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Geopolitics and food security: A comprehensive review of emerging risks and responses

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Abstract: This review paper examines the relationship between geopolitics and food security through a Systematic Literature Review guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses framework. A total of 15 peer-reviewed journal articles published between 2015 and 2026 were reviewed to identify emerging geopolitical risks and responses affecting global food systems. The study synthesizes literature on armed conflicts, trade restrictions, climate change, supply chain disruptions, energy market instability, and technological transformation in agriculture. The findings identified four major themes. First, geopolitical conflicts and protectionist trade policies significantly disrupt global food supply chains and increase food price volatility. Second, climate-related shock such as droughts, floods, and extreme weather events intensifies food insecurity, particularly in import-dependent and developing economies. Third, weaknesses in global logistics and energy dependence expose food systems to external shocks and market instability. Fourth, technological innovations, including smart farming, precision agriculture, and digital monitoring systems, play an increasingly important role in strengthening agricultural productivity, improving resource efficiency, and enhancing resilience against geopolitical and environmental uncertainties. The policy implications of this study include strengthening regional food reserves, diversifying import sources, investing in climate-resilient agriculture, promoting the adoption of smart farming technologies, and enhancing institutional cooperation between governments and international organizations. The relevance of smart farming is increasingly evident, as precision agriculture, Internet of Things (IoT)-based monitoring systems, and data-driven farming technologies play a critical role in improving productivity, reducing resource inefficiency, and enhancing food system resilience under geopolitical stress. The study contributes to a broader understanding of how geopolitical dynamics shape food security and provides recommendations for building sustainable, resilient, and technology-driven food systems in an increasingly uncertain global environment.

Keywords: climate resilience, food security, geopolitics, precision agriculture, smart farming, supply chain disruption

1. Introduction

Food security remains one of the most significant global challenges, influenced by a combination of environmental, technological, political, and economic factors. Despite significant improvements in agricultural productivity innovation, access to sufficient safe nutritious food remained unequal across many regions and demographics. Rapid population

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growth, urbanisation, land degradation, and water scarcity continue to place increasing pressure on global food systems. At the same time, advancements in technology have created new opportunities to improve agricultural efficiency and sustainability, particularly through smart farming and precision agriculture.

According to recent studies, digital technologies have the potential to revolutionize the agriculture industry. Continuous monitoring of crops, soil conditions, and environmental conditions is made possible by the Internet of Things (IoT), artificial intelligence (AI), and smart sensors. This leads to the efficient utilization of resources and improved yields (Miller et al., 2025). The advances help in the use of precision agriculture, which improves productivity, sustainability, and reduces resource waste (Dhanaraju et al., 2022; Karunathilake et al., 2023). Additionally, machines and artificial intelligence have enhanced the process of decision-making, allowing farmers to be more responsive to production risks and environmental uncertainty (Ahmad et al., 2024). As a result, the goal of improving global food security has given significant importance to technological innovation.

In addition to technological advances, the agricultural sector and global food security are facing an increasing threat from climate change. Crop yields and production stability have been reduced by rising temperatures, changes in rainfall distribution, and the increasing frequency of extreme weather events. As a strategy to increase resilience, improve farm productivity, and reduce environmental impacts, climate-resilient agricultural systems have been strongly supported. However, the implementation of these methods is not consistent and is primarily found in developing nations with limited infrastructure, resources, and access to technology. Because they typically lack the capacity to respond to climate-related risks, smallholder farmers are especially vulnerable (Rankoana, 2022).

Particularly in rural and low-income areas, traditional agricultural systems continue to play a major role in food production. These systems frequently use sustainable practices and local knowledge, such as agroforestry and diversified land-use systems, which support long-term resilience and environmental balance (Achmad et al., 2022). However, structural challenges such as climate change and limited access to modern technologies create pressure on traditional farming methods. One approach that has been suggested to make food systems more resilient and sustainable in the future is the integration of traditional knowledge with agricultural advances.

While there is a substantial body of literature available on agricultural production, climate resilience, and technological innovation, it is becoming increasingly clear that these approaches alone are insufficient to explain the current challenges in food security. International trade relations, armed conflicts, economic sanctions, and competition over essential resources such as oil, fertilizer, and agricultural land form the basis of geopolitical dynamics that affect agricultural systems. Globalization of food supply chains has improved market integration and efficiency, but it has also created structural vulnerabilities due to increased dependence on external markets and geographically dispersed production systems (Clapp, 2021; FAO, 2022).

The importance of geopolitics in shaping food security has been demonstrated by recent global developments. Global supply chains are at risk, as evidenced by the COVID-19 pandemic, which affected labor availability, transportation infrastructure, international trade, and ultimately food accessibility and availability globally (World Bank, 2021). In the same way, global agricultural markets have been affected by geopolitical conflicts in key producing regions, which has increased volatility in prices and supply disruptions. These patterns show that political decisions, strategic interests, and global power dynamics all play a role in determining food security outcomes, in addition to production capacity (Clapp, 2021).

A major limitation in traditional food security frameworks is highlighted by this evolving situation. The complexity of modern food systems, which are built on the four pillars of availability, access, utilization, and stability, cannot be fully captured by conventional models.

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In particular, restrictions on trade, supply chain dependence, and the strategic use of food and agricultural inputs as instruments of political power are geopolitical factors that these frameworks often overlook (Food and Agriculture Organization, 2022). As a result, there is a growing need for a more analytical approach that incorporates geopolitical variables into food security analysis.

Considering this, this paper aims to provide a comprehensive examination of the relationship between food security and geopolitics. First, it synthesizes existing literature on the main factors influencing food security such as agricultural systems, climate change, and technological innovation and relationship between them to broader geopolitical dynamics. Second, it identifies emerging trends and risks in global food systems, particularly in relation to supply chain concentration, technological disparities, and institutional weaknesses. Third, the study evaluates strategic initiatives and policies aimed at strengthening food system resilience, including the adoption of climate-smart agricultural practices, smart farming technologies, and international cooperation mechanisms.

The remainder of this paper is structured as follows. The conceptual relationship between geopolitics and food security, as well as the limitations of existing analytical frameworks, are examined in the following section. The main risk factors affecting food systems, including technological, environmental, and geopolitical disruptions, are then analyzed. The next section examines strategic measures and policy responses to improve food system resilience. The paper concludes with a summary of key findings and recommendations for future research and policymaking in an increasingly unpredictable global environment.

2. Conceptual and Theoretical Foundations

When everyone has physical and financial access to enough safe, nutritious food that exceeds their nutritional needs, it is usually referred to as food security. The four main elements of this concept are availability, access, utilisation, and stability. Access refers to people's economic and physical ability to receive food, while availability refers to the real supply of food by production, imports, and reserves. Stability makes sure all of these three aspects remain stable over time, especially in periods of crisis or emergency, while utilisation focus on the nutritional value and proper use of food (Food and Agriculture Organization [FAO], 2022)). These factors show that food security includes stability, low prices, and supply infrastructure in addition to productivity.

Geopolitics in terms of global food systems refers to how political power, relations between nations, and strategic goals impact food production, distribution, and access. Trade policy, geopolitical disputes, conflicts, and competition for critical resources like land, water, energy, and agricultural inputs are increasingly influencing food systems. Although the efficiency of food supply systems has increased due to globalisation, countries are becoming more vulnerable to external factors due to their greater dependence on external markets and individuals (Clapp, 2021). Food security have to be seen as a geopolitical problem in addition to agricultural or economic problem.

2.1 Theoretical lenses

Several theoretical frameworks that explain how power, economic systems, and governmental systems affect food outcomes must be put into practice to fully understand the relationship between geopolitics and food security. The political economics theory emphasizes that food instability is mostly caused by inequalities in access, distribution, and policy choices rather than just production limits.

Dependency theory highlights differences in structure between Industrialized and developing economies, showing how the way they depend on imports and global markets makes them more vulnerable to crises from external factors. Food regime theory provides a historical

examination of how the wider economic and political institutions driven by capital and states organize the world's food systems. Furthermore, the institutional theory focuses on how organizational capability, management, and policies affect food systems and crisis solutions. When taken as a whole, these theoretical frameworks offer a comprehensive explanation that goes past technology or environmental analyses of how geopolitical processes affect food security.

2.1.1 Political economy of food security

The political economics of food security comes from classical economic theory but gained popularity through the works of Amartya Sen, who highlighted that food insecurity is mostly a result of lack of access rather than unavailability (Sen, 1981). This view provided an alternative to traditional production-based thinking by including a broader understanding of food systems, emphasising power and inequity issues.

The concept has increasingly included global factors, including global trade systems, economic power, and governance frameworks. Studies such as Jennifer Clapp emphasis the impact of global markets and organisations, such the Food and Agriculture Organization, on the formation of food systems and the maintenance of inequality (Clapp & Fuchs, 2009; Clapp, 2021). The idea is particularly effective for understanding the influence of geopolitical factors, such as trade policy and global market trends, on food security.

This method's key advantage is due to its ability to explain structural factors of food security, especially inequalities in supply and distribution of food, making it very useful for policy research. However, it includes limitations, including a limited number of technology and environmental factors, and its general character may provide challenges for actual use.

2.1.2 Dependency theory and global supply chains

The dependency theory originated by Andre Gunder Frank and Theotonio Dos Santos, who examined the unequal economic relations between industrialised and developing countries (Frank, 1967; Dos Santos, 1970). The idea says that developing nations often create systemic use of international economies for resources, technology, and markets.

Dependency theory has been used to global supply chains and food security to show the need of countries on imported food, agricultural inputs, and foreign technologies. This dependency makes it more vulnerable to external factors such as changes in prices, supply chain failures, and geopolitical conflicts. While the theory efficiently determines global inequities and systemic issues, it generally simplifies the relationship between countries and often minimises the impact of domestic policies and technology advancements.

2.1.3 Food regime

Harriet Friedmann and Philip McMichael developed food regime theory to analyse the organization of global agriculture during different economic periods of capitalism (Friedmann & McMichael, 1989). The idea identifies specific time periods in which food production and trade are determined by dominant economic and political factors.

This framework has evolved to illustrate the impact of government power, large companies, and international trade regulations on global food systems. Understanding the impact of geopolitical dynamics on global food production, distribution, and consumption patterns is very important. However, its theoretical and general focus make it more ideal for local analysis and advancements in technology.

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2.1.4 Institutional theory

Institutional theory is primarily associated with the work of Douglass North, who emphasised the importance of institutions in shaping economic performance and development (North, 1990). Institutions include formal rules Institutions include formal rules, policies, organisations, and informal norms that regulate social and economic behaviour. Within the context of food security, institutional theory highlights the role of governance systems, policy frameworks, and institutional capacity in influencing food availability, access, utilisation, and stability.

Strong institutions contribute to food system resilience by regulating markets effectively, supporting agricultural development, facilitating technological adoption, and responding efficiently to economic or environmental crises. Effective governance can also strengthen food supply chains, reduce market instability, and improve the implementation of food security policies. In contrast, weak institutions may increase vulnerability to food insecurity through poor policy coordination, corruption, limited administrative capacity, and ineffective crisis management.

Recent empirical studies suggest that institutional quality significantly influences food security outcomes, particularly in developing economies where governance capacity remains limited (Clapp, 2021; FAO, 2022). Institutional theory therefore provides an important framework for understanding how governance and policy effectiveness shape resilience within global food systems. However, the theory places less emphasis on global power relations and structural inequalities compared to political economy and dependency perspectives.

2.2 Linking geopolitics to food system disruptions

Due to national and global effects on food production, distribution, and access, food system geopolitics are key for food system disruption. Political conflicts, trade policies, and resource competition can affect agriculture and global supply systems. Wars may destroy agricultural land, lose workers, and transit infrastructure, reducing food production and supply. The geopolitical may slow food trade across countries by trade limits, export bans, and other economic measures, producing low prices and shortages, especially in import-dependent economies.

The international of food systems has increased country security and made them more vulnerable to external forces. Global supply systems improve efficiency, but problems in major producing countries could risk food security. Competition for key agricultural inputs like fertilisers, energy, and water may severely limit agricultural productivity if shortages or prices rise. The COVID-19 pandemic has proven how pressure can undermine supply networks and affect food availability and accessibility global (World Bank, 2021).

Geopolitical decisions include strategic objectives rather than human rights, which can lead to unequal food distribution. It can help strong countries secure food security, but weaker economies will suffer. This shows that food security is a political issue affected by global powers. Geopolitical analysis must be included in the food security theory to understand food system issues since political influence and international relations are becoming the key factors of resilience and stability. (Clapp, 2021; Food and Agriculture Organization (FAO, 2022).

3. Methodology of the Review

This study used a Systematic Literature Review (SLR) methodology to examine the relationship between geopolitics and food security. The SLR method has been selected to provide a systematic, clear, and thorough strategy for identifying, analysing, and synthesising important research. This study provides a systematic methodology to reduce bias in source selection and improve accuracy of the results.

The application of SLR is especially good for this research due to the broad character of the issue, which includes ideas from agriculture, economics, environmental studies, and

political studies. This method allows a critical analysis of current research, identifies significant trends and gaps, and offers a clear summary of knowledge related to geopolitical risks and changes in food systems.

3.1 Review protocol (PRISMA)

This study follows to the Preferred Reporting Items for Systematic Reviews (PRISMA) methodology to provide a comprehensive systematic literature review. The PRISMA methodology (Figure 1) has four fundamental phases: identification, screening, eligibility, and inclusion. The use of PRISMA will extensively scan all literature published on the subject to find answers to the clearly defined research question, and to that end use various inclusion and exclusion criteria to identify the reports to be included in the review, and then synthesize the findings (Wong, 2023).

During the identification stage, 50 articles were identified from selected academic databases using predefined keywords. During the screening stage, titles and abstracts were reviewed, and 15 irrelevant or duplicate articles were excluded. The remaining 35 full-text articles were assessed for eligibility according to the inclusion and exclusion criteria. Finally, all 15 articles were included in the final analysis. This systematic procedure improves the transparency, consistency, and reliability of the review process.

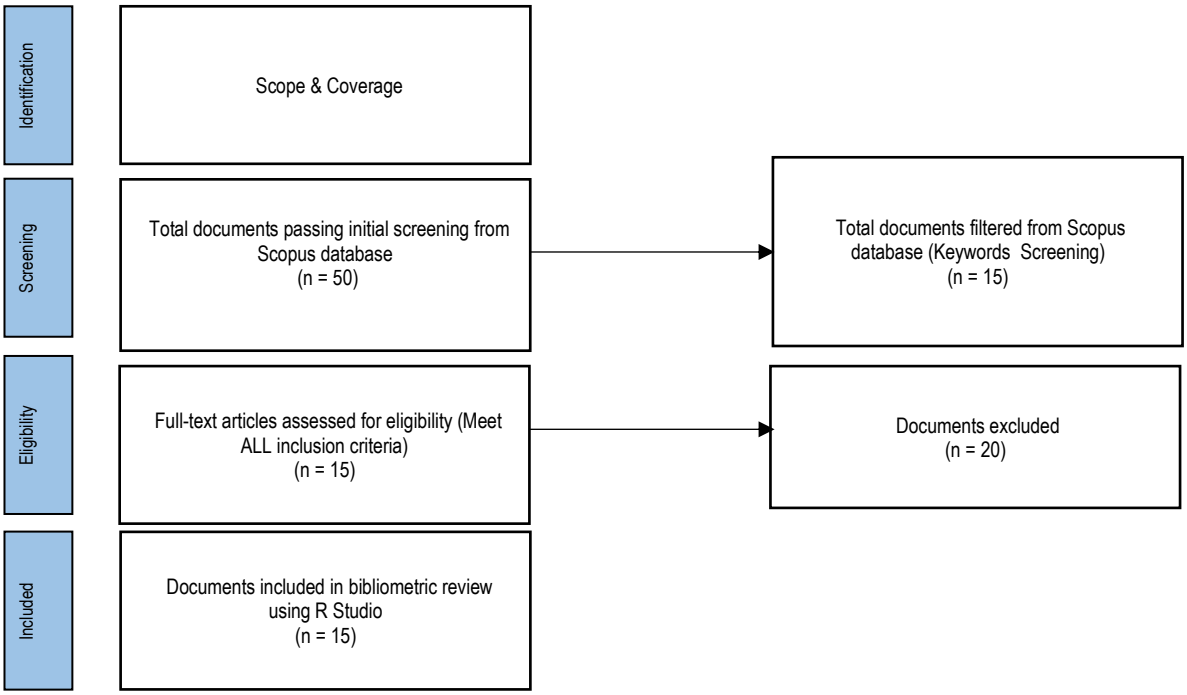

Figure 1. Preferred Reporting Items for Systematic reviews (PRISMA) Flow. The PRISMA flow diagram used in this study (Figure 1) illustrated the process of identifying, screening, and selecting relevant articles. A total of 50 studies were initially identified, of which 15 were included in the final review after applying the screening and eligibility criteria.

3.2 Database selection

The literature for this study was collected from major academic databases, primarily Scopus, along with supplementary searches conducted through Google Scholar. These databases were selected due to their extensive coverage of peer-reviewed journal articles across multiple disciplines, including agriculture, economics, environmental studies, and political science.

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Scopus was chosen as the main database because of its high-quality indexing and reliability in providing relevant scholarly sources. Google Scholar was used to complement the search by identifying additional studies that may not have been indexed in Scopus. This combination ensured a comprehensive and diverse selection of literature relevant to the topic of geopolitics and food security.

Table 1. Keyword search strategy and the number of articles identified and screened during the review process.

No.	Keyword search	Criteria applied	Number of articles
1	"Food Security" AND "Geopolitics"	Limited to journal articles and English language	50
2	"Food Supply Chain" AND "Conflict" OR "Trade Disruption"	Title and abstract screening applied	35
3	"Geopolitical Risk" AND "Agriculture"	Full-text screening based on relevance	15

Table 2. Inclusion and exclusion criteria.

Inclusion criteria
Full-text journal articles related to food security and geopolitics
Studies focusing on geopolitical risks, trade disruptions, or food systems
Peer-reviewed academic journal articles
Articles written in English
Exclusion criteria
Articles not relevant to food security or geopolitics
Papers not written in English
Duplicate articles
Conference proceedings, reports, or non-academic sources
Articles outside the selected time range

3.3 Inclusion and exclusion criteria

The inclusion and exclusion criteria were implemented to make sure the selection of topical and excellent articles for this review. Articles were considered if they were reviewed journal publications, composed in English, and focused on subjects involving food security, geopolitics, or global food systems. Furthermore, research that examined trade problems, supply chain issues, and geopolitical risk proved to be significant.

However, articles were not included if they were not specific to the research topic, not composed in English, or duplicated across databases. Non-scholarly sources, including conference proceedings, reports, and opinion articles, were eliminated to maintain the accuracy and academic accuracy of the review.

3.4 Screening and selection process

The screening and selection process was executed methodically in accordance with the PRISMA methodology. A total of 50 articles were first identified by database searches. At first, titles and abstracts were assessed to determine their relevance to the research subject.
During this stage, 35 articles were excluded due to lack of relevance.

The second stage involved a full review of the remaining 15 articles to confirm their eligibility according to the defined inclusion and exclusion criteria. Only studies that directly examined a relationship between geopolitics and food security were selected. This systematic procedure guaranteed that only the most relevant research were accepted into the final analysis.

3.5 Analytical approach

The selected works were examined through a thematic analysis method, which requires identifying and categorizing key topics within the literature. This approach allows a systematic comparison of results and helps in identifying patterns and relationships among the selected studies.

This paper analyses key themes including geopolitical risks, trade disruptions, supply chain weaknesses, and policy responses on food security. All the documents were carefully analysed and classified according to these topics to allow for a systematic comprehension of the subject. This method provides a detailed analysis of the literature and helps in identifying key findings and research limitations.

4. Global Trends in Food Security Under Geopolitical Stress

4.1 Overview of global food security status

Global food security is an important issue, with many societies unable to maintain access to sufficient and nutritious food. This issue occurs not just from constraints in food production but also from challenges related to pricing, distribution, and accessibility. Geopolitical conflict, economic instability, and international trade are other variables that have affected food systems in the past several years. This has undermined food security, especially in developing areas where individuals use external food supplies (Food and Agriculture Organization (FAO, 2022).

The overall rise in hunger and malnutrition shows instability within food systems. It has been significantly caused by geopolitical wars, economic challenges, and challenges in food supply systems, which decrease food availability and accessibility. Furthermore, these situations increase by environmental issues, particularly in affected areas. As a result, food insecurity, nutrition-related health issues, and poor nutrition have increased among various populations, especially within areas of poverty (Clapp, 2021; World Bank, 2021; FAO, 2022).

4.2 Role of globalization vs. fragmentation

The conflict between globalisation and fragmentation is increasingly influencing the global food system. Globalisation has improved food distribution and accessibility through international trade, while developing major interdependence among states. However, increasing geopolitical conflicts have resulted in fragmentation characterised by trade limits, export limitations, and protective policies. The change reduces international collaboration and affects global food distribution. This has rendered the food system more vulnerable to disruptions and increased the likelihood of supply issues and instabilities (Clapp, 2021).

4.3 Increasing volatility in food prices and supply chains

Food supply chains and food prices have become increasingly volatile in recent years. The principal causes of this issue are geopolitical wars, trade disruptions, and volatility in energy and fertiliser markets, all of which affect food production and delivery. The COVID-19 epidemic and conflict areas have further exposed the weakness of the global supply chain. This resulted in a rapid rise of food prices, and supply has become more unstable, that significantly impact low-income populations who struggle to buy basic food supplies (Food and Agriculture Organization (FAO, 2022).

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5. Emerging Geopolitical Risks Affecting Food Security

5.1 Armed conflicts and war

Arms races and wars are one of the main strategic dangers to food security around the world. This type of wars affect agriculture by destroying farmlands, forcing farmers to move, and damage important structures like transportation and storage systems. Also, the war makes it difficult for food from huge producing areas to be exported, which leads to a lack of supplies around the world. The best example of this is the war between Russia and Ukraine, which had a big effect on the world's agricultural markets because both countries exported a lot of it and other basic foods.

This caused food prices to rise around the world and supply problems, especially in places like Africa and the Middle East that depend on importing food. These results show that conflicts in some places can have a big impact on the rest of the world, because food systems connect (Food and Agriculture Organization (FAO, 2022).

5.2 Trade restrictions and protectionism

There are more protectionist policies and trade limits now that the world's geopolitics become less explicit. For food security at home, governments typically ban exports, raise taxes on goods, and punish people who break the rules. Still, these moves could break in the world's food markets by making it harder to get essential products.

Countries that depend on food imports may not be able to get enough food and have to pay a lot for it because of these limits. This makes things even harder for poor countries that can't make many things on their own. This makes the difference in access to food around the world larger still, which shows the dangers of relying too much on global trade systems (World Bank, 2021).

5.3 Energy–food nexus

One important thing that affects food security is how the energy and food systems function together. The cost of farming moves upward when the price of energy goes upward because fuel is needed for machines, farming, and transportation. In addition, the price of fertilisers has gone upward because most of them need a lot of energy to make. This is because of the changes in the energy markets around the world.

These issues have become worse because of political conflicts in big energy-producing areas, which has made fertiliser less available and forced upward the cost of production. As a result, this could make farmers produce less, which would lower the quantity of food and make prices go upwards. This shows that the unstable energy market could have a direct effect on food systems and cause people to not have enough food.

5.4 Climate–geopolitics interaction

We can work at the risks to food security by looking at how climate change and conflicts connect more and more. Climate shocks like droughts, floods, and other extreme weather events make farms less productive and put stress on natural resources. These natural risks can make things worse in the world at the same moment, especially in places where resources like water and land are scarce.

People struggling for these resources may result in wars and unstable governments, which would make it hard to grow and supply food. So, when climate change and geopolitics relate, they create a process of vulnerability in which natural and political factors make each other stronger, making it more likely that people will not have enough food (Food and Agriculture Organization (FAO, 2022).

5.5 Supply chain fragmentation and strategic decoupling

The lack of stability in world politics and the frequent changes in trade strategies are breaking up the global food supply limits even more. It is toward strategic divide and regionalisation so that countries do not have to depend on markets outside of their borders and can improve food security in their own countries. This method can make the country more resilient, but it slows down the flow of goods between countries.

Because of this, division could lead to higher costs, less access to food goods, and more volatility in the global market. Changing away from globalisation and toward more localised systems shows that geopolitics is playing a bigger part in food supply chains and that food systems need to become more resilient and diverse (Clapp, 2021).

6. Policy and Strategic Responses

6.1 Short-term responses

Rapid a lack of food due to global issues must be solved by emergency actions. When there are shortages or price rises, programs like emergency food supplies, safety nets, and targeted supplies are used to protect people who are most at risk. These steps solve short-term issues by making it easier to get basic foods and stop rapid hunger. For instance, when there is a global crisis, governments often put price controls in place to keep the market from going upward or downward and to help those impacted right away. These actions work in the short term, but they fail to fix the basic issues in food systems that cause them to be vulnerable ((Food and Agriculture Organization (FAO, 2022).

6.2 Medium-term strategies

Medium-term plans focus on making supply chains and national food systems stronger in order to lower vulnerability. Some of the most important things that can be done are to improve import supplies, set up strategic food supplies, and make it easier for countries to work together. By getting goods from a number of suppliers, countries become less dependent on a few big exports and lower their risks of being affected by trade limitations or geopolitical wars. Strategic stores help in periods of difficulty, and working together with other countries in the area makes it easier to coordinate things like trade, distribution, and reaction to crises. during the following three to five years, these strategies will make food supplies more stable and reliable (Clapp, 2021; World Bank, 2021).

6.3 Long-term structural responses

Long-term goals aim to make food systems strong and sustainable so they can handle changes in politics and the environment for many years. This includes putting money into new farming methods and technologies, moving to farming methods that are more resilient to climate change and more resilient, and changing the way institutions and governments work to make policy development and food system management effective. Long-term sustainability also depends on developing upward local production, making infrastructure better, and encouraging study on high-income and climate-stable foods. These steps fix basic defects to make sure that food systems can handle future geopolitical risks and help reach global food security goals (FAO, 2022; Clapp, 2021).

7. Discussion

A lot of important information about the relationship between food security and geopolitics can be found in the literature study. The main things that cause problems in the world's food systems because of politics are armed wars, trade restrictions, and energy crises (Clapp, 2021; FAO, 2022). Second, global interdependence has made supply lines even less stable because a shock in one place can quickly change the prices and availability of food around the world (World

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Bank, 2021). Third, to make things more resilient, we need both short-term emergency responses and long-term structural responses. However, most study focuses too much on short-term emergencies and not enough on long-term systemic responses.

Even though a lot of study occurs, there are still some areas that need more research. The way geopolitics and climate change affect each other is one of the biggest gaps. In particular, how environmental shocks make geopolitical conflicts and food insecurity more serious. Second, the small-scale effects on families or communities are never looked into, and not much is known about how geopolitical changes can affect vulnerable groups' access to food and nutrition. Third, not much study has been done on how digital technologies can help make things more resilient, but their use in keeping a look on, managing, and lowering the risks in the food system is growing.

Most studies use sections or case-based analyses as their main method. There lack many across or comparative analyses that look at food security outcomes over time or by area. This makes it harder to generalise or predict how global changes will happen in the future. Also, there are not many methods that join political economy, climate science, and technology studies. This makes it harder to get a complete understanding of the many risks that affect the world's food systems and how they are connected. The analysis emphasized various fields where further research is significantly required to enhance knowledge of the complex connection between geopolitics and food security. There is significant needs for global approaches that combine political economy, environmental science, agricultural economics, and technology analyses. These approaches provide a full understanding of how geopolitical dynamics combine with other systemic elements to influence food security outcomes (Clapp, 2021; FAO, 2022).

The development and implementation of geopolitical risk factors into food security models could improve prediction skills, allowing policymakers and researchers to prepare for future crises and develop active reduction methods. Third, it is essential to conduct policy assessment studies to examine the efficiency of both short-term efforts and long-term structural measures, especially across various geopolitical situations. Ultimately, geographic comparison assessments will clarify the varied responses of food systems to identical geopolitical challenges, thereby underscoring best practices and lessons that could enhance international collaboration and policy planning. These research directions collectively highlight the necessity of addressing gaps in theoretical frameworks and empirical studies, providing that future analyses are complete and important to policy.

8. Conclusion

This review has analysed the relationship between geopolitics and global food security, emphasising how conflicts, trade barriers, energy crises, and climate-induced shocks increase instability in agricultural systems. The production of research indicates that food insecurity is not simply the result of production constraints; it is profoundly affected by political dynamics, supply chain vulnerabilities, and policy deficiencies. Short-term emergency responses, albeit essential for addressing immediate emergencies, are inadequate without accompanying long-term initiatives that bolster resilience, foster technological innovation, and improve institutional ability.

The evaluation enhances academic literature and policy discussions by identifying significant research deficits and emphasising areas requiring special focus. It highlights the insufficiently examined relationship between geopolitics and climate change, macroeconomic effects on households, and the prospective role of digital technology in increasing food system resilience. Moreover, it highlights a need for quantitative changes, including long-term, comparative, and global research, to gain a deeper understanding of complex global food security issues.

Achieving strong and equitable global food systems needs focused effort across several levels. Enhancing governance, investing in sustainable and climate-resilient agriculture, boosting economic performance and promoting global collaboration are essential measures for reducing the risks related to geopolitical factors. A summary of policy-making initiatives, scientific advancements, and international cooperation is crucial to ensure global food security in an increasingly unstable and related environment (FAO, 2022; World Bank, 2021).

Data Availability

No new data were created in this study. The article is based on previously published journal articles and secondary sources collected through a Systematic Literature Review approach. Therefore, data sharing is not applicable to this article.

Author Contributions

Parameswaran Mahendran: Conceptualization, Literature Review, Data Curation, Writing – Original Draft Preparation. **Wong Sing Yun:** Supervision, Methodology, Validation, Writing – Review and Editing.

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Conflicts of Interest

The authors declare no conflicts of interest.

Ethics Statement

Ethics approval was not applicable for this review article because the study did not involve human participants, animal subjects, or confidential personal data.

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