage food supply chains more efficiently. Integrated information systems can provide accurate data on supply and demand, enabling more timely and effective decision-making.

By developing adequate infrastructure, Indonesia can overcome several key challenges in food security, including unequal distribution and post-harvest losses. Investment in infrastructure is a strategic step that will have a positive impact on strengthening food security and supporting sustainable economic development in Indonesia.

3.2.2 Agricultural Diversification

In facing the challenges of climate change, agricultural diversification strategies are the right choice. Agricultural diversification plays an important role in efforts to increase food security and reduce the risks associated with dependence on certain types of crops. Apart from relying on the production of main food crops such as rice, corn, and soybeans, expanding production to various other types of crops such as vegetables, fruit, and spices is a strategic step. By diversifying agriculture, the availability of diverse food can be guaranteed. The various types of crops grown provide the possibility of alternative food sources when one crop experiences crop failure. For example, if rice plants experience crop failure due to weather factors or pest attacks, farmers still have other crops such as vegetables and fruit as alternative food sources.

Agricultural diversification also provides economic benefits for farmers. By planting a variety of crops, farmers can create a more stable source of income. For example, when the price of one type of crop is low, farmers can still earn income from selling other crops that have high market demand. This helps improve the economic welfare of farmers and reduces their vulnerability to price fluctuations of certain commodities.

Apart from an economic perspective, agricultural diversification also contributes to the sustainability of the agricultural ecosystem. By planting various types of plants, farmers can improve soil fertility and reduce the risk of decreasing soil fertility due to monoculture. Different plants require varying nutrients from the soil, which helps maintain the balance of soil nutrients and reduces the need for chemical fertilizers.

Thus, agricultural diversification is not only about creating diverse food availability but also about creating an agricultural system that is more stable, economically profitable, and environmentally sustainable. This is one of the key strategies in strengthening food security and improving farmer welfare and the sustainability of the agricultural system as a whole.

3.2.3 Expansion of New Agricultural Land

In facing the challenge of agricultural land degradation due to conversion or decreased land fertility, expanding new agricultural land is the right solution. The expansion of new agricultural land is a controversial strategy, but it is an important strategy in the face of population growth and increasing food demand. Therefore, land expansion must be carried out sustainably and based on environmental conservation principles, to prevent land degradation and damage to natural habitats.

It is necessary to ensure that land expansion is conducted in an orderly manner and sustainable. It means not only paying attention to current needs but also considering future needs. The approach involves selecting appropriate locations for land expansion, and prioritizing lands that do not have high conservation value or vital ecosystem functions. Apart from that, we must also pay attention to aspects such as preserving biodiversity and protecting natural habitats which are important for the continuity of the ecosystem. By paying attention to these aspects, expanding agricultural land can be an effective strategy in facing challenges.

3.2.4 Increasing Agricultural Productivity

Increasing productivity is the key to increasing food production without having to sacrifice more land or natural resources. Things that can be done as a strategy to increase agricultural productivity are as follows:

1. Use of modern agricultural technology.

   The application of modern agricultural technology is the key to increasing productivity. For example, using superior plant varieties that are resistant to disease, pests and extreme weather conditions. Apart from that, the use of organic fertilizers that are environmentally friendly and efficient in improving soil quality and increasing crop yields is also essential. Efficient and innovative irrigation systems are also an important part of modern technology that helps in optimal crop water management.

2. Farmer education and training.

   Providing education and training to farmers on more efficient farming practices is an important step in increasing overall productivity. Training can include the use of modern technology, good land management, and effective fertilization and irrigation strategies. By understanding and implementing best practices in agriculture, farmers can increase their crop yields without sacrificing more natural resources.

3. Innovation in plant management techniques.

   The development and implementation of innovative crop management techniques is also an important step in increasing agricultural productivity. It can include the use of agroforestry techniques, smart crop rotation, and intercropping to improve soil fertility, reduce erosion, and increase overall crop yields. By applying these techniques, farmers can maximize the productivity of available land without having to sacrifice environmental sustainability.

4 Conclusion

There are many food security problems that pose challenges in efforts to strengthen them, such as unequal distribution of food due to inadequate and uneven infrastructure, climate change, degradation of agricultural land due to land conversion, and declining interest of the younger generation in the agricultural sector. These challenges need to be faced by adopting the right strategy because strengthening food security is an important prerequisite for achieving sustainable economic development in Indonesia.

Strategies that can be adopted to overcome these challenges are through infrastructure development, agricultural diversification, expansion of new agricultural land, and increasing agricultural productivity. Indonesia can overcome the challenges of food security and achieve food freedom and sustainable economic development for all its people. With these steps, Indonesia can become a country that is not only economically prosperous, but also environmentally and socially endurable.

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