RESEARCH ARTICLE

A Literature Review of Food Security

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ABSTRACT
As a pervasive and extensively researched issue, addressing food insecurity necessitates scholars to synthesise previous studies and comprehend the current global scenario to approach its challenges with renewed insight. This paper consolidates existing literature on food insecurity, integrating fundamental concepts following food accessibility, availability, utilisation, and stability. It further examines three crucial factors impacting food insecurity - climate change, conflict, and COVID-19 - as identified by the UN. The objective is to offer researchers a comprehensive perspective, fostering fresh insights to contribute towards global efforts to achieve the overarching goal of food security.

KEYWORDS
Literature Review, Food Security

1. Introduction

The lack of food security, or food insecurity is a pressing issue closely related to hunger and malnutrition and has consistently been a focal point for various organisations and scholars. Food production, distribution, and consumption dynamics have undergone significant transformations with a steadily expanding population and advancing technology. It has become more vulnerable to external events and influences worldwide and is susceptible to outbreaks like COVID-19. Therefore, there is a need to understand the causes of food insecurity in light of existing research.

There is a cyclical correlation between food insecurity and conflict, particularly pronounced in the Sahel region (*1*). While an escalation in food insecurity can serve as a source of discontent, fuelling insurgencies, the impact of severe and acute food insecurity can also mitigate conflict behaviour. It is evident in areas where urban riots primarily manifest through the surge in consumer prices, particularly for essential commodities like food and fuel. Interestingly, these riots are not typically instigated by the most food-insecure groups but rather by those with relatively better access to food. However, these collective actions can potentially escalate conflict, creating a more challenging and stressful food security environment. Global warming and extreme weather are significant factors affecting food security. One illustrative example is the impact of droughts resulting from elevated seasonal temperatures, particularly during the summer months (June, July and August) in the Sahel region (*2*). These droughts severely impact crop and livestock production, affecting yields and soil conditions and causing the loss of livestock assets. People might have to give up on agriculture in

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certain situations completely. The consequences of climate change can lead to extreme food insecurity in many vulnerable regions. In a scenario of high emissions, projections indicate that by 2050, the amount of food required to offset these impacts in adversely affected regions, such as South Asia, would be a staggering three times the current food reserves of the regions (*3*).

However, we found few literature reviews that provide a comprehensive overview of food security. We address this by providing a detailed literature review of food security research in this paper. In our literature review, we delve into the nature of the four components of food security - namely, food accessibility, availability, utilisation, and food stability. In particular, we examine two critical food security elements: conflict and extreme weather. We stress the significance of considering country-specific contexts and the nation's geographical and political positioning. The four dimensions of food security, often conceptualised, exhibit inherent layers (*4*). Ample supplies are necessary but cannot ensure that people can access "sufficient, safe and nutritious food". Social science concepts like individual income, household food distribution, and geographic location (*5*, *6*). Utilisation rates reflect how food contributes to each individual's health status (*4*). Moreover, the stability of food security is not just relevant but is of utmost importance at every level. Ensuring a basic level of security for each of these components enables individuals to anticipate their food needs, fostering a stable environment essential for food security.

2. Literature Review

Previous studies have broken down the issue of food security into four components (accessibility, availability, utilization, and stability) (*7*). Our literature review explores food security from a temporal, global and international perspective. Considering the chronological dimension, it is imperative to recognize the area's historical background and how it relates to food security. In addition, we develop an international viewpoint, with particular attention to the participation of governmental organizations, non-governmental organizations (NGOs), and other groups. The actions of international organizations on direct local food security are discussed in this study, along with local conflicts, economic shocks, and other anthropogenic influences. In this section, we utilise a concept-centred approach (*8*) to synthesise the literature on food security, as illustrated in Table 1.

2.1. *Sustainable Development Goals and Food Security*

The United Nations established 17 Sustainable Development Goals (SDGs) in 2015[1]. SDG 2 is directly related to food security, whose goal is "Zero Hunger". The official wording of SDG 2 is "End hunger, achieve food security and improved nutrition, and promote sustainable agriculture", and the idea is to achieve this goal by 2030. We start with a definition of food security. FAO[2] (2002) defines it as *"food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and dietary preferences for an active and healthy lifestyle"* (*9*). Therefore, food insecurity refers to the lack of secure access to safe and nutritious food for average human growth and development and active

[1] `https://sdgs.un.org/goals`

[2] Food and Agricultural Organization of the United Nations, https://www.fao.org/home/en/

Table 1. An overview of previous literature on food insecurity(i.e. a Concept Matrix), where a ✗denotes that the particular paper (in the row) covers the topic (in the column).

Articles	Concepts			
	Food security	Conflicts	Climate	COVID-19
Acharya et al, 2020		✗		
Agyei et al,2021				✗
Arias et al, 2019		✗		
Ashley, 2016	✗			
Baer, 2017	✗			
Benjaminsen, 2021		✗	✗	
B. Korf, 2004		✗		
Brck et al, 2019		✗		
Eck et al, 2007		✗		
GFSI, 2021	✗			
GRFC, 2020	✗			
GRFC, 2022	✗			
Iacoella et al, 2020		✗		
Jafri et al, 2021	✗			✗
Kalyvas, 2006		✗		
Karen, 2020		✗	✗	
Martin et al, 2019	✗	✗		
Mbaye, 2020		✗	✗	
Mihai et al, 2017		✗		
M.R.Garfinkel, 2011		✗		
Mukiibi, 2020				✗
Nicholson, 2013			✗	
Riebe et al, 2021			✗	
RIMA-II, 2016	✗			
Shilomboleni, 2020				✗
Sissoko et al, 2011			✗	
Stern, 2008			✗	
Themnr et al, 2014		✗		
UN Mechanisms and Documents, 1999	✗			
UN, 2018			✗	
Werndl, 2016			✗	
W.Zhu et al, 2019			✗	
Yobem et al, 2020	✗		✗	

and healthy life (*10*). Food insecurity can be divided into *acute food insecurity* and *chronic food insecurity*. Acute food insecurity is any manifestation of food insecurity at a specific time of severity that threatens lives, livelihoods, or both, regardless of the causes, context, or duration (WFP, 2020). FAO defines chronic food insecurity as 'undernourishment', a long-term or persistent inability to meet dietary energy requirements (lasting for a significant period during the year) (WFP, 2020).

There are four components of food security: food accessibility, availability, use, and stability of food (*7*). Accessibility includes both economic and physical accessibility (*11*). Economic accessibility implies that personal or household financial costs associated with obtaining food for an adequate diet should be at a level that does not impede or jeopardise the attainment and satisfaction of other basic needs (General Comment 12). Physical limitations may also prevent access to food (*7*). People in remote areas, for example, lack access to affordable food due to underdeveloped infrastructure. Food availability is frequently mentioned in conjunction with food accessibility. In many parts of the world, social or political barriers cause hundreds of families to become poor and hungry (*7*).In addition, food accessibility and food availability were even more directly impacted by COVID-19. The COVID-19 pandemic altered dietary practices and worsened food insecurity, particularly in the most fragile regions (*12*). The food industry suffered as a result of the pandemic-induced blockade. For the uptown area, ploughing is quite significant for livelihood. Nevertheless, delivering services became more challenging as customs and toll roads were partially closed. Reserving agro-veterinary slots also required a longer waiting time (*13*). In addition, basic food prices began to rise due to supply chain restrictions and increased consumer demand. Fruits, vegetables, grains, and meat were the most commonly affected food groups. However, the most widely reported price increase in African countries was for staple foods such as grains (*12*). The third component of food security is consumption or utilisation. This aspect relates to the outcome of food utilisation. For example, when people cannot absorb nutrients from food because of contaminated water or poor sanitation (*7*). The fourth component of food security is food source stability over time, including availability, accessibility, and predictability (*14*). Food price spikes can be triggered by local, regional, or international events that a community has little or no control over (*7*).

2.2. *Factors affecting food security*

According to the Global Report on Food Crises in 2022 (*15*), conflict, weather extremes, and economic shocks were the main drivers of rising acute food insecurity in 2021. These drivers are commonly interconnected and mutually reinforcing, making it difficult to pinpoint the specific trigger for each food crisis.

2.2.1. Conflict and food security

It is not easy to measure and categorise conflicts. The Uppsala Conflict Data Program's (UCDP) (*16*) event-based measures and categories have become a standard metric of conflict at the national level. An event is defined as "the incidence of the use of armed force by an organized actor against another organized actor, or against civilians, resulting in at least 1 direct death in either the best, low or high estimate categories at a specific location and for a specific temporal duration" (*17*). War intensity is described as the size of a conflict with at least 1000 combat-related deaths in a calendar year (*17*). There are four conflict types: interstate conflict, intrastate conflict, internation-

alised intrastate conflict, and one-sided violence. A traditional country-versus-country conflict is an interstate conflict. Intrastate conflict is a conflict within a country where one side is the government and the other side is a non-state group. Internationalised intrastate conflict is defined as an intrastate conflict that includes significant involvement from other countries. Finally, one-sided conflict is the direct targeting of civilians by government or non-state forces (*18*).

Conflict is a major factor driving people into severe food insecurity. Food security and violent conflict have a bi-directional relationship (*19*). Nutritional status, agricultural production, coping, and consumption are all impacted by violent conflict. Violent conflict displaces people. Conflicts have a negative relationship with the height of children and adolescents and have an equal impact on the nutritional status of both boys and girls (*20*). In addition, conflicts impose costs on economic production from two angles (*21*). Firstly, conflicts directly damage public property, private capital, and human capital. As a result, the productivity of these places gets dramatically reduced (*22*). Secondly, conflicts can impact agricultural production by enforcing rules of conduct, taxing households and production, and forcing households to grow certain crops (i.e., illegal crops) (*23*, *24*). The topic of conflict and food security is inextricably linked to family resilience. Following the FAO Resilience Index and Measurement Analysis (RIMA) framework (*25*), households are the central decision-making units for maintaining a certain level of food security through consumption smoothing, asset selling, and coping strategies. Conflicts can reduce the overall resilience of families, particularly the adaptive capacity of families. Conflicts also dramatically impact family resilience based on family members' income sources, education levels, and employment characteristics (*26*, *27*).

Food insecurity, on the other hand, can influence antisocial behaviour. Civilians will survive and protect their food security through armed groups, prioritising shelter, food, and information (*28*). The dominant explanation for the food price-conflict link is consumer grievances; higher prices increase economic constraints and sentiments of perceived relative deprivation, which activates grievances that lead to conflict (*19*).

According to the Global Report on Food Crises (GRFC, 2022), the severe food insecurity in the Sahel region of Africa has deteriorated alarmingly in recent times. Governance, favouritism, and ethnic and religious factors all play a role in Sahelian conflicts, with climate change increasingly acting as an amplifier that contributes to triggering violence (*29*). For example, the Western Sahel states (Mauritania, Mali, Burkina Faso, Niger, Chad, and northern Nigeria) are politically fragile. Recent severe climate change is hastening conflict and violence in this region, leading to increased conflict between pastoralists and farmers, the depletion of water resources, and the resulting migration of many people to North Africa. From 2016 to 2021, the Sahel countries have experienced unprecedented levels of violence. Much of this violence results from inter-communal conflict between pastoralists and farmers. At the same time, jihadist groups have used pastoralist competition for land and water to recruit members and collect taxes (*30*).

2.2.2. Climate changes and food security

Climate change manifests itself in various ways, including higher global average temperatures, greater temperature, precipitation variability, and more extreme events such as droughts, floods, and high winds. Climate experts disagree on climate, global warming, trends, and other terms. Werndl (2016) defines climate as a finite distribution over time resulting from the regime of variable external conditions. With this in mind, (*31*)

defines climate change as when two climates exist for two consecutive periods. There may be external and internal climate change resulting from different initial values. This definition is both specific and practical because it allows a direct link to the observations.

Climate change has the most profound and direct impact on agriculture. Many food-insecure countries and regions rely on local agricultural production to meet their food needs. Agriculture is the most researched sector in those areas due to its economic importance and reliance on climatic conditions and the mixed effects. In economic terms, climate change results from negative global externalise. (*32*) claims that climate change can be seen as one of the world's most serious market failures. In other words, both the market and the state will fail to address climate change, so it is necessary to resort to international action.

According to the Global Food Security Index (*33*), Africa's central area suffers from a food crisis. Like other African countries, the Sahel region faces a volatile climate. The unstable climate situation exacerbates the problem of food insecurity in the Sahel. The population in the Sahel is primarily rural, and agriculture is heavily reliant on weather conditions. Therefore, any change in the climate will impact agriculture and the economic performance of these areas. A critical issue common to all Sahel countries is a lack of water.

(*14*) found that the annual minimum temperature trend increased significantly during the rainy season in all countries. During the dry period, all countries experienced a significant increase in maximum temperature. This fact directly impacts the people and the growth of crops in these countries. The second indicator of climate change in the Sahelian region is precipitation. There is a strong link between precipitation and temperature in the region, as rainfall can be affected by temperature during the rainy season. The Sahel experiences a wide range of precipitation. Precipitation distribution is a problem not only between countries but also within countries.

The two catastrophic climatic effects of drought and floods correspond to temperature and precipitation in the Sahel region. Both floods and droughts are the results of water-related climate change. On the one hand, the IPCC (2012) defines flooding as the overflow of a watercourse's normal boundaries or the accumulation of water over areas not usually submerged. On the other hand, there are two types of droughts. A meteorological drought is defined as a period of abnormally low precipitation. A megadrought is a prolonged and widespread drought that lasts much longer than usual, typically a decade or more. These catastrophic climatic conditions can lead to human deaths, famine, malnutrition, health problems, and mass migration in many countries and regions.

2.2.3. COVID-19 and food security

The third factor that exacerbates food insecurity is economic shocks. Around the world, economies are still struggling to recover from the devastating effects of the COVID-19 pandemic. However, many people still find it challenging to return to work and rebuild their businesses due to the pandemic. Higher global commodity prices have resulted from these economic challenges and pandemic-related supply chain disruptions, limiting household access to food in many food-insecure countries. Many African countries are net food importers. Public outcry during pandemics has prompted governments to seek emergency food relief, but some of these have resulted in massive corruption scandals and poor food quality. Furthermore, many countries have implemented agricultural policies emphasizing agricultural exports from commercial in-

dustries to boost the sector's contribution to GDP and balance of payments. These policies made subsistence farming illegal and demoralized many small family farms, driving them out of production (Mukiibi, 2020). Food shortages, skyrocketing prices, and further worsening food insecurity.

3. Discussion

Our literature review provides a comprehensive overview of the concept of food security and its four key dimensions: food accessibility, availability, utilization, and stability. The paper also discusses the factors that can affect food security, including conflict, climate change, and COVID-19.

The paper's findings suggest that food insecurity is a complex and multifaceted issue that is influenced by a variety of factors. These factors can interact in complex ways to create conditions of food insecurity. For example, conflict can disrupt food production and distribution, and climate change can make it more difficult to grow crops. COVID-19 has also exacerbated food insecurity by disrupting supply chains and reducing household incomes.

The paper highlights the importance of addressing food insecurity to promote global development and human well-being. Addressing food insecurity requires a multi-pronged approach that includes investments in agriculture, social protection, and conflict resolution.

Here are some specific points that the paper raises:

- The paper discusses the importance of differentiating between acute and chronic food insecurity. Acute food insecurity is a short-term condition that can be caused by a variety of factors, such as conflict, natural disasters, or economic shocks. Chronic food insecurity is a long-term condition that is caused by underlying structural issues, such as poverty, lack of access to food, or poor health.
- The paper stresses the impact of COVID-19 on food security. While globalisation has facilitated the collaboration of international efforts to improve food security in certain regions, it also exposes vulnerabilities when these regions heavily rely on international assistance for their food security. In the face of a global-scale pandemic like COVID-19, food stability in some countries has become fragile. Moreover, corruption within a country further exacerbates the risk, potentially leading to the complete breakdown of food security. The pandemic has starkly revealed the interconnections of global health and food systems, emphasising the need for resilient and self-sustaining measures at both national and international levels.
- The paper underscores the significance of viewing food security as a global goal within the framework of SDGs, emphasising that factors intrinsic to food, such as accessibility, availability, utilization and stability should not be overlooked. As international organisations dedicate efforts to providing food assistance to specific regions, it is imperative to consider the local context comprehensively. For instance, exploring whether global entities can contribute infrastructure development in the region becomes crucial, as this has the potential to impact the residents' accessibility to food resources positively.

The paper concludes by emphasising the need for more research on food insecurity. More research is needed to understand the causes and consequences of food insecurity and to develop effective interventions to address it.

4. Conclusion

By synthesising past literature with the current global situation, this paper comprehensively explores the fundamental characteristics constituting food security and the influencing factors behind food insecurity. Through our literature, we aim to present novel perspectives and insights to guide future research on food insecurity. Amidst the myriad challenges posed by food insecurity, this paper lists its intricate nature, cutting across various social, economic, political, and environmental domains. We describe the root causes of food insecurity, including conflict, climate change, and COVID-19.

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