

Examining the Influence of Governmental, Socioecological, and Economic Perspectives as Determinants of Food Security

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Abstract

The concept of food security has traditionally encompassed complex issues that underpin human health and development globally. Defined and categorized by scholarly researchers, food security encompasses stability, access, and availability in its shaping. These characteristics are influenced by three major pillars that determine consistent and equitable access to food: the role of governance and policy implementation, socioecological challenges, and contrasting economic systems. This paper examines how each determinant intertwines and has proven its significance in either ensuring or challenging food security on all regional, national, and international levels. Strategic leadership and policies set by governments play a pivotal role in enhancing food security in both direct and indirect methods. International examples include China and Indonesia's success in re-achieving food security via an active government that supported their agricultural industries to flourish. The socioecological approach examines how both human society and natural disasters affect the creation and maintenance of secure food systems. Pandemics and climatic catastrophes damage the most vulnerable in disproportionate ways, underlining the importance of social capital in food systems. In developing economies, social burdens like food loss become a prevalent issue due to poor infrastructure in society. In developed economies, however, patterns of a weak food system occur at the consumption stage. Economic intervention in the form of better wages, quality housing, and reduced food prices raises levels of access to healthier diets. Economic limitations, however, include foreign land investment displacements, global price changes, and insufficient food systems (e.g., food deserts, oases, swamps). All three determinants of food security align clearly with the following United Nations Sustainable Development Goals (SDGs): Goal 2 (Zero Hunger), Goal 3 (Good Health and Well-Being), and Goal 17 (Partnerships for the Goals). Furthermore, these frameworks align with the United States Department of Agriculture's (USDA) Agriculture and Food Research Initiative's (AFRI) priority of Food Safety, Nutrition, and Health. Food security is ultimately driven by inclusive and collective action among its three major determinants, grounded in the principles of the AFRI and the SDGs, with a commitment to reducing inequality and fostering resilience.

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Introduction

Food security is defined as the state of individuals' access to safe and nutritious food for normal development and growth (World Bank, n.d.). Under this notion, credible researchers have identified that determinants of food security must affect the essential pillars of availability, stability, and access to achieve or challenge a state of security within its food cycle (Timmer, 2015). Distinct pressures, specifically government, socioecological, and economic, interact in an interdisciplinary manner to shape progress toward food security within a region. Likewise, the government's involvement via a strong public presence and the proposal of timely policies is critical for creating a stable, functioning food system globally. Social structures either harmonize or experience disruptions from natural disasters, influencing the availability of food security. Finally, economic constraints or obstacles at individual and regional levels play a decisive role in determining accessibility within food systems.

These pillars can be both upheld and undermined by food systems—the networks responsible for producing and transforming food to ensure it reaches consumers. Three categorized types of food systems are prominent in this discussion: food oasis, food desert, and food swamp. Food oases refer to areas with abundant access to fresh, affordable, and nutritious food through supermarkets, farmers' markets, and other reliable sources. Food deserts, on the other hand, are geographic areas where residents have limited or no access to affordable, nutritious food, typically due to the absence of nearby supermarkets or grocery stores. Food swamps are areas oversaturated with fast food outlets and convenience stores, where unhealthy food options significantly outnumber nutritious ones (França, 2024). While the discussion of food security centers on its primary determinants, the recognition of different food systems provides a foundational context for how governmental, socioecological, and economic factors can play different roles across various living contexts.

Inequities and achievements within food systems can be viewed from the perspective of the United Nations' (UN) mission and Sustainable Development Goals (SDGs). There is particular pertinence with goals 2 (Zero Hunger), 3 (Good Health and Well-Being), and 17 (Partnerships for the Goals). All three pillars intertwine with the following goals: hunger will be prevalent when food security is challenged. Good health and well-being are not attainable without well-functioning food systems, and nations, organizations, policymakers, etc., must put forth a collaborative effort to achieve partnerships for the SDGs. Ultimately, these objectives align with the United States Department of Agriculture's (USDA) grant program, the Agriculture and Food Research Initiative's (AFRI) priority of Food Safety, Nutrition, and Health. Each determinant is categorized under AFRI's respective focus areas, and all must be effectively addressed for a region to achieve food security. Governance will ensure efficient agriculture and supplementary policies to promise higher-quality nutrition. Socioecological determinants will act as the foundation for food safety. Economic barriers or availabilities will allow individuals to prioritize their health and well-being with access to strong food systems.

This paper aims to investigate the multilayered framework of food security under governance, social and ecological well-being, and economic inputs. From the perspective of achieving or removing barriers related to availability, affordability, and stability, food security is a complex issue influenced by its underlying factors. Ultimately, each component exerts a significant impact on the overall state of food security.

Problem Statement

Categorized under the three determinants, food security reflects its clear strengths and weaknesses that differ in regional contexts. A co-dependent relationship between fixed (resistant to change) and flexible (adjustable) factors leads to prevalent challenges that limit the progression of food security. The governance and policy determinant has a higher likelihood of tackling flexible issues that require longevity. Specifically, poor agricultural management and insufficient land for food production in different countries have received direct support from their governments to resolve this hardship. However, both developing and developed nations are facing problems in socioecological and economic ties that often receive little assistance or struggle with slow progress from national support. For example, environmental catastrophes and public health crises may also impact an individual or household's economic stability in accessing an appropriate amount of nutritious food. Classified as failing to meet food security according to the three determinants, these issues remain a global problem.

Methods

Reports with credible findings utilized in the paper were derived from academic search engines provided during the program (notably JSTOR and Google Scholar). Pertinent index terms related to the selected topics were entered into the search engines, and usable literature was selected based on its relevance to the topic. The keywords, which were also searched in combinations in conjunction with Boolean operators ("or," "and"), included "food security," "food desert," "food swamp," "policy," "economics," "social," "zero hunger," "sustainability," and "determinants." Government resources and the Virginia Tech library database were also utilized. Both quantitative and qualitative data from such academic sources were used to ensure maximum accuracy across the paper. All searches and literature reviews were conducted between the periods of June 29th and July 18th, 2025.

Literature Review

The Role of Governance and Policy

Addressing food security requires coordinated management of government intervention to maintain consistent access to sufficient, safe, and nutritious food. Primarily achieved through lawmaking and effective leadership, the government plays a critical role in successfully facilitating the provision of dietary resources at regional, national, and international diplomatic levels.

For nutrient-dense offerings to reach food-insufficient populations, a well-functioning market, facilitated by the government, is essential (Timmer, 2015). Effective protocols require

institutional capacity to design, adapt, and ultimately implement policies to make food both affordable and accessible. The regulations themselves must strike a balance between short-term responsiveness to market fluctuations and long-term trends in agricultural infrastructure and institutional capacity. Furthermore, globalization has made food systems more complex and interconnected than ever in the modern world (McDonald, 2015). In response to this complication, governments act as stabilizers and intervene when markets fail to deliver affordable food. When conditions allow, governments also facilitate innovation and growth. Government funding allocation in storage facilities, irrigation, and research can lower dependency on imports and external factors, thereby increasing affordability.

Food security is unattainable without interdisciplinary executive involvement, as demonstrated across international contexts. Indonesia's rice policy from the 1970s to the 1990s acts as a promising case to illustrate how success in food security hinges on administrative capacity as much as it rests on investment and economics. In the 1980s, Indonesia achieved greater food stability and reduced hunger by investing in a coordinated network of village-level cooperatives, subsidized credit, and national food reserves (Timmer, 2015). The government's three major pillars of strong government leadership, farmer-government coordination, and rural investment yielded tangible outcomes nationwide. As a result, Indonesia's government successfully supported nearly the entire population to experience food security through easy access to affordable and high-quality rice. Indonesia's advancement is a compelling example of how government intervention can enhance food security by stabilizing agricultural infrastructure, improving access for vulnerable populations, and ensuring consistent availability of nutritious food across different countries.

China's strengthened food security is also a product of the government's intensified efforts to prioritize industries associated with food production. Although China utilized its agricultural industry as a major sector for economic growth over the decades, the nation's historical ramifications of famine for social stability in the 1950s-60s have become the cause of present-day challenges in tackling the food crisis (Dong et al., 2024). To combat this, China's central government established policy measures to tackle both direct and indirect factors that influence nationwide food security. China's National People's Congress created a five-year legislative plan for 2023-2028 with 10 laws addressing topics such as protections for arable land, governance of urban land use, utilization of water, and food security (Dong et al., 2024). Under Xi, China has also executed specific agricultural protection policies in an attempt to overcome the country's decline in arable land. The Farmland Construction Plan (2021-2030) serves as a blueprint for China's struggling agricultural production, with the government supporting farmland restoration, improving technological practices, and investing in high-quality land. This initiative, set in place, focuses on consolidating fragmented landholdings, implementing irrigation systems that save water, and mechanizing agricultural labor with modern technology. Since its execution, these action items have directly improved land productivity and lowered production costs for farmers, showing a rapid progress in China's crop yield by 17.45% (Dong et al., 2024). The increase in domestic grain production reduced China's reliance on imports, thereby decreasing China's dependency on imports and mitigating the severity of global market trends. These laws represent just a portion of the policies China has enacted to tackle food security in an integrated manner over a short timespan. Taken together, the government's involvement successfully allowed China to revive the core foundation of food security

(Dong et al., 2024). Furthermore, comparative research by Fan et al. (2023) highlights how proactive governance in agricultural investment can directly correlate with higher crop yields and poverty reduction across Asia and Sub-Saharan Africa, underscoring the global consistency of this policy-driven relationship. Well-implemented, actionable policy items similar to or in the same effort as these developments can expand availability while mitigating fixed challenges and creating a stronger foundation for self-sufficiency across countries.

While policies can create national-level improvements by directly tackling the roots of agricultural production and its impact on food security, they also play a decisive role in controlling indirect factors that determine the consumer's ability to access food. Essentially, regulatory action is a primary factor in supporting demographics that reside in socially or economically disadvantaged regions. Rapid urbanization and environmental hazards in low and middle-income countries are common challenges that exacerbate disparities for citizens who already struggle to access necessary nutrition sources (Tacoli, 2013). Without thorough assistance, these physical barriers and concerns can extend to issues such as national hunger, urban poverty, and little to no access to food markets; similarly, the International Institute for Environment and Development argues that improving food security in highly saturated or damaged regions requires multidimensional support, including salaries, housing conditions, and prices. Social protections and the recognition of local markets are also paramount for improving food security, but they are only achievable through government support (Tacoli, 2013). Therefore, it is reasonable to conclude that government support can create higher disposable income and better living conditions, increasing people's access to and purchasing power for healthier food options with the enforcement of appropriate policies. Additionally, neighborhoods with well-established government systems are more likely to have stable markets that provide their community with nutritious food. Although government aid groups may struggle to offer comprehensive assistance at times, active national involvement with efficient policies serves as the backbone for increasing food security by enhancing people's quality of life and easing the process of achieving SDG 2, Zero Hunger, for citizens across the country.

The Role of Socioecological Influences

The complex relationship between social behaviors and the consequences of natural disasters can often challenge or elevate the flourishing of food security. Socioecological difficulties can severely impair food security and contribute to volatile food access, especially in developing and vulnerable countries. Countries that are more prone to these natural hazards are more likely to face disruptions in the food supply chain, where food can be lost as it is harvested, processed, or transported, and potentially damaged or spoiled throughout a weakened distribution cycle (Fattibene & Bianchi, 2017). These complications can lead to larger-scale food loss and waste, which are tangential to nutritional vulnerability, regressing the existing food systems within the region. Food loss refers to the decrease in edible food mass in production. Food waste, on the other hand, refers to the discard of edible food at the retail and consumer levels, an issue commonly seen in developed countries (Food and Agriculture Organization, n.d.). One occurs during processes before food reaches the consumer, and the other occurs afterward. Although the two concepts differentiate at their core, both are key elements that weaken the stability and accessibility of food security.

The country's ability to overcome longstanding social challenges reflects competency in sustaining and providing necessary nutrients for its demographic. In developed nations, most food waste occurs at the retail and consumer levels due to overproduction and consumer behavior. In contrast, developing countries experience losses earlier in the supply chain due to inadequate infrastructure and technology, as mentioned above (Fattibene & Bianchi, 2017). This global imbalance contributes to staggering losses: the combined cost of food loss and waste is estimated at \$2.6 trillion annually, which includes environmental costs like soil erosion, danger to biodiversity, social costs in CO₂ emissions, and risk of conflict in developing countries (Fattibene & Bianchi, 2017). This social challenge ultimately limits the capacity of different regions to allow a resilient and streamlined food system.

“Social capital,” a concept that examines the bonds, bridges, and linkages of relationships between people, is a facet of sociological association that also heavily influences food security (Paul et al., 2009). Different considerations, such as race, culture, and health, all influence social capital, which can dictate a specific demographical community's ability to access sufficient amounts of nutrition-dense food. Moreover, both bonding capital (connections within a community) and bridging capital (connections across different groups of institutions) are decisive in facilitating access to food assistance, funding, and health services. For example, if a subpopulation has government representation, shared demographic traits are more likely to encourage the use of institutional power and address social challenges. A study of low-income United States neighborhoods conducted by Paul et al. (2009) proves this point, revealing that community organizations with strong leadership and external networks were significantly more effective in advocating for residents, securing food programs, and coordinating support. Social capital is more than a theoretical concept; when effectively cultivated within communities, it can facilitate access to resources that combat social challenges that prohibit accessibility to food security. Ultimately, the absence of social capital will withhold vulnerable communities disconnected from resources, serving as a negative influence on food affordability and SDG 3, Good Health and Well-Being, with limited access to healthy food.

Climate and natural disasters are also cardinal in determining food availability. Ecological disasters demonstrate a pattern of destabilizing agricultural practices within a country that regulates large-scale food production for a region. Climate change now accounts for more than one-fifth of global yield variability, a staggering statistic showcasing that environmental shocks have become the single largest driver of instability in modern food systems (Wheeler & von Braun, 2023). For example, low-income and developing countries often rely on technology vulnerable to climate fluctuation, increasing the likelihood of facing longer consequences from natural disasters. Environmental catastrophes, especially floods, can significantly deter a region like this, as informal urban settlements are less likely to have strong surface water drainage systems; in 2010 alone, 178 million people faced consequences from floods globally (Tacoli, 2013). These floods caused a severe loss of crops and farmland, destroying years' worth of harvest and livestock populations in an instant. Along with this, natural disasters can worsen a region's food safety level, triggering one of the major focuses of AFRI, and the stability of food security in a given area. Ultimately, socioecological upheavals similar to these can heighten disturbance in food security at all levels.

Global health crises are also prone to creating major disruptions in existing food systems and their surrounding social structures. A notable example is the COVID-19 pandemic, where the long period of quarantine aggravated existing socioecological vulnerabilities within food security, particularly among low-income and marginalized communities. The pandemic caused turmoil in food distribution channels and created physical barriers to food due to lockdowns, border closures, and labor shortages. This disproportionately affected those with limited mobility, a lack of employment, or inadequate resources (Caballero-Anthony et al., 2020). Migrant workers, small-scale farmers, and low-income urban populations also experienced the brunt of these shocks; many could not obtain access to healthy and nutritious food, leading to the formation of food deserts internationally (Caballero-Anthony et al., 2020). Dimitri and Rogus further analyze this phenomenon by arguing that urban food insecurity is in essential need of direct-to-consumer networks like farmers' markets and community-supported agriculture (CSA) programs when conventional food distribution methods fail. However, during COVID-19, access to these "safety nets" was limited. The pandemic exemplifies how global upheavals can disrupt access to fundamental necessities. Without fast-paced, adaptive social systems, vulnerable populations face heightened barriers to food access and affordability during global emergencies.

The Role of Economics and Affordability

Economics lies at the heart of food accessibility, shaping and influencing every stage of food production and trade to consumer access. Poverty, income inequality, national economic systems, and trade policy are all under the discipline of economics that play a defining role in shaping food security. Economics controls and examines people's ability to afford essential dietary resources without sacrificing other basic needs in life. In many regions, affordability has become a greater barrier than availability.

As the cost of living rises across many countries, families with limited income face infeasible choices between groceries, rent, and healthcare. Tarasuk et al. (2019) found that even though poverty rates in Ontario declined, food insecurity stayed alarmingly high, particularly for those dependent on welfare and disability benefits. Over 60 percent of those households remained food insecure, however, revealing that simply raising income or lowering poverty on paper does not guarantee better nutritional access. Ford and Beaumier echoed this pattern in the Inuit community, where substantial living prices and limited access to markets left nearly half of households struggling with food insecurity. These findings illustrate a hard truth: a paycheck or a government subsidy may not be enough if prices rise faster than wages. This economic imbalance that disrupts food security is not confined to one country. Globally, inflation acts like an invisible tax on the poor. The World Bank (2022) notes that a 10% increase in food prices results in a far greater drop in calorie intake among low-income families than more affluent households. The reason is simple: nutritious foods like fruits, vegetables, and proteins are often price-sensitive. When prices climb, families turn toward cheaper, processed alternatives. Regmi and Meade (2013) described how this shift creates a cycle where hunger is replaced by malnutrition. The body gets calories, but not nutrients.

Geography adds another layer to the problem. Walker et al. (2010) detailed that food deserts, areas without full-service grocery stores, are prevalent in low-income, minority communities. This is

not a coincidence but a consequence. Supermarkets follow profit, not need, and zoning decisions often neglect these neighborhoods. Without nearby stores, residents must rely on overpriced convenience options or devote additional time and money to find affordable produce. In these situations, food becomes not just a nutritional challenge, but a logistical one.

On a global scale, economic complexities intensify the challenges of achieving accessibility, a main pillar of food security. McDonald (2015) outlines how international trade has tied food systems together so tightly that a crisis in one country ripples across continents. A drought, war, or pandemic of socioecological difficulties anywhere can send global prices soaring. These disruptions hit low-income countries the hardest, where people already spend a larger share of their income on food. The irony is painful: globalization was supposed to make food more accessible, but it has also made it more fragile. Complementing this, Headey and Alderman (2023) find that real food price spikes increase household food insecurity in low-income nations by up to 14%, confirming that inflation magnifies nutritional inequity even when supplies are sufficient.

While the following are common constraints that primarily affect lower-income nations, wealthier countries encounter different economic challenges. Fattibene and Bianchi (2017) argue that overproduction and consumer habits lead to substantial amounts of wasted food in wealthier countries, demonstrating the influence of the second determinant (socioecological). However, developing nations are simultaneously losing as much as 40 percent of their harvests before they even reach markets, due to poor roads, storage, and technology. This contrast exposes the moral and structural imbalance of the global food economy; some throw food away while others never see it reach their plate. Zhou et al. (2020) add another layer by examining how foreign land investment displaces local farmers, cutting into domestic food supplies and driving up prices. In countries like Ethiopia and Cambodia, investors prioritized export crops for profit, leaving local markets undersupplied. Clapp (2014) expands this argument by emphasizing that when food becomes just another asset for investors, its value shifts from feeding people to feeding profits. The financialization of food means prices often reflect speculation rather than accurate supply and demand, making essentials even less affordable for the poor.

At its core, food security is not only an agricultural or logistical issue; it is an economic one. Market systems that prioritize profit over equity ensure that even when food exists in abundance, millions go hungry. Addressing food security, therefore, requires more than increasing supply. It is also an interdisciplinary approach among governments, the private sector, and society to control food security, accounting for the significance of SDG 17, Partnerships for the Goals. Furthermore, it demands fair wages, stable prices, investment in rural infrastructure, and trade systems that place people above profit. Until then, the simple act of eating will remain a privilege determined by economics, not by need.

Future Research Direction

Although the three pillars of governance, socioecological influences, and economic stability play pivotal roles in determining food security, the academic concept encompasses additional factors in its shaping. Several other elements that were not addressed can also play a role in the intricate system that constitutes food security, depending on the different environmental and social

contexts. In recent years, additional fields and new advancements have emerged that fall under this category.

Future research efforts should further explore and thoroughly review the deep consideration of the rigorous and fast-growing technological industry. Digital technology can be used to tackle obstacles in low-, middle-, and high-income nations to overcome challenges that currently disrupt their communities' ability to achieve food security. Although countries may differ in demand and ability to invest in these technologies, their presence can lead to better productivity and a faster pathway to food security.

As climate change becomes an increasingly prevalent issue, future research should also prioritize the exploration of adaptive, climate-resilient food systems that could increase progress towards food security. Technological advancements can intertwine with climate awareness as innovations in indoor farms or the creation of hydroponic engineering increase. Furthermore, countries that take appropriate action and implement new features that cater to the planet's growing needs accordingly may have a high likelihood of achieving food security. Academic observations of these fields will supplement research findings to adapt to the growing changes and necessary advancements that encompass the future of food security globally.

Conclusion

At the core of food security are its cornerstones: the role of governance and policy, socioecological behaviors that examine the intersection of social conduct and environmental challenges, and economic influences on both micro and macro levels. These factors demonstrate credibility as they directly influence the major pillars that researchers identified to supplement food security, availability, stability, and accessibility. Essentially, each determinant uniquely contributes to the definition of food security in different regional contexts. Governmental policies influence food distribution and crisis response, social capital and natural world occurrences control access to resources, and monetary elements like income and private firms' priorities exert an effect on purchasing power and availability disparities. As demonstrated through various multinational case studies, food insecurity is found when these determinants do not align. Addressing and achieving food security will require not only cross-sector collaboration and smarter policy design but also equitable investment in infrastructure, inclusive governance, and recognition of the realities of marginalized communities. Ultimately, advancing the three determinants of food security will support not only SDG 2, SDG 3, and SDG 17 but also AFRI's priority of Food Safety, Nutrition, and Health, as food security involves and relies on health equity, population well-being, and an international collaborative effort.

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