

SIX PILLARS OF GLOBAL FOOD SECURITY IN INDONESIA: A SYSTEMIC LITERATURE REVIEW

M Fauzan 'Azhima¹, Shannaz Mutiara Deniar², Tubagus Chaeru Nugraha³, Salahudin⁴

^{1,2,4}International Relation Department, Universitas Muhammadiyah Malang, Indonesia

³Linguistic Departement, Arabic Literature, Universitas Padjadjaran, Bandung, Indonesia

Email: azhimaaaaaagmailcom@webmail.umm.ac.id; shannazdeniar@umm.ac.id; t.chaeru@unpad.ac.id; salahudinmsi@webmail.umm.ac.id

ABSTRACT. Indonesia's national food security is still in an unstable condition. Indonesia is currently a food-importing country. Therefore, the purpose of this study is to describe the six pillars of global food security in Indonesia. To achieve the objectives of this study, a systematic literature review method was used. The data used were 254 scientific articles sourced from the Scopus database. To review the articles, the Vosviewer application was used. The results of the study reveal that food availability, food access, food utilization, food stability, food agency, and food sustainability are the six main pillars that must exist in every country to support their food security. This research contributes to two main things. First, the description of the six pillars of food security contributes to the development of the roadmap of Food Security. Second, the description of the six pillars of food security acts as the direction of Indonesia's food policy. However, in this study, the articles used were only sourced from the Scopus and Mendeley databases, so the findings of this study have not comprehensively described the issue of the six pillars of global food security in Indonesia. Future research needs to use scientific articles sourced from other reputable international databases, such as the Web of Science and Pilaronds Scholars.

Keywords: food security; global food security; food policy; systematic literature review method; reputable international databases

ENAM PILAR KETAHANAN PANGAN GLOBAL DI INDONESIA: TINJAUAN LITERATUR SISTEMIK

ABSTRAK. Ketahanan pangan nasional Indonesia masih berada pada kondisi yang belum stabil. Bahkan, saat ini Indonesia sebagai negara pengimpor pangan. Oleh karena itu, tujuan dari penelitian ini adalah untuk mendeskripsikan bagaimana enam pilar dari ketahanan pangan secara global di Indonesia. Agar tujuan penelitian ini tercapai, maka digunakan metode *systematic literature review*. Adapun data yang digunakan 254 artikel ilmiah yang bersumber dari data base scopus. Review artikel menggunakan aplikasi Vosviewer. Hasil dari penelitian mengungkapkan bahwa ketersediaan pangan (*availability*), akses pangan (*access*), pemanfaatan pangan (*utilization*), stabilitas pangan (*stability*), agensi pangan (*agency*), dan keberlanjutan pangan (*sustainability*) merupakan enam pilar pokok yang harus ada dari setiap negara untuk menyokong ketahanan pangan negaranya. Pada penelitian ini berkontribusi pada dua hal pokok. Pertama, deskripsi enam pilar ketahanan pangan ini berkontribusi pada pengembangan *roadmap* dari *Food Security*. Kedua, deskripsi enam pilar ketahanan pangan sebagai arah kebijakan pangan Indonesia. Hanya saja, pada penelitian ini, artikel yang digunakan hanya bersumber dari database scopus dan mendeley sehingga temuan penelitian ini belum menggambarkan secara komprehensif tentang isu enam pilar ketahanan pangan global di Indonesia. Penelitian berikutnya perlu menggunakan artikel ilmiah yang bersumber dari database internasional bereputasi lainnya, seperti *Web of Science* dan *Pilaronds Scholars*.

Kata kunci: Ketahanan pangan; ketahanan pangan global; kebijakan pangan; metode tinjauan pustaka sistematis; database internasional terkemuka

INTRODUCTION

Research on food security in Indonesia has been widely carried out, including research by Indah (2020), Hadi (2020), Herjito (2021), and Salasa (2021). According to Indah P. & Setyaningsih (2020), food security is a continuous fulfillment of needs so the Indonesian government requires the right policy directions and strategies. This was confirmed by Hadi et al. (2020) that food was a fundamental need for humans and its fulfillment was a human right guaranteed by the 1945 Constitution. Furthermore, according

to Herjito and Setiawan, (2021), until now, Indonesia's national food security is still in an unstable condition. On the other hand, according to Salasa (2021a), Indonesia is currently known as a food-importing country. Therefore, food security research is needed based on the latest paradigm.

The development of the issue of food security has become a topic that is frequently discussed in various parts of the country (Zhao et al., 2022). Food security refers to the circumstances and actions required to ensure that food is free from potential biological, chemical,

and other contaminants that could affect, injure, or otherwise jeopardize human health while remaining consistent with local religion, belief, and cultural practices. In recent years, there have been many studies on the issue of food security (FS) crisis which focused on various issues and topics. Jennifer (Clapp et al., 2022a) explained that the definition of FS had developed and changed over the past fifty years, including a discussion of the four pillars of food security, namely: availability, access, utilization, and stability of food. Mehrjerdi & Amiri (2022) in their research on food security stated that national security was a complex and ambiguous concept that emerged after World War II. However, food security has become very important in all countries. Food security is one of the factors that affect national security. According to Amin et al. (2022), it is not only the government that must prevent a food security crisis, but the community can also help build food sovereignty and self-sufficiency.

Although research on food security has been widely carried out, there has never been any research using the Systematic Literature Review (SLR) analysis method with article sources from the Scopus database. In addition, there isn't much research that combines the Vosviewer application analysis approach with the article review method. Therefore, by collecting data from 254 scientific articles retrieved from the Scopus database, this study focuses on paper reviews using the SLR analysis approach. This scientific approach to SLR analysis includes advantages and strengths for comprehending research problems based on prior studies.

Attempts are made to respond to the research question, "How is the evolution of research on the food security dilemma in the globe," at the heart of this study. Utilizing the SLR analysis method and article analysis procedures with the Vosviewer program, content analysis qualitative research is the research methodology used. This study advances science in general, and government-related food security science in particular, as well as Indonesian food policy development. Therefore, the aims of this research are (1) to describe the six pillars of food security broadly; and (2) to describe how the six pillars of food security in Indonesia are.

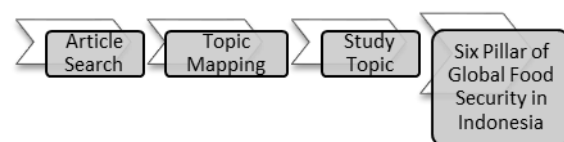
METHOD

The analytical method used in this research

is the Systematic Literature Review (SLR) method (Rethlefsen & Page, 2022). Research using the SLR method is of course not just reading and taking notes on articles. However, the library data obtained from various journal articles from the Scopus database are processed so that they become scientific works that can be useful for readers.

The SLR research approach uses topic mapping, article searches, and study topics drawn from all accessible research to do the research (Rethlefsen et al., 2021). This approach allows researchers to methodically review and identify journals that, during each procedure, adhere to preset steps. (Triandini et al., 2019). Look at the following schematic:

Schematic 1. Process of Article Review Activities

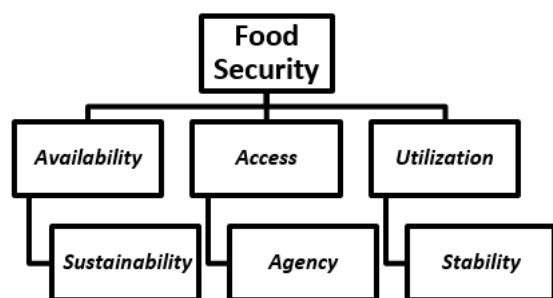


The researchers searched for journal articles using the keywords "food security crisis" based on the stages mentioned above. Data was gathered by cataloging all the papers found for this study report. 254 journal articles from the Scopus database were used in this study, and the Vosviewer tool was employed for article analysis. The chosen publications were those with comparable research, and they were then evaluated and condensed. The research's findings were then transformed into a thorough discussion for this article.

RESULTS AND DISCUSSION

Food Security Journal Article Review

Some of the food security (FS) findings taken from the Scopus database are (1) analysis of FS articles from year to year; (2) the countries of origin of the authors of the FS articles and the number of articles; (3) data analysis of authors who have major contributions to the topic of food security (FS). The findings of the data using the Vosviewer application on food security (FS) are in the forms of (4) a network cluster of links between one topic and another; and (5) density, showing the number of research that has been conducted on each topic. Figure 1 regarding food security articles by year of publication is as follows.

Schematic 2. Six Pillars of Food Security

It is evident from Schematic that the capacity to have adequate food for necessities constitutes the initial definition of food availability. Food supply and availability are related through production, exchange, and distribution. The selection, breeding, and management of crops, the breeding and management of livestock, the harvest, and land ownership and use are only a few of the variables that affect food production. Temperature and rainfall variations can have an impact on the yield of crops. Other demands frequently conflict with the utilization of land, water, and energy for food production. Because of desertification, salinization, and soil erosion brought on by unsustainable agricultural methods, land used for agriculture may become settled or disappear altogether.

Second, the term “access to food” relates to a person’s and a household’s financial resources, the quantity of food provided, as well as their personal preferences. According to the United Nations, poverty-related access barriers rather than a lack of food are frequently to blame for hunger and malnutrition. Food diversity and security for smallholder households are impacted by market access in many different ways. According to research conducted in Ethiopia by (Usman & and Callo-Concha, 2021), the majority of smallholder farmers there are subsistence farmers with little access to markets. According to multivariate regression analysis, households that are farther from the market’s center not only eat a less varied diet but also spend less money on food than those that are closer to the market’s center. Both the effect of market access on household consumption and food diversity through income, as determined by the Household Food Insecurity Access Scale (HFIAS), and the association between market access and food security do not approach statistical significance. Greater market access, on the other hand, seems to have pushed smallholder households to depend more on market purchases than on their produce to broaden household consumption. Infrastructure investment to develop rural road

connections is a quick way to promote market accessibility. This will lower transaction costs and improve the welfare of smallholder farmers and communities. Sen (2017) found that famine circumstances have occurred throughout history even when food was freely accessible in markets because a sizable population was unable to get that food. A person’s right to food is impacted by a variety of elements, including the availability of arable land, their employment situation, their ability to possess and sell goods, their assets, and their social standing.

Third, food safety affects how food is handled, prepared, and cooked in a household or community can affect how it is consumed. Access to health facilities also affects food utilization because an individual’s health affects how food is digested. For example, the presence of parasites in the intestines can reduce the body’s ability to obtain certain nutrients, thereby reducing the quality of food utilization by individuals. Education on nutrition and food preparation can have an impact on the quality of food use because the presence and spread of diseases are influenced by sanitary standards as well. El-Bilali et al. (2020) mentioned in their research that dietary and food use changes could result from changes in agricultural systems brought on by climate change.

Fourth, the 1982 report of the FAO Director-General made clear the significance of supply stability as the core of the notion of food security. According to Erokhin & Gao (2020), For individuals to have access to adequate nutrition, the food supply chain’s stability is crucial. Due to the COVID-19 outbreak, this stability has been put through one of the most rigorous stress tests ever since early 2020. The pandemic, which started as a health issue only, evolved into an economic danger to world food security due to lockdowns, economic downturns, trade restrictions, and growing food inflation. Since individuals in emerging and less developed nations are more susceptible to hunger and malnutrition, it is reasonable to believe that a new health crisis has affected these regions. However, because of the recent COVID-19 problems, little research has been done on how macroeconomic changes affect food insecurity.

Fifth, the idea of an active “food citizen” is relevant at both the individual and communal levels (Fernandez-Wulff, 2019; Vivero-Pol, 2017). Ensuring that everyone has access to the food system requires cultural adjustment, respecting human dignity, reducing their fear

of hunger, and increasing autonomy and self-determination of their involvement in the food system. (Maxwell, 1990, 1996). When a collective agency is improved through more participation and voice in deciding food and farm development efforts and food system governance, better food security and nutrition outcomes are also attained at the community level. (Bezner Kerr et al., 2019; Crocker, 2008).

Sixth, to maintain, promote, and sustain a resilience system, it is necessary to integrate it with ecosystems, livelihoods, society, and the political economy. Through more significant legislative initiatives like the Sustainable Development Goals, sustainability is emphasized (SDGs). SDG 2 particularly draws a connection between sustainability and food security in its call to action to “Eliminate hunger, achieve food security and improve nutrition, and succeed in sustainable agriculture programs.” The UN Food System Summit in 2021, which aims to make progress on all 17 SDGs and calls for “healthier, more sustainable, and more equitable food systems,” has sustainability as one of its key objectives (Nations, 2021). Therefore, in research conducted by Berry et al. (2015), when evaluating the long-term pillar of time for food security, sustainability must be taken into account. From this vantage point, preserving nutritional well-being and health while guaranteeing sustainability for future food security can be accomplished in large part by focusing on sustainability, including in Indonesia (Nugraha, 2019).

The Six Pillars of Food Security in Indonesia

Based on the results of research review articles from the Scopus and Mendeley database related to the six pillars of global food security, it can be seen that by research conducted by Clapp et al. (2022b), availability, access, utilization, stability, security and sustainability of food are six important pillars that need to exist in every actor or a country to maintain the food security of every country, including Indonesia.

The relation between food security (FS) research in Indonesia and the 6 pillars of food security is that the problem of food security in Indonesia has many challenges. According to Suryana (2014), the issues and obstacles to achieving sustainable food security in Indonesia are multifaceted, encompassing economic, social, political, and environmental factors. In another study conducted by (Harvian & Yuhan, 2021), it was stated that Indonesia was a country that had food security most vulnerable to the effects of climate change in the Southeast Asian region,

which could be concluded that Indonesia was a country that was vulnerable to food security.

Given its abundance of natural resources, Indonesia shouldn't generally have issues with food availability. This is to research conducted by Sepriyani (2020) that Indonesia has a very high potential for food availability, including cereals, palms, and tubers, which flourish in practically every region of the country. According to Wahyu Adhi Saputro et al. (2021), food availability and adequate nutrition are important things to do to fulfill food. This increase in availability will later affect indicators of the value of food security. Research conducted several years ago by DKP (2014) stated that Indonesia produced around 31 million tonnes of rice annually and consumed slightly above this production level; where imports were generally less than 7% of consumption. Furthermore, private distribution networks that run efficiently help strengthen food security throughout Indonesia.

However, two years later in another study conducted by (Kariyasa & and Suryana, 2016), it was stated that efforts to increase food availability in building sustainable food security were increasingly difficult to do. This was related to the problems of agricultural land conversion and climate change, which worsened the performance of agricultural production and the volatility of food prices. This unfavorable trend did not provide incentives for farmers to invest in agricultural technology development. Other research related to the issue of food security in Indonesia conducted by Christyanto & Mayulu (2021) stated that at that time, people on the border regions of Kalimantan Island (Sanggau, Nunukan, and Malinau Regencies) still relied on Malaysia for their food security, particularly for livestock and agricultural items due to their ample supply, simple accessibility, and reasonable prices. Food distribution is included in the component of the success factor of the food availability pillar. The lack of an even distribution of food to all regions in Indonesia is an obstacle to the success of Indonesia's food availability pillar.

Food access is one of the most crucial elements that must exist to preserve the stability of food security, which is also tied to it. According to research conducted by Arif et al. (2020), it was said that Indonesia has made tremendous progress in the creation of social protection programs to ensure that the poor and vulnerable have appropriate access to food. However, in another study conducted by Salasa (2021b)

regarding food access in Indonesia, it was stated that Indonesia was known as an agricultural country with abundant natural resources, but this condition did not necessarily mean that Indonesian people could access food easily and cheaply. Indonesia is currently known as a food-importing country, which shows that Indonesia has not succeeded in providing access to food to maintain food security in Indonesia.

Food utilization is also important for food security in Indonesia. In research conducted by Dewi Rahmawati et al. (2021), Sangkuriang catfish were grown in Cikakak Village, Banjarharjo District, but their use has been restricted to being sold to clients directly or being sold on the market unprocessed and for daily consumption. Integrated Service Post (Posyandu) cadres, catfish farming business actors, and housewives from the Family Welfare Program (PKK) were the focus of a community service program that was put in place in Cikakak Village to increase the inventiveness and economic value of catfish as a result of cultivation. In other research conducted by Kiyat et al. (2019), The inclusion of bromelain in regional Indonesian foods may enhance their nutritional content and quality, according to information about the usage of the enzyme. Local dishes like embus tempeh, virgin coconut oil, and dumbo catfish fish sauce can all be made with bromelain. The addition of bromelain can raise the pH and water-soluble nitrogen content of gembus tempeh. Bromelain can, however, boost the yield of products like dumbo catfish fish sauce and virgin coconut oil. To fulfill the food utilization pillar to maintain food security, Indonesia has been quite creative in utilizing its food resources. Therefore, Indonesia can be categorized as successful in fulfilling the third pillar of food security, namely food utilization.

Regarding stability in the context of food security, this concept encompasses the preceding 3 elements of this security, namely the availability, access, and utilization of food within a specific time frame. Based on the previously mentioned information, it can be said that of the three pillars of global food security, Indonesia has only met the requirements of one, namely the pillar of food use, proving that it has not adhered to stable standards. Research conducted by Sianipar & G Tangkudung (2021) emphasized that transitional, seasonal, or chronic (permanent) conditions could all have an impact on how stable food security is. Food may not be accessible for a while in food security during the transition. Drought and

natural catastrophes can destroy crops and have an impact on food production. Access to food can be impacted by civil unrest. Food insecurity may result from market instability's increase in food prices. The workforce's use of food might be impacted by other variables including lost productivity or labor due to disease outbreaks. Because food is only available throughout specific seasons, the growing season has an impact on seasonal stability. Food insecurity that is permanent or chronic is ongoing and persistent. The ultimate level of food ownership or control is food stability.

In previous research conducted by Clapp et al. (2022b), it had been explained that agency was an important element in food security both at the individual and community levels. Agency is a crucial component because it describes people's and communities' ability to have some influence over their own lives and contribute meaningfully to governance processes. Today, it is widely believed that this capacity is essential for addressing the widespread injustices in the food systems, such as the power disparity between the actors in those systems and the systems themselves.

Agency at the individual level has been increased in Indonesia, such as the establishment of a food bank organization. In research conducted by Minhajuel & Widiastuti (2021), it was stated that a food bank was an organization that aimed to save food that had the potential to be wasted due to the amount of food produced by a surplus industry by collecting and distributing food to hunger relief charities. Surabaya has a social enterprise that forms a food bank to address the problem of food waste that occurs in the city of Surabaya, namely *Garda Pangan*. *Garda Pangan* is present to help overcome the problem of food waste by collecting excess food from restaurants, hotels, bakeries, catering, agricultural land, to weddings through the food rescue program and distributing it to groups of people who have problems in the economy and find it difficult to meet their daily needs.

According to an FAO and UN study, the COVID-19 pandemic epidemic has the potential to plunge more than 50 million people into abject poverty within the pillar of food security at the collective level of the organization. This affected the worldwide food crisis, which threatened nations if the appropriate actions were not taken right away. According to research conducted by Lasminigrat & Efriza (2020), in response to the potential for this food crisis, President Jokowi

built a national food barn in Central Kalimantan. Indonesia's food stocks were expected to be sufficient after the pandemic thanks to the national food barn's completion in the coming years.

In the case of food sustainability, Indonesia is a maritime country and this can be used as an axis for food sustainability in Indonesia. In research conducted by Nikawanti (2021), it was claimed that Indonesia had aspirations to become the world's maritime axis because the potential for its marine natural resources was quite significant. Indonesia's strength as an archipelagic nation supports its ambition to become the world's maritime axis. Indonesia is an archipelago with a variety of natural resources, including food resources. Food security reflects the prosperity of a country. The country of Indonesia has great potential in building food security so it is expected to be able to have food strength to fulfill the nation's sustainable welfare. Indonesia's food strength is not only derived from agrarian natural resources but also from maritime resources. Indonesia's marine wealth is very great, starting from the potential of fish and marine resources in it.

However, research conducted by Setyawati et al. (2021) stated that our maritime world has a bad reputation due to the abundant oceans and impoverished fishermen inside. In actuality, Indonesia's abundance of marine resources does not always ensure the well-being of fishing communities, particularly traditional fishermen. According to Ali (2020), the existence of traditional fishermen has been defeated by modern fishermen so traditional fishermen are still in the cycle of poverty so there is a need for empowerment efforts to improve the welfare of traditional fishermen. The causes of poverty among traditional fishermen include limitations in education, lack of technology, limited access to capital, limited marine resource potential, and intense competition. This poverty has an impact on their slum environmental conditions and the sustainability of food security in Indonesia. The attached stigma of poor fishermen in rich seas shows that Indonesia is still not successful in overcoming the welfare of the actors fulfilling the pillars of food sustainability, which shows that the food sustainability pillar in Indonesia has not yet been realized.

CONCLUSION

Based on the findings of a survey of papers about food security (FS) from the Scopus database, it

can be said that every country should prioritize having the six pillars of food security. The six pillars include stability, agency, sustainability, access, utilization, and availability. Second, in Southeast Asia, Indonesia is the nation with food security that is most susceptible to the effects of climate change, indicating that Indonesia is a country with weak food security. Only two of Indonesia's six national food security pillars, namely food agency and food utilization, have been fully implemented. As a result, Indonesia still does not have food security that complies with the six principles of global food security. Due to the limited sources of this research where the articles used are only sourced from the Scopus and Mendeley databases, the research findings have not comprehensively described the dynamics of food security in Indonesia. In the next study, the researchers suggest the need to use other scientific articles sourced from reputable international databases, such as Web of Science and Pilaronds Scholars.

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