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Global Food Instability Due to Climate Change: A Study from Non-Traditional Security Perspective

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Abstract

Food security is central to human security in the world. In 21st century, the climate and the other natural entities are changing so rapidly which are directly affecting the food security of the people. The paper will examine the impact of climate change in the global food stability from the perspective of human security lens. The paper will also analyze how global food supply chains are getting disrupted in different places of the world in terms of production and consumption as well. The global warming, excessive heat, lack of rainfall and drought made the agricultural condition so vulnerable over the period. As a result, the effect of these instabilities created hunger, malnutrition and chronic diseases. The primary research objective of this paper is to find out the root level causes and understand how climate induced the food insecurity in a longer period of time. About 7.8% of people all over the world are suffering from chronic hunger and the population number stands at 645 million people. The growing establishment of industry, technological innovation and modernization are the main cause of increasing toxic Green House Gas (GHG) in the environment. Later on, these become the reasons for climate change and environmental degradation. The paper will anticipate finding the cause of this destruction in food stability and also search for the available pragmatic solution in order to solve this issue. Food security is more important because everyone in the world depends on this. This paper will bring these points so that people can understand the depth of this human security despite taking consideration only visible hard power and national security.

Keywords: Food security, nutrition, food safety, Bangladeshi food chain, apatite.

1. Introduction

Food security lies at the very heart of global human security. In the 21st century, the rapid acceleration of climate change and environmental degradation poses a unprecedented threat to the stability of planetary food systems, directly impacting human survival and well-being. While traditional security discourses have historically prioritized national borders, military defenses, and visible hard power, the contemporary era demands a broader understanding of human security—one that recognizes freedom from hunger and malnutrition as fundamental components of global stability. Today,

approximately 645 million people—representing roughly 7.8% of the global population—suffer from chronic hunger, a vulnerability exacerbated by shifting climate patterns, extreme weather events, and ecological imbalance.

The root causes of this crisis are deeply intertwined with modern anthropogenic activities. The rapid expansion of industrialization, technological acceleration, and unchecked modernization have drastically increased the concentration of toxic greenhouse gas (GHG) emissions in the atmosphere. This ongoing climate disruption manifests through rising global temperatures, severe heatwaves, erratic rainfall, and prolonged droughts, severely destabilizing agricultural yields worldwide. Beyond localized production failures, climate impacts ripple across global food supply chains, disrupting both production networks and consumption access across diverse regions. The resulting agricultural vulnerability translates directly into widespread food insecurity, hunger, malnutrition, and long-term health crises.

To address these vulnerabilities, this paper examines the impact of climate change on global food stability through a human security lens. Specifically, it investigates the root causes of climate-induced food insecurity, analyzes how global supply chains are disrupted, and highlights the downstream socio-health consequences on vulnerable populations. Ultimately, this study aims to evaluate pragmatic, actionable solutions to restore food stability and reframe food security as a critical priority in the global human security paradigm.

2. Background of the Study

The concept of security has undergone a profound transformation in recent decades. Traditional approaches emphasized military strength, territorial integrity, and state sovereignty. However, these frameworks often failed to account for the everyday threats faced by individuals, such as hunger, disease, poverty, and environmental degradation. In response, the idea of human security gained prominence, shifting the focus from states to people.

Food security is a cornerstone of human security. Without reliable access to sufficient and nutritious food, individuals cannot lead healthy, productive lives, and societies cannot achieve stability or prosperity. In the 21st century, despite technological advancements and increased global food production, hunger and malnutrition persist on a massive scale. Global food systems face mounting pressures from climate change, population growth, urbanization, economic volatility, and geopolitical conflict. Climate change is a bigger factor nowadays cause traditional system cannot make sure the production of crops due to drought, excessive heat and other natural disasters. Side by side, green house gas and other toxic elements made the environment unbearable for the agriculture as well.

This paper explores the necessity of global food stability for achieving human security. It analyzes the relationship between food security and human security, identifies key challenges to food stability, examines the consequences of food insecurity, and evaluates policy responses and international cooperation mechanisms aimed at building resilient food systems.

3. Literature Review

From Pakistani economist **Mahbub ul Haq's** concept of human security of UNDP 1994, we get the concept of food stability and environmental issues in broader sense. The idea was beyond one-dimensional national security idea to multilateral security issues which was an example of a paradigm shift in the world. Environmental issue got priorities for the first time as a documented way in the global order.

Amartya Sen's entitlement approach, developed in *Poverty and Famines* (1981), remains foundational to how the literature explains why climate shocks translate into hunger. Sen showed, through case studies including the 1943 Bengal famine, that starvation frequently occurs without any overall decline in food supply; what fails is people's entitlement — their ability to command food through production, labour, trade, or transfers. Here from his work, the historical evidence got a place to remark the relationship between food and environment in the sub-continent back in colonial period of time.

Applied to climate change, this insight redirects attention from aggregate crop-yield projections toward the uneven collapse of entitlements among landless labourers, smallholders and the urban poor — groups whose access to food is most easily severed by a flood or price spike even when national harvests remain adequate.

Jon Barnett's work extends this reasoning explicitly into the climate domain. In "Security and Climate Change" (2003) and, jointly with Neil Adger. In this study "Climate Change, Human Security and Violent Conflict" (2007), Barnett argues that climate change undermines human security by degrading the natural resources — water, arable land, fisheries — on which livelihoods depend while weakening the capacity of states to cushion these losses. Notably, Barnett and Adger caution against treating climate-driven food insecurity as a direct trigger of conflict; rather, it is one stress among several that erode livelihoods and, only under particular political conditions, contribute to instability.

W. Neil Adger's own contribution centres on vulnerability as a socially differentiated condition. Building on the concept of an "architecture of entitlements," Adger shows that exposure to climatic hazards is filtered through institutions, markets, and power relations, so that the same drought produces starkly different outcomes for different social groups. His later work, including the human security chapter he coordinated for the IPCC's Fifth Assessment Report, consolidates evidence that climate change functions as a "threat multiplier," compounding existing food and livelihood insecurities rather than generating them from nothing.

Saleemul Huq, long-time director of the International Centre for Climate Change and Development in Dhaka and a lead author on adaptation for the IPCC, argued consistently that the countries least responsible for greenhouse gas emissions bear the earliest and most severe food and livelihood losses. His advocacy for a loss-and-damage finance mechanism, realised at COP27, rested on the claim that adaptation alone cannot restore food security once salinity intrusion, cyclones, or riverbank erosion have destroyed farmland beyond recovery.

Camilla Toulmin's research on dryland Africa broadens the picture. In *Climate Change in Africa* (2009) and related studies of Malian smallholders, Toulmin argues that African food security is jeopardised less by any single climatic trend than by the compounding of climate stress with insecure land tenure, weak infrastructure, and volatile global commodity markets. She contends that the global response to climate change has too often prioritised the energy security of wealthy nations over the food security of the world's poorest smallholders — a normative claim that echoes Haq's original call to rebalance security priorities toward human welfare.

Tim Wheeler and Joachim von Braun's widely cited synthesis, "Climate Change Impacts on Global Food Security" (2013), consolidates the biophysical and economic evidence base. Reviewing decades of crop-modelling and market studies, they conclude that climate change is likely to depress cereal yields across many tropical and sub-tropical regions while increasing short-term supply volatility, with knock-on effects on food access and utilisation compounding the direct impact on availability. Von Braun's broader body of work has consistently argued that food-system resilience requires simultaneous investment in agricultural research, social protection, and trade policy — a prescription that treats stability, not merely output, as the proper object of policy.

4. Research Gap

Human security gained international recognition with the **1994 United Nations Development Programme (UNDP) Human Development Report**, which defined security as protection from chronic threats and sudden disruptions to daily life. This approach emphasized “freedom from fear” and “freedom from want” as essential components of security.

Theoretical mismatch — Sen's entitlement framework was built for acute famine shocks, not slow-onset stress like salinity intrusion or shifting monsoons.

Disciplinary fragmentation — biophysical/economic modeling (Wheeler & von Braun) rarely connects with household-level entitlement analysis (Sen, Adger, Huq, Rahman).

Missing indicators — no standardized way to measure food security as a human security dimension across countries.

Geographic unevenness — Bangladesh and the Sahel dominate case studies, leaving Pacific SIDS, Central America, and the Middle East under-studied.

Gender/intersectionality gap — vulnerability is known to be socially differentiated, but few studies disaggregate by gender, caste, or ethnicity.

Policy sequencing gap — how loss-and-damage finance, migration, and social protection should work together remains unresolved.

Research Question:

Primary Question - How does climate change undermine global food stability through the erosion of human security and food entitlements among vulnerable populations?

Secondary Research Questions

1. How do slow-onset climatic stressors erode household food entitlements differently than acute shocks?
2. How do gender, land tenure, and socioeconomic status shape climate change's impact on food access and human security?
3. How can loss-and-damage finance, climate-resilient agriculture, and social protection be sequenced to strengthen food-related human security?

Theoretical Framework: Human Security Theory (UNDP, 1994)

Imagine a mother in Darfur watching the sky for rain that never comes, or a farmer in the Sana'a basin drilling deeper each year for water that keeps receding. Neither is thinking about armies or borders. Their fear is quieter and more immediate: will there be enough to eat. This is the everyday reality the UNDP's 1994 Human Development Report tried to capture when it introduced Human Security Theory — a deliberate shift away from asking "is the state safe?" toward asking "are people safe?"

The report defined security as freedom from want and freedom from fear: protection not only from violence, but from the slower, quieter threats of hunger, disease, and deprivation that touch far more lives than war ever does. It named seven dimensions — economic, food, health, environmental, personal, community, and political security — and insisted they were never separate boxes. A failed harvest becomes hunger, hunger becomes lost income, lost income becomes displacement or unrest. One thread pulled, the whole fabric moves.

Implication: security stops being something governments hold and becomes something people either have or lack in their daily lives — measured in meals, medicine, and stability rather than tanks or treaties.

Relevance here: food security is one of the theory's own seven pillars, so this thesis is not borrowing a foreign lens — it is using the framework's own vocabulary. And the theory's central insight, that threats cascade rather than stay contained, is exactly what Gaza, Sudan, and Yemen demonstrate: a drought or a blockade rarely stays a food problem. It becomes an economic, health, and community crisis within months — the human chain reaction this thesis exists to trace.

5. Methodology

This study adopts a qualitative, exploratory research design, driven by the global scope of the research question and the practical impossibility of running a statistically representative survey across every climate-vulnerable region discussed in this thesis. Rather than seeking numerical generalisability, the study privileges contextual depth, triangulating expert testimony, institutional and community perspectives, and secondary documentary evidence to understand how climate change erodes food-related human security.

Primary data: Key Informant Interviews (KII). Given the impracticality of a global survey, primary data was collected through semi-structured KIIs with individuals and organisations positioned to speak to different layers of the climate-food-security nexus. Academic and policy expertise was drawn from Dhaka University scholars Syeda Rozana Rashid, Tanzim Uddin Khan, Saima Ahmed, and Niloy Ranjan Biswas, whose specialisations in migration, international relations, and security studies informed the conceptual grounding of the research. Institutional and grassroots perspectives were captured through KIIs with Ekmattra Society, an organisation working with marginalised urban communities; representatives of e-waste companies operating in the informal recycling sector; and waste pickers working in Gulistan, whose lived experience illustrates how environmental and economic insecurity intersect at the household level. Together, these informants span the expert-to-grassroots spectrum, allowing the study to connect theoretical framing with lived, on-the-ground vulnerability rather than relying on expert opinion alone.

Secondary data: Document analysis. Secondary data was drawn from institutional and academic documents, including IPC food security classifications, UN agency reports (FAO, WFP, UNICEF, UNDP), IPCC assessments, and peer-reviewed literature on human security and climate change. This layer anchors the qualitative primary data in verifiable, up-to-date evidence and situates local findings within the broader global literature reviewed earlier in this thesis.

Case study approach. The research is further structured around case studies — Gaza, Sudan, and Yemen at the international level, and Bangladesh at the national and local level — selected purposively for their acute exposure to the climate-conflict-food insecurity nexus. This comparative case design allows patterns identified in the literature and KIIs to be tested against concrete, documented realities, strengthening the study's analytical validity despite its non-random sample.

Limitations. Because sampling was purposive rather than random, and the KII pool relatively small, findings are not statistically generalisable across countries or populations; the study instead offers analytical depth and contextual insight, consistent with accepted norms for qualitative, exploratory research on complex, cross-border phenomena.

Summary Table

Component	Type	Details
Research design	Qualitative, exploratory	Global scope precluded a representative survey
Primary data — Expert KII	Academic/policy informants	Syeda Rozana Rashid, Tanzim Uddin Khan, Saima Ahmed, Niloy Ranjan Biswas (Dhaka University)
Primary data — Institutional KII	Organisational informants	Ekmattra Society; e-waste companies
Primary data — Community KII	Grassroots informants	Waste pickers, Gulistan
Secondary data	Document analysis	IPC, FAO, WFP, UNICEF, UNDP, IPCC reports; peer-reviewed literature
Analytical structure	Case study	Gaza, Sudan, Yemen (international); Bangladesh (national/local)

Component	Type	Details
Sampling technique	Purposive	Non-random, selected for relevance to climate-food-security nexus
Key limitation	Generalisability	Findings analytically rich but not statistically generalisable

From UNDP,1994 perspective the study will analysis the aspect of human security. The human security framework identifies multiple interrelated dimensions, including:

- Economic security
- Food security
- Health security
- Environmental security
- Personal security
- Community security
- Political security

Unlike traditional security paradigms, human security recognizes that threats are interconnected and often transnational in nature.

Food Security as a Core Dimension

Food security occupies a central place within the human security framework because it underpins physical survival and social stability. The internationally accepted definition states that food security exists when all people, at all times, have access to sufficient, safe, and nutritious food that meets dietary needs for an active and healthy life.

Food stability, a critical component of food security, refers to the consistency of food availability and access over time. Even populations that are food secure at present may become vulnerable if food systems are unstable.



Global Food Systems in the 21st Century

Structure of the Global Food System

The global food system encompasses all processes involved in feeding the world's population, including:

Agricultural production

- Food processing and storage

- Transportation and distribution
- Trade and markets
- Consumption and waste

While global food production has increased significantly, access to food remains uneven due to socioeconomic disparities and governance challenges.

In the interview of Dr. Rozana, she has said, " In International Relations, we study about traditional security mostly where the world should pay attention to hunger and the innocent people of the world. There are million of people who can not take meal everyday. But we are not talking enough of it."

Achievements and Persistent Gaps

Advances in agricultural science, biotechnology, and logistics have enabled the world to produce more food than ever before. However, these gains have not eliminated hunger. Millions continue to suffer from chronic undernutrition, while others experience food insecurity due to conflict, economic shocks, or environmental stress.

Furthermore, modern food systems are highly interconnected, making them vulnerable to disruptions that can ripple across borders.

6. Key Drivers of Global Food Instability

Climate Change and Environmental Stress

Climate change is one of the most significant threats to global food stability. Rising temperatures, shifting rainfall patterns, extreme weather events, and sea-level rise directly affect agricultural productivity.

Environmental degradation—such as soil erosion, deforestation, biodiversity loss, and water scarcity—further undermines the sustainability of food production. Smallholder farmers, particularly in developing countries, are among the most vulnerable.

Conflict and Political Fragility

Armed conflict severely disrupts food systems by displacing populations, destroying farmland, interrupting markets, and restricting humanitarian access. In many fragile and conflict-affected states, hunger is both a cause and consequence of instability.

Food insecurity can exacerbate tensions over land and resources, creating feedback loops that prolong violence and insecurity.



Economic Inequality and Poverty

Poverty remains a primary cause of food insecurity. Even when food is available in markets, low-income households may lack the purchasing power to access it. Global and domestic inequalities exacerbate disparities

in nutrition and health outcomes.Rising food prices disproportionately affect the poor, who spend a large share of their income on food.

Professor Dr. Tanzim said in an interview that, " Capitalism system and free economy have taken all the humanity out of the people where businessmen only think about profit and they exploit the environment in the name of the development mostly."

Consequences of Food Insecurity for Human Security

Health and Nutrition Outcomes

Food insecurity has severe health consequences, including:

- Undernutrition and stunting in children
- Increased susceptibility to disease
- Maternal malnutrition and poor pregnancy outcomes
- Micronutrient deficiencies

At the same time, food instability can promote unhealthy diets, contributing to obesity and non-communicable diseases.

Economic and Developmental Impacts

Malnutrition reduces cognitive development, educational achievement, and labor productivity. These effects hinder economic growth and perpetuate cycles of poverty.

Food insecurity also places strain on public health systems and social services, diverting resources from other development priorities.

Social Unrest and Political Instability

Historically, food shortages and price spikes have been associated with protests, riots, and political upheaval. Food insecurity undermines trust in institutions and can weaken state legitimacy.

In extreme cases, it contributes to state fragility and governance breakdown.

Migration and Displacement

Food scarcity drives migration as people seek livelihoods and security elsewhere. Climate-induced food insecurity is increasingly recognized as a driver of displacement, with implications for regional and global stability.



The concept might be different in various way but food stability always dependable on environmental issue and its system. Without a proper environmental structure and a proper distributive method, food can not be

well served. Environment degradation is the most vital cause for the hunger and malnutrition. The study will explain the root cause with statistics about the food instability in the global environmental politics and its surroundings. Climate change is a lengthy process but it has a great negative side effect on global south countries like Asian and African nations. Food is the most vital element of a person. And environment degradation along with external climate change are the main issue to demolish the basic needs. People all over the world cannot lead a normal life due to migration, internal conflict in country and displacement due to natural calamities mostly. From this point of view, the study will explain more about the relativity of food stability on environmental issues and climate change.

Additionally it is also added in this study that there is a difference between the effect of climate change in global north and global south perspective. In global north, due to economical balance and alliances, it is very much possible to cover up the food instability. Ukraine-Russia war is the major example where Ukraine people are treated with sympathy and care due to its geographical position and geopolitical stand where Gaza people do not get the care and well structure system because of its recognition as a global south country. It is also a discrimination of being a part of global south in this case of climate change and food stability.

The situations in Gaza, Sudan, and Yemen illustrate the profound link between food insecurity and human security, demonstrating how political instability, conflict, and economic crises can destabilize entire societies.

Gaza

In Gaza, food insecurity has reached critical levels due to prolonged conflict and strict blockades. The region faces severe restrictions on the movement of goods, agricultural inputs, and people, which has significantly disrupted food production and supply chains. Agricultural land has been damaged by repeated military operations, while fishing activities along the coast are heavily restricted, further limiting local food sources. As a result, a substantial portion of Gaza’s population relies on humanitarian assistance to meet basic nutritional needs.

Gaza illustrates how conflict and climate stress can compound to produce acute food instability. According to the UN-backed Integrated Food Security Phase Classification (IPC), famine conditions confirmed in Gaza Governorate in August 2025 were pushed back after the October 2025 ceasefire improved humanitarian and commercial access. Even so, by early 2026 roughly 1.6 million people, about 77 percent of the population, remained in Crisis or worse (IPC Phase 3+), including 571,000 in Emergency (Phase 4) and around 1,900 in Catastrophe (Phase 5). Projections for mid-2026 showed over 1.2 million people (59 percent) still facing Crisis-or-worse conditions across all five governorates, with the situation expected to worsen again toward year's end, reaching roughly 1.4 million people (67 percent). Acute malnutrition has affected well over 100,000 children under five, with tens of thousands of severe cases at heightened risk of death, alongside tens of thousands of pregnant and breastfeeding women requiring treatment.

This instability stems primarily from conflict-related destruction and restricted access rather than climate change alone, but climate stress compounds the crisis and complicates recovery. An estimated 40 to 45 percent of Gaza's farmland has been damaged or destroyed, along with irrigation infrastructure, greenhouses, and roughly 70 percent of its fishing fleet. Desalination plants and wells — Gaza's main freshwater sources in a naturally water-scarce coastal strip — have been damaged or diverted away from agriculture, accelerating saltwater intrusion into the coastal aquifer. The Eastern Mediterranean is warming faster than the global average, and forecasts point to further temperature rises alongside roughly a one-metre sea-level rise by 2050, both threatening the long-term viability of Gaza's coastal farmland and water supply.

Gaza therefore illustrates a human security case where acute, conflict-driven entitlement failure and slower-moving climate vulnerability reinforce one another, complicating both immediate relief and long-term food-system recovery.

The effects of food insecurity in Gaza extend beyond hunger. Chronic malnutrition, particularly among children and pregnant women, threatens long-term health outcomes and cognitive development. High unemployment and widespread poverty exacerbate the problem, as many households cannot afford sufficient

food even when it is available. The instability of food access also increases social stress and reliance on external aid, undermining resilience and dignity. Gaza exemplifies how sustained disruption to food systems can directly erode human security, contributing to both physical vulnerability and social instability.

Sudan

Sudan's food crisis highlights the interplay between conflict, economic instability, and human security. Armed conflicts in various regions of the country have forced millions of people to flee their homes, displacing them from productive farmland and disrupting local markets

Sudan is currently one of the world's most severe food crises, and it shows conflict and climate stress reinforcing each other. According to the latest Integrated Food Security Phase Classification (IPC) analysis, nearly 19.5 million people, about 41 percent of the population, faced Crisis-or-worse food insecurity (IPC Phase 3+) between February and May 2026, including roughly 135,000 in Catastrophe (Phase 5) and over 5 million in Emergency (Phase 4). Famine was confirmed in El Fasher (North Darfur) and Kadugli (South Kordofan) from September 2025, with famine risk identified in 14 additional areas across North Darfur, South Darfur, and South Kordofan for mid-2026. An estimated 825,000 children under five are expected to suffer severe acute malnutrition in 2026 — about 25 percent above pre-conflict levels — while over 8.9 million people remain internally displaced. Humanitarian access remains among the most restricted in the world, and only about a fifth of the 2026 response plan was funded as of April.

As in Gaza, conflict and displacement are the immediate drivers, but Sudan's location in the Sahel makes climate stress a powerful compounding factor. Desert and semi-desert land already covers roughly 72 percent of the country, and 60 to 80 percent of households depend on climate-sensitive rain-fed agriculture. Rainfall has become increasingly erratic — later onset, shorter seasons, intense localized storms — while long-term projections point to crop-yield declines of up to 70 percent in the most vulnerable areas as desertification pushes the viable farming zone further south. Land degradation and shrinking pasture have historically intensified competition over farmland and water between farming and pastoralist communities, a dynamic UNEP has linked to earlier rounds of conflict in Darfur.

Sudan therefore illustrates how acute, conflict-driven entitlement collapse and long-term climatic degradation combine to erode food-related human security simultaneously, at both emergency and structural timescales.

The combination of conflict and economic collapse has caused sharp inflation, currency depreciation, and spikes in food prices, making even basic staples unaffordable for large segments of the population.

Food insecurity in Sudan affects health, livelihoods, and societal stability. Malnutrition rates are high, particularly among children, and inadequate access to food reduces productivity and limits educational opportunities. The scarcity of food can also intensify local tensions, as communities compete over limited resources, creating a feedback loop where hunger contributes to conflict and vice versa. Sudan demonstrates how fragile governance and weak food systems amplify vulnerability and perpetuate cycles of poverty and insecurity.

Yemen

Yemen represents one of the most severe contemporary food security crises in the world. Years of civil war have devastated the country's infrastructure, reduced domestic agricultural production, and disrupted essential imports, leaving millions dependent on external aid. Blockades, damaged ports, and high fuel prices have further constrained food availability, while inflation and loss of purchasing power have made food unaffordable for much of the population.

Yemen shows a food crisis where economic collapse, conflict, and severe water scarcity intersect. According to the latest Integrated Food Security Phase Classification (IPC), around 18.1 million people (52 percent of the analysed population) were projected to face Crisis-or-worse acute food insecurity (IPC Phase 3+) between September 2025 and February 2026, including about 5.5 million in Emergency (Phase 4) and roughly 41,000 people facing Catastrophe (Phase 5) in districts of Hajjah, Al Hodeidah, and Amran governorates. This marked a record number of Emergency-classified districts in Yemen's IPC history. By early-to-mid 2026, aid agencies

warned the situation was deteriorating not primarily from renewed large-scale fighting but from collapsing household purchasing power and sharp cuts to humanitarian food assistance — which fell from about 3.6 million people reached in mid-2024 to under 3 million by mid-2025, with further reductions since as donor funding declined.

Climate stress compounds this fragility chiefly through water, not just rainfall. Yemen is among the world's most water-scarce countries, with annual renewable freshwater of roughly 86 cubic metres per person — far below the 500 cubic metre scarcity threshold. Agriculture consumes about 90 percent of water withdrawals, yet groundwater is being depleted at roughly twice its recharge rate, with water tables in critical basins falling 3 to 8 metres a year; studies have long warned Sana'a could become one of the first capitals in the world to run dry. Rainfall has grown more erratic, with sharper droughts followed by damaging floods within the same season, while Aden, the temporary capital, ranks among the world's cities most exposed to sea-level rise and coastal aquifer salinization.

Yemen therefore illustrates a case where slow-onset climatic and hydrological decline steadily narrows food-producing capacity, while conflict, displacement, and economic collapse determine how quickly that narrowing translates into acute hunger and malnutriti

The human cost of food insecurity in Yemen is immense. Widespread malnutrition has led to famine-like conditions in certain regions, threatening the health and survival of children and vulnerable populations. The breakdown of the healthcare system, combined with widespread hunger, has created a situation where basic human security—health, nutrition, and protection—is severely compromised. Yemen underscores how conflict-induced disruption of food systems can have long-term consequences, affecting entire generations and undermining prospects for peace and recovery.

7. Significance of These Cases

The experiences of Gaza, Sudan, and Yemen illustrate that food insecurity is not merely a humanitarian challenge but a core threat to human security. In each case, conflict and political instability have disrupted food systems, while food scarcity has, in turn, reinforced social, economic, and political instability. These examples highlight the urgent need for global efforts to stabilize food systems, strengthen local resilience, and ensure that all people have reliable access to sufficient and nutritious food as a fundamental aspect of human security.

8. A Statistical Overview — IPC Acute Food Insecurity Classifications, Late 2025–2026

Gaza, Yemen, and Sudan currently rank among the world's most severe food crises. Each reflects a different mix of conflict, economic collapse, and climate stress, but all three show large shares of the population facing acute hunger. The charts below summarise the latest Integrated Food Security Phase Classification (IPC) data for each country.

1. Share of Population Facing Crisis-or-Worse Food Insecurity

Gaza has the highest proportion of its population in acute food insecurity (77%), despite having the smallest population and total case count of the three. Yemen (52%) and Sudan (41%) follow, each driven by a different combination of conflict, currency collapse, and access restrictions.

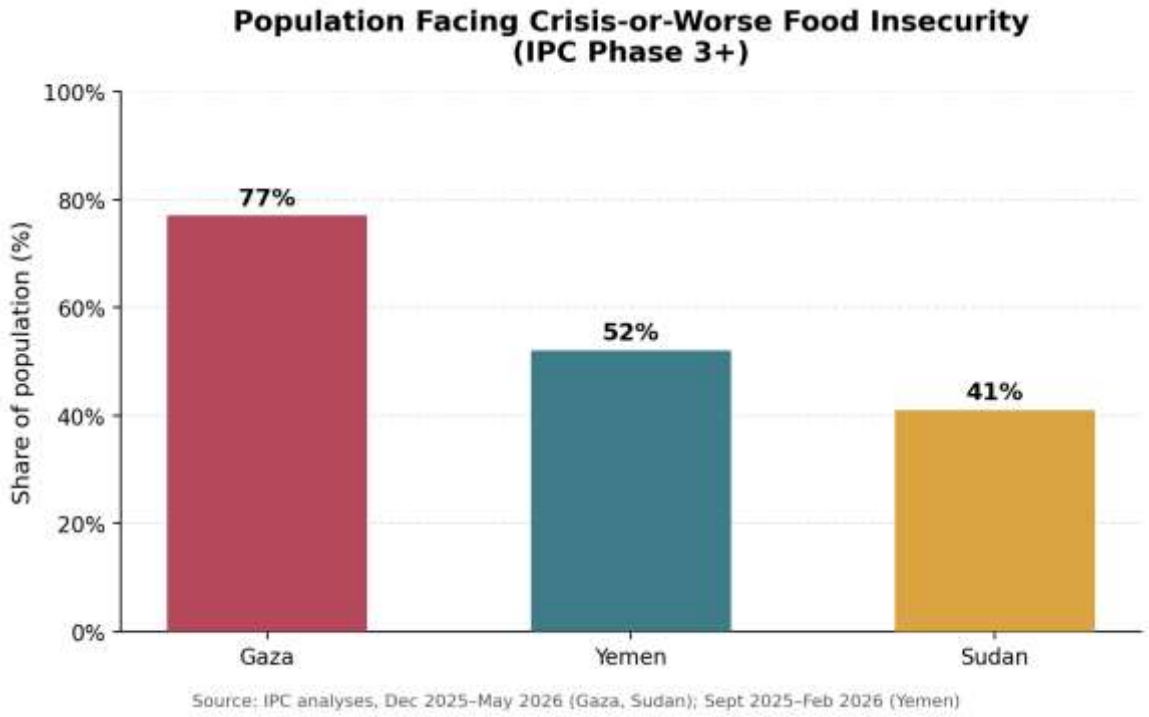


Figure 1: Share of population in IPC Phase 3 or above, by country.

2. Population by IPC Phase

In absolute terms, Sudan and Yemen carry by far the largest caseloads — 19.5 million and 18.1 million people respectively — reflecting their much larger populations. Gaza's 1.6 million affected people represent a smaller total but a far higher concentration relative to population size.

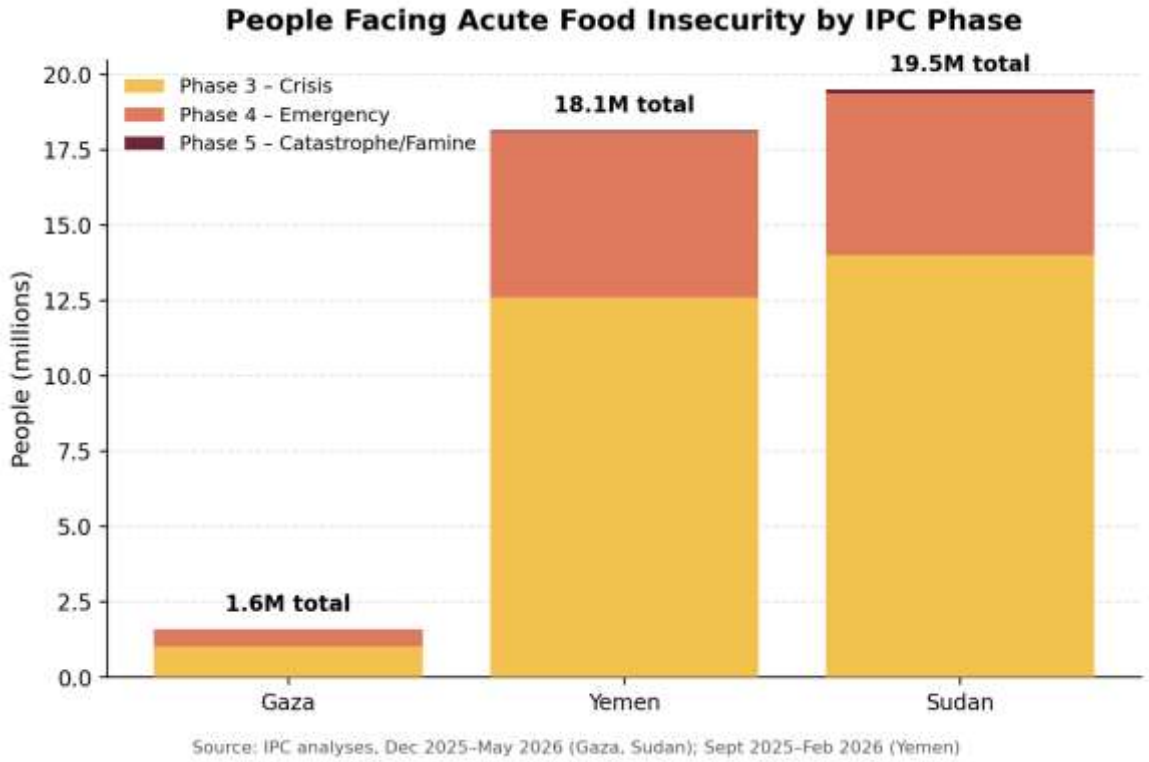


Figure 2: People facing acute food insecurity, broken down by IPC phase (millions).

3. Populations Facing Catastrophe or Famine (IPC Phase 5)

IPC Phase 5 marks the most extreme classification — catastrophic hunger or confirmed famine. Sudan has by far the largest Phase 5 population, consistent with confirmed famine conditions in El Fasher and Kadugli. Yemen's Phase 5 population is concentrated in a handful of districts in Hajjah, Al Hodeidah, and Amran. Gaza's Phase 5 population fell sharply after the October 2025 ceasefire improved humanitarian and commercial access.

Gulistan (Bangladesh)

For the waste picker families of Gulistan, food insecurity is not a distant threat tied to some future climate scenario — it is a daily calculation shaped by forces they never caused but cannot escape. Living on 200 to 300 taka a day, these households already spend nearly everything they earn simply trying to eat, with almost nothing left over as a buffer against shocks. Climate change removes what little buffer remains. When erratic rainfall, heatwaves, or flooding disrupt Dhaka's supply chains, the price of rice, vegetables, and cooking oil rises first and fastest for people at the bottom of the informal economy — and waste pickers, who earn in cash and buy day to day, feel that price spike almost immediately. There is no savings account to draw from, no pantry stocked in advance. When prices climb, the response is immediate and painful: smaller portions, skipped meals, and mothers quietly eating less so their children can eat more.

The physical toll compounds the economic one. Waste picking is outdoor, exposed labor, and as heat stress intensifies across Dhaka, working through the hottest hours of the day becomes both harder and less survivable. Fewer productive hours mean less collected material, which means less income, which translates directly into less food on the table that evening. The body that earns the meal is also the body most punished by the heat that makes earning harder. Meanwhile, families living in open spaces or under temporary shelter, as many in Gulistan do, have no real protection when sudden downpours or flash flooding strike. Waterlogging can destroy whatever meager food stores or cooking arrangements a family has managed to maintain, soak the little bedding and belongings they own, and halt waste collection routes for days at a time — cutting off income at its very source, right when the need for food is most acute.

Children bear the sharpest edge of this cycle. Already disadvantaged in access to healthcare and education, they are also the first to feel the nutritional consequences when a household's food intake shrinks. Stunted growth, weakened immunity, and reduced ability to concentrate follow closely behind hunger, and these effects rarely show up as emergencies — they accumulate quietly, month after month, in children who never had much margin to begin with. A missed meal today becomes a developmental setback tomorrow, one that no clinic visit can fully reverse once the damage sets in.

Seen through a human security lens, the food insecurity of Gulistan's waste pickers is not a side effect of climate change — it is one of its clearest and most human faces. These are not abstract statistics about rising temperatures or shifting rainfall patterns; they are mothers rationing rice, fathers working through dangerous heat, and children whose growth is quietly stalling. Any serious climate adaptation strategy for Bangladesh has to reckon with these informal, invisible communities, because they are absorbing climate shocks first, hardest, and with the least support to recover — and their hunger is the earliest warning sign of a much larger crisis still unfolding.

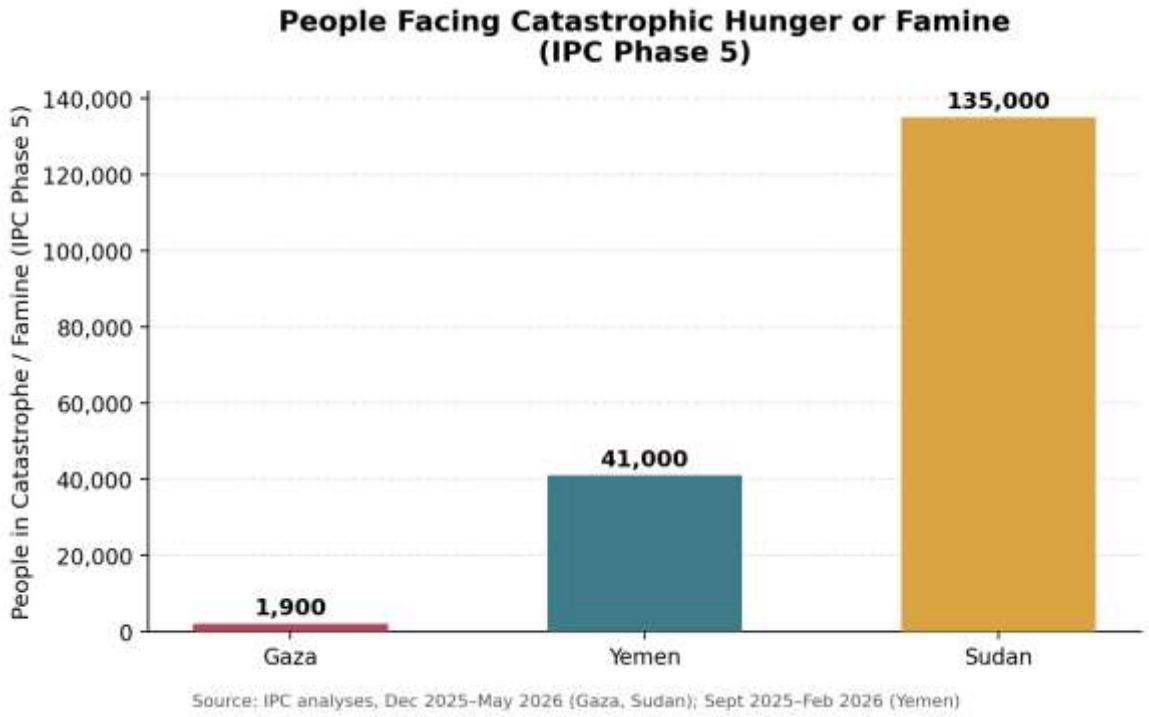


Figure 3: People in IPC Phase 5 (Catastrophe/Famine), by country.

Summary Table

Country	Phase 3 – Crisis	Phase 4 – Emergency	Phase 5 – Catastrophe/Famine	Total (Phase 3+)
Gaza	1.03 million	571,000	1,900	1.6 million (77%)
Yemen	12.6 million	5.5 million	41,000	18.1 million (52%)
Sudan	14.0 million	5.36 million	135,000	19.5 million (41%)

Sources

IPC Gaza Strip Special Snapshot (Dec 2025 & Apr–Jun 2026); IPC Sudan Acute Food Insecurity Special Report (Feb–May 2026); IPC Yemen (GoY/SBA) Combined Special Brief (Sep 2025–Feb 2026); joint FAO/UNICEF/WFP/WHO statements, 2025–2026.

Food Security and Conflict Prevention

Stable access to food reduces competition over scarce resources and lowers the risk of conflict. Integrating food security into peacebuilding and development strategies can help address root causes of violence.

Food Systems and Economic Resilience

Resilient food systems support livelihoods, stabilize incomes, and enhance community coping capacity during crises. Agricultural development plays a key role in poverty reduction, particularly in rural areas.

Environmental Sustainability and Long-Term Security

Sustainable food systems balance productivity with environmental stewardship. Practices such as agroecology, conservation agriculture, and sustainable fisheries contribute to long-term food stability and ecological health.

Policy Responses and Strategies

Sustainable Agricultural Development

Governments and international organizations must invest in:

- Climate-resilient crops
- Improved irrigation and water management
- Agricultural research and extension services
- Infrastructure and market access

These investments increase productivity while reducing vulnerability to shocks.

Social Protection Mechanisms

Social safety nets play a crucial role in protecting vulnerable populations. Programs such as cash transfers, food subsidies, and school feeding initiatives enhance food access and human capital development.Policies must prioritize nutrition, not just calorie intake. Strategies include food fortification, nutrition education, and promotion of diverse diets.



9. Reducing Food Loss and Waste

A significant portion of global food production is lost or wasted. Reducing losses through better storage, processing, and consumer awareness can improve food availability without increasing production. International trade can enhance food stability if governed effectively. Coordinated policies, transparent markets, and avoidance of protectionist measures during crises are essential.

Picture a fisherman in Gaza mending a net he can no longer use because the sea is closed to him, a herder in Darfur watching his cattle thin as the last waterhole dries, a farmer outside Sana'a drilling one more failed well into an aquifer that keeps retreating. None of them wake up thinking about geopolitics or greenhouse gas emissions. They wake up thinking about whether there will be enough to eat today, and whether that will still be true next season. This is where food stability actually lives: not in trade statistics or crop-yield models, but in the quiet arithmetic of daily survival that either holds a community together or slowly pulls it apart.

That is also why food stability belongs at the center of any serious conversation about peace. Hunger rarely starts wars on its own, but it is patient kindling. When entitlements collapse, as Amartya Sen showed decades ago, people do not simply go without; they migrate, they compete for what little remains, and they lose faith in institutions that cannot feed them. Jon Barnett and Neil Adger's work on climate and human security makes a related point from a different angle: climate stress rarely triggers conflict directly, but it steadily erodes the livelihoods and state capacity that keep people patient and communities cohesive. Sudan's famine-hit Darfur, Yemen's drying aquifers, and Gaza's shattered farmland are not separate stories told in isolation. Each shows

the same underlying pattern: food insecurity as the pressure that makes fragile peace fragile, and fragile peace as the condition that turns ordinary climate stress into full catastrophe.

Climate resilience and food stability are, in this sense, two names for the same underlying protective capacity. A community that can adapt — through salt-tolerant crops, water harvesting, or diversified livelihoods — is also a community with more room to absorb shocks without turning on itself or on its neighbours. This is precisely why scholars like Saleemul Huq and Atiq Rahman treated adaptation not as a technical afterthought but as a matter of daily survival and dignity for Bangladesh's coastal communities, and why Mahbub ul Haq insisted that real security is built through development rather than through arms. Resilience, built early and deliberately, is cheaper and gentler than the alternative: waiting for hunger to become displacement, and displacement to eventually become conflict.

Seen this way, protecting food stability is not merely a development goal sitting quietly alongside peace and climate policy. It is the connective tissue between them, the unglamorous foundation without which neither can truly hold. A world serious about peace, and genuinely serious about climate resilience, has to start with something almost embarrassingly simple: making sure ordinary people, from Gulistan's waste pickers to Sana'a's farmers, can count on their next meal.

Role of International Institutions and Actors

United Nations and Multilateral Agencies

Organizations such as the FAO, WFP, IFAD, and World Bank play critical roles in:

- Emergency food assistance
- Development financing
- Technical support
- Policy coordination

The **Sustainable Development Goals**, particularly SDG 2 (Zero Hunger), provide a global framework for action.

Regional and National Governments

National governments are responsible for implementing policies that promote food security, including land reform, agricultural investment, and inclusive governance.

Regional cooperation enhances early warning systems and collective response mechanisms. Climate change has introduced unprecedented volatility into food systems through rising temperatures, changing precipitation patterns, more frequent droughts and floods, and rising sea levels. These shifts threaten crop yields, livestock health, fisheries, and rural livelihoods.

Environmental degradation, including soil depletion and water scarcity, compounded by unsustainable agricultural practices, further erodes food production capacity,Global integration of food markets has both benefits and risks. It allows food to flow from surplus to deficit regions, stabilizing supplies. However, it also exposes vulnerable countries to global price shocks and supply chain disruptions.

For example, food price spikes in 2007–2008 triggered social unrest in several countries, highlighting the fragility of interconnected food markets.

Civil Society and the Private Sector

Civil society organizations contribute grassroots knowledge and accountability, while private sector actors bring investment, innovation, and efficiency. Partnerships among these stakeholders are increasingly important. Dr. Saima has talked about the role civil society and private sector that they should play a vital role

in order to solve the hunger issue and poverty side by making awareness and foreign fund as well. It is not possible for government as well to maintain the problem in the long run.

Another critical opportunity is the expansion of **climate-resilient and sustainable agricultural practices**. Climate-smart agriculture, agroecology, and regenerative farming methods can help maintain productivity while preserving soil health, water resources, and biodiversity. Investing in research and development of drought-resistant and heat-tolerant crops will be essential as climate variability increases. These practices not only enhance food stability but also contribute to environmental security and long-term sustainability.

Strengthening global and regional cooperation offers further opportunities for improving food stability. Coordinated trade policies, shared food reserves, and regional early warning systems can help mitigate the effects of food shortages and price volatility. International frameworks such as the Sustainable Development Goals provide a common platform for collaboration, encouraging countries to align policies and share best practices in food security and nutrition.

Urbanization also presents opportunities to rethink food systems through **urban and peri-urban agriculture**. Innovations such as vertical farming, rooftop gardens, and localized food production can increase access to fresh food in cities, reduce transportation costs, and lower environmental footprints. These approaches can enhance food availability while creating employment and promoting community resilience.

Based on what I have observed and heard from senior policymakers over the past few days, I believe Bangladesh's progress toward the SDGs requires a more people-centered and participatory approach.

One of the most important lessons for me was that development cannot be measured only through GDP growth or national-level statistics. We often study poverty, hunger, inequality, water security, and energy security in classrooms, but the reality becomes very different when we hear directly about people struggling with these issues. Millions of people outside Dhaka still face difficulties accessing safe drinking water, reliable electricity, employment, and basic services. Therefore, development planning needs to look beyond the capital and give greater attention to regional inequalities.

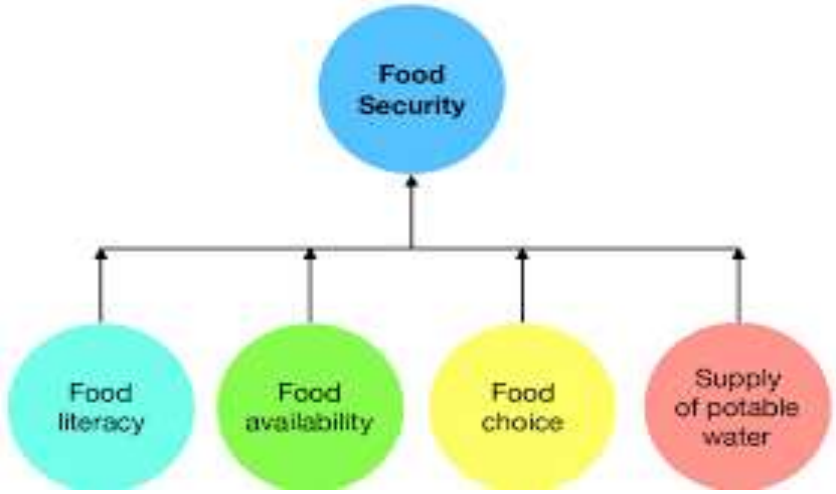
Another important issue is the use of accurate information. For sustainable development, people need to know the actual condition of the country rather than politically convenient figures. Reliable data should guide policy decisions, resource allocation, and evaluation. Without honest data, even a well-designed development plan can fail to address the problems that people actually face.

Future Challenges and Opportunities

Looking ahead, global food systems must confront:

- Increasing climate uncertainty
- Rapid population growth
- Urban food insecurity
- Technological and digital divides

At the same time, opportunities exist through innovation, data-driven agriculture, and greater awareness of sustainable consumption patterns.



10. Future Opportunities

As the world advances further into the twenty-first century, addressing global food stability presents not only significant challenges but also important opportunities for strengthening human security. Rapid technological innovation, growing global awareness, and evolving policy frameworks offer promising pathways to build more resilient, inclusive, and sustainable food systems.

One major future opportunity lies in the use of **technology and digital innovation** in agriculture and food systems. Advances in artificial intelligence, remote sensing, big data analytics, and precision farming can improve crop yields, optimize resource use, and enhance early warning systems for climate-related shocks. Digital platforms can also connect farmers to markets, financial services, and climate information, empowering smallholder farmers and reducing vulnerability to food insecurity.

The SDGs also cannot be achieved by the government alone. Private investment, civil society, academics, NGOs, local communities, and other non-state actors need to be meaningfully involved. Individual responsibility matters as well. The government can create policies and institutions, but implementation ultimately depends on cooperation across society.

Energy security also deserves greater attention. Persistent load-shedding, particularly outside major urban areas, affects not only people's daily lives but also agriculture, businesses, industries, and investment. These problems should be acknowledged openly and addressed through stronger planning and accountability.

Finally, I found one thing particularly encouraging during these interactions: the willingness of some senior policymakers to listen. Seeing the Prime Minister taking notes and ministers engaging directly without constantly trying to portray themselves was genuinely refreshing. If this culture of listening, humility, and accountability can gradually spread throughout public institutions, it could make a real difference.

Bangladesh has limited time to achieve its SDG targets. What we need now is not only ambitious promises, but honest data, public participation, effective implementation, and accountability.

In the end, development should not simply look good on paper. It should be something ordinary people can actually feel in their everyday lives.

Additionally, growing recognition of the importance of **inclusive governance and social protection** offers opportunities to ensure that food security initiatives reach the most vulnerable populations. Expanding social safety nets, empowering women and youth, and supporting small-scale farmers can strengthen household-level food security and reduce inequality.

In conclusion, future opportunities for achieving global food stability lie in innovation, sustainability, cooperation, and inclusivity. By leveraging these opportunities, the global community can enhance human security and move closer to a future where access to adequate and nutritious food is a universal reality.

11. Conclusion

The impact of food insecurity extends beyond individual nutrition, affecting entire societies. Lack of food stability can undermine economic productivity, exacerbate poverty, trigger social unrest, and drive migration and displacement. The experiences of Gaza, Sudan, and Yemen exemplify this dynamic, showing how prolonged conflict, political instability, and disrupted food systems create cycles where hunger increases vulnerability and insecurity, while insecurity further limits food access. These cases emphasize the interconnected nature of human security, highlighting that food, health, economic stability, and political governance are deeply interlinked.

Addressing global food instability requires comprehensive strategies that integrate innovation, sustainability, policy intervention, and international cooperation. Policy makers should give priority to Climate change and make policy sustainable policy for the people so that agriculture sector gets the highest priority. Without developing the environmental issue, it can not possible for any government to produce food for people, specially for the global south countries. For the Advancement such as climate-resilient crops, precision farming, digital agricultural platforms, and urban farming can enhance efficiency, resilience, and accessibility. At the same time, social protection measures, nutrition-focused interventions, and inclusive governance ensure that vulnerable populations are not left behind. Effective collaboration among national governments, international institutions, civil society, and the private sector is essential to manage global risks such as market volatility, climate change, and humanitarian crises.Food stability is inseparable from human security. Ensuring equitable and consistent access to nutritious food protects health, strengthens economies, mitigates conflict, and fosters resilient communities. As the world confronts climate change, population growth, and geopolitical challenges, achieving sustainable and inclusive food systems must remain a global priority to secure a future marked by dignity, stability, and shared prosperity.

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