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A Review of the Critical Gaps in the Food Security Literature: Addressing Key Issues for Sustainable Development

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Abstract: This review paper covers important gaps in the knowledge base on food security, which have an impact on world development and cause an estimated 820 million people to suffer from chronic hunger and malnutrition. Food waste, climate change, socioeconomic considerations, agricultural policy, access to wholesome foods, food sovereignty, and food security are some of the major topics covered in the literature. Because of this, ensuring food security is not a straightforward issue that can be resolved by changing a single variable; rather, it necessitates the combination of numerous multidisciplinary approaches. Therefore, the goal of this study is to pinpoint the major gaps in the literature, such as a lack of attention to the perspectives of marginalized groups and a lack of investigation into the connections between food security and other global issues. The article offers suggestions for future work, including how to prioritize understudied subjects, incorporate other points of view, and enhance data collection techniques. As a result, it can be a useful starting point for linguists who want to research related topics. This study offers new researchers and practitioners a place to start to learn more about the rapidly, growing field of sustainable food security. Future research can also address these gaps and enhance food security globally for a sustainable future. This will require the participation of new scholars, policymakers, and practitioners.

Keywords: *Food security, Global development, Marginalized groups, Sustainable future.*

1. Introduction

Food security is defined as a state where all individuals have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and preferences for an active and healthy life. It plays a crucial role in achieving the United Nations' Sustainable Development Goals (SDGs) related to poverty reduction, hunger eradication, and sustainable agriculture. Food security also has a significant impact on health outcomes, as poor nutrition can lead to malnutrition and diet-related chronic diseases. However, with an estimated 690 million people experiencing hunger and malnutrition in 2019, it is considered one of the most significant global challenges of the 21st century (FAO, 2019). To make matters worse, the COVID-19 pandemic has further exacerbated food insecurity, with an additional 132 million people experiencing hunger in 2020 (Clapp & Moseley, 2020). In addition, food insecurity can lead to social unrest, political instability, and conflict. Recent research has highlighted the importance of addressing food security through a multidimensional and interdisciplinary approach. For instance, there is a growing recognition of the role of food systems in achieving food security and the need to transform them to be more sustainable and resilient (IPBES, 2019).

There is also a need to address the social and economic factors that contribute to food insecurity, such as poverty, inequality, and conflict (FAO, 2019). Thus, food security is a critical global issue that impacts human health, economic development, and social stability. It is essential to address this challenge through a multidimensional and interdisciplinary approach that considers the complex interactions between food systems, social and economic factors, and environmental sustainability. The current state of food security literature highlights the complexity of the issue and the need for a multidimensional and interdisciplinary approach. Recent research has identified key issues related to food security, including food waste, climate change, socioeconomic factors, agricultural policies, access to healthy food, and food sovereignty and security (Alexander, Brown, Arneth, Finnigan, & Rounsevell, 2019; FAO, 2019). However, there are critical gaps in the literature that need to be addressed for sustainable development. For instance, there is inadequate attention to certain issues, such as food sovereignty and food waste; insufficient exploration of the intersections between food security and other global issues such as gender inequality and environmental sustainability;

and limited focus on the perspectives and experiences of marginalized groups (Galli & Watters, 2019; Rosenthal, Quinn, Hatt, & Wallinga, 2021).

To address these gaps, recent literature has recommended incorporating diverse perspectives and voices into food security research, prioritizing research on understudied issues and intersections with other global issues, strengthening partnerships and collaborations between researchers, policymakers, and practitioners, as well as improving data collection and analysis methods to better capture the complexity of food security issues (Galli & Watters, 2019). Overall, the current state of food security literature highlights the urgent need to address this critical global issue through a holistic and interdisciplinary approach that takes into account the complex interactions between food systems, social and economic factors, environmental sustainability, and other global issues. The review aims to provide recommendations for future research and action by highlighting the issues that have been inadequately studied in the literature. The scope of the review article is broad, encompassing a multidimensional and interdisciplinary approach to food security that takes into account social, economic, and environmental factors. The review article draws on recent literature on food security and related issues, including food waste, climate change, socioeconomic factors, agricultural policies, access to healthy food, and food sovereignty and security. The article aims to contribute to the understanding of food security as a critical global issue and provide insights for researchers, policymakers, and practitioners on how to address the gaps in the literature and improve food security globally for a sustainable future.

2. Key Issues in Food Security Literature

Food waste is a critical issue in the context of food security, with significant implications for food availability, access, and utilization (FAO, 2019). Food waste occurs at different stages of the food supply chain, from production to consumption, and has negative economic, environmental, and social impacts (FAO, 2019; Leip, et al., 2022). According to the Food and Agriculture Organization (FAO), one-third of all food produced for human consumption is lost or wasted each year, amounting to about 1.3 billion metric tonnes globally (FAO, 2019). Food waste reduces the availability of food for consumption and can contribute to food insecurity, particularly in low-income countries and among vulnerable populations (Nabuuma, Reimers, Hoang, Stomph, & Swaans, 2022). Food waste also has significant environmental impacts, including the waste of natural resources, greenhouse gas emissions, and pollution (FAO, 2019). Moreover, food waste has economic implications, such as increased costs for farmers, food producers, and consumers (Philippidis, Sartori, Ferrari, & M'Barek, 2019). Addressing food waste is critical for achieving food security goals and sustainable development. Recent literature has identified several strategies to reduce food waste, including improving storage and transportation infrastructure.

Promoting sustainable consumption patterns, reducing food losses at the production and post-harvest stages, and redistributing surplus food to those in need (Nakawuka, Langan, Schmitter, & Barron, 2018). Food waste is a significant issue in the context of food security, with negative implications for food availability, access, and utilization. Addressing food waste is critical for achieving food security goals and sustainable development and requires a multidimensional and interdisciplinary approach. Climate change is a critical issue in the context of food security, with significant implications for food production, distribution, and access. Climate change affects agricultural productivity, natural resources, and food systems and contributes to increased food insecurity and malnutrition (FAO, 2019). According to the Intergovernmental Panel on Climate Change (IPCC), climate change is likely to increase the frequency and intensity of extreme weather events such as droughts, floods, and heat waves, which can lead to crop failures, livestock losses, and food price volatility (IPCC, 2019). In addition, climate change affects the nutritional quality of food as changes in temperature, rainfall, and soil moisture can impact the composition of crops and their nutrient content (Godde, Mason-D'Croz, Mayberry, & Thornton, 2021).

Furthermore, climate change exacerbates existing inequalities and vulnerabilities, with marginalized populations such as smallholder farmers, women, and indigenous communities being particularly affected by its impacts (FAO, 2019). Addressing the impacts of climate change on food security requires a comprehensive and coordinated approach, including mitigation and adaptation strategies. Mitigation measures aim to reduce greenhouse gas emissions and limit the extent of climate change, while adaptation measures focus on building resilience and reducing vulnerability to the impacts of climate change (Sharifi, 2020). Some of the

recommended strategies include promoting sustainable agriculture and land-use practices, improving water management, enhancing biodiversity and ecosystem services, and building climate-resilient food systems (IPCC, 2019). Addressing the impacts of climate change on food security requires a comprehensive and coordinated approach, including mitigation and adaptation strategies that are tailored to the specific needs and contexts of different populations. Socioeconomic factors, such as poverty, income inequality, and social exclusion.

Play a critical role in determining access to food and nutrition and are major drivers of food insecurity globally (O'Hara & Toussaint, 2021). In many countries, people who live in poverty often lack the resources to purchase enough food or to access nutritious foods, leading to undernutrition and malnutrition (Fanzo, 2014). In addition, socioeconomic factors also affect the quality of diets and food choices, as individuals with low income or education may have limited access to information on healthy diets (Liguori, et al., 2022) and may rely on cheap, energy-dense, and nutrient-poor foods (Ignowski, Belton, Tran, & Ameye, 2023). Furthermore, socioeconomic factors interact with other determinants of food insecurity, such as climate change and conflicts, exacerbating their impacts on food access and nutrition (Ripkey, et al., 2021; Godde, Mason-D'Croz, Mayberry, & Thornton, 2021). Addressing the role of socioeconomic factors in food security requires a multifaceted approach that addresses the root causes of poverty and inequality as well as the immediate challenges of food access and nutrition. Some of the recommended strategies include promoting inclusive economic growth, improving social protection programs, enhancing access to education and health services, and empowering marginalized groups to participate in decision-making and advocate for their rights (Di Prima, Wright, Sharma, Syurina, & Broerse, 2022).

Addressing the role of socioeconomic factors in food security requires a comprehensive and coordinated approach, including strategies that tackle poverty, inequality, and social exclusion and promote inclusive and sustainable development. Agricultural policies can promote or hinder food security depending on how they are designed and implemented (Adenle, Wedig, & Azadi, 2019). For example, policies that support smallholder farmers and prioritize food production for domestic consumption can enhance food security, while policies that prioritize export-oriented agriculture and large-scale commercial farming may undermine food security by reducing access to food and disrupting local food systems (Bjornlund, Bjornlund, & van Rooyen, 2022). Moreover, agricultural policies also affect the quality and safety of food as they regulate food standards, certification, and labeling. Policies that prioritize food safety and quality can enhance consumer confidence and promote healthy diets, while inadequate or poorly enforced policies may lead to food-borne illnesses and negative health outcomes (Liguori, et al., 2022). To address the role of agricultural policies in food security, it is important to adopt a holistic approach that considers the diverse needs and perspectives of different stakeholders, including farmers, consumers, policymakers, and civil society organizations (Mattas, et al., 2021).

Some of the recommended strategies include promoting sustainable agriculture practices, investing in rural infrastructure and services, strengthening food safety and quality standards, and promoting participatory decision-making processes that engage diverse stakeholders (Geekiyanage, Fernando, & Keraminiyage, 2020). Addressing the role of agricultural policies in food security requires a comprehensive and participatory approach that considers the diverse needs and perspectives of different stakeholders. Access to healthy food is a key aspect of food security, as it determines whether individuals and communities have the ability to obtain and consume nutritious food in sufficient quantities (Smith, Ng, & Popkin, 2017). Access to healthy food is influenced by a range of factors, including income, affordability, availability, and proximity to food outlets. However, disadvantaged communities, such as low-income households and rural populations, often face significant barriers to accessing healthy food, which can lead to higher rates of food insecurity and diet-related diseases (Penne & Goedemé, 2021). The lack of healthy food options in food deserts can contribute to poor dietary choices, limited food diversity, and an increased risk of chronic diseases such as obesity, diabetes, and heart disease (Fitzpatrick, Greenhalgh-Stanley, & Ver Ploeg, 2019).

Moreover, access to healthy food is not only a matter of physical availability but also affordability, as healthy food options are often more expensive than processed and unhealthy foods, making it difficult for low-income households to purchase nutritious food (Anderson, et al., 2021). To address the issue of access to healthy food, it is necessary to adopt a multi-sectoral approach that addresses the underlying factors that contribute to food

insecurity and food deserts (Speich, et al., 2023). Some of the recommended strategies include promoting healthy food retail options in underserved areas, increasing the purchasing power of low-income households through food assistance programs, promoting urban agriculture and community gardening, and supporting local food systems that prioritize healthy and sustainable food production (Diekmann, Gray, & Thai, 2020). Addressing the issue of access to healthy food requires a comprehensive approach that considers the multiple factors that contribute to food insecurity. Food sovereignty and security are increasingly recognized as critical aspects of ensuring access to safe, nutritious, and culturally appropriate food for all. Food sovereignty refers to the right of communities and people to control their food systems.

Including the production, distribution, and consumption of food, in ways that are sustainable, equitable, and culturally appropriate (Desmarais, 2017). On the other hand, food security focuses on ensuring that all individuals have access to sufficient, safe, and nutritious food to meet their dietary needs and preferences (Ingram, 2020). Food sovereignty and security are interrelated concepts that recognize the importance of local and community-based food systems and the need for equitable distribution of resources and power (Poirier & Neufeld, 2023). These concepts emphasize the importance of food production and distribution that is ecologically sustainable, socially just, and culturally appropriate, with a focus on supporting small-scale farmers and local food systems (Desmarais, 2017). Moreover, they prioritize the inclusion of marginalized communities and the recognition of their knowledge and expertise in food systems. The issue of food sovereignty and security has important implications for policy and practice.

For example, global food policies and trade agreements can impact the ability of communities to maintain control over their food systems, as large corporations often dominate the global food trade (Clapp, 2021). Additionally, the focus on increasing food production through industrial agriculture can have negative impacts on the environment and small-scale farmers, contributing to land degradation, loss of biodiversity, and social inequalities (FAO, 2019). To address the issue of food sovereignty and security, it is necessary to adopt a comprehensive approach that includes the perspectives and needs of local communities and small-scale farmers (Adu-Baffour, Daum, & Birner, 2021). Some of the recommended strategies include promoting agroecological and sustainable food production methods, supporting local food systems and small-scale farmers, and incorporating community-led approaches to food governance and decision-making (Desmarais, 2017). Addressing the issue of food sovereignty and security requires a comprehensive approach that considers the perspectives and needs of local communities and small-scale farmers.

The Importance of Addressing These Key Issues for Sustainable Development: Sustainable development aims to meet the needs of the present without compromising the ability of future generations to meet their own needs. This requires addressing the social, economic, and environmental dimensions of food security and ensuring that all individuals have access to safe, nutritious, and culturally appropriate food (FAO, 2019). The importance of addressing key issues related to food security is multifaceted. For example, reducing food waste can help conserve resources and reduce greenhouse gas emissions while also ensuring that food is used more efficiently (Panchasara, Samrat, & Islam, 2021). Addressing the impacts of climate change on food production can help ensure that food systems remain resilient and adaptable in the face of changing environmental conditions (IPCC, 2019). Improving access to healthy food can contribute to reducing rates of malnutrition and diet-related diseases while also promoting social and economic development (FAO, 2019). Moreover, promoting food sovereignty and security can support the development of local and community-based food systems that are sustainable, equitable, and culturally appropriate (Desmarais, 2017). In addition to these benefits, addressing key issues related to food security can also have positive impacts on other global development goals.

Such as reducing poverty, promoting gender equality, and protecting biodiversity (FAO, 2019). For example, improving access to healthy and nutritious food can help reduce rates of malnutrition and stunting, which are major contributors to poverty and poor health outcomes (Agostoni, Baglioni, La Vecchia, Molari, & Berti, 2023). Promoting gender equality in food systems can support the empowerment of women and girls, who are often responsible for food production and preparation in many communities (FAO, 2019). Additionally, sustainable food systems can contribute to the conservation of biodiversity and ecosystem services, which are critical for supporting human livelihoods and well-being (IPBES, 2019). Furthermore, addressing these issues is critical for achieving the Sustainable Development Goals (SDGs) established by the United Nations in 2015.

The SDGs aim to end poverty, protect the planet, and ensure that all people can enjoy peace and prosperity by 2030. Food security is a critical component of achieving these goals, with many of the goals directly or indirectly related to food security issues. For example, SDG 2 aims to end hunger and achieve food security and improved nutrition, while SDG 13 focuses on climate action to combat climate change, which has significant implications for food security.

Additionally, SDG 1 aims to end poverty, and SDG 5 aims to achieve gender equality, both of which are closely linked to food security issues. Addressing these key issues requires a multi-sectoral approach involving collaboration and partnerships between researchers, policymakers, practitioners, and community members. It is crucial to incorporate diverse perspectives and voices into food security research, prioritize research on understudied issues and intersections with other global issues, and strengthen partnerships and collaborations between stakeholders. Improving data collection and analysis methods to better capture the complexity of food security issues is also important. Finally, fostering sustainable development requires prioritizing the resolution of fundamental concerns connected to food security. To achieve this goal, it is necessary to use a holistic strategy that values the acknowledgment of the knowledge and experience of marginalized populations and takes into account the social, economic, and environmental aspects of food security. By focusing on these basic concerns, we can encourage the growth of sustainable and equitable food systems that contribute to the present and future well-being of all people.

3. Critical Gaps in Food Security Literature

Despite the significant amount of research conducted on food security, there are critical gaps in the literature that need to be addressed for sustainable development. These gaps include:

Limited Attention to Certain Issues: The food security literature has not given adequate attention to certain issues such as food waste, food sovereignty, and the perspectives and experiences of marginalized groups (Garnett et al., 2013). The issue of food waste has received limited attention in the food security literature despite its significant impact on food availability and accessibility. Globally, around one-third of the food produced for human consumption is lost or wasted each year (FAO, 2019). This represents a significant loss of resources including land, water, and energy, and has negative environmental and social implications. Addressing food waste is therefore crucial for ensuring food security and sustainable development. Similarly, food sovereignty, which emphasizes the right of people to control their food systems, including production, distribution, and consumption, has not been given adequate attention in the food security literature (Nisbett, et al., 2022).

This is even though food sovereignty is closely linked to food security and has important implications for the resilience and sustainability of food systems. Finally, the perspectives and experiences of marginalized groups, such as small-scale farmers and low-income communities, have received limited attention in the food security literature (Scoones, et al., 2020). This is a significant gap as these groups often face unique challenges in accessing and producing food, and their perspectives and experiences are essential for understanding and addressing food insecurity. To address these gaps, it is essential to incorporate diverse perspectives and voices into food security research and to prioritize research on understudied issues such as food waste and food sovereignty. Furthermore, it is crucial to ensure that the perspectives and experiences of marginalized groups are adequately represented in the literature and to develop effective strategies that promote sustainable and equitable food systems for all.

Insufficient Exploration of Intersections: There has been insufficient exploration of the intersections between food security and other global issues such as gender inequality, environmental sustainability, and animal welfare (Belton, et al., 2022). The intersectional nature of food security issues and their links with other global challenges such as gender inequality, environmental sustainability, and animal welfare has been recognized in the literature. For instance, research suggests that women are disproportionately affected by food insecurity due to gender-based discrimination in access to resources and education, as well as cultural norms and gender roles (Sinclair, et al., 2022). Additionally, environmental degradation and climate change have direct and indirect impacts on food security, particularly for vulnerable populations in developing countries (IPCC, 2019). The impact of animal agriculture on food security and the environment has also

gained attention in recent years, with debates on the sustainability of current consumption patterns and production methods (Garnett, et al., 2013). Despite these links, the literature on food security has generally focused on food production and distribution while neglecting the broader social and environmental contexts that underlie food security challenges (Belton, et al., 2022). This lack of attention to intersections limits the effectiveness of food security policies and programs in addressing the complex and multifaceted nature of food insecurity. Therefore, there is a need for research that explores the intersections between food security and other global issues to develop more holistic and effective strategies to address food insecurity.

Limited Focus on Policy Implications: The food security literature has a limited focus on the policy implications of research findings, which can hinder effective policy and practice (Filippini, Mazzocchi, & Corsi, 2019). This is a critical gap, as policymakers often rely on evidence-based research to make informed decisions. Inadequate consideration of policy implications in food security research can hinder the development of effective policies and practices to address food security issues (Balehegn, et al., 2020). For example, a study by (Savari & Amghani, 2022) found that while there is a large body of literature on small-scale farming, there is a lack of attention to the policy implications of these findings. This gap in the literature highlights the need for more research on the policy implications of food security research to support the development of effective policies and practices for sustainable development. Research studies that do not provide clear policy implications may not be able to contribute to decision-making and action (Spanaki, Karafili, Sivarajah, Despoudi, & Irani, 2022).

Therefore, it is crucial that food security research not only identify the problems but also provide practical policy recommendations for addressing them. Furthermore, some scholars have argued that there is a need for interdisciplinary and cross-sectoral approaches to food security research that consider the role of different actors in policy development and implementation (Zhang, Dhir, & Kaur, 2022). This requires not only collaboration between researchers but also between researchers, policymakers, and practitioners. Policymakers need to be involved in the research process to ensure that the findings are relevant and applicable to policy development and implementation (Namany, Govindan, Alfagih, McKay, & Al-Ansari, 2020). Overall, food security research must provide clear policy implications and recommendations to ensure effective policy and practice for addressing food insecurity. Additionally, interdisciplinary and cross-sectoral approaches to research can enhance the effectiveness of policy and program development and implementation.

Impact of Climate Change on Food Security: Temperature and CO2 increases can facilitate plant growth to some extent. However, rising temperatures also accelerate plant and soil evapotranspiration, which necessitates adequate water for agricultural growth. Climate change will have increasingly negative effects on agricultural production in countries that are already water-scarce as a result of declining water supplies; an increase in extreme events such as floods and severe storms, heat stress, and an increase in pests and diseases will have devastating effects on agricultural production (Asiedu, Adetola, & Odame Kissi, 2017; Odeku, 2013). At a certain threshold of warming, specifically above a two-degree Celsius increase in average global temperatures, adaptation would become exceedingly difficult and costly. In regions where temperatures are already extremely high, such as the Sahel region of Africa or South Asia, less heat-tolerant crops, such as wheat, could be impacted promptly by temperature increases (Máté, Novotny, & Meyer, 2021).

If nothing is done to enhance agricultural yields in the continent's most food-insecure nations, an estimated 43 million more Africans could fall below the poverty line by 2030 (Djankov & Panizza, 2020; Wudil, Usman, Rosak-Szyrocka, Pilař, & Boye, 2022). It is anticipated that climate change will affect the frequency and intensity of extreme events. Already, the effects of extreme events on agriculture are significant (Bindi, Palosuo, Trnka, & Semenov, 2015). Climate change is significantly altering the conditions under which agriculture is practiced. The effects of climate change on agricultural production systems are both direct and indirect. Changes in physical characteristics, such as temperature and precipitation patterns, have direct effects on specific agricultural production systems. Indirect effects include those that alter the productivity of other species, such as pollinators, parasites, disease vectors, and invasive species. These secondary effects can play a significant role. Given a large number of interacting traits and connections, the majority of which are unknown, it is significantly more challenging to evaluate and predict them (Nunn & Kumar, 2018; Scholtz, Schönfeldt, Neser, & Schutte, 2014; Wang & Wang, 2022).

Lack of Standardized Methods: There is a lack of standardized methods for measuring and assessing food security, which can limit comparability and generalizability. Furthermore, the lack of standardized methods also presents challenges in tracking progress toward achieving food security goals, such as those outlined in the Sustainable Development Goals (SDGs) (FAO, 2019). The SDGs include a specific target to end hunger and achieve food security by 2030, as well as targets related to nutrition and sustainable agriculture. Without standardized methods for measuring and monitoring progress toward these targets, it becomes difficult to assess the effectiveness of interventions and track progress towards achieving the goals (Heidkamp, et al., 2021). The absence of standardized methods can limit the comparability and generalizability of findings and hinder the development of effective policies and interventions. In addition, the concept of food security is complex, encompassing multiple dimensions such as availability, access, utilization, and stability of food (Clapp, Moseley, Burlingame, & Termine, 2022). As a result, there is a need for standardized methods to assess food security that capture its multidimensionality and variability across contexts. Some studies have highlighted the importance of using standardized methods for measuring food security.

For example, a study (Pérez-Escamilla & Segall-Corrêa, 2008) emphasized the need for standardized methods to assess food security and proposed a framework that considers the multiple dimensions of food security. Another study (Coates, 2013) reviewed various methods for measuring food security and found that the methods differed in their conceptualization and operationalization of food security, leading to variations in the estimated prevalence of food insecurity. To address these gaps, there have been calls for the development of standardized methods for measuring and assessing food security, as well as for the incorporation of a more comprehensive and multidimensional approach to measuring food security (Pérez-Escamilla, Shamah-Levy, & Candel, 2017). This includes the use of mixed-methods approaches and the incorporation of qualitative data to better understand the perspectives and experiences of food-insecure populations. Overall, addressing the lack of standardized methods is critical for improving the accuracy and comparability of food security research and tracking progress toward achieving global food security goals.

Lack of Advanced Technology: There are competing and complementary perspectives on food safety in the era of big data (Vågsholm, Arzoomand, & Boqvist, 2020). (Ben Ayed & Hanana, 2021), argue that multidisciplinary approaches should provide the food industry with more effective tools to ensure food quality and safety. Complex and enigmatic processes, such as machine learning and computational intelligence, are used for the real-time processing of these enormous data sets (Ben Ayed & Hanana, 2021). Lack of transparency makes it more difficult to scrutinize data and provide evidence-based recommendations. Utilizing food supply and demand forecasts and tracking food from farm to table without regard for food safety is also hazardous (Sapienza & Vedder, 2021). Consequently, initiatives involving big data must incorporate food safety considerations.

The advantages could include the reduction of food waste, the assurance of food safety through more effective process control, and the restoration of consumer and food industry confidence (Misra, et al., 2022). In addition, it would be advantageous to transition from destructive or invasive testing to sensor-based, non-invasive automated monitoring. Simply deploy these sensors on-site to monitor production in real-time. Large volumes of high-throughput, analytical, and imaging metadata obtained with these instruments will enable more precise food supply forecasting by shedding light on the rotting and decay processes of various food products stored under varying conditions (temperature, packaging). If made available online, this developing knowledge could provide the food company with ongoing benefits (Rejeb, Rejeb, & Zailani, 2021; Talari, Cummins, McNamara, & O'Brien, 2022).

4. Addressing Critical Gaps in Food Security

Several suggestions for further research and action can be made to overcome the significant gaps found in the literature on food security. To better capture the complexity of food security issues, data collection and analysis methods need to be improved. These include incorporating diverse perspectives and voices into food security research, prioritizing research on understudied issues and their connections to other global issues, fostering partnerships and collaborations between researchers, policymakers, and practitioners, and focusing on understudied issues and their intersections with other global issues. First off, multiple viewpoints and voices must be included in food security research to fully comprehend the complexities of the problems

involved. In particular, this entails giving special weight to the viewpoints and experiences of marginalized groups that are frequently disproportionately impacted by food insecurity, such as small-scale farmers and low-income communities. To ensure that these groups' needs and perspectives are heard, researchers can use community-based participatory research techniques. Second, it is essential for creating successful policies and practices to alleviate food poverty to prioritize research on understudied topics and how they connect with other global concerns.

This includes expanding studies on food sovereignty (Bezner Kerr, Hickey, Lupafya, & Dakishoni, 2019), food waste, and how issues like gender inequity, environmental sustainability, and animal welfare connect with concerns about food security (Mardones, et al., 2020). To ensure a thorough grasp of these difficulties, policymakers might prioritize financing for research in these areas and promote collaboration between academics from diverse disciplines. Thirdly, creating opportunities for knowledge sharing and collaboration between various stakeholders as well as strengthening partnerships and collaborations between researchers, policymakers, and practitioners can help ensure that research findings are effectively translated into practices and policies that address food insecurity. For instance, to discuss research findings and their implications for policy and practice, officials should arrange regular meetings with researchers and practitioners (Gava, Bartolini, Venturi, Brunori, & Pardossi, 2020). Developing effective policies and practices requires enhancing data collection and analysis techniques to better represent the complexity of food security concerns. This entails using quantitative and qualitative techniques that can capture the lived experiences of people and communities affected by food poverty, as well as standardized procedures for measuring and assessing food security. To learn more about the social and cultural aspects that contribute to food insecurity, researchers should also look into new data sources like social media and other digital platforms.

5. Conclusion and Recommendations

In conclusion, the food security literature has critical gaps that limit our understanding of the complex nature of food security issues and hinder effective policy and practice. These gaps include inadequate attention to certain issues, insufficient exploration of intersections with other global issues, limited focus on the perspectives and experiences of marginalized groups, a lack of attention to policy implications, and a lack of standardized methods for measuring and assessing food security. Addressing these gaps is crucial for sustainable development, as food security is a fundamental component of global development and has far-reaching implications for social, economic, and environmental well-being. To address these gaps, researchers, policymakers, and practitioners must work together to incorporate diverse perspectives and voices into food security research, prioritize research on understudied issues and intersections with other global issues, strengthen partnerships and collaborations, and improve data collection and analysis methods to better capture the complexity of food security issues? By addressing these critical gaps, we can gain a more comprehensive understanding of food security and develop more effective policies and practices that promote food security for all. It is essential to recognize that food security is a complex and multifaceted issue that requires collaborative efforts from various sectors to achieve sustainable solutions.

Therefore, it is a call to action for researchers, policymakers, and practitioners to work together and prioritize efforts to address these gaps and improve food security globally. Only then can we create a more just and equitable food system that ensures access to nutritious and culturally appropriate food for all. Gaps in the food security literature can have significant implications for policy and practice as they can limit the effectiveness of efforts to address food insecurity. One of the most pressing implications is the limited attention given to certain issues such as food waste, food sovereignty, and the perspectives and experiences of marginalized groups. This can result in policies and programs that do not fully address the root causes of food insecurity or that inadvertently perpetuate inequalities. For example, the issue of food waste has received inadequate attention in the literature on food security, despite the fact that around one-third of all food produced for human consumption is lost or wasted each year (Santeramo & Lamonaca, 2021). Addressing food waste not only reduces food insecurity but also contributes to environmental sustainability by reducing greenhouse gas emissions and conserving natural resources (Pörtner, et al., 2022). Policies and programs that promote food waste reduction, such as food recovery programs and improved supply chain management, can therefore have significant impacts on both food security and sustainability. Similarly, the concept of food sovereignty has received limited attention in the literature on food security.

It's the potential to challenge the dominant paradigm of global food systems and promote more equitable and sustainable food production and distribution (Clapp, Moseley, Burlingame, & Termine, 2022). Food sovereignty emphasizes the rights of people to define and control their food systems and to produce and consume food that is culturally appropriate, environmentally sustainable, and socially just. By prioritizing the perspectives and needs of small-scale farmers and marginalized communities, food sovereignty can address the root causes of food insecurity and promote more sustainable and equitable food systems. Insufficient exploration of the intersections between food security and other global issues such as gender inequality, environmental sustainability, and animal welfare also has significant implications for policy and practice. For example, the gendered dimensions of food insecurity have been largely overlooked in the food security literature, despite the fact that women and girls are disproportionately affected by food insecurity (Morales, Morales, & Beltran, 2021). Addressing gender inequality in food systems, such as by promoting women's land rights and improving access to education and resources, can therefore be crucial for achieving food security and reducing poverty. Furthermore, the limited focus on policy implications of research findings in the food security literature can hinder effective policy and practice. Without clear and actionable policy recommendations, research may not be translated into effective interventions, and efforts to address food insecurity may be less effective or inefficient.

Therefore, there is a need for greater collaboration between researchers, policymakers, and practitioners to ensure that research findings are translated into effective policies and programs that can address the root causes of food insecurity (Murrell & Jones, 2020). Finally, the lack of standardized methods for measuring and assessing food security can limit the comparability and generalizability of findings, making it difficult to identify and address food insecurity on a global scale. This underscores the need for the development and implementation of standardized methods and indicators for measuring and assessing food security, which can improve comparability in addition to enabling more effective monitoring and evaluation of interventions. In conclusion, gaps in the food security literature can have significant implications for policy and practice, as they can limit the effectiveness of efforts to address food insecurity. Addressing these gaps will require greater attention to certain issues, such as food waste and food sovereignty, as well as greater exploration of the intersections between food security and other global issues. Additionally, there is a need for greater collaboration between researchers, policymakers, and practitioners to ensure that research findings are translated into effective policies and programs and for the development and implementation of standardized methods and indicators for measuring and assessing food security.

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