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Exploring the nexus of agricultural policy reforms and food security

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Agricultural policies play a critical role in determining the availability and stability of food supplies for individuals and communities. This study underscores the importance of incorporating social, economic, environmental, and political dimensions of food security when developing agricultural policy reforms. The study has two main objectives: (1) to disentangle the complexity surrounding food security by mapping policy reform decisions onto a suggested framework, and (2) to provide an empirical basis for analyzing food security using frame package analysis. To achieve these objectives, this study conducted an inductive frame analysis of agricultural policy reforms, using the theoretical framework of the "fractured consensus" regarding the CAP (Common Agricultural Policy). The case of Israel was chosen as an empirical example for the frame package analysis. The extended suggested theoretical framework can contribute to enhancing the research literature on the nexus between agricultural policy reforms and food security from both theoretical and empirical perspectives. Additionally, the proposed framework and its application can serve as a benchmark for evaluating agricultural policy reforms in the context of food security and developing practical strategies in the agri-food sector, considering the involvement of multiple players and interests.

KEYWORDS

agricultural policy, agriculture reforms, food security, long-term planning, multiple players

1 Introduction

Food security constitutes a fundamental aspect of national security. However, a substantial number of nations are inadequately prepared to manage prolonged scenarios, crises, and disasters proficiently. Disruptions induced by the 2020 COVID - 19 pandemic and the Russian - Ukraine conflict along with the climate crisis, the rapid urbanization process, loss of agricultural land and the growing population demonstrate the impact of long-term shocks on local and global resilience of food systems and food security (Al-Bakri et al., 2013; Shi et al., 2016; Hatab et al., 2019; Béné, 2020; Devereux et al., 2020; Akparibo et al., 2021; Ali et al., 2021; Béné et al., 2021; Ben Hassen and El Bilali, 2022; Hellegers, 2022; Horn et al., 2022; Khan et al., 2022; Lin et al., 2023).

The traditional definition of food security encompasses four well-known pillars: availability, access, utilization, and stability. Clapp et al. (2022) suggest adopting agency and sustainability, as complimentary pillars in both policy and scholarly settings, alongside the more established pillars. They claim that these elements are absent in the formal food security frameworks. Agency refers to individuals' and communities' capacity to actively engage in food systems, thereby addressing hunger and inequality in resource distribution (Sen, 1985;

Thompson, 2015; Burchi and De Muro, 2016; Chappell, 2018). Sustainability emphasizes the interconnection between economy, society, ecosystems, livelihoods, and politics to ensure the long-term viability of food systems and support food security. This broader perspective aligns with initiatives such as the Sustainable Development Goals (SDGs), particularly SDG2, which explicitly links sustainability with food security, aiming to "End hunger, achieve food security and improved nutrition, and promote sustainable agriculture" (Clapp et al., 2022).

The agricultural sector plays a pivotal, strategic role in ensuring food security and availability. Rapid population growth and greater demand alongside external shocks, highlight the importance of expanding agricultural production and food supply. Different policy interventions are needed to improve countries nutrition status and to achieve stability and sustainability of agriculture (Pawlak and Kołodziejczak, 2020). Policymakers' strategies have a crucial impact on designing agricultural policy reforms as well as on farmers' viability and sustainability. The exogenous factors posing threats to food security necessitate the implementation of effective agricultural adaptation strategies. These strategies must include government intervention and prioritize policy-driven adaptation efforts (Kan et al., 2023). In line with Fanzo et al. (2020): "Tackling global food insecurity and malnutrition can only be achieved in the context of broader food systems thinking and policymaking, particularly in a world that will be increasingly affected by inter-connected, multi-sectoral risks." (Fanzo et al., 2020, p. 2).

In recent years, scholars have been recognizing the central role of governance addressing food security. They acknowledge that effective food security solutions must not only tackle technical and environmental issues, but must also consider the social, economic, and political dimensions (Mooney and Hunt, 2009; Von Braun, 2009; Candel, 2014; Candel et al., 2014; Leeuwis et al., 2021). Ensuring food security requires the implementation of supportive agricultural policies and carefully formulated long-term strategies. Consequently, the decision-making process of policymakers poses a multifaceted socio-economic-political challenge, serving as an endogenous factor that significantly influences a country's food security. Additionally, there is considerable variation in the interpretations of food security among stakeholders, attributable to diverse interests and policy positions (Mooney and Hunt, 2009; Zahrnt, 2011; Lang and Barling, 2012; Kirwan and Maye, 2013; Maye and Kirwan, 2013). The subsequent section illustrates this complexity by presenting the EU experience.

1.1 The EU experience as conceptual framework for the Israeli case

The EU's common agricultural policy, i.e., the CAP, illustrates a comprehensive agricultural reform which has been developed and reframed throughout five phases. The first phase spans from the Treaty of Rome in 1985 up until 1992, embodies two-fold aims: ensuring food security and creating a "European Agriculture Welfare" (Sheingate, 2006; p. 115). The second Phase (1992–2000) pursues the identification of European agriculture within free trade market and environment frames: market distortions, market imperfections and environment externalities. The third phase (2000–2013) reflects two opposing policy frames: the "first pillar" that is focused on market competitiveness concerns, and the "second pillar" aimed at rural development. The fourth phase (2013–2019) began with the 2013 CAP reform and was influenced by the 2007–2008 food crisis when world food prices were volatile and increased dramatically. This reform highlighted the issue of food security; however, food security was mainly interpreted as a food availability issue and was used to sustain high level of production and to justify farmers' support. The fifth phase – the current CAP reform – under the pressure of agricultural and environmental lobbies and critiques on inefficient CAP spending, from the year of 2023 a new reformed policy will be adopted to respond the changing needs and challenges emphasizing the goals of environmental sustainability and food security (Candel et al., 2014; Nazzaro and Marotta, 2016; Galli et al., 2020; Toma et al., 2021; European Council, 2022).

Candel et al. (2014) address which food security frames can be identified in the CAP post-2013 reform process and suggest an inductive frames analysis encompassing six sub-frames regarding the issue of food security: (1) The productionist frame introduces several challenges regarding EU production and food security, among others, price volatility, dependence on imports for some goods and climate change. (2) The environmental frame argues that the CAP paying insufficient attention to the negative effects of intensive agriculture on nature, countryside, environment, and land. (3) The development frame criticizes the impact of the CAP on food security in developing countries, that have limited their opportunities toward achieving food provision autonomy. (4) The free trade frame supports in equal market access for all, to give farmers from all over the world an opportunity to enter commodity markets and to allow consumers to buy products at lowest price. (5) The regional frame concerns about the impact of the CAP on regional differences in food security, i.e., markets alone will not compensate farmers in remote rural areas. (6) The food sovereignty frame focuses on the people's rights to food and to decide about the modes of production.

Recanati et al. (2019) reviewed 165 papers providing policy recommendations for the future directions of the CAP and emphasized the need for a comprehensive approach to policy-making able to link together social, environmental, food and agricultural policies to create an integrative package including "whole food system" impacts.

This research utilizes the EU experience as a benchmark for best practices, guiding the conceptualization of the Israeli framework.

1.2 The Israeli case

The agricultural policy in Israel is characterized by inconsistency and a lack of long-term strategic planning (Hadas and Gal, 2014), which leads to frequent changes in decision-making and poses risks to farmers' livelihoods and the sustainability of food systems.

Since the early 1990s, Israel has undergone significant changes in its agricultural policy, with the aim of reducing government regulation in the agricultural sector. The Israeli government's historically high priority and ideological commitment to agricultural development (Abraham et al., 2019) have diminished, and the heavily regulated agriculture has been replaced with a free-market perception among policymakers. Indirect support mechanisms for agriculture have been reduced, including the allocation of production quotas in the livestock

sector, price control measures, import protection policies, and the provision of subsidies. Reforms continued in the 2000s, with a focus on promoting competition and reducing government intervention in the eggs, dairy and beef sectors (OECD, 2022). As a result of these major reforms and the absence of a strategic plan to encourage the development of alternative sources of employment and income for smallholder farmers, many farmers have been forced to leave the sector due to factors such as age, lack of professional skills, or the inability to cope with frequent structural changes, agricultural reforms, and the prevailing free-market perception (Sofer, 2005; OECD, 2010; Kimhi, 2011; Kimhi and Reznik, 2018; Lipshits and Barel-Shaked, 2021).

Additionally, Israel has experienced significant political instability in recent years, with five rounds of parliamentary elections held between 2019 and 2022, leading to the election of a new government in November 2022. The previous government, established in June 2021, adopted a market-oriented approach, and introduced a key resolution, known as Decision no. 213, to advance agricultural policy reforms. This decision sought to enhance competition in the agricultural sector and streamline import regulations by reducing customs duties on fresh produce, simplifying import procedures, gradually exposing many crops to competing imports over five years, and increasing the budget for R&D and capital investments in the agricultural sector. In March 2022, the Ministry of Finance and the Ministry of Agriculture formulated an outline for the gradual reduction of tariffs on products, along with direct payments for farmers based on their growing areas. Currently, customs duties on certain products have been immediately reduced to zero, including garlic, beans, mushrooms, avocado, raspberry, blueberry, and others. For the remaining products, customs reductions have been implemented in two phases, continuing annually until 2027, gradually reducing rates to between 10% and 50% of their pre-reform value. However, the promised direct compensation of NIS 270 million to farmers has not materialized (Israeli Ministry of Agriculture, 2023). As a result of the import reform, profitability in certain crop industries has been compromised, leading to reductions and paralysis in their activities (e.g., the olive and garlic industries).

The implementation of import reforms, a political issue that remains unresolved, may lead to a reduction in fresh food prices in the short term but will certainly increase Israel's food supply exposure to global risks and endangers food security in Israel in the long term. Israel's population has been growing at an annual rate of 1.9% over the last decades (Israeli Central Bureau of Statistics, CBS). However, the rate of increase in agricultural output has been on a downward trend for four decades, and the share of agriculture in total employment and GDP in Israel has fallen to around 1% (OECD reports, 2020, 2022). Given the continued shrinking of cultivated land areas, no significant change is expected. This implies that Israel's food supply will increasingly rely on imports, with all the attendant risks.

This study employs an inductive frame analysis, drawing upon Candel's (2014) theoretical framework of the "fractured consensus" regarding the Common Agricultural Policy (CAP). It focuses on agricultural policy reforms, with the case of Israel serving as an empirical illustration for the frame package analysis. By examining the linkage between food security and agricultural performance, the study aims to clarify the impact of Israeli agricultural policy reforms on shaping food security exploiting the EU experience as a conceptual framework for the Israeli case. Additionally, the research endeavors to shed light on the role of governance in addressing food security challenges and to contribute to ongoing debates in this field.

2 Methodology

Several studies propose a conceptual framework that views food security as a consensus. However, their identification of frames lacks empirical basis (Mooney and Hunt, 2009; Brunori et al., 2013; Maye and Kirwan, 2013). This study challenges this consensus perception by presenting a contradiction perspective. It delves into the complexity of framing the issue of food security due to the involvement of multiple players and their diverse interests and analyzes the varied interpretations of the definition of food security and its implications. To disentangle this complexity, the study employs a three-fold analysis. Firstly, it conducts a comprehensive examination of the structural adjustments and policy reforms within the Israeli agricultural sector from 1994 to 2022. The primary aim is to assess the extent to which policymakers have influenced food systems and security outcomes. Data utilized in this research are sourced from reputable institutions such as the Israeli Central Bureau of Statistics (CBS), the Israeli Ministry of Agriculture, and OECD reports spanning from 2010 to 2022. Additionally, stakeholder perspectives from various agricultural associations enrich the examination of policy dynamics. Secondly, the study organizes the gathered information into a suggested framework, categorizing the multiple players and their divergent interests into schematic model. Lastly, it employs an empirical basis for approaching food security through frame package analysis, as advocated by Candel et al. (2014). This analysis aims to identify variations across five frames: Productionist, Environmental, Development and Regional, Free trade, and Sovereignty frames, aiming to challenge the expected consensus frame of food security. The inductive frame analysis presents the definition, challenges, opportunities, and implications of each frame, thereby contributing to a clearer understanding of the issue's complexity. The suggested methodological approach can be replicated by other scholars in diverse settings.

2.1 Conceptual analysis

The research contributes to the academic literature by challenging the consensus regarding food security. The following section is divided into two sub-sections: the first presents conflicts within the context of multiple players involved in decision-making regarding food security. The second part presents an inductive frame analysis applied to the case study of Israel.

2.2 The conflict among multiple players

There is an extensive variation in the meaning that stakeholders attach to food security resulting from different

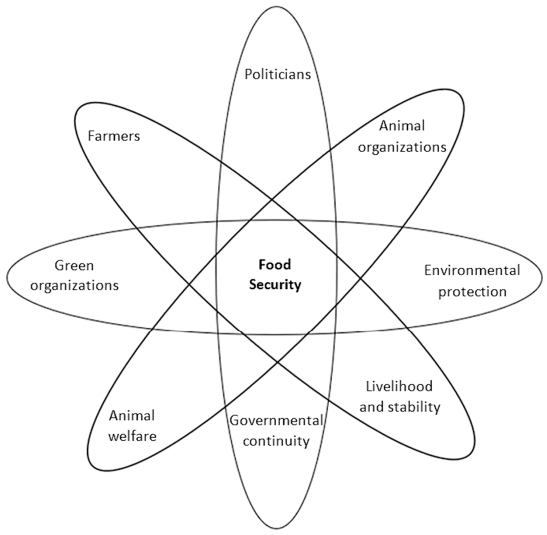

FIGURE 1
Schematic model – the conflict among multiple players.

interests and policy positions of stakeholders. The involvement of stakeholders and their interests generates an environment akin to a playground with multiple players, each representing different perceptions and interests. This creates a conflict-ridden atmosphere and results in multiple frames in food security analysis (Mooney and Hunt, 2009; Zahrnt, 2011; Lang and Barling, 2012; Maye and Kirwan, 2013; Béné, 2022). Policy integration should take into consideration all the players and to disentangle competing perspectives and conflicts; to support agricultural objectives along with protecting on human ecosystem on which food production depends; to implement improvements relating to environment and farmers' livelihoods (Walls et al., 2016; Candel and Pereira, 2017; Recanati et al., 2019).The following schematic model presented in Figure 1 above illustrates the conflict among multiple players including stakeholders, farmers, cooperatives, and organizations, involved in the decision-making process in agriculture, emphasizing the resulting complexity. Governance volatility and frequent policy reforms exacerbate this effect. The one part of each oval represents the players, while the other part represents the interests they represent.

The schematic model shown in Figure 1 above underscores the trade-off between competing interests and values. Politicians are often motivated by the continuity of government, potentially leading to decisions that harm the survival and continuity of farmers. For instance, they may decide to lower customs duties and open import channels to reduce the cost of living, potentially impacting farmers' profitability. Conversely, farmers seek to maintain their survival and profitability through government support. Additionally, environmental and animal welfare organizations advocate for reforms to protect the environment and animal welfare, even if it means potentially harming farmers' interests. Therefore, there are conflicting interests in setting agricultural policies that affect food security and the stability of farmers, who are crucial for maintaining food systems. The described environment exemplifies the convergence of economic, social, political, and environmental interests.

2.3 Inductive frame analysis

An inductive frame analysis is applied to the case of Israel by demonstrating the application of each frame. The frame package analysis presented in Table 1 below, illustrates the chosen criteria for mapping food security with respect to each frame: the definition of food security, challenges, perspective for action/opportunities, and implications. The development and regional frames were integrated due to their strong connection and overlapping nature in the case of Israel.

The conceptual analysis results shown in Table 1, highlight the conflict among multiple players and stakeholders involved in the decision-making process in agriculture, which complicates the possibility of establishing a unified policy in the context of food security. As a result, a fragmented framework is revealed, consisting of different layers that sometimes overlap and sometimes contradict each other. For instance, a conflict may arise between the productionist, free-trade, and sovereignty frames in the context of Israel. With the reduction of customs duties, Israel imports certain fruits and vegetables from neighboring countries such as Turkey, Jordan, and Egypt, at competitive prices. Consequently, local production of these commodities is expected to decline in the short term, potentially hastening the departure of small family farms from agriculture and impeding local food production. The long-term implications of this scenario are threefold. Firstly, the neighboring countries are less equipped to cope with climate change compared to Israel, thus the feasibility of continued low-cost imports from these nations may diminish over time. Additionally, political instability in these regions and fluctuations in diplomatic relations with Israel pose risks to the consistent supply of agricultural products. Moreover, there remains uncertainty regarding the quality of produce imported from these nations and the effectiveness of monitoring environmental and health standards among their farmers (Kimhi, 2022).

Another illustration of contradiction surfaces between the productionist frame and the development and regional frames. To uphold the local production aspect of food, substantial technological advancements in agriculture are deemed necessary, enabling greater output with fewer resources and at a reasonable cost. However, doubts linger regarding the timely fruition of increased research and development budgets, potentially benefiting only those farms capable of embracing new technologies, while traditional farms or veteran farmers may struggle to adapt and to survive. In essence, technological advancement clashes with the regional frame, thereby imperiling long-term food security in Israel.

This complex environment constrains the formulation of a coherent long-term strategy and undermines the efficacy of agricultural policy reforms, leading to various consequences, including:

- Lack of Implementation due to objected interests of politicians: Reforms may fail to achieve their intended outcomes if they are not implemented properly or fully due to incoherent policy. In some cases, political will or bureaucratic inefficiencies can hinder the effective execution of reforms, resulting in limited or inconsistent results.

TABLE 1 An inductive frame analysis application.

Frame	Definition of Food Security	Problems/challenges	Perspective for action/ opportunities	Implications
1 Productionist frame	• Domestic food production resilience • Security of food supply provision and food resources • Food inventories accumulation.	• Climate fluctuations • Price volatility • Incoherent agricultural policy reforms • Dependence on imports • Growing population- annual growth rate of 1.9%.	• Sustainable agricultural production, R&D • Competitiveness, Production efficiency and quality • Globalization, Supportive policy mechanisms • Reducing distorted policy mechanisms (quotas, minimum prices, subsidies), • Reducing regulation, Revenue support for farmers.	• Exit of small farmers; lack of financial compensation mechanism for ensuring farmers' livelihoods • Concentration of production by monopolies and cartels • Lower income
2 Environmental frame	• Expand production in rural regions. • Protecting land and water resources.	• land and water are state owned. • High rate of population growth • Limited space and natural resources. • Scarcity of land and water resources.	• Agri-environmental payment to development regions (Negev desert, Lake Kinneret) • Farmers are eligible for environmental investment grants. • Meeting establishing agri-environmental policy measures (payments/incentives for ecosystem services). • Environmental regulations in livestock branches to decrease the pollution of land and water. • Sub-surface drip irrigation. • Using desalination water.	• Lack of nature resources • Price for recycled water used by agriculture is lower than freshwater to encourage farmers to substitute freshwater for recycled water. • Conservation of biodiversity and open space related to agriculture.
3 Development and Regional frames.	• Strengthen rural community. • Re-design and restructure the Israeli settlement model including kibbutzim and moshavim.	• Adopting new technologies in agriculture and agri-food, replacing traditional agriculture and veteran farmers. • The younger generation reluctant to integrate into the agriculture sector due to the relatively low-income potential. • Fluctuations of governance decisions poses uncertainties; The absence of a well-defined long-term strategy hinders effective planning and implementation.	• Implementing regional and settlement plans to promote the development of rural areas, peripheries, in the north and south of Israel. • Training and educating the younger generation of farmers. • Allocating substantial financial resources to support the development of Israel's peripheral regions.	• Decline in profitability in the agricultural sector. • Young generation is abandoning the rural peripheral regions and the agriculture sector. • The agricultural reforms pose a risk to the livelihood and stability of veteran farmers.
4 Free trade frame	• The protection of domestic farmers and production. • Control imports of food products. • Reducing country's dependence on imports.	• Ensuring meeting quality requirements and international standards. • Trade – distorting mechanisms. • Encouraging export and generating a surplus in the trade balance.	• Decreasing cost of living • Competitiveness • Innovation • Trade agreements • Subsidizing export and increasing food supply	• Reducing local agricultural production • Exit of local farmers. • An increase in importer profitability, which leads to higher food prices and dismisses the purpose of decreasing the cost of living.
5 Sovereignty frame	• Ensuring stable food supply	• Exogenous crises: Covid – 19 pandemics, Russian-Ukraine conflict, Climate volatility. • Israel geopolitical location. • Incoherent agricultural policy and lack of long- term planning.	• Accumulation of inventories. • Long-term strategy. • Supporting policy in local producers.	• Risk for the resilience of local farmers. • High reliance on food imports.

- Insufficient Resources: Agricultural reforms often require adequate financial resources, infrastructure, and technical support to be successful. If these resources are lacking or not properly allocated, the reforms may not be able to address the underlying challenges faced by farmers or improve productivity and sustainability in the sector.
- Resistance to Change: Agricultural reforms often involve changes in traditional practices, land-use patterns, or market structures. Resistance from various stakeholders, such as farmers, agricultural workers, or powerful interest groups, can hinder the adoption and implementation of reforms. This resistance may arise due to concerns over livelihoods, fear of market uncertainties, or cultural attachments to traditional farming methods.
- Lack of Stakeholder Involvement: Effective agricultural reforms require the active participation and involvement of key stakeholders, including farmers, agricultural cooperatives, researchers, and policymakers. When these stakeholders are not adequately consulted or involved in the reform process, the resulting policies may not reflect the realities on the ground or address the specific needs and challenges of the farming community.
- Unintended Consequences: Sometimes, agricultural reforms can have unintended negative consequences. For example, policies aimed at promoting large-scale commercial agriculture may lead to concentration in the sector, marginalization of small farmers, and increased inequalities. Reforms that prioritize productivity gains without considering environmental sustainability can lead to ecological degradation, soil erosion, and water resource depletion.

3 Discussion

This study offers a comprehensive critical perspective for the food security policy, which may be of interest of scholars and policy makers. It enriches the current research literature by suggesting an evidence-informed strategic perspective which challenges the status quo regarding food security governance literature.

Agricultural policies play a critical role in determining the availability and stability of food supplies for individuals and communities. The impact of agricultural policies on food security can be significant, and it is important to ensure that policies promote sustainable agricultural practices and fair trade to improve food security. Additionally, investing in food storage and distribution infrastructure, and encouraging local food systems are also essential to improve food security. It is important for governments to carefully consider the impact of their agricultural policies on food security as well as on farmers' livelihood and to make necessary adjustments to ensure that food is available, accessible, and stable for all individuals and communities.

The consequences of ineffective agricultural reforms can be significant and far-reaching. They may include:

1 Persistent Poverty and Food Insecurity: Ineffective reforms can perpetuate poverty among smallholder farmers, who often lack access to credit, modern technologies, and markets. This can lead to increased food insecurity and malnutrition, particularly in rural areas where agriculture is the primary source of livelihood.
2 Environmental Degradation: Inadequate attention to environmental sustainability in agricultural reforms can result in deforestation, soil erosion, water pollution, and depletion of natural resources. These environmental consequences can undermine long-term agricultural productivity and compromise ecosystem services.
3 Rural–Urban Migration: When agricultural reforms fail to improve farm incomes or livelihood opportunities, rural populations may be compelled to migrate to urban areas in search of better prospects. This can contribute to urban overcrowding, unemployment, and social challenges.
4 Socioeconomic Inequalities: Ineffective reforms may exacerbate socioeconomic inequalities within the agricultural sector, with large-scale farmers benefiting disproportionately compared to smallholder farmers. This can widen the income gap, increase social tensions, and hinder overall economic development.

Global threats such as the COVID-19 pandemic and the ongoing Russian-Ukraine conflict are undermining the functionality of global food systems, which are inherently vulnerable due to dependency on fertilizer imports, volatility in grain markets, and elevated energy prices. Consequently, governments are urged to implement national food security measures, recognizing the interconnectedness of global crisis response systems. It is imperative that during crises, policies are enacted to incentivize farmers to undertake adaptive measures to mitigate anticipated losses resulting from shifting economic conditions and to ensure the continuity of local food systems (Lugo-Morin, 2020; Hellegers, 2022; Abay et al., 2023; Rabbi et al., 2023).

The study results highlight the importance of designing and implementing agricultural reforms in a comprehensive and inclusive manner, considering the local context, the needs of farmers, and the long-term sustainability of the sector. Additionally, continuous monitoring and evaluation of the reforms can help identify shortcomings and enable timely adjustments to improve their effectiveness.

The study proposes to the policymakers to devise a long-term strategic planning to invest, support, and strengthen local farmers as the pillar of local agricultural production and food security, as well as to reduce the concentration created by agricultural reforms. To improve food security through agricultural policy by implementing the following potential solutions:

- Supporting sustainable agricultural practices: This can be achieved through policies that provide financial and technical assistance to small-scale farmers, as well as policies that encourage the use of sustainable farming methods.
- Investing in food storage and distribution infrastructure: This can help to ensure a stable food supply by allowing food to be stored and distributed in times of need.
- Encouraging local food systems: This can help to improve food security by reducing the dependence on imports and increasing the resilience of food systems to disruptions.

Author contributions

SB-S: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. EB: Conceptualization, Data curation, Formal analysis, Methodology, Software, Validation, Visualization, Writing – review & editing, Investigation, Resources, Writing – original draft.

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