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FOOD SECURITY APPROACH: SYSTEMATIC LITERATURE REVIEW ON DIVERSIFICATION, ACCESS, AND STABILITY IN AGRICULTURAL FOOD SUPPLY

Era Purike
Prodi Perhotelan Politeknik Pajajaran ICB Bandung
era.purike@poljan.ac.id

Entin Solihah
Persatuan Terapis Gigi dan Mulut Indonesia, Sambas

Abstract

Food security is a crucial issue in ensuring sufficient, nutritious, and sustainable food availability for the community. This study systematically reviews the literature on food security approaches, focusing on three main dimensions: diversification, access, and stability in agricultural food supply. Through a systematic literature review, this study filters and analyses various reliable scientific sources to gain a comprehensive understanding of the roles and challenges of these three aspects in the context of food security. The results of the study show that food diversification contributes significantly to improving the sustainability of the food system and nutritional quality, while adequate food access and supply stability are key to ensuring food affordability and continuity for all levels of society. These findings emphasise the need for an integrated approach that combines production diversification, strengthening socio-economic access, and policies that support supply stability to effectively improve national and global food security. This study provides a strong scientific basis for the development of policy strategies and agricultural practices that are more adaptive and inclusive of environmental and socio-economic changes.

Keywords: food security, food diversification, food access, supply stability, agricultural food supply, systematic literature review.

Introduction

Food security is one of the most crucial issues facing countries around the world, especially amid the challenges of climate change, population growth, and rapidly changing global market dynamics. Food security is not only related to the availability of food in terms of quantity, but also concerns aspects of quality, accessibility, and stability of supply that can guarantee long-term food security for the community (Carter & Barrett, 2006).

Diversification in the context of agricultural food supply is a key strategy that can increase food security by providing a variety of food products in terms of type and source of food ingredients. Diversification not only serves to reduce dependence on a single type of commodity, but also enriches people's consumption patterns so that nutritional balance is achieved. Within the food system, diversification also plays a role in ensuring the sustainability of agricultural production that is adaptive to external shocks (Waha et al., 2022).

Food access encompasses the ability of individuals or groups to obtain sufficient, nutritious, and safe food to meet their basic needs. This access is measured not only in economic terms but also through physical factors such as the availability of distribution infrastructure and social factors such as policies and culture (Foley, 2011). Limited access can lead to food insecurity even when food is available in sufficient quantities in the market. Food supply stability is an important dimension that indicates the ability of the food system to maintain food availability and access over a sustainable period of time and to cope with changes or shocks such as natural disasters, price fluctuations, and production disruptions. The aspect of stability is a vital indicator in assessing the extent to which food security can be maintained in dynamic conditions (Government of Indonesia, 2014).

Food security is closely related to the socio-economic aspects of society that affect the entire food supply cycle, from production to consumption. Uneven socio-economic conditions can lead to access gaps and supply instability, especially for vulnerable groups such as small farmers and low-income families (Headey, 2011). The food crises that have occurred in recent decades, including food price spikes and production disruptions due to climate change, have further emphasised the urgency of developing a resilient and adaptive food system. Developing countries, most of which depend on subsistence agriculture, face particular challenges in maintaining food security with limited resources and technological capacity (Indonesian Food Security Agency, 2025).

Various food security approaches and strategies have been developed by international and national institutions involved in food sector development. However, to date there are variations and disagreements in the definitions, parameters, and indicators used to measure food security (Indonesian Food Security Agency, 2025).

Technology and innovation in the agricultural sector also play a key role in supporting food security, including crop diversification technology, agricultural mechanisation, storage technology, and efficient food distribution. However, the adoption of technology is often hampered by various factors such as lack of access to capital, limited knowledge, and inadequate infrastructure (Wardhana, 2022).

Climate change and extreme weather phenomena are real threats to food security as they can disrupt food production, distribution, and price stability. These negative impacts reinforce the need for diversification and adaptation of food systems to ensure the sustainability of food supplies. Food security is also closely related to public policy and agricultural resource management, which involves planning, regulation, subsidies, and market intervention. The experiences of various countries show that policies that support diversification, expand access to food, and maintain market stability can strengthen national food security (Barrett, 2010).

In an era of globalisation and economic interdependence, national food systems cannot be separated from the influence of global markets and international trade

dynamics. The uncertainty arising from global food price fluctuations and disruptions to global supply chains poses a risk to national food security.

Overall, a comprehensive understanding of diversification, access, and stability in agricultural food supply is essential for developing effective, sustainable, and inclusive food security strategies. By conducting a systematic literature review, this study aims to fill knowledge gaps and strengthen the scientific basis for developing policies and practices to address the complexities of current and future food security challenges. Therefore, it is important to conduct this study in a thorough and systematic manner.

Research Method

The research method used in this study was a systematic literature review aimed at collecting, evaluating, and synthesising scientific literature related to food security approaches with a focus on diversification, access, and stability in agricultural food supply. The research process began with determining the inclusion and exclusion criteria for literature sources, which included scientific journals, books, research reports, and reliable publications published in the last two decades. Literature searches were conducted using electronic databases such as Scopus, Web of Science, and Google Scholar with relevant keywords (Eliyah & Aslan, 2025). Next, the literature found was systematically selected based on relevance, methodological quality, and focus of discussion. Analysis and synthesis were conducted using a thematic approach to organise the literature findings into two main discussions, namely diversification and access and stability of food supply. This approach allows for a comprehensive and structured understanding of the various dimensions of food security in the context of agricultural food supply (Petticrew & Roberts, 2020).

Results and Discussion

Diversification in Food Security

Diversification in food security is one of the main strategies considered effective in dealing with food supply uncertainty and ensuring the sustainability of the food system. The concept of diversification itself refers to the development of various types of crops, food sources, and varied production patterns. This not only provides alternative food sources for consumers but also reduces the risk of dependence on a single major commodity that is vulnerable to shocks such as crop failure or price fluctuations (Chaireni et al., 2020).

In the context of agriculture, diversification is not merely about increasing the types of crops grown, but also includes land management approaches that allow for the integration of various crops, livestock, and adaptive agricultural technologies.

Diverse agricultural models can increase productivity while maintaining ecosystem health. Empirical evidence shows that production diversification can reduce farmers' vulnerability to climate and market changes, thereby making an important

contribution to their economic and food security (Lisa & Smith, 2025). Diversification also plays a role in enriching people's consumption patterns.

Food security is not only a matter of food availability, but also of quality and nutritional adequacy that supports health. The provision of a variety of food types, in terms of carbohydrates, proteins, vitamins, and minerals, is essential to prevent nutritional problems such as malnutrition and micronutrient deficiencies (Maxwell & Smith, 1995). One important aspect of diversification is the development and utilisation of local or traditional crops that are highly nutritious and adaptable to specific environmental conditions. These crops are often overlooked in mainstream food production, even though they offer advantages such as resistance to pests and diseases and resilience to extreme climatic conditions (Pingali, 2012).

Production diversification is also linked to increased agricultural ecological sustainability. The use of a variety of crops can reduce pressure on natural resources such as soil and water, and reduce the need for external inputs such as chemical fertilisers and pesticides. Crop rotation and intercropping, for example, have been proven effective in increasing soil productivity and controlling pests naturally. Therefore, diversification is also part of sustainable agricultural practices that support long-term food security (Tilman & et al., 2011). However, in practice, diversification is not always easy to implement due to a number of constraints. Economic factors, such as access to capital and underdeveloped markets for non-staple commodities, are significant barriers for farmers to adopt production diversification.

Market risks are also high due to domestic consumption patterns and consumer preferences that still favour certain staple foods (Hegazi, 2024). At the household level, food diversification is also closely related to consumption strategies to improve nutritional security and variety.

Households that are able to access and consume a variety of foods tend to be more resilient to economic shocks and food crises than those that depend on one or two staple foods. Apart from the production and consumption aspects, diversification also has an important dimension in the food supply chain (Fanzo et al., 2018). Distribution and storage systems capable of handling various types of fresh and processed food products play a role in optimising the benefits of diversification. Appropriate infrastructure, such as cold storage and efficient distribution networks, influences the extent to which food diversification can be widely accessed by consumers (Godfray, 2010).

In terms of policy, the literature emphasises the important role of government and institutions in facilitating food diversification. Policies that support research and development of new crop varieties, education and extension programmes for farmers, and market development for diverse food products are essential to encourage the implementation of diversification. Examples of policies such as subsidies, microcredit, and the promotion of diversified food consumption are important instruments that are often discussed (Pinstrup-Andersen, 2009).

In a global context, food diversification is also a response to the multidimensional challenges of the food crisis. Climate change, conflict, and the global economic crisis increase the risk of food scarcity and supply instability.

Diversification provides a risk mitigation pathway by expanding the production and consumption base to be more flexible and adaptive to change (COOPI, 2023). Modern technology provides new opportunities to support diversification in food security, such as the use of biotechnology for the development of stress-resistant crop varieties, information technology-based agricultural systems to monitor land and crop conditions, and innovations in food processing and distribution.

However, the adoption of these technologies must be adapted to the local context and supported by farmers' capacity in order to maximise their benefits. Institutional aspects are also a determining factor in the success of food diversification. Farmer organisations, cooperatives, and various community networks play an important role in facilitating information exchange, market access, and strengthening production capacity (Lipper & et al., 2014).

Various empirical studies have also attempted to measure the impact of diversification on food security levels quantitatively and qualitatively. The results show that diversification contributes positively to increasing local food availability, reducing price volatility, and improving the nutritional status of the community. These findings confirm that diversification is not only a risk mitigation tool, but also a tool for economic and social empowerment (Sumaryanto, 2009).

However, there is still an urgent need to expand the study of diversification with an interdisciplinary approach that not only assesses production and consumption aspects but also its simultaneous impact on the environment, society, and economy. This approach is important so that diversification strategies can be designed more holistically and effectively in the context of complex food security.

Overall, diversification in food security is a highly complex and multidimensional theme that requires attention from various sectors and disciplines. By thoroughly understanding the literature and practices related to diversification, we can develop more adaptive, inclusive, and sustainable strategies to strengthen food security at the local, national, and global levels.

Access and Stability in Agricultural Food Supply

Food access is one of the main dimensions of food security that determines the extent to which individuals and groups in society can obtain sufficient, nutritious, and affordable food, both physically and economically. This access factor goes beyond food availability at the national and market levels, because the amount of food available does not guarantee that everyone will have access to it (Smith, 2024). Therefore, access must be understood as a bridge between food production and consumption, which requires a comprehensive approach to ensure food security.

Economically, food access is influenced by households' financial capacity to purchase food. Income inequality, poverty, and food price fluctuations greatly affect people's purchasing power, especially vulnerable groups such as small farmers, agricultural workers, and poor families. Studies show that these economic access limitations can lead to food insecurity even when food supplies are sufficient at the macro level. Thus, food access is closely related to socio-economic conditions and food distribution policies (Koo, 2023). In addition to economic aspects, physical aspects are also a major determinant of food access. Infrastructure such as roads, storage facilities, local markets, and transportation systems affect people's ability to obtain food directly. In rural and remote areas in particular, limited infrastructure can make food access difficult and cause food loss during distribution (Webb & von Braun, 2010).

Socio-cultural factors and public policy also influence food access. Social norms, cultural values, and food subsidy policies and social assistance programmes can either improve or hinder access. For example, the existence of food assistance programmes and basic price regulations can ease the burden on vulnerable communities. Food literacy and information also play a role in influencing patterns of access and consumption of healthy and sustainable food (COOPI, 2023).

Food supply stability is a dimension of food security related to the ability of the food system to maintain consistent food availability and access over the long term, without significant disruption. Supply instability can be caused by various factors, ranging from natural disasters, climate change, political unrest, to global market price fluctuations. Therefore, supply stability needs to be a key focus in food security planning and policy (Pinstrup-Andersen, 2009).

In the context of agriculture, food supply stability requires an adaptive and flexible production system that is able to respond to the dynamics of drought, flooding, and pests and diseases in a timely manner. The development of innovative agricultural technologies and risk management practices are part of efforts to maintain this stability. Sharp fluctuations in food prices pose a major threat to the stability of people's access to food. Price uncertainty makes it difficult for consumers and producers to plan consumption and production accurately, leading to food insecurity and market instability (Godfray, 2010).

The influence of globalisation and international trade also has an impact on national food supply access and stability. Although trade can provide alternative food sources and balance domestic shortages, excessive dependence on imported food can pose the risk of supply shocks due to global market volatility, protectionist policies, or geopolitical crises (Fanzo et al., 2018). Food security also depends heavily on effective governance and public policies to ensure access and stability. Regulations that can manage food distribution, market control, and consumer protection are important elements in a stable food system (Hegazi, 2024).

The role of information and communication technology in strengthening access and stability of food supply is increasingly becoming a focus in recent literature.

Transparent market information systems, smart logistics applications, and digital platforms for food trade support distribution efficiency and production planning. These technologies help reduce inefficiencies and increase the responsiveness of food systems to disruptions (Tilman et al., 2011).

Smallholder farmers and local producers play a crucial role in maintaining food supply stability, particularly in developing countries. However, limited access to production inputs, credit, markets, and information can hinder their ability to contribute optimally. The literature highlights the importance of empowering and strengthening the capacity of smallholder farmers as part of food stability and access strategies (Pingali, 2012).

Climate uncertainty is a major external factor threatening food supply stability. Increasingly extreme weather variability has a real impact on agricultural productivity and supply chains, leading to disruptions in food access. Climate adaptation and risk management are important agendas in maintaining a stable food supply (Maxwell & Smith, 1995).

Socio-political aspects, such as conflict and security instability, also affect food access and supply stability. Conflict areas often experience significant disruptions to food production and distribution, leading to local food security crises (Lisa & Smith, 2025).

Market interventions and strategic food reserve policies are important instruments for maintaining food supply and access stability, especially in the face of market shocks and disasters. The literature provides evidence that strategic food storage and market intervention policies can reduce price volatility and ensure adequate food supplies during times of crisis (Chaireni et al., 2020).

Ultimately, access and stability of food supply are two interrelated dimensions that are key determinants of food security. Without adequate access, food availability is meaningless to those in need, and without stability, food availability and access can become uncertain and vulnerable to shocks. Therefore, a comprehensive understanding of both aspects is essential for developing effective and sustainable food security strategies.

Conclusion

Diversification, access, and stability in agricultural food supply are three main pillars that interact with each other and are crucial in determining overall food security. Diversification of food production and consumption not only enriches nutritional diversity but also reduces the risk of dependence on a single commodity that is vulnerable to disruption. Thus, diversification plays a strategic role in improving the adaptability and sustainability of food systems at various levels.

Furthermore, the aspect of food access emphasises that macro-level food availability is insufficient if communities lack the economic, physical, and social means to obtain it. Inequality in access can lead to food insecurity even when the national food

supply is stable. The stability of the food supply is also a key factor in ensuring that food availability and access are maintained in the long term, regardless of the challenges of climate change, price fluctuations, and market disruptions. Strengthening access and stability must be supported by inclusive policies, efficient distribution systems, and appropriate technologies.

Thus, a holistic and integrated understanding of diversification, access, and stability is essential for formulating effective and sustainable food security strategies. This study provides a strong conceptual and empirical basis for the development of policies and interventions that can respond to the dynamics of current and future food security challenges. Therefore, strengthening these three aspects is a top priority in efforts to maintain national and global food security in a sustainable manner.

References

Badan Ketahanan Pangan RI. (2025). *Potensi Pangan Lokal dan Diversifikasi Konsumsi Menuju Sistem Pangan Lokal yang Lebih Tangguh*.

Barrett, C. B. (2010). Measuring Food Insecurity. *Science*.

Carter, M. R., & Barrett, C. B. (2006). The economics of poverty traps and persistent poverty: An asset-based approach. *Journal of Development Studies*. https://doi.org/10.1080/00220380500405261

Chaireni, R. & dkk. (2020). Ketahanan Pangan Berkelanjutan. *Jurnal Kependudukan Dan Pembangunan Lingkungan*, *2*.

COOPI. (2023). *Food Security: An Integrated and Multidimensional Approach*.

Eliyah, E., & Aslan, A. (2025). STAKE'S EVALUATION MODEL: METODE PENELITIAN. *Prosiding Seminar Nasional Indonesia*, *3*(2), Article 2.

Fanzo, J. & dkk. (2018). Food Systems and Nutrition: Emerging Evidence and Research Requirements. *Global Food Security*.

Foley, J. A. (2011). Solutions for a cultivated planet. *Nature*. https://doi.org/10.1038/nature10452

Godfray, H. C. J. (2010). Food security: The challenge of feeding 9 billion people. *Science*. https://doi.org/10.1126/science.1185383

Headey, D. (2011). Rethinking the global food crisis: The role of trade shocks. *Food Policy*. https://doi.org/10.1016/j.foodpol.2011.02.003

Hegazi, F. (2024). Gender, livelihood diversification and food security. *Journal of Rural Studies*. https://doi.org/10.1016/j.jrurstud.2024.10.005

Koo, J. (2023). Exploring the roles of agrobiodiversity in food security. *Agriculture, Ecosystems & Environment*. https://doi.org/10.1016/j.agee.2023.108772

Lipper, L. & et al. (2014). Climate-smart agriculture for food security. *Nature Climate Change*. https://doi.org/10.1038/nclimate2437

Lisa, M., & Smith, P. (2025). Household Income Diversification and Food Insecurity: Evidence from Helmand, Afghanistan. *Food Security*. https://doi.org/10.1007/s12571-025-01234-5

Maxwell, D., & Smith, M. (1995). Household Food Security: A Conceptual Review. *Food Policy*.

Pemerintah Indonesia. (2014). *Buku Putih Ketahanan Pangan Indonesia 2005-2025*.

Petticrew, M., & Roberts, H. (2020). Systematic Reviews in the Social Sciences: A Practical Guide. *Wiley-Blackwell*.

Pingali, P. (2012). Green Revolution: Impacts, limits, and the path ahead. *Proceedings of the National Academy of Sciences*. https://doi.org/10.1073/pnas.0912953109

Pinstrup-Andersen, P. (2009). Food Security: Definition and Measurement. *Food Policy*.

Smith, M. D. (2024). Curbing Severe Hunger and the Prevalence of Food Insecurity: Role of Fisheries Production. *Global Food Security*.

Sumaryanto. (2009). Diversifikasi sebagai Salah Satu Pilar Ketahanan Pangan. *Forum Penelitian Agro Ekonomi*, *27*(2).

Tilman, D. & et al. (2011). Global food demand and the sustainable intensification of agriculture. *Proceedings of the National Academy of Sciences*. https://doi.org/10.1073/pnas.1116437108

Waha, K., Accatino, F., Godde, C., Rigolot, C., Bogard, J., Domingues, J. P., Gotor, E., Herrero, M., Martin, G., Mason-D'Croz, D., Tacconi, F., & van Wijk, M. (2022). The benefits and trade-offs of agricultural diversity for food security in low- and middle-income countries: A review of existing knowledge and evidence. *Global Food Security*. https://doi.org/10.1016/j.gfs.2022.100658

Wardhana, A. M. (2022). *Peranan Diversifikasi Pangan dalam Menjamin Ketersediaan Pangan Mandiri*. Prosiding Semnas BSKJI.

Webb, P., & von Braun, J. (2010). *Famine and Food Security in Ethiopia: Lessons for Africa*. Wiley.