From conflict to resilience

Tackling climate, debt and food insecurity in Somalia

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About ALL ACT

ALL ACT is an initiative working to optimise existing finance, expertise and delivery mechanisms to support agile responses to loss and damage, led by communities made vulnerable by climate change.

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Cover photo: People arrive at a displacement camp on the outskirts of Dolow, Somalia, amid a drought. © AP Photo/Jerome Delay/Alamy

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Somalia is one of the world's most fragile states, facing intersecting crises of intense climate change, conflict, debt distress and mounting food insecurity. This calls for an urgent integrated and multipronged response. Exploring the structural drivers of food insecurity, this paper assesses the linkages between these crises that underscore the unique challenges Somalia confronts. Building resilience and targeted and strategic investment will be key to breaking the cycle of vulnerability and securing a stable future. The paper provides comprehensive recommendations around locally led adaptation, social protection and building sustainable food systems, which offer a roadmap for Somalia and other fragile and conflict-affected states in the region.

Contents

Foreword by His Excellency Deputy Prime Minister of Somalia Salah Ahmed Jama

Somalia faces a complex and urgent reality shaped by climate change, economic fragility and food insecurity. The impacts of prolonged droughts, erratic rainfall and ongoing conflict have disrupted lives, displaced millions and placed immense pressure on communities already struggling with limited resources. These challenges are deeply interwoven, creating a cycle of poverty and vulnerability that requires immediate and sustained attention.

This paper offers a timely and insightful analysis of these challenges. It explores the links between climate risks, economic instability and food insecurity, and presents practical recommendations for building resilience. Solutions such as locally led adaptation, anticipatory social protection and the Debt Sustainability Support Service (DSSS) are highlighted as pathways to strengthen Somalia's ability to address these issues.

For Somalia, the solutions outlined here align closely with the steps we are already taking. Through the National Transformation Plan, we are working to integrate climate adaptation, improve debt management and enhance social safety nets. These efforts aim to ensure that communities most affected by crises are at the heart of our policies and strategies. However, we cannot achieve these goals alone. Strong partnerships with international donors, climate finance institutions and global development agencies are essential to ensure Somalia has access to the resources and support it urgently needs.

This paper is more than a roadmap for Somalia. It carries lessons that extend beyond our borders. Many other fragile and conflict-affected states share similar challenges, and the insights offered here can guide global efforts to address the growing impacts of climate change and economic instability.

I welcome this paper's thoughtful analysis and encourage its readers to see it as a call to action. By working together — government, international partners, civil society and communities — we can chart a path toward resilience, stability and opportunity for Somalia and other nations facing similar struggles.

Hon. Salah Ahmed Jama

Deputy Prime Minister of Somalia

Abbreviations

AfDP	African Development Bank
CSO	Civil society organisation
DSSS	Debt Sustainability Support Services
FAO	Food and Agriculture Organization of the United Nations
FCAS	Fragile and conflict-affected states
FRLD	Funds for Responding to Loss and Damage
GCF	Green Climate Fund
GDP	Gross domestic product
HIPC	Heavily Indebted Poor Countries
IDA	International Development Association
IDP	Internally displaced persons
IMF	International Monetary Fund
IPC	Integrated Food Security Phase Classification
LDC	Least developed country
NDC	Nationally Determined Contribution
NRC	Norwegian Refugee Council
NTP	National Transformation Plan 2025–2029
PSNP	Productive Safety Net Programme
SDGs	Sustainable Development Goals
SIDS	Small Island Developing States

Summary

Somalia is at the centre of an escalating crisis where climate change, economic distress and food insecurity intersect, creating a self-perpetuating cycle of vulnerability. As one of the most fragile and conflict-affected states (FCAS) in the world, Somalia faces compounded risks due to weak governance, limited fiscal space and an over reliance on climate-sensitive livelihoods. The country's exposure to extreme weather events, coupled with an unsustainable debt burden, has severely constrained its ability to invest in resilience, social protection and sustainable food systems. This paper examines the depth of these interconnected crises by assessing the scale of climate impacts, linkages between climate risk and debt distress, and how these factors drive food insecurity. Through empirical data analysis, trend assessments and regression modelling, the study provides a comprehensive evidence base for policymakers to act on targeted solutions.

Climate crisis: rising vulnerability and escalating disasters

Climate change has disproportionately impacted Somalia, worsening its already fragile state. The country has experienced a steady rise in average surface air temperature, increasing from 25.9°C in 1960 to over 27°C in recent years, amplifying water scarcity and degrading arable land.[1] The number of days with a heat index above 35°C has significantly increased, causing severe heat stress, livestock mortality and health hazards. Erratic rainfall patterns and prolonged droughts have led to repeated crop failures, diminishing food production and straining water resources. The disaster intensity in Somalia has increased more than sixfold since 1990, far outpacing trends in other FCAS and least developed countries (LDCs).[2] The impacts of these disasters have driven massive displacement, with 11.26% of the population forced to migrate internally due to climate-related shocks in 2023, while conflict-induced displacement reached 3.71%.[3] These overlapping crises have resulted in escalating humanitarian needs and worsening food insecurity.

Climate change and debt distress: a dangerous nexus

Somalia's economic distress has been exacerbated by its high debt burden, which stands at 88% of gross domestic product (GDP),[4] leaving little room for social investments. Analysis shows that years with extreme climate disasters coincide with sharp increases in debt defaults by Somalia, where the government struggles to balance emergency response spending with debt servicing obligations. The average sovereign default-to-debt ratio of FCAS like Somalia stands at 6.26, which is 11 times higher than non-FCAS developing and developed countries,[5] reflecting the growing risk of fiscal collapse. The high cost of borrowing further restricts Somalia's ability to finance climate adaptation measures, forcing it into cycles of emergency borrowing to respond to recurring disasters. This pattern highlights a dangerous feedback loop where climate shocks reduce government revenue while increasing expenditure, pushing the country further into unsustainable debt. Regression analysis confirms that countries with high climate risk exposure face significantly higher debt distress, positioning Somalia among the most vulnerable nations in the world.

The food security crisis: a breakdown across key dimensions

Somalia ranks among the countries with the worst levels of food security, with millions facing chronic hunger and malnutrition. According to the Integrated Food Security Phase Classification (IPC), 3.4 million Somalis suffer from acute food insecurity, a figure that is expected to rise to 4.4 million (23% of the analysed population) between April and June 2025.[6] Malnutrition rates are critically high, with 1.7 million children under five suffering from acute malnutrition and 466,000 from severe acute malnutrition (SAM).[7] The crisis is worsened by Somalia's reliance on food imports, as over 90% of its wheat supply comes from Ukraine and Russia, making the country highly

vulnerable to global market fluctuations.[8] Food prices surged by 17.5% in 2023, further reducing affordability for vulnerable populations, particularly in rural areas.[9]

To quantify food insecurity, the study constructed a food security index, assessing four key dimensions: availability, accessibility, utilisation and stability. Somalia scores 2.46, one of the lowest globally, placing it behind even other fragile states. In food availability, Somalia scores 2.65, highlighting its low agricultural productivity and heavy reliance on imports. Food accessibility, with a score of 3.44, reflects severe economic and infrastructure barriers that prevent communities from obtaining adequate food. The food utilisation index of 1.50 underscores nutritional deficits, poor sanitation and limited access to healthcare, exacerbating malnutrition. The food stability index of 2.27 demonstrates Somalia's extreme exposure to climate shocks, conflict and weak governance, which disrupt long-term food security.

Regression analysis: understanding the structural drivers of food insecurity

To determine the key drivers of food insecurity, the study applied regression modelling, identifying three significant factors: climate risk, economic resilience (GDP per capita) and fragility status (FCAS designation). The results show that climate risks have the strongest negative impact on food security, confirming that increased exposure to climate hazards significantly reduces food availability and stability. Economic resilience, measured through GDP per capita, has a positive effect, meaning that higher income levels improve food security by increasing purchasing power and investment in agriculture. However, high debt burdens act as a counterforce to economic resilience, restricting fiscal space for social protection, food subsidies and climate adaptation investments. Somalia's FCAS status further exacerbates food insecurity, as conflict and weak governance disrupt food production, trade and distribution. The combination of climate risks, unsustainable debt levels and fragility creates a compounding crisis, limiting Somalia's ability to strengthen food systems and respond effectively to climate-related shocks.

Recommendations: breaking the cycle of fragility and food insecurity

Addressing the compounding crises of climate change, debt distress, food insecurity and conflict requires an integrated, multipronged approach that scales up climate adaptation, enhances debt sustainability and builds resilient food systems.

1. Scaling up locally led adaptation (LLA) for climate resilience: LLA must be at the core of Somalia's resilience-building efforts. This should include expanding drought-resistant farming, improving water conservation and supporting community-led resource management initiatives. The government should integrate traditional knowledge systems into national adaptation strategies, ensuring community ownership of climate solutions. International donors and climate finance institutions must prioritise direct funding to local adaptation projects, reducing reliance on top-down, donor-driven responses.

2. Expanding anticipatory and shock-responsive social protection: social protection systems should be strengthened with climate-triggered mechanisms that allow for early disbursement of food aid and cash transfers before food crises escalate. This includes digitised food vouchers, portable benefits for displaced populations and climate risk-indexed cash transfers. Scaling up school feeding programmes with climate-resilient food sources will also help improve nutrition outcomes. These interventions should be financed through international grants and concessional financing, given Somalia's limited fiscal space.

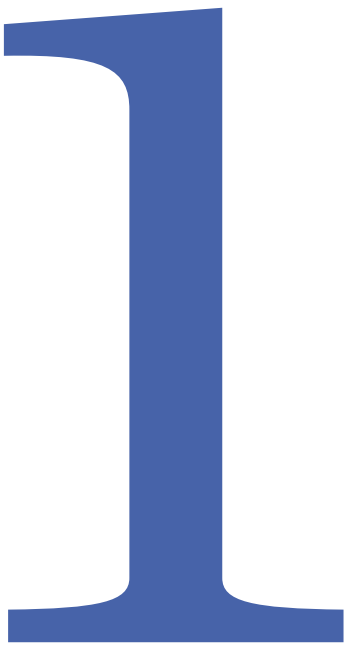
3. Strengthening climate information systems for risk management: investing in climate forecasting and disaster early warning systems is essential for anticipatory action and better resource allocation. Somalia should expand hydro-meteorological data collection, integrate community-based climate risk mapping and develop mobile-based alert systems for farmers and pastoralists. Strengthening technical capacity at the local government level will ensure climate data is actionable and effectively used in decision making.

4. Enhancing debt sustainability: debt distress is a major barrier to resilience investments. Expanding the Debt Sustainability Support Service (DSSS), an initiative developed by the Small Island Developing States (SIDS) to address the intersecting challenge of climate and debt, to Somalia can provide much-needed debt relief, protection from the economic impact of climate disasters and the provision of resilience investments. Climate-linked debt relief mechanisms can allow Somalia to reinvest in food security, climate resilience and sustainable infrastructure.

Somalia's intersecting crises require transformative policy shifts and strong international cooperation. Scaling up LLA, anticipatory social protection, climate risk management and debt sustainability measures will be critical in breaking cycles of vulnerability. With the right investments and governance improvements, Somalia can transition from reactive crisis response to proactive resilience building, ensuring a stable and food-secure future for its people.

Intersecting issues facing fragile and conflict-affected states such as Somalia

The vulnerability of FCAS is among the most pressing global challenges today, with the scale, complexity and impact of fragility worsening significantly over the past two decades.[10] FCAS represent a diverse group of countries, including LDCs, SIDS and other developing countries. Despite this diversity, they share similar characteristics that impede their sustained progress. Weak administrative capacity, poor rule of law, insufficient access to basic services and high levels of social polarisation are common features. These structural weaknesses hinder their ability to manage and mitigate risks arising from social, economic, political, governance, security and environmental challenges. The compounding effects of these issues create persistent cycles of fragility and vulnerability.[11]



1.1 Worsening landscape of vulnerabilities in fragile and conflict-affected states

Currently, nearly one billion people live in FCAS (see Box 1 for definition), which is almost double the figure from 20 years ago.[12] The number of people in proximity to conflict-related deaths has also nearly doubled since 2007, reflecting the growing geographic spread of violence.[13] The world is experiencing more violent conflicts than at any time in the past 30 years.[14]

The worsening landscape of fragility poses significant challenges to achieving the Sustainable Development Goals (SDGs). Two-thirds of the 155 million acutely food-insecure people requiring urgent assistance globally reside in FCAS.[15] These countries also exhibit some of the highest levels of gender inequality, with pervasive gender-based violence, child marriage, and limited access to education and healthcare.[16] In many FCAS, a significant proportion of youth, more than half of whom are women, are not engaged in employment, education or training, creating a severe skills deficit and perpetuating economic stagnation.[17] Addressing these systemic inequalities is critical, as evidence shows that countries with greater gender equality are more stable and experience faster economic growth.[18]

Extreme poverty is also becoming increasingly concentrated in FCAS. These countries account for only 10% of the global population yet bear a disproportionate share of global poverty.[19] Of the world's 43 poorest countries, most are either classified as FCAS or located in sub-Saharan Africa, where poverty rates exceed 19%.[20] Currently, about half of the global poor reside in FCAS or sub-Saharan Africa, and this figure is projected to rise to two-thirds by 2030.[21] While countries that have escaped fragility have reduced poverty rates by more than half, those trapped in chronic fragility have seen little to no progress. Individuals living in chronically fragile economies are ten times more likely to remain poor compared to those in stable regions.[22]

Climate change further compounds vulnerabilities in FCAS, acting as a threat multiplier that intensifies existing social, economic and political pressures.[23] While climate change does not directly cause conflict, its impacts exacerbate fragility by interacting with governance failures, driving forced displacement, worsening food insecurity and undermining development gains.[24] For example, by 2030, climate change is projected to push an additional 100 million people into poverty.[25] By 2050, as many as 143 million people across sub-Saharan Africa, South Asia and Latin America could become climate migrants due to the combined effects of climate impacts like droughts and floods.[26] Notably, more than half of FCAS are at significant risk of major natural disasters.[27] The world is already witnessing the largest forced displacement crisis in history.[28] For instance, by the end of 2023, the global forcibly displaced population reached 117.3 million, the twelfth consecutive annual increase.[29] Internally displaced persons (IDPs) now exceed refugees, with 68.3 million displaced within their own countries, compared to 43.4 million refugees crossing international borders.[30] While children make up 30% of the world's population, they account for 40% of all those forcibly displaced, highlighting the disproportionate impact of these crises on vulnerable people.[31]

Given the interconnected nature of these challenges, a fragmented response is inadequate. Instead, addressing the chronic issues facing FCAS requires a multidimensional, integrated approach that accounts for the social, economic and environmental dimensions of fragility. Without it, these countries will remain trapped in cycles of displacement, poverty and hunger, undermining progress toward sustainable development and global stability.

BOX 1. DEFINITION OF 'FRAGILE AND CONFLICT-AFFECTED STATES'

The World Bank defines FCAS as countries "where state institutions are weak or non-existent, and where fragility, conflict or violence threatens to exacerbate poverty, vulnerability and inequality".[32]

UNDP defines FCAS as countries "where institutional capacity is inadequate, the social contract is weak, and individuals and communities are vulnerable to shocks".[33]

OECD defines FCAS as countries or regions "experiencing serious long-term problems with governance, institutional capacity, development policies or violent conflict".[34]

While these definitions might vary, each provides an insight into the characteristics and challenges faced by FCAS, highlighting the complex interplay of political, social and economic factors that contribute to their fragility. For analysis purposes, in this study we have predominantly used the World Bank's definition of FCAS.

1.2 Somalia, a fragile state facing compounding crises

Somalia exemplifies the acute vulnerabilities faced by FCAS, shaped by decades of protracted conflict, systemic governance failures and escalating development challenges. As the world's most fragile and conflict-affected state globally,[35] Somalia also ranks worst on food security indices,[36] where intersecting crises have left millions trapped in poverty, displacement and hunger. Its fragility stems from the collapse of state institutions in the early 1990s, which created a persistent governance vacuum. This instability has driven widespread development deficits, leaving much of the population without access to essential services such as healthcare, education, adequate food and clean water.[37] Urgent action is needed to strengthen economic resilience, enhance climate adaptation, expand social protection and improve governance to break this cycle of fragility, climate vulnerability and food insecurity in Somalia and other fragile states.

This paper examines these interconnected challenges, particularly those between climate change, debt distress and food insecurity in Somalia, with the goal of understanding how these crises interact and intensify one another. The analysis provides: an assessment of the scale and impact of climate change in Somalia; an exploration of debt distress and its linkages with climate vulnerabilities; and an analysis of how these compounding crises affect food security systems.

By employing tools such as climate risk indices, regression analysis and food security metrics, the study identifies areas where interventions are most urgently needed. The findings and recommendations presented in this paper aim to contribute to the development of a roadmap for addressing the compounding crises of climate change, debt distress, food insecurity and conflict.

While Somalia is the focus of this research, the findings hold broader relevance for other FCAS facing similar challenges. Many FCAS share structural weaknesses, dependence on climate-sensitive livelihoods and constrained fiscal resources, making them equally vulnerable to the compounding effects of climate shocks, fiscal instability and food insecurity. The insights from this study can offer guidance for policymakers and development practitioners in designing integrated approaches to address these interconnected crises in other fragile contexts, particularly across sub-Saharan Africa.

Scale and impact of the climate crisis in Somalia

Climate change has had a disproportionate impact on Somalia. Extreme weather events have not only worsened Somalia's existing vulnerabilities but also stalled its development progress, creating a relentless cycle of fragility and environmental stress.[38] This section assesses the climate crisis in Somalia by examining three key dimensions: changes in climate patterns, such as rising temperatures and unpredictable rainfall; the country's heightened exposure to climate risks; and the tangible impacts of these challenges, including the number of people affected, fatalities, and the relationship between climate-related displacement and conflict. This detailed analysis highlights the far-reaching consequences of the climate crisis on Somalia's stability and resilience.

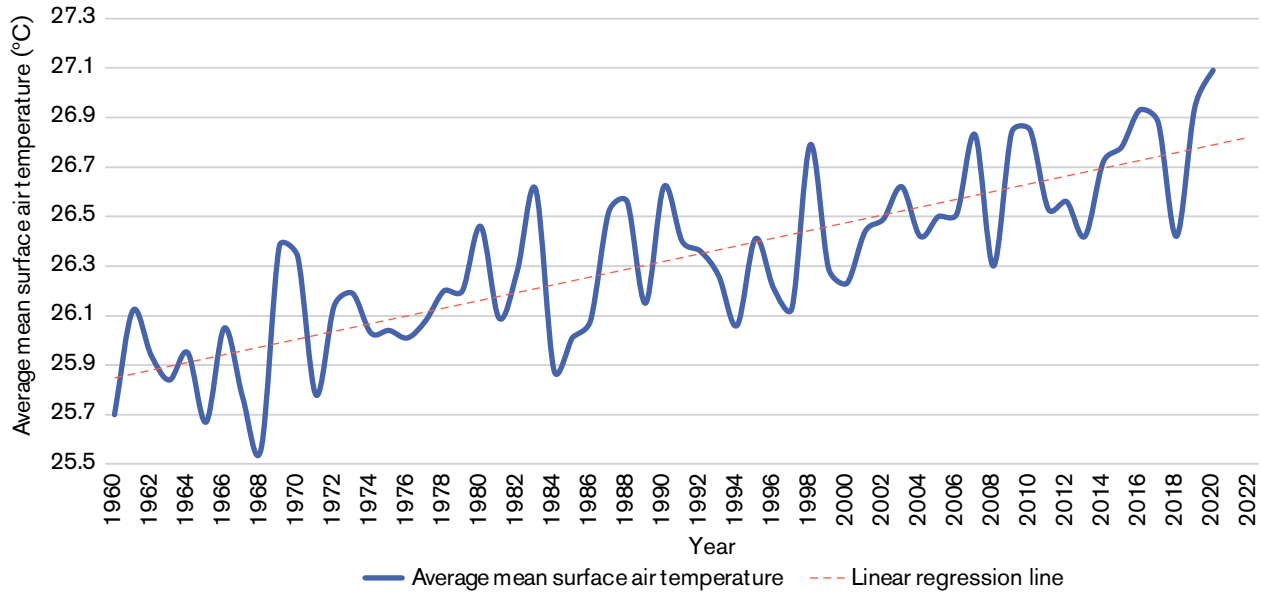
2

2.1 Changing climate patterns and disaster intensity

The climate variability in Somalia has intensified over the past decades, causing prolonged droughts, erratic precipitation and escalating disaster severity. Figure 1 presents the rising surface air temperature in Somalia, which shows a steady rise in the average mean surface air temperature from 1960 to 2022. The linear trend indicates a gradual increase, with average temperatures rising from approximately 25.9°C in the 1960s to over 27°C in recent years. While the rise in temperature aligns with global climate change trends, these changes are particularly concerning for a country like Somalia with high reliance on climate-sensitive sectors like agriculture and pastoralism, which provide livelihoods for over 70% of its population.[39] Higher temperatures accelerate land degradation, reduce water availability and increase evaporation rates, making farming and livestock management increasingly untenable.[40]

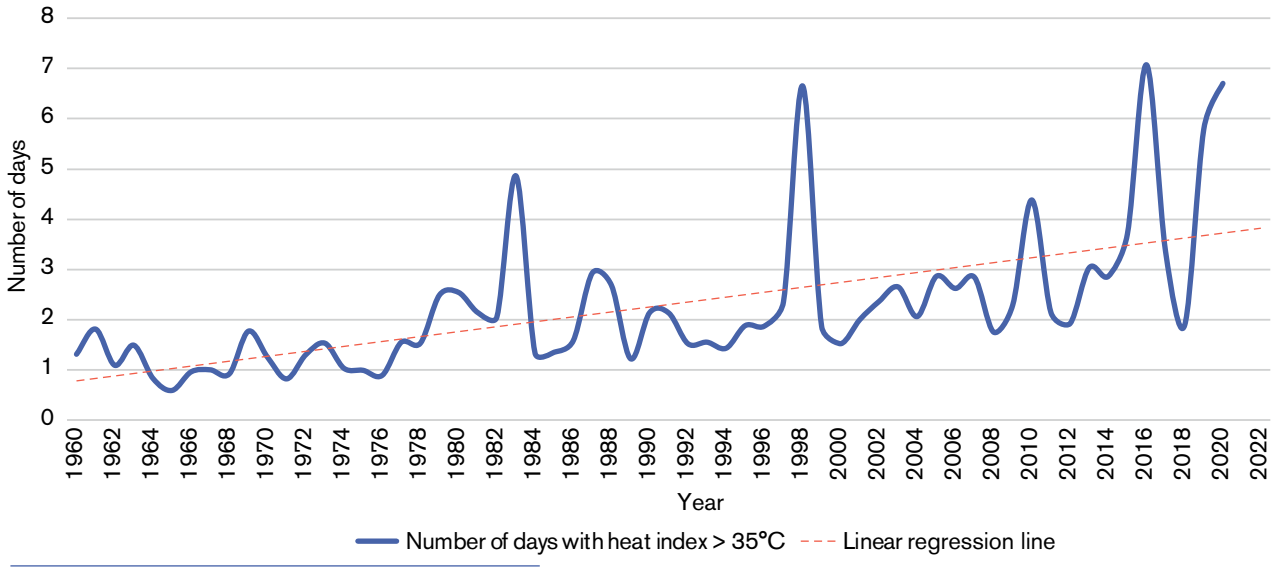
In Figure 2 we present the increasing number of days with a heat index exceeding 35°C. This trend has shown marked peaks, particularly in the late 1990s and post-2010, with a general upward trend. These extreme heat conditions have direct impacts on human health, causing heat stress and dehydration, while also reducing labour productivity.[41] For Somalia's pastoral communities, heat stress has severe implications for

Figure 1. Changing pattern of surface air temperature (average mean) in Somalia, 1960–2022



Source: Author assessment based on data from World Bank[42]

Figure 2. Rising pattern of high heat index days in Somalia, 1960–2022



Source: Author assessment based on data from World Bank[43]

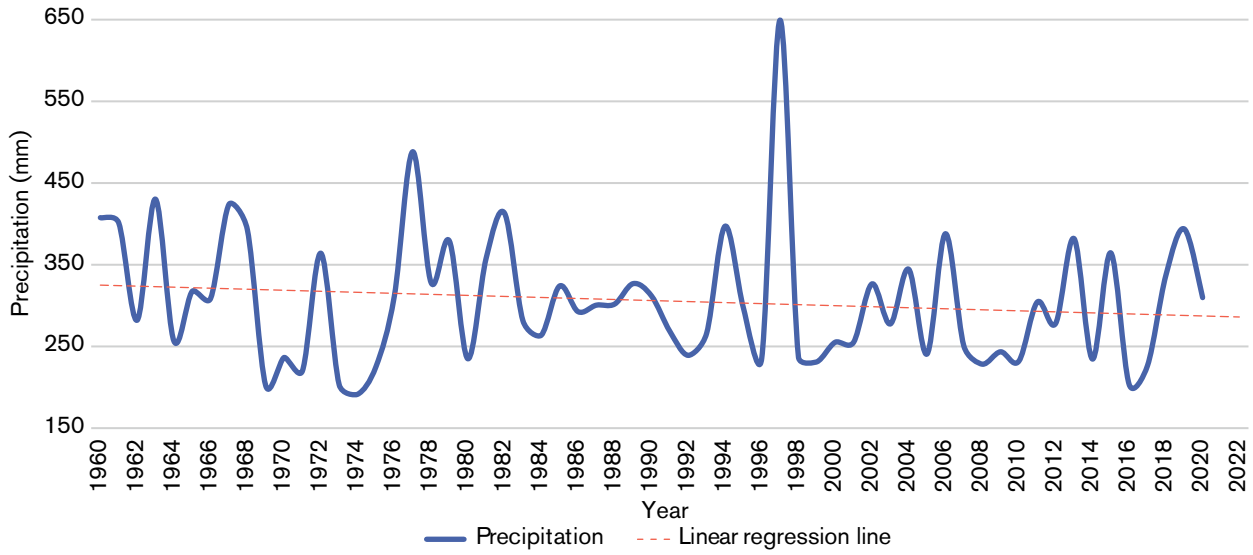
livestock health and mortality, leading to substantial economic losses. Evidence from the Somalia household shocks and responses report highlights how these conditions disrupt livestock-dependent households, further exacerbating poverty and food insecurity.[44]

Similar trends were seen in the rainfall pattern in Somalia from 1960 to 2022 (see Figure 3). Rainfall, which is critical for Somalia's predominantly rainfed agricultural systems, has become increasingly unpredictable, with extended dry periods and sporadic intense rainfall events. Inadequate rainfall during critical planting seasons results in failed harvests.[45] Rainfall variability is destabilising farming cycles and increasing the vulnerability of communities to both food and water shortages.[46]

The changing climate patterns in Somalia have amplified the frequency and severity of disasters. As depicted in Figure 4, Somalia's disaster intensity[i] trends show a sharp increase compared to other FCAS, LDCs, and developing and developed nations over the period from 1960 to 2022.

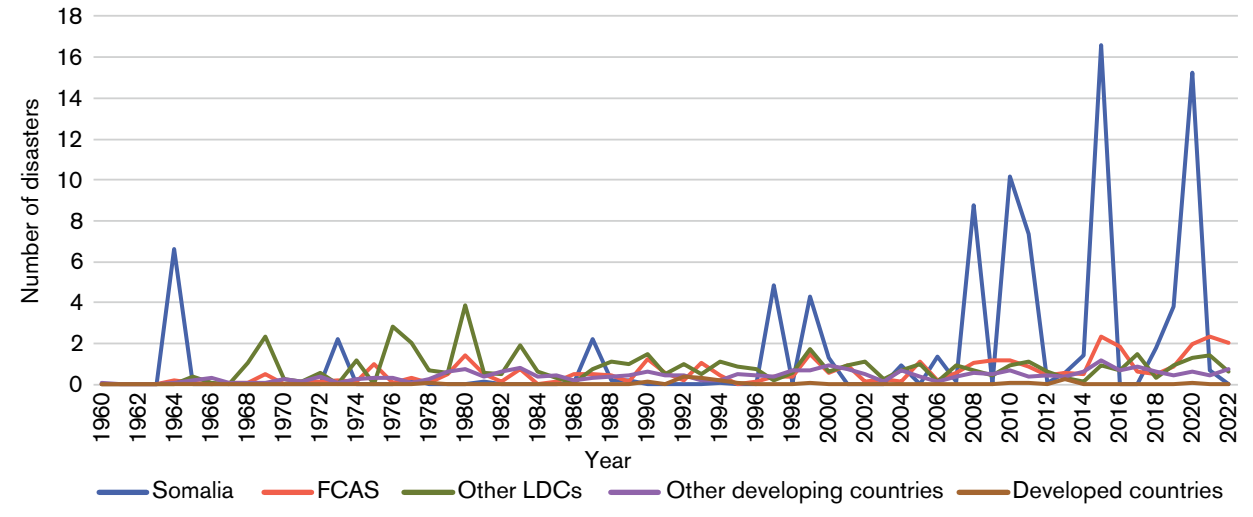
The analysis shows that Somalia has experienced a disproportionate increase in disaster intensity, particularly post-1990. While the average disaster intensity for Somalia was relatively low between 1960 and 1990, at 0.39, it surged to an average of 2.49

Figure 3. Change in the pattern of precipitation in Somalia, 1960–2022



Source: Author assessment based on data from World Bank[47]

Figure 4. Disaster intensity trend in Somalia compared to different country groups, 1960–2022



Source: Author assessment based on data from EM-DAT[48]

i Disaster intensity, as used in this study, is derived from the EM-DAT database, which quantifies disaster severity based on the number of affected people, fatalities and economic damage. The index provides a standardised measure to compare trends across different countries and time periods. For more information, see: doc.emdat.be

between 1991 and 2022. This represents more than a sixfold increase, significantly higher than the trends observed in other FCAS and LDCs, where during the same period disaster intensity remained at 0.84 and 0.78 respectively. In contrast, developed nations saw only a marginal increase, from 0.02 to 0.06.

In comparison with other FCAS, Somalia's disaster intensity peaks, such as the droughts of 2010 and 2016 and the floods of 2020, are noticeably higher. This underscores the compounded impact of fragility and climate variability. For instance, during the 2010 drought, Somalia recorded a disaster intensity of 10.18, far exceeding the FCAS average of 1.15 for the same year. Similarly, during the 2020 floods, Somalia's disaster intensity reached 15.26, highlighting the recurrent and severe nature of its climate shocks.

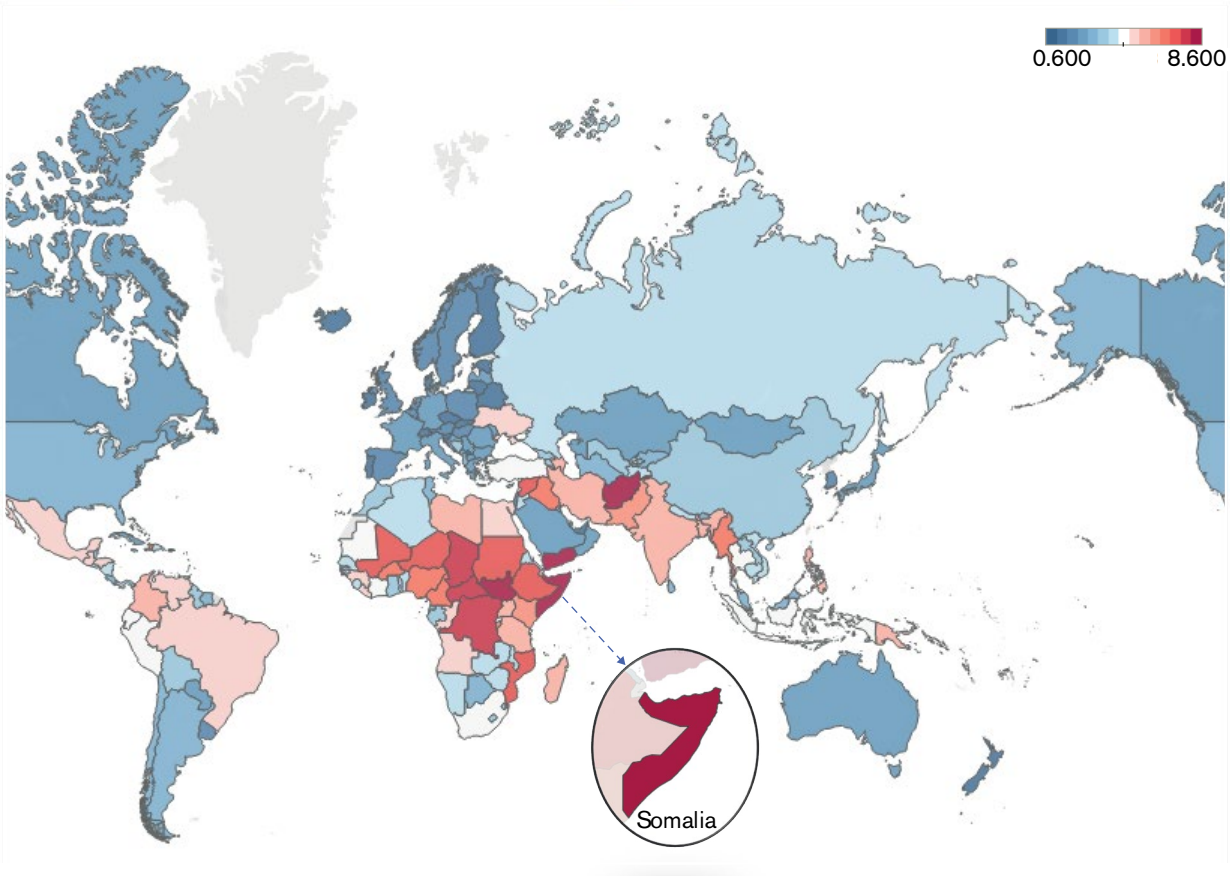
2.2 Assessment of climate change risk

The increasing trends of rising temperatures, shifting precipitation patterns, and escalating disaster frequency and intensity have profoundly exacerbated Somalia's vulnerability to climate risks. These climatic shifts have intensified hazards such as prolonged droughts and flash floods. The impacts of these events are compounded by Somalia's limited capacity for disaster preparedness, including deficiencies in infrastructure, weak early warning systems and inadequate social protection measures, which further amplify the risks faced by communities.

Somalia's position in the global climate risk landscape, as highlighted by the INFORM Climate Change Risk Index 2022,[49] underlines its precarious situation. The risk index evaluates a combination of vulnerability, exposure to hazards and lack of coping capacity, scoring countries from 0 for very low risk to 10 for very high risk. Somalia has a score of 8.8. This is significantly higher than the average for different groups of countries: developed countries, 1.88; developing countries, 3.21; and even LDCs, 4.32. Somalia's climate risk score is even higher than the average for all FCAS, which is 5.83.

We plotted a global map of the climate change risk index (see Figure 5) to show where Somalia sits compared to other critical hotspots of climate risk. While Somalia's geographic location contributes to the risk, its lack of adequate disaster preparedness has been the main contributor towards its high risk profile. This

Figure 5. Climate change risk index



Source: Developed by author based on data from INFORM[50]

includes deficiencies in infrastructure, limited access to early warning systems and inadequate social protection measures. Over 80% of Somalia's population lacks access to basic early warning systems, leaving communities unprepared to respond to sudden shocks.[51] Similarly, infrastructure deficits such as limited water storage systems and inadequate flood barriers make even moderate climate events disproportionately disruptive. Combined with the impacts of ongoing conflict and governance challenges, these factors diminish resilience, leaving the country's population acutely vulnerable to cascading climate-related crises.[52]

2.3 Scale of climate impacts

Somalia's high climate risk profile directly translates into severe impacts on its communities. Over the past five years, Somalia has faced five consecutive failed rainy seasons, marking the worst drought in over four decades. As a country heavily reliant on rainfed agriculture, where 75% of GDP is dependent on agriculture[53] and there is limited irrigation infrastructure (with only 3% of cultivated land irrigated, or 110,800 hectares out of the 8.9 million hectares),[54] it is acutely sensitive to such rainfall variability. This unprecedented drought has devastated agricultural productivity, disrupted pastoral livelihoods and displaced over one million people, with women and children disproportionately affected.[55] Our analysis shows a sharp rise in the number of people affected by climate-related disasters in Somalia. Between 1960 and 1990, the average number of affected individuals was approximately 52,196 annually. However, from 1991 to 2022, this figure increased dramatically to over 1,060,101 annually, reflecting a 20-fold increase. This rise was due to the growing intensity and frequency of disasters such as droughts and floods (see Figure 4).

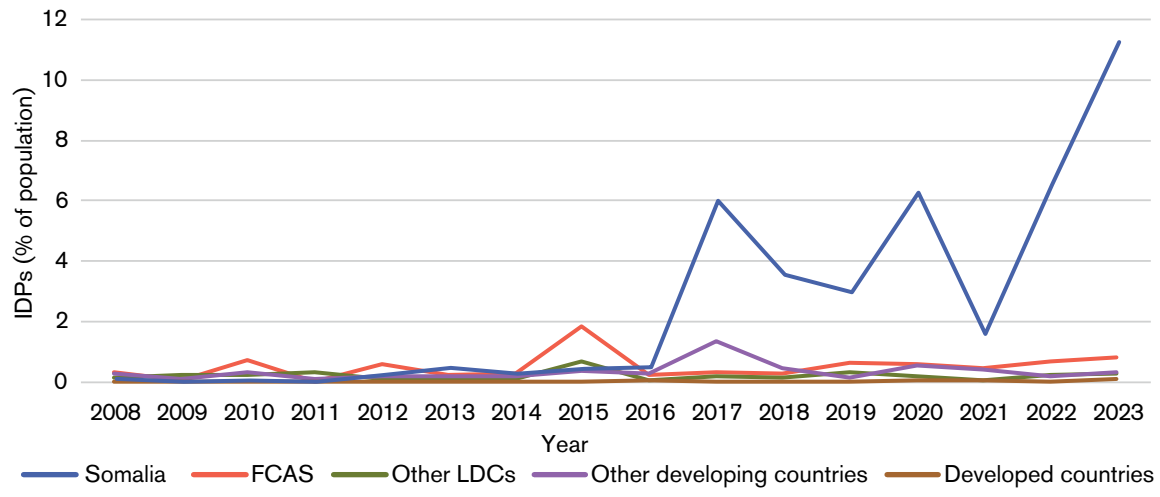
The number of deaths from climate-related disasters has also risen. Our assessment shows that between 1960 and 1990, approximately 725 deaths were recorded annually, increasing to 891 deaths per year from 1991 to 2022. Many of these fatalities are linked to prolonged droughts, which exacerbate famine, malnutrition and outbreaks of diseases like cholera. Women and children are again disproportionately affected, as they are often forced to travel long distances to find water and food, increasing their exposure to health risks and violence.[56]

The increasing frequency and intensity of droughts and floods have also made disaster displacement one of the most pressing challenges for Somalia. These displacement trends are further compounded due to conflict. In Figure 6 we have presented the percentage of the population who are IDPs in different country groups.

Disaster-induced displacement has seen a dramatic increase in recent years. In 2023, 11.26% of the population was displaced due to disasters, marking the highest rate recorded. This is significantly higher than average FCAS figures, where disaster-induced displacement has typically remained below 2% of the population. Droughts are the primary drivers of this displacement, as they deplete water sources and render farmland unusable, forcing families to migrate in search of basic necessities.[57]

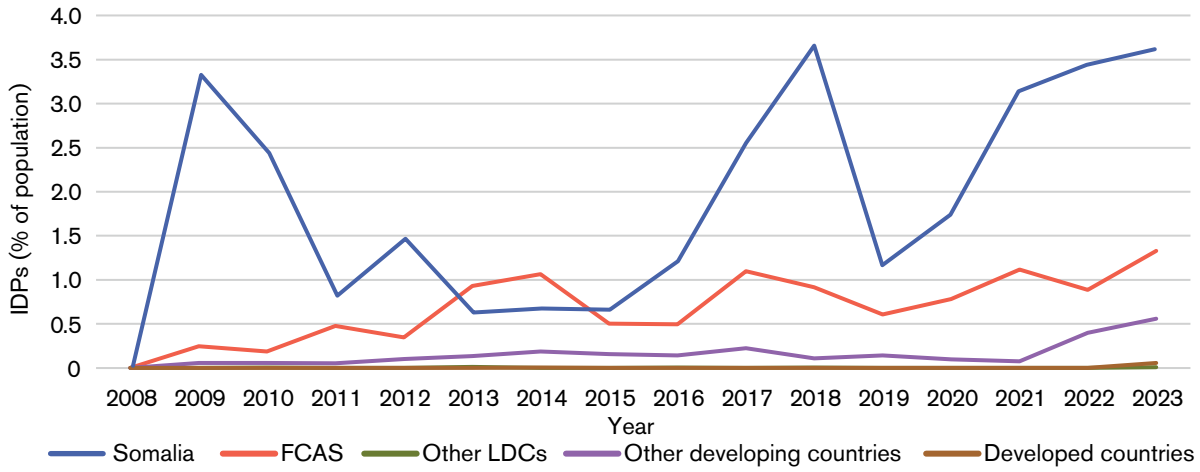
Simultaneously, conflict-related displacement has also remained a persistent issue for Somalia. In 2023, 3.71% of the population was displaced due to conflict and violence (see Figure 7). Although lower than disaster-induced displacement, conflict-related displacement reflects the insecurity and fragility that compound the impacts of climate change. For example, 2017 and 2018 saw notable spikes in both conflict (2.61% and 3.75%,

Figure 6. New displacement associated with disasters, 2008–2023



Source: Author assessment based on data from IDMC[58]

Figure 7. New displacement associated with conflict and violence (% of population), 2008–2023



Source: Author assessment based on data from IDMC[59]

respectively) and disaster-induced displacement (6% and 3.55%). These statistics highlight the interplay of violence and climate shocks, where conflict disrupts recovery efforts and exacerbates vulnerability to disasters.

Failed harvests have led to widespread food shortages, forcing over 1.1 million people to migrate internally in search of water, food and pasture.[60] Climate projections indicate that rising temperatures and increasingly erratic rainfall patterns will continue to intensify these challenges, pushing more households into poverty and displacement.

Somalia's climate action plan, known as a Nationally Determined Contribution (NDC),[61] provides a comprehensive assessment of climate-related security risks. It points out that over the past 50 years, Somalia has experienced 14 major drought events that have adversely affected more than six million people. The NDC highlights the detrimental impact of climatic variability, climate change and land degradation on the country, leading to increased rural-to-urban migration and intensified conflicts over natural resources, resulting in loss of lives and livelihoods.

The dual pressures of conflict and climate thus exacerbate community vulnerability. Addressing these challenges requires a holistic approach that combines climate adaptation with conflict mitigation and resilience-building strategies.

Links between risk and debt crisis

The impacts of climate change reach far beyond individual households and local economies, destabilising national financial systems, straining government resources and driving debt crises. This section explores the interplay between climate risk and debt distress in Somalia, contextualised within the broader challenges faced by FCAS. We examine the impact of climate hazards on sovereign debt default risks, the association between hazard exposure and debt crisis in FCAS, and how Somalia compares to different country groups. We also analyse Somalia's debt levels, repayment burdens and the role of high disaster intensity periods in influencing debt defaults.

3

3.1 Impact of climate change on sovereign debt default risks

Sovereign debt default occurs when a government is unable to meet its debt obligations, such as missing payments on the principal amount or the interest. This often leads to a cascade of challenges, including the loss of access to international credit markets, eroded investor confidence and severe economic consequences. Sustainable debt servicing is essential for maintaining economic stability, enabling public service delivery, and funding investments in development and resilience building. For countries like Somalia, these challenges are amplified due to overlapping vulnerabilities, including prolonged conflict, weak governance and heightened exposure to climate risks.

Somalia, like many FCAS, faces significant challenges in accessing international financial markets. Its high-risk profile discourages investor confidence and limits opportunities to secure affordable financing. As a result, the country often finds itself locked into unfavourable borrowing conditions, increasing the strain on its finances. Limited access to financial markets forces FCAS like Somalia to rely on alternative sources of financing such as donor guarantees — for example, those provided by the World Bank's Multilateral Investment Guarantee Agency — or assistance from international financial institutions with higher interest rates.[62]

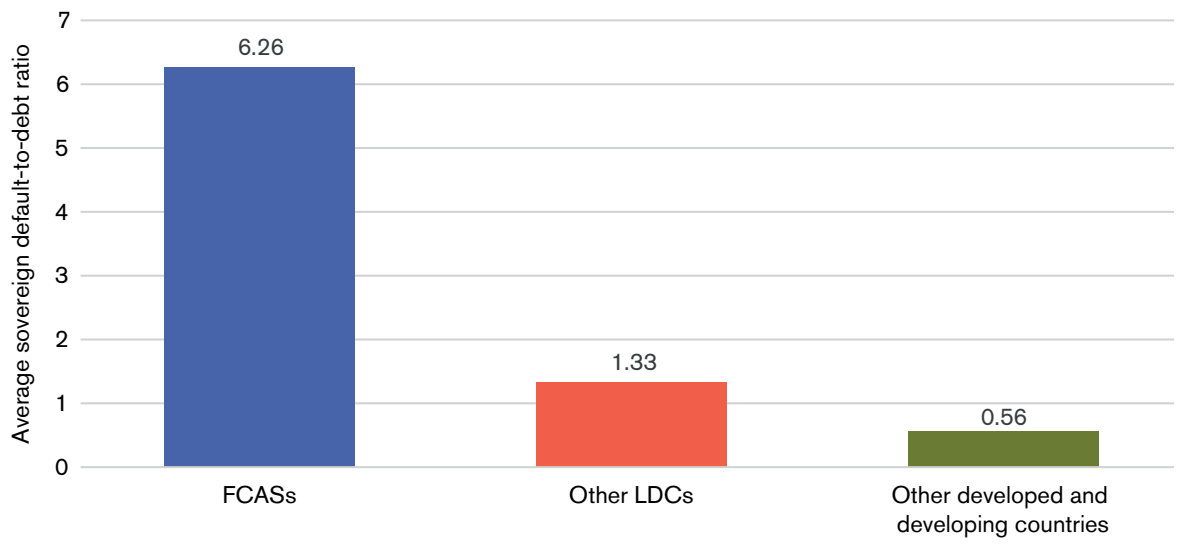
In Figure 8, we have analysed the average sovereign default-to-debt ratio for different categories of country. As shown in Figure 8, the average sovereign default-to-debt ratio for FCAS is 6.26, far exceeding the 1.33 ratio for other LDCs and more than 11 times higher than the 0.56 ratio for non-FCAS developing and developed countries. This stark disparity underscores the precarious fiscal position of FCAS. For Somalia, these challenges are compounded by its limited revenue base and structural economic weaknesses.[63]

Climate change plays a central role in escalating debt default risks. High-intensity climate events disrupt key economic sectors, creating a dual financial burden for governments. Recurring and high-intensity climate disasters can lead to sharp declines in government revenue and tax collections due to disruptions in economic activities, damage to infrastructure and destruction of natural resource-based livelihoods. At the same time, government expenditures may increase due to the urgent demand for emergency relief, disaster response and reconstruction efforts. To bridge this gap between income and expenditure, and in order to continue providing essential services and support to their citizens, governments may need to borrow money. With the increasing frequency of climate impacts, many countries are being pushed towards unsustainable levels of debt, leading to the risk of debt defaults.

However, debt default risks due to climate impacts are not evenly distributed across countries. FCAS are particularly exposed to these risks due to their compounded vulnerabilities. Figure 9 shows the association between the hazard and exposure index and sovereign default-to-debt ratio.

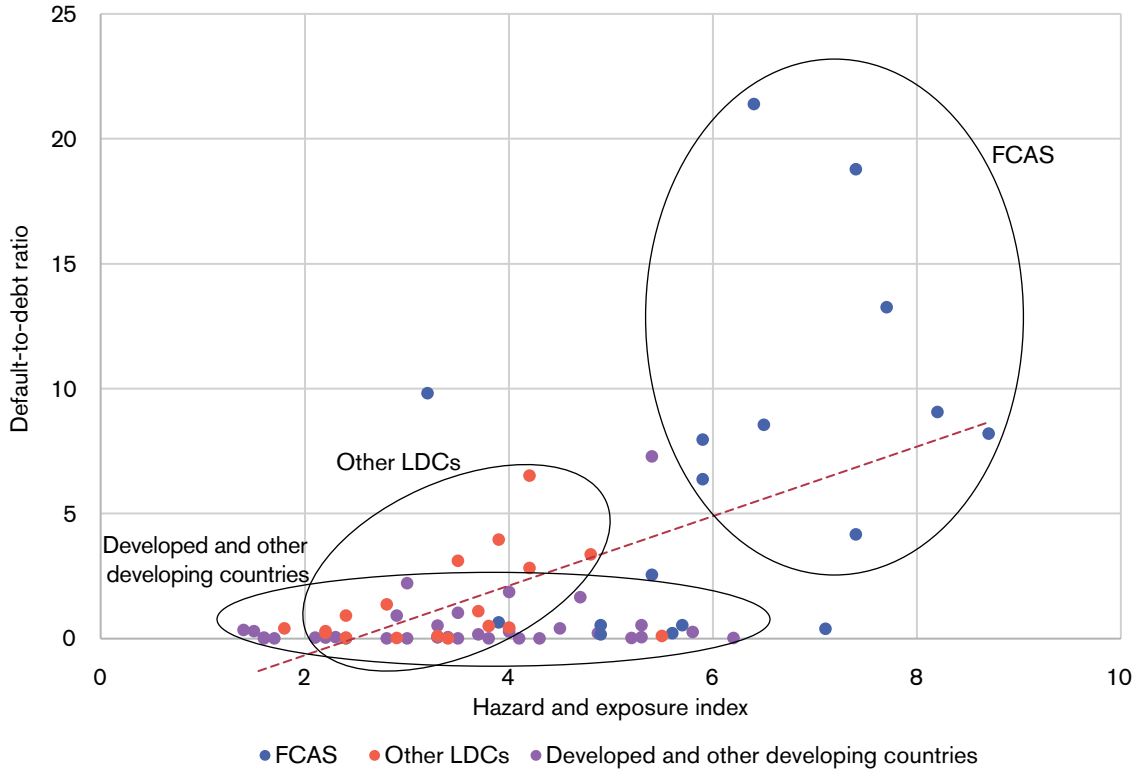
Our analysis shows that countries with higher hazard and exposure index scores demonstrate significantly higher default-to-debt ratios compared to other countries. Somalia, alongside FCAS such as Niger, Sudan and Mozambique, falls within the highest risk category. In Somalia, where agriculture forms the backbone of the economy, prolonged droughts have

Figure 8. Average sovereign default-to-debt ratio in FCAS and other countries



Source: Author assessment based on data from International Monetary Fund's (IMF) Global Debt Database[64]

Figure 9. Relationship between hazard exposure and sovereign default-to-debt ratio



Source: Author assessment based on data from IMF's Global Debt Database and INFORM Risk Index[65]

repeatedly devastated productivity, eroded household incomes and increased reliance on humanitarian aid.[66] The 2017 drought alone led to a substantial loss in livestock in some regions, wiping out significant economic assets and livelihoods, with reports indicating losses of up to 60% of herds in certain areas.[67]

This assessment highlights that greater exposure to natural hazards significantly amplifies fiscal pressures, increasing the likelihood of sovereign debt distress.

3.2 Overview of debt burden in Somalia

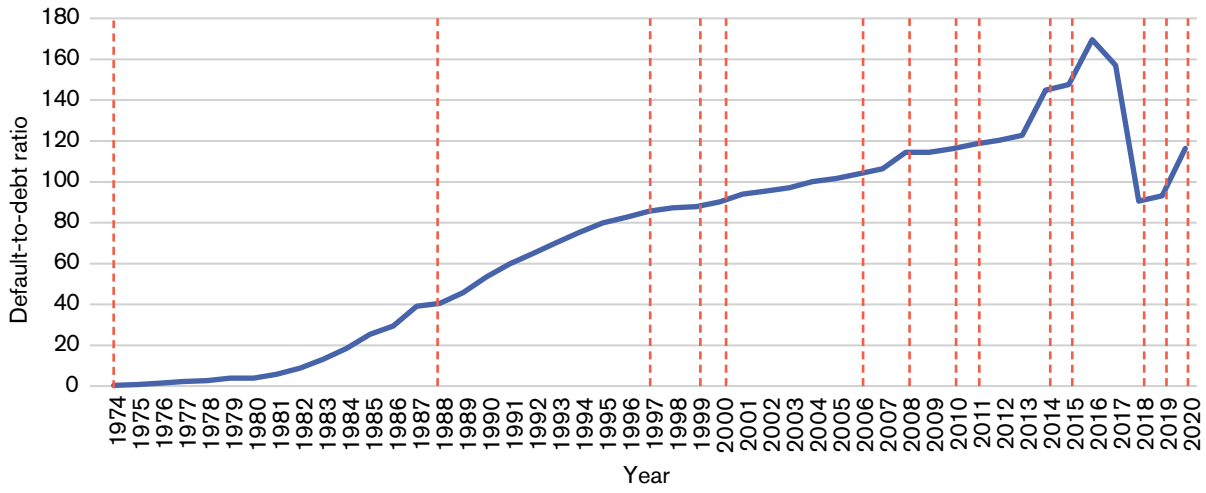
Somalia's existing debt burden reflects the combined impact of decades of conflict, weak governance and climate-related shocks. As of 2020, Somalia's total external debt was estimated at approximately US$5.3 billion, equivalent to 88% of its GDP, according to historical data from the International Monetary Fund (IMF).[68] This overwhelming debt burden has severely constrained the government's ability to invest in critical sectors such as healthcare, education and infrastructure, leaving little fiscal space for building resilience against future climate shocks. Somalia's reliance on external financing stems from its extremely limited domestic revenue base, which, as highlighted by the World Bank, has averaged just 3% of GDP over the last decade, making it one of the lowest globally.[69]

In recent years, Somalia has taken steps to address its unsustainable debt burden through the Heavily Indebted Poor Countries (HIPC) Initiative.[70] This initiative aims to reduce debt burdens for the world's poorest countries to sustainable levels, enabling them to focus on development priorities. Somalia reached the HIPC 'decision point' in March 2020, which resulted in US$1.4 billion in debt relief from international creditors such as the International Development Association (IDA) and the African Development Bank (AfDB).[71] While this marked a critical step toward financial stabilisation, the country still faces significant hurdles. According to the IMF, Somalia must achieve additional policy milestones to reach the HIPC 'completion point', which could potentially lead to a substantial reduction in its debt burden, bringing it down to US$557 million in net present value terms.[72] This highlights Somalia's ongoing dependence on external support and international frameworks to navigate its fiscal challenges.

However, Somalia's fiscal fragility is being exacerbated by recurring climate disasters. In Figure 10 we present the percentage of Somalia's debt default to external debt stock during high disaster intensity periods.

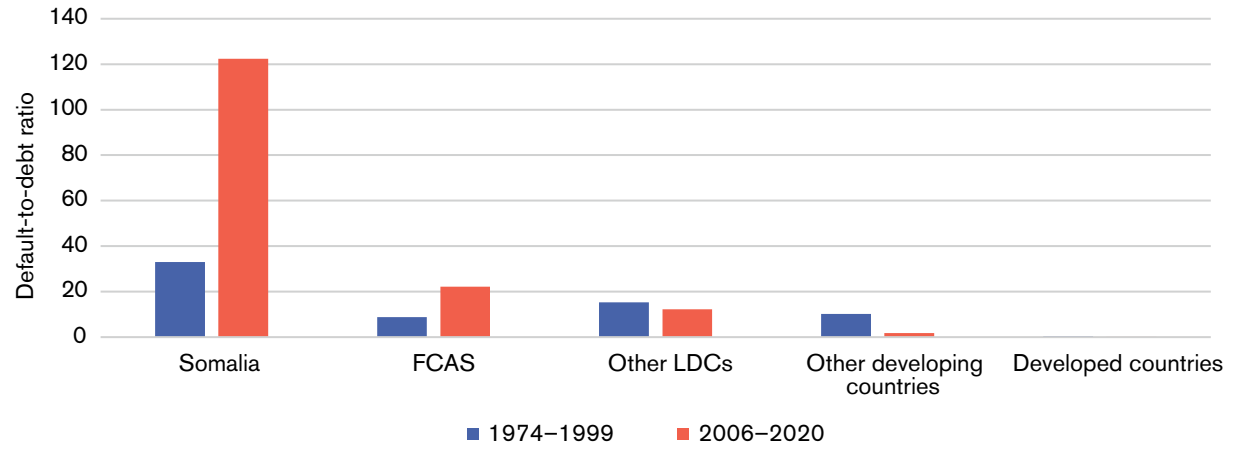
As Figure 10 shows, years with a disaster intensity exceeding 1 are consistently associated with significant surges in debt defaults. For instance, the severe droughts of 2010 and 2016 disrupted agricultural productivity, displaced millions and eroded government revenues. During these periods, debt defaults increased

Figure 10. Somalia default-to-debt ratio during high disaster intensity periods, 1970–2020



Note: Red lines indicate years experiencing disaster intensity more than one. Source: Author assessment based on data from World Bank[73]

Figure 11. Debt default to debt stock: two period average analysis



Source: Author assessment based on data from World Bank[74]

sharply, as emergency response expenditures outpaced available fiscal resources. Similarly, the 2020 floods, coupled with locust infestations, caused widespread damage to infrastructure and livelihoods, further straining Somalia's capacity to service its debt.

Somalia's borrowing terms also exacerbate its fiscal challenges. The IMF notes that the country's external debt portfolio primarily consists of short-term commercial loans with high-interest rates, reflecting lenders' heightened risk perceptions due to Somalia's fragile state status.[75] The World Bank's Somalia country assessment[76] highlights that such unfavourable borrowing conditions amplify the long-term repayment burden, reducing the fiscal space available for essential investments in development and climate resilience.

In Figure 11 we present the analysis of Somalia's debt default trends over time, which illustrates the extent of its fiscal vulnerability. Our analysis shows that Somalia's default-to-debt ratio increased dramatically between two periods: 1974–1999 and 2006–2020. During the earlier period, the average default-to-debt ratio was 38.07%, reflecting limited fiscal flexibility even before climate shocks intensified. By the latter period, the ratio had surged to 122.44%, driven by worsening disaster intensity and mounting debt servicing obligations. In comparison, average FCAS figures saw a less pronounced increase in default-to-debt ratios, rising from 10.19% to 23.45% over the same periods. This disproportionate increase highlights Somalia's heightened exposure to the dual pressures of climate and fiscal fragility.

The Oxfam Debt Report[77] emphasises that Somalia's limited economic diversification and dependence on climate-sensitive sectors such as agriculture and livestock has left it highly vulnerable to such shocks, perpetuating a cycle of borrowing and fiscal distress. Repeated climate shocks, such as prolonged droughts and erratic rainfall, have decimated these sectors, reducing government revenues and increasing the need

for external financing. The Supporting Pastoralism and Agriculture in Recurrent and Protracted Crises (SPARC) report[78] similarly notes that Somalia's recovery periods are frequently interrupted by new disasters, undermining any progress towards fiscal stabilisation.

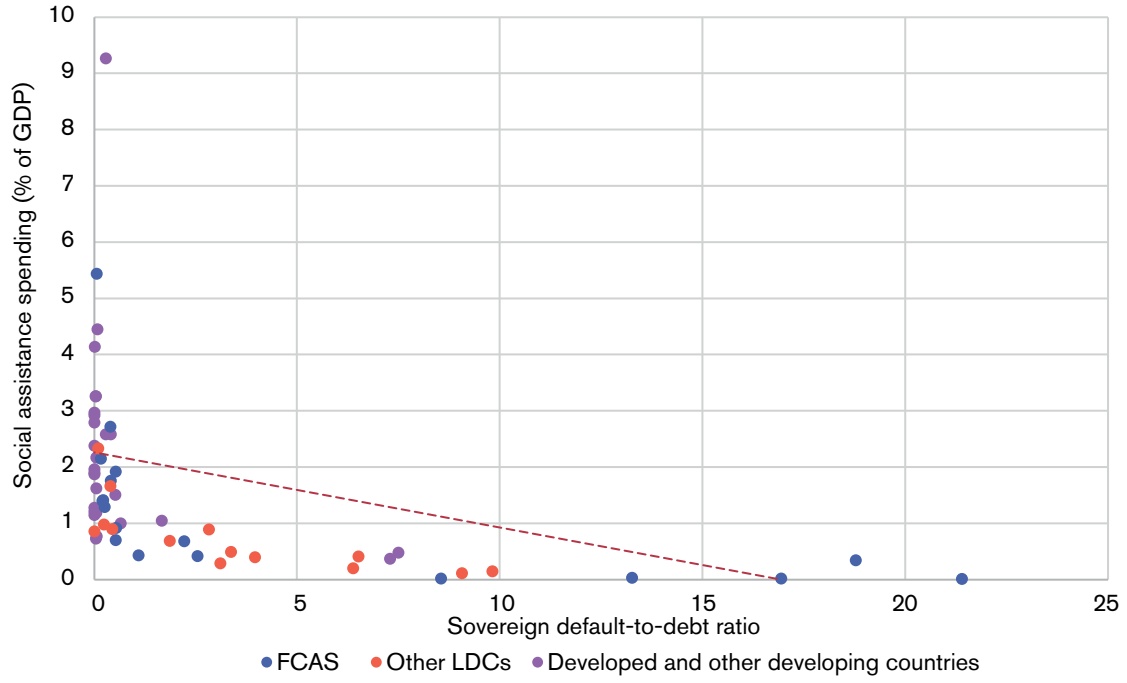
3.3 Rising debt crisis impacting investment in social protection

The escalating climate and debt crises in Somalia have severely undermined investments in social protection programmes, such as cash transfers, food aid and public work schemes, which are essential for providing safety nets to vulnerable communities during times of crisis. These programmes not only offer immediate relief but also enable households to avoid harmful coping strategies, such as selling productive assets, skipping meals or withdrawing children from school — measures that could otherwise lock families into long-term poverty and vulnerability.[79] Evidence demonstrates that well-designed social protection systems play a vital role in helping households maintain consumption levels, protect livelihoods and recover from climate-related shocks.[80]

However, rising debt servicing costs have become a significant portion of government expenditure, with international reports indicating a considerable financial burden on Somalia's budget,[81] diverting resources away from critical sectors like health, education and social safety nets. This constrained fiscal space has limited Somalia's ability to invest in climate adaptation and food security initiatives, leaving its population increasingly exposed to recurring shocks. The IMF has cautioned that without substantial debt restructuring and concessional financing, Somalia's fiscal challenges will persist, jeopardising progress towards achieving the SDGs, particularly those related to hunger, health and wellbeing.[82]

In Figure 12 we have analysed the relationship between sovereign default-to-debt ratio and social assistance spending (as a percentage of GDP) across different country groups. Countries with higher default-to-debt ratios, such as Somalia and other FCAS, allocate significantly less of their GDP to social assistance programmes. For Somalia, this has had dire consequences for food security, as social safety nets designed to protect the most vulnerable have been grossly underfunded. With social assistance spending often falling below 1% of GDP in FCAS, millions of Somalis face hunger, malnutrition and displacement. This is in stark contrast to developed and other developing countries, where debt burdens are lower and social assistance spending often exceeds 2% of GDP, enabling more robust food security systems and disaster response mechanisms. The intersection of climate change, debt distress and underinvestment in social protection reduces access to basic services such as food, water, education and health, amplifying Somalia's food insecurity. Recurring droughts and floods disrupt agriculture, deplete livestock and strain water resources, while limited social protection leaves communities without a safety net. This combination creates a fragile, less resilient society, where even minor shocks can trigger severe and lasting impacts.

Figure 12. Relationship between sovereign default-to-debt ratio and social assistance spending



Source: Author assessment based on data from World Bank[83] and IMF[84]

How climate change and debt crisis are creating food insecurity

In Somalia, the intersection of climate change, conflict and a burgeoning debt crisis has precipitated one of the world's most severe food insecurity situations. The country is facing a vicious cycle where environmental degradation, exacerbated by climate change, impacts agricultural productivity, while a mounting debt burden restricts the government's ability to invest in sustainable food systems, emergency aid responses and longer-term resilience. This section explores how these intertwined challenges translate into a severe food security crisis.

4

The analyses in previous sections have shown how climate change exacerbates economic vulnerabilities, particularly through increased disaster frequency and intensity, which in turn strain the country's already fragile fiscal situation due to high debt servicing costs. Here we examine the current state of food security in Somalia, presenting statistics on hunger, malnutrition and food import dependency, and their impact on poverty. We construct and analyse a food security index based on availability, accessibility, utilisation and stability. Finally, we use regression analysis to assess how climate change and the economic crisis affect these dimensions, comparing Somalia with other countries to understand the scale of its food insecurity.

4.1 Food security in Somalia

The current state of food security in Somalia is characterised by acute levels of hunger, widespread malnutrition and huge dependency on food imports, all of which contribute significantly to the entrenched poverty within the country. According to the IPC's latest data, approximately 3.4 million Somalis are grappling with acute food insecurity, a situation made worse by environmental challenges and economic constraints.[85] This statistic represents around 17% of Somalia's population, highlighting the scale of the crisis, where individuals are unable to meet their basic food needs consistently.

Malnutrition, particularly among children, is also in a critical state. The IPC forecasts that in 2025, 1.7 million children under five years old face the risk of acute malnutrition, with 466,000 of these cases being SAM.[86] This represents a 4% increase in the burden of global acute malnutrition (GAM) and a 9% increase in SAM compared to the same season last year, highlighting a worsening nutritional crisis.[87] Such high rates of malnutrition not only affect the immediate health of children but also have long-term developmental impacts, perpetuating a cycle of poverty.[88]

Somalia's dependency on food imports further exacerbates its food security challenges. Historically, Somalia has relied heavily on imported grains, with over 90% of its wheat coming from Ukraine and Russia, regions currently embroiled in conflict, disrupting these supply chains.[89] This dependency makes Somalia particularly vulnerable to global market fluctuations, leading to an increase in food prices domestically. According to the IPC, the number of Somalis facing acute food insecurity was projected to increase to 4.4 million by June 2025 due to below average rainfall between October and December 2024, exacerbating food scarcity.[90]

The rise in food prices, combined with local currency devaluation, has inflated the cost of imported foods, making them less accessible to the average household in Somalia. The Norwegian Refugee Council (NRC) indicates that food insecurity rates in Somalia increased by 22% between the summer of 2024 and the end of that year.[91] The poorest households spend most of their income buying one meal a day, making basic sustenance a financial burden that contributes to deepening poverty levels.[92]

Moreover, the interplay between climate change and existing economic fragility has intensified the food crisis. Recurrent droughts, as noted by the UN's Food and Agriculture Organization (FAO), have led to significant losses in agricultural productivity, with cereal production in some areas being 60% below the yearly average, directly impacting the income of farmers and pastoralists.[93] This reduction in local food production increases reliance on imports, further straining the national economy and household budgets, pushing more families into poverty.

The compounded effect of these factors is reflected in the poverty statistics. Before the COVID-19 pandemic, the poverty rate in Somalia was already 69%, with rural areas facing 72%.[94] The economic fallout from the global health crisis, combined with pre-existing conditions of conflict and climate variability, has left Somalia at a precarious juncture where food insecurity directly fuels poverty. The World Bank has noted that food inflation in Somalia reached approximately 17.5% in 2023, putting additional pressure on household budgets, with more than half of the population living below the poverty line.[95] According to the Somalia government's economic outlook report, the agricultural sector, which employs the majority of the population, has suffered from successive failed rainy seasons, leading to reduced crop yields and livestock deaths, impacting rural livelihoods and further driving poverty and food insecurity.[96] This scenario underscores the urgency for both domestic policy reform and international aid to address this multifaceted crisis.

4.2 What drives food insecurity in Somalia compared to other countries?

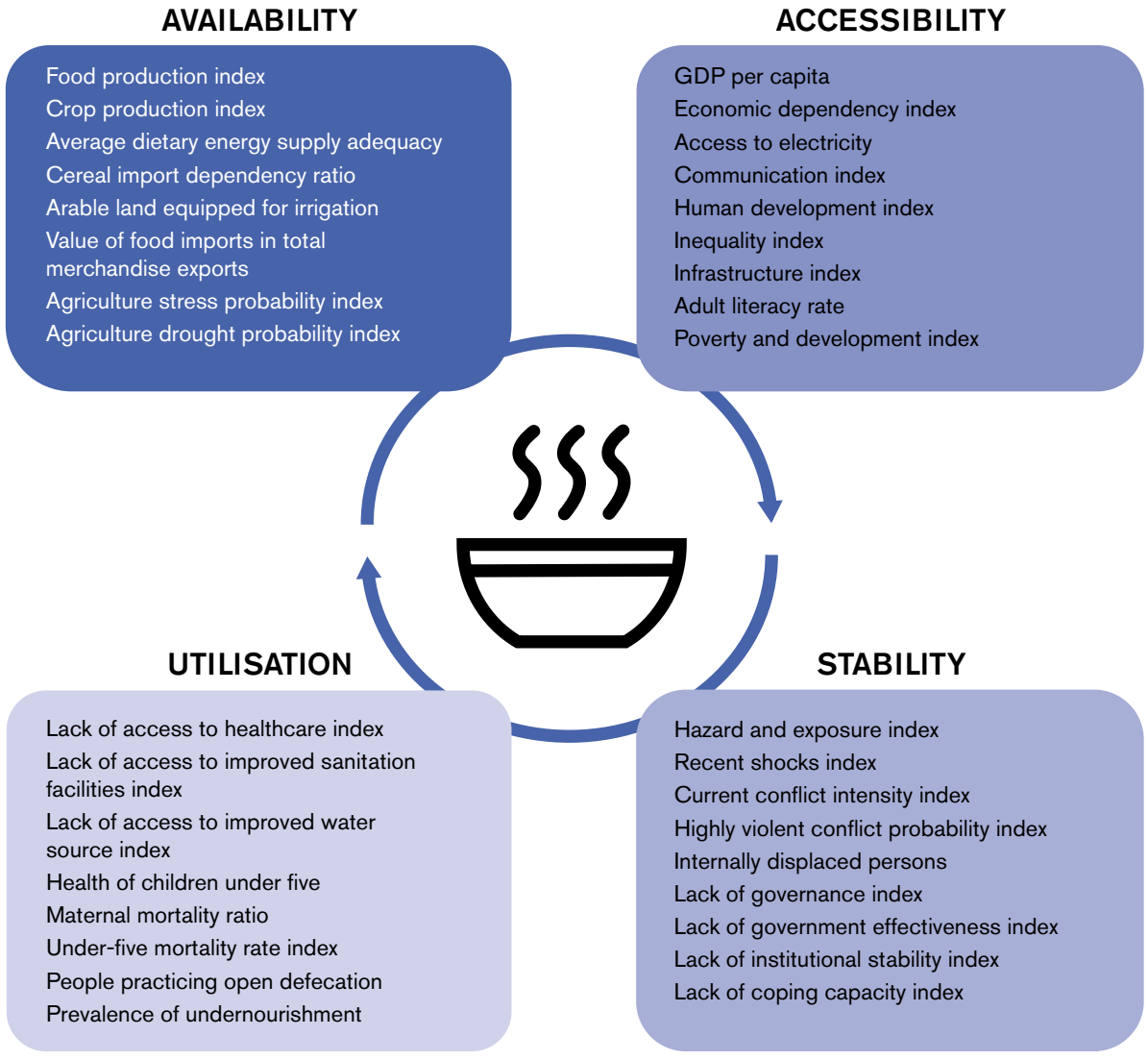
To effectively tackle the food security crisis in Somalia, it is important to unpack the factors that influence or worsen this situation. The FAO defines food security through four dimensions: availability, accessibility, utilisation and stability.[97] Availability is about having enough food through production, distribution and exchange, ensuring it is physically present either from local sources or imports. Accessibility deals with people's ability to get this food, considering both economic factors like income and food prices, and physical factors like infrastructure. Utilisation is concerned with the proper biological use of food, which is influenced by nutrition, food safety, sanitation and water quality, all directly linked to health outcomes.

Stability means food security must be consistent over time, resilient against disruptions such as climate change, conflict or economic downturns.

Understanding these four dimensions is vital because food security is about more than just having enough food. It is about ensuring continuous access, maximising nutrition and ensuring stability over time. Somalia has historically lagged in all these areas due to ongoing conflict, environmental challenges and economic underdevelopment. For instance, poor infrastructure affects food distribution, while governance issues hinder policy implementation. Each dimension faces unique risks. Similarly, climate change impacts availability through drought and floods, economic crises and conflicts disrupt accessibility, poor health outcomes affect utilisation, and political instability undermines stability.

To create a comprehensive food security index for Somalia and different country groups, we have used the FAO's definition of food security. Figure 13 shows the indicators we used to construct the food security index along the four dimensions.

Figure 13. Food security indicators used to construct the food security index across the four pillars of availability, accessibility, utilisation and stability



Source: Developed by authors

BOX 2. UNDERSTANDING THE EXTENT TO WHICH CLIMATE AND ECONOMIC CRISES INFLUENCE FOOD SECURITY

To properly address food insecurity, it is important to unpack its nexus with climate change and economic challenges. To assess the level to which each of these factors individually and collectively influence food security, we carried out a regression analysis. The regression model as detailed in Annex 1, uses the food security index and its four dimensions (availability, accessibility, utilisation and sustainability) as dependent variables. By examining economic resilience (measured by GDP per capita), climate risks (captured through the climate change risk index) and Somalia's designation as a FCAS, the analysis highlights the structural and immediate determinants of food insecurity. These findings are essential for shaping targeted interventions and policies that address the root causes of food insecurity within the broader context of climate and economic crises.

4.3 Food availability index

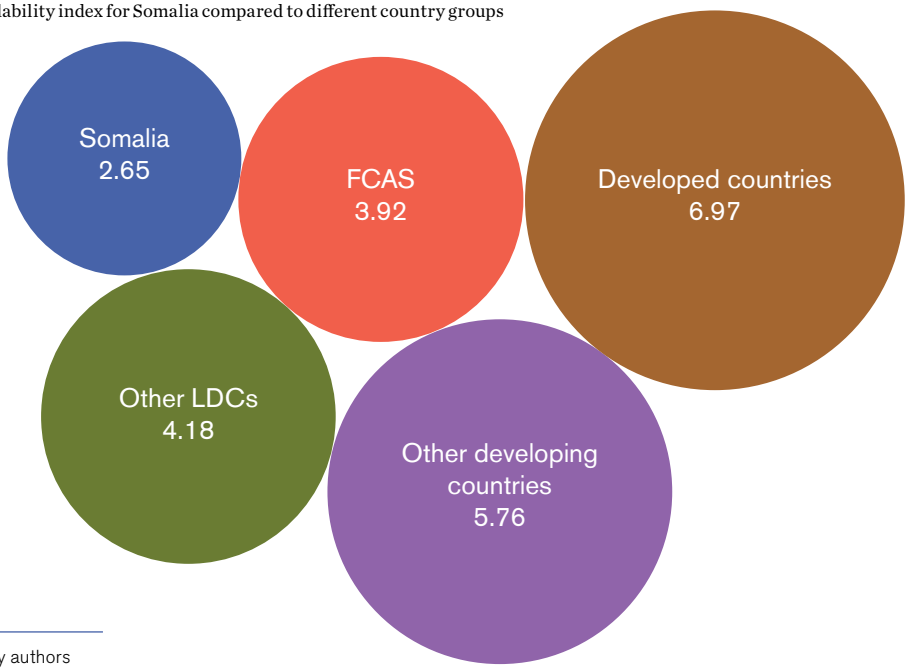
To assess availability, we looked at indicators like the food production index, which measures agricultural productivity, the crop production index for staple food output and the average dietary energy supply adequacy to see if food supply meets dietary needs. The cereal import dependency ratio highlights Somalia's reliance on imports, which can be disrupted by global issues. Arable land equipped for irrigation shows the capacity to sustain food production in harsh conditions, while the value of food imports in comparison to total merchandise exports indicates economic vulnerability. The agriculture stress probability index helps predict agricultural failures due to environmental stress.

The analysis of the food availability index provided in Figure 14 shows where Somalia stands in comparison to the averages for different country groups.[ii]

With a score of 2.65, Somalia ranks significantly lower for food availability compared to the average for all FCAS at 3.92, highlighting its acute challenges in food availability. This low score is indicative of Somalia's heavy dependence on food imports and its vulnerability to climate change, which severely impacts local food production. In contrast, developed countries achieve the highest score of 6.97, reflecting their robust agricultural systems, advanced infrastructure for food distribution, and economic stability. Other developing countries and LDCs score 5.76 and 4.18 respectively, showing a clear gradient in food availability from developed to the least developed, with Somalia positioned at the lowest end.

Further review of the factors that we have used to develop the food availability index can help us better understand the reasons contributing towards vulnerability. For example, Somalia's food production index of 98.94 and crop production index of 101.37 are close to average for FCAS and other LDCs, suggesting that the issue is not solely to do with production. However, the agriculture stress probability index of 0.55 for Somalia is much higher than its counterparts, indicating a heightened

Figure 14. Food availability index for Somalia compared to different country groups



Source: Developed by authors

ii The data for FCAS includes Somalia throughout, whereas the data for 'Other LDCs' and 'Other developing countries' exclude the figures for Somalia.

risk of agricultural stress due to conflict, environmental degradation and other factors. More concerning is the agriculture drought probability of 20.00, which is much higher than for other groups, pointing to the severe impact of droughts on Somalia's food production capacity. This situation forces Somalia into a precarious reliance on food imports, which are vulnerable to global market fluctuations and supply chain disruptions, as noted by the NRC,[98] which reported that over 90% of Somalia's wheat is imported, often from conflict zones.

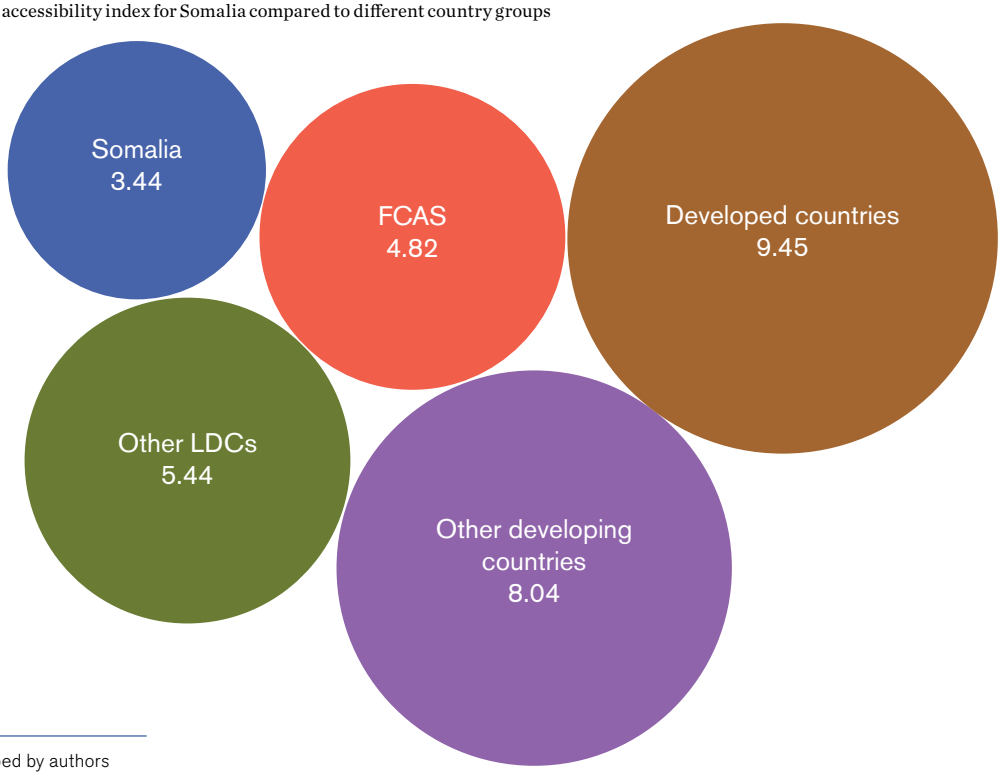
The regression analysis provides further insights into the factors influencing food availability in countries. The regression coefficients,[iii] which measure the expected change in the dependent variable (food availability) for a one-unit change in the predictor variable, reveal distinct patterns. The analysis shows that GDP per capita[iv] has a positive influence on availability, indicating that each one-unit increase in GDP per capita is associated with a 0.110-unit increase in availability, likely due to greater food production and imports. In contrast, climate risks[v] have a significant negative effect, suggesting that each one-unit increase in climate risks leads to a 0.348-unit decline in food availability by disrupting agricultural output and supply chains. The weaker impact of FCAS status[vi] indicates that fragility has a less direct influence on availability compared to other factors, as the relationship is not statistically significant. However, the constraints imposed by debt obligations, particularly in importing essential food items and stabilising supply chains, further limit availability. Investments in climate-resilient food production and infrastructure are critical to stabilising food availability in Somalia. This analysis underscores the multifaceted nature of food availability in the country: it is not just about producing more food, it is about creating resilience against environmental shocks like drought.

4.4 Food accessibility index

To assess food accessibility, we used indicators like GDP per capita, which reflects economic stability, and the economic dependency index, showing reliance on external economic factors. The access to electricity and infrastructure index reflects how crucial these factors are for food storage and preparation, while the communication index indicates the level of information access, vital for market integration. The inequality index, literacy rate, and poverty and development index provide insights into social and economic development, which affect awareness of and access to institutions and decision making that impact accessibility.

The analysis of the food accessibility index provided in Figure 15 shows where Somalia stands in comparison to the averages for different country groups.

Figure 15. Food accessibility index for Somalia compared to different country groups



Source: Developed by authors

iii The regression coefficient (β) indicates the strength and direction of the relationship between a predictor variable and the outcome variable. It represents the expected change in the outcome variable for each one-unit increase in the predictor variable, assuming all other factors remain constant.
iv $\beta 1 = 0.110$, $p < 0.05$
v $\beta 2 = -0.348$, $p < 0.01$
vi $\beta 3 = -0.157$, $p > 0.1$

With a score of 3.44, Somalia ranks the lowest for food accessibility compared to the different country groups, indicating severe challenges in ensuring that its population can access sufficient food. This score is notably lower than the average for FCAS at 4.82, suggesting that while conflict and fragility affect food accessibility across these states, Somalia faces unique and intensified barriers. Other developed countries lead with a score of 9.45, showcasing their high levels of economic stability, infrastructure and social services, which facilitate food access. Other developing countries and other LDCs follow with scores of 8.04 and 5.44 respectively, highlighting how accessibility diminishes with development status, with Somalia at the bottom.

There are various factors contributing to this low accessibility score for Somalia. Access to electricity stands at a mere 54% for Somalia, significantly lower than the 100% in developed countries, which impacts food storage, preparation and the overall economic environment necessary for food distribution. The communication index of 7.90 indicates limited information access, crucial for market integration and awareness of food availability. The economic dependency index is high at 8.00, reflecting Somalia's vulnerability to external economic shocks, which can disrupt food imports and local market dynamics.

Somalia's GDP per capita is US$643.75, far below that of developed countries at US$48,651.45, which directly affects purchasing power for food. The human development index score of 1.00 is the lowest, indicating poor overall development, which impacts education, health and income, all of which are vital for food accessibility. The inequality index at 9.00 and infrastructure index at 8.00 further highlight Somalia's infrastructural deficits, which hinder food distribution. With only 11.80% of the population being internet users and a total adult literacy rate of 41.03%, information dissemination and education levels are low, affecting the ability to access food through modern means or to understand nutritional needs. The mobile cellular subscriptions per 100 people stand at 57.96, lower than other groups, which could limit communication for food-related activities. Lastly, the poverty and development index of 10.00 underscores the deep poverty levels in Somalia, directly correlating with food insecurity.

The regression analysis provides further insights into the factors influencing food accessibility in countries. The results indicate that GDP per capita[vii] has a significant positive effect, meaning a one-unit increase in GDP per capita is associated with a 0.198-unit increase in food accessibility, as higher incomes enable households to better afford food. In contrast, climate risks[viii] and FCAS status[ix] exert strong negative effects. A one-unit increase in climate risks corresponds to a 0.596-unit decrease in accessibility, as climate shocks disrupt markets and supply chains. Similarly, each one-unit increase in FCAS status leads to a 0.961-unit decline, as conflict impedes food distribution and access. Debt distress further compounds these challenges by diverting resources from social protection programmes and poverty reduction efforts, leaving households more vulnerable to food insecurity. Addressing these barriers requires expanding income-generating opportunities, strengthening social protection systems and ensuring the resilience of food supply chains during crises.

Overall, this analysis of the food accessibility index reveals that Somalia's challenges in food security are not just about availability but are critically compounded by severe limitations in economic access, infrastructure and information dissemination. These factors create a complex web of issues that significantly hinder Somalia's ability to ensure food reaches those in need. This situation calls for interventions that not only increase food production but also address the economic, infrastructural and informational barriers to food access.

4.5 Food utilisation index

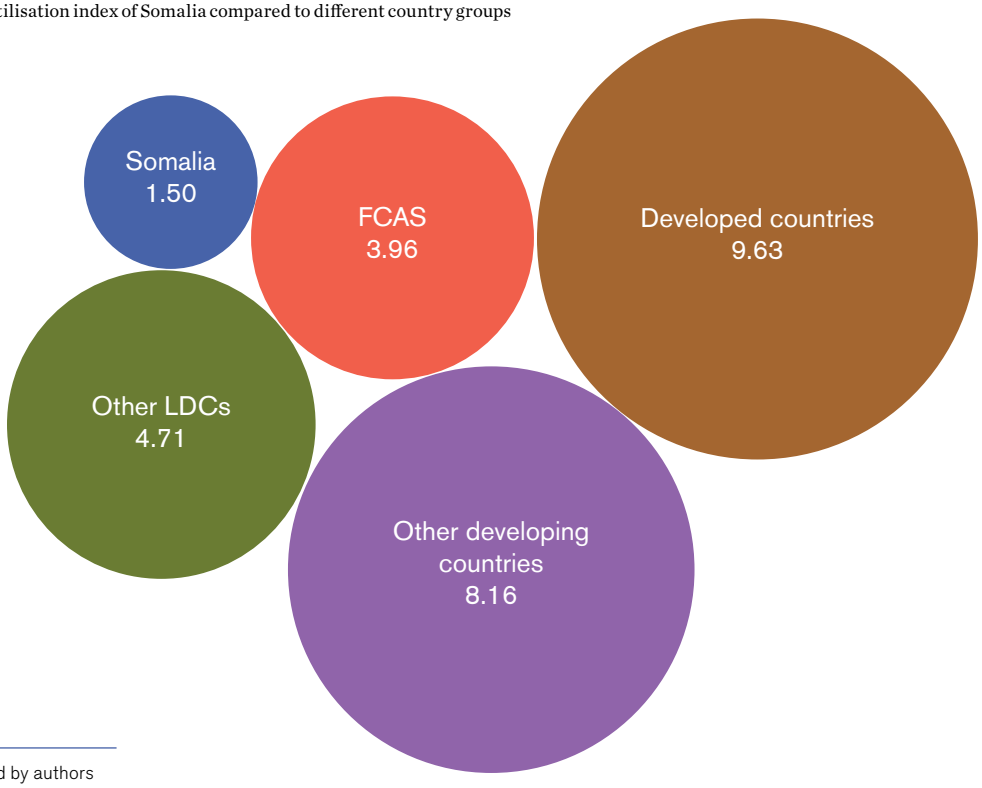
For food utilisation, we considered indicators like the lack of access to healthcare index, which shows how health services affect food security, and indices for lack of access to improved sanitation facilities and lack of access to improved water sources, which influence health and thus food utilisation. The maternal mortality ratio and under-five mortality rate index reflect the broader health system's effectiveness, impacting food security through family health. People practicing open defecation and the prevalence of undernourishment directly measure health parameters that impact the utilisation or absorption of food.

The analysis of the food utilisation index provided in Figure 16 shows where Somalia stands in comparison to the averages for different country groups.

With a score of 1.50, Somalia significantly trails behind the average score of all FCAS for food utilisation, which average at 3.96, indicating a severe challenge in utilising available food for nutritional health. This low score reflects deep-seated issues in health infrastructure, sanitation and water access, all critical for effective food utilisation. In contrast, developed countries score 9.63, demonstrating high levels of healthcare, sanitation and nutritional education, which facilitate optimal food use. Other developing countries and LDCs score 8.16 and 4.71 respectively, showing a gradient where food utilisation improves with development, with Somalia at the lowest point.

vii $\beta 1 = 0.198, p < 0.01$
viii $\beta 2 = -0.596, p < 0.01$
ix $\beta 3 = -0.961, p < 0.01$

Figure 16. Food utilisation index of Somalia compared to different country groups



Source: Developed by authors

Several factors contribute to Somalia's low food utilisation index. Lack of access to healthcare is 8.90, compared to 0.66 in developed countries, highlighting a significant barrier to health services, which are vital for food utilisation through proper nutrition and disease prevention. Lack of access to improved sanitation facilities stands at 6.60, compared to 0.24 in developed nations, indicating poor sanitation can lead to health issues affecting food absorption. Similarly, lack of access to improved water sources at 8.30 contrasts with 0.13 in developed countries, highlighting water quality issues that impact food preparation and health.

The average dietary energy supply adequacy for Somalia is 84.00, which, while not the lowest, still suggests that the food available might not meet the nutritional needs adequately, especially when compared to 137.06 in developed countries. Health conditions score at 2.10, a figure that correlates with a high prevalence of health issues that could hinder food utilisation. The health of children under-five index at 8.20 and maternal mortality ratio at 627.90 are particularly alarming, indicating poor health outcomes for the most vulnerable, which directly impacts food utilisation through malnutrition and related health complications.

The practice of open defecation at 21.32% is very high compared to negligible rates in developed countries, contributing to health risks that impair food utilisation. The density of physicians is 0.17, much lower than 43.03 in developed countries, reflecting a lack of medical personnel to support health-related aspects of food utilisation. The prevalence of undernourishment at 51.30% and under-five mortality rate at 8.20 further underscore the dire situation, where malnutrition and child health are critical barriers to effective food utilisation.

The regression analysis provides further insights into the factors influencing food utilisation in countries. The results show that GDP per capita[x] has a significant positive effect, indicating that a one-unit increase in GDP per capita is associated with a 0.214-unit improvement in food utilisation, as higher incomes support better access to cooking resources, clean water and healthcare. In contrast, climate risks[xi] and FCAS status[xii] have substantial negative impacts. Each one-unit increase in climate risks corresponds to a 0.660-unit decrease in utilisation due to the disruption of sanitation and health infrastructure, which limits access to safe water and reduces nutritional quality. Similarly, a one-unit increase in FCAS status leads to a 1.660-unit decline, as conflict weakens public health services and compromises household nutrition. Debt distress further compounds these challenges by reducing fiscal space for investments in health and sanitation services. Enhancing food utilisation requires prioritising infrastructure improvements in health and sanitation, alongside targeted nutrition programmes to mitigate these risks.

x $\beta 1 = 0.214$, $p < 0.01$
xi $\beta 2 = -0.660$, $p < 0.01$
xii $\beta 3 = -1.660$, $p < 0.01$

This analysis of the food utilisation index underscores that Somalia's food insecurity is not only about having food but also about the capacity to convert that food into health and nutrition. The country's challenges in healthcare, sanitation, water access and overall health conditions create a substantial barrier to effective food utilisation, contributing to its status as one of the world's most food-insecure countries. Addressing these issues requires comprehensive health, sanitation and nutritional interventions to improve the utilisation aspect of food security.

4.6 Food sustainability index

Food sustainability was assessed through risk indicators like the hazard and exposure index, recent shocks index, current conflict intensity index and highly violent conflict probability index, which highlight vulnerabilities to natural and human-induced disruptions. The number of IDPs shows how displacement impacts the stability of food access, while governance indices like lack of governance index, lack of government effectiveness index, lack of institutional stability index and lack of coping capacity index illustrate how governance affects food security resilience.

The analysis of the food sustainability index provided in Figure 17 shows where Somalia stands in comparison to the averages for different country groups.

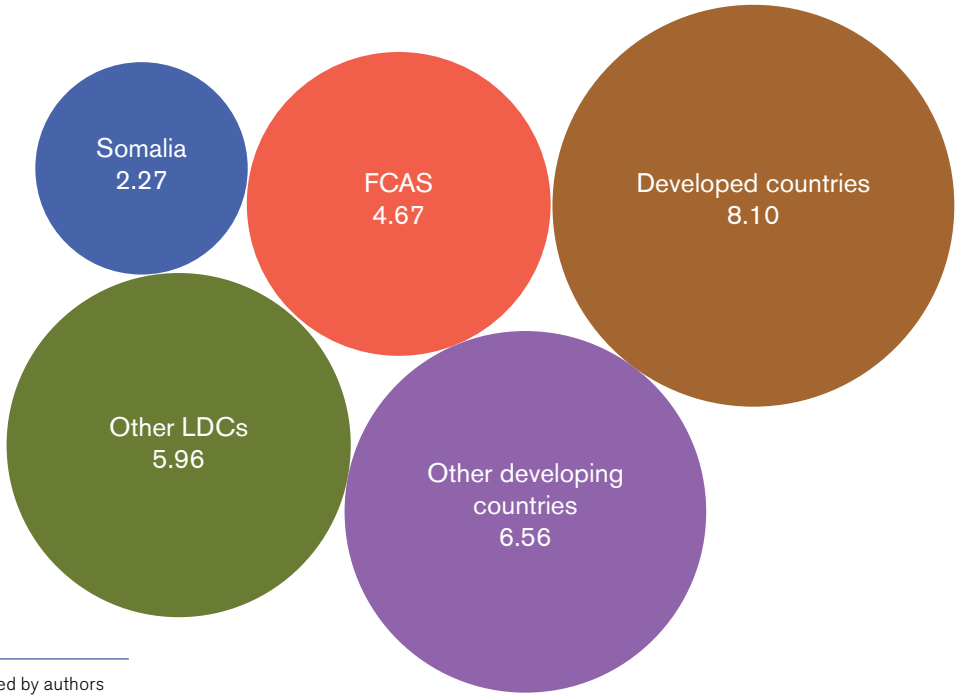
With a score of 2.27, Somalia ranks lower than all of the country groups for food sustainability, indicating profound difficulties in ensuring food security stability due to environmental, political and social vulnerabilities. This score is considerably lower than the average for all FCAS at 4.67, underscoring Somalia's unique struggles with sustainability. In contrast, developed countries score 8.10, reflecting their ability to maintain stable food systems through strong governance, effective risk management and resilience to shocks. Other developing countries and LDCs score 6.56 and 5.96 respectively, showing a clear progression in sustainability capabilities with development level, placing Somalia at the bottom.

Several critical factors contribute to Somalia's low sustainability score. The frequency of drought events score of 9.50 is alarmingly high, compared to 1.08 for developed countries, indicating Somalia's extreme vulnerability to climate change, which disrupts agricultural productivity and food availability. The current conflict intensity score stands at 10.00, higher than all the country groups, reflecting ongoing conflicts that destabilise food systems by disrupting production, distribution and access.

Governance in Somalia scores 9.00, significantly worse than the 3.01 in developed countries, suggesting weak governance structures that fail to provide the necessary framework for sustainable food security policies. The government effectiveness score of 7.07 further indicates inefficiencies in policy implementation and public service delivery, which are crucial for food system resilience. The hazard and exposure index score of 8.90 points to Somalia's high exposure to various risks, including natural disasters, which threaten food production stability.

The highly violent conflict probability score of 0.99 is much higher than in developed countries at 0.04, showing a constant threat of violence that can lead to

Figure 17. Food sustainability index of Somalia compared to different country groups



Source: Developed by authors

displacement and food insecurity. The number of IDPs in Somalia is 3,861,643, very high compared to the 13,186 in developed countries, illustrating the scale of displacement due to conflict and climate change, which severely impacts food sustainability by disrupting community structures and agricultural practices.

Institutional stability is rated at 8.50, indicating a lack of stable institutions capable of supporting long-term food security initiatives. The lack of coping capacity index score of 6.60 suggests limited ability to manage and recover from shocks, further compounded by a natural hazard score of 8.90, showing Somalia's susceptibility to environmental disasters. Finally, the recent shocks score of 8.90 underlines the frequency of events that have recently disrupted food security, from economic downturns to natural calamities.

The regression analysis provides further insights into the factors influencing food sustainability in countries. The results show that climate risks[xiii] pose the most significant threat, with each one-unit increase in climate risks associated with a 0.513-unit decline in stability, as climate-related shocks undermine agricultural productivity and deplete natural resources. Conversely, GDP per capita[xiv] has a positive effect, indicating that a one-unit increase in GDP per capita corresponds to a 0.166-unit improvement in stability by enabling investments in sustainable practices and technologies. Meanwhile, FCAS status[xv] exerts a more moderate negative influence, as fragile governance structures create systemic challenges to long-term sustainability. High debt burdens further restrict Somalia's capacity to invest in climate adaptation and resilient food systems by diverting resources away from critical infrastructure. Strengthening food stability requires addressing climate risks, improving governance and pursuing debt relief initiatives to unlock resources for sustainable food systems capable of withstanding future shocks.

Overall, this analysis of the food sustainability index reveals that Somalia's food insecurity is deeply rooted in systemic issues that affect the sustainability of its food systems. The combination of frequent environmental shocks, ongoing conflict, poor governance and institutional instability creates a challenging environment for maintaining and developing sustainable food security. To improve this situation, interventions must focus on enhancing resilience against climate change, addressing conflict, improving governance and building institutional capacity to manage and recover from shocks. This would require a multifaceted approach involving international cooperation, local governance reform and community-based resilience programmes.

4.7 Overall food security index

Building on our previous analyses of the individual dimensions of food security, we have integrated these into an overall food security index for 170 countries, as presented in Figure 18.

This map visually represents the global distribution of food security, with colours ranging from dark red, indicating the lowest levels of food security, to dark blue, representing the highest. Somalia, highlighted in the darkest red, has a food security index of 2.46, the lowest among the countries mapped, underscoring its position as one of the world's most food-insecure nations.

When we compare the global food security index results by different country groups, the stark contrast becomes evident. Somalia's index score of 2.46 is significantly lower than the average for all FCAS at 4.34, indicating that even within a group of countries facing similar challenges, Somalia's food security situation is dire. The average for other LDCs is 5.07, further illustrating the gap in food security between Somalia and other nations with comparable economic profiles.

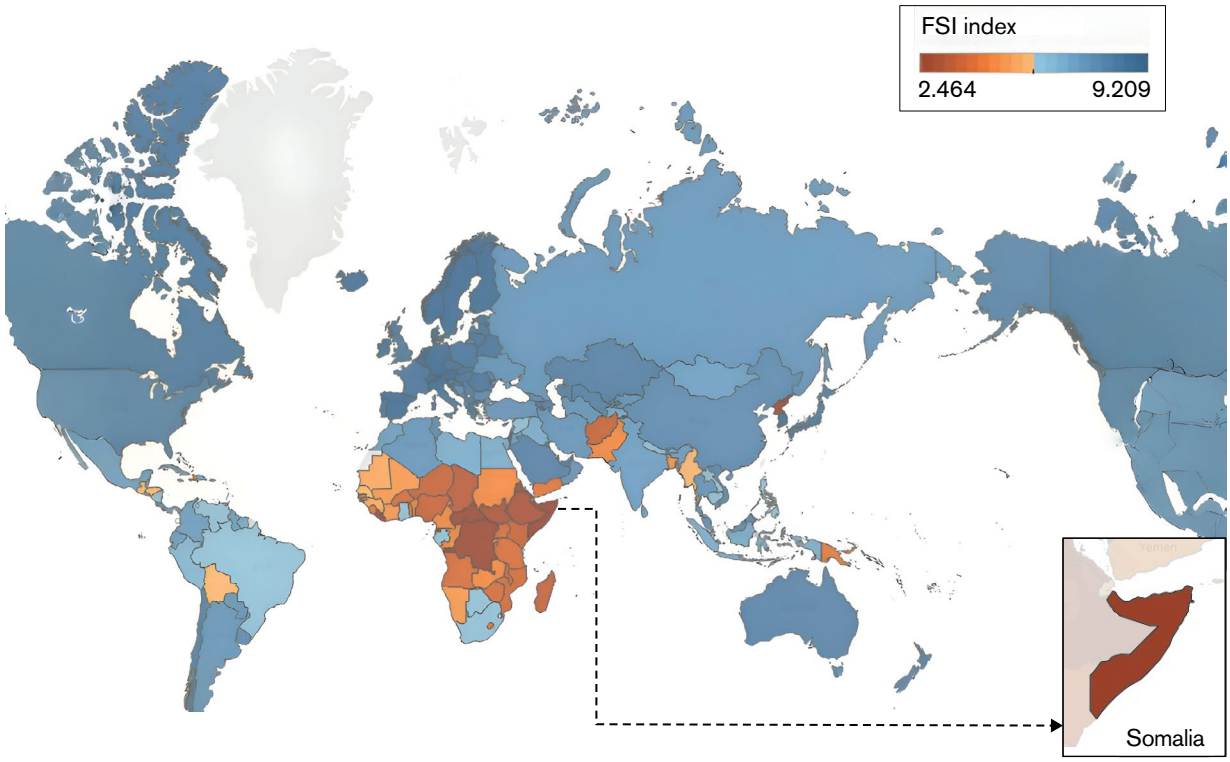
Other developing countries fare better with an average index score of 7.13, exemplifying more robust food systems despite facing their own set of challenges. This can be attributed to relatively better governance, infrastructure and economic stability, which support food security. The highest scores are unsurprisingly seen in developed countries, with an index score of 8.54, where comprehensive social safety nets, advanced agricultural practices and strong economic foundations provide a stark contrast to Somalia's situation.

The regression model, based on data from 170 countries, explains 70.3% of the variance in food security,[xvi] indicating that the included variables — GDP per capita, climate risks and FCAS status — collectively account for 70.3% of the differences in food security outcomes across countries. R^2 measures the model's explanatory power, with a value of 1 indicating a perfect fit. Here, an R^2 of 0.703 reflects a strong predictive ability, suggesting that these factors play a significant role in shaping food security.

The analysis reveals that GDP per capita[xvii] has a positive effect, with each one-unit increase associated with a 0.168-unit improvement in food security. This relationship indicates that higher income levels enable households to access food through imports, stable markets and investments in agricultural systems. The p-value indicates the probability that the observed relationship occurred by chance. A p-value less than 0.05 suggests that the relationship is statistically significant, meaning there

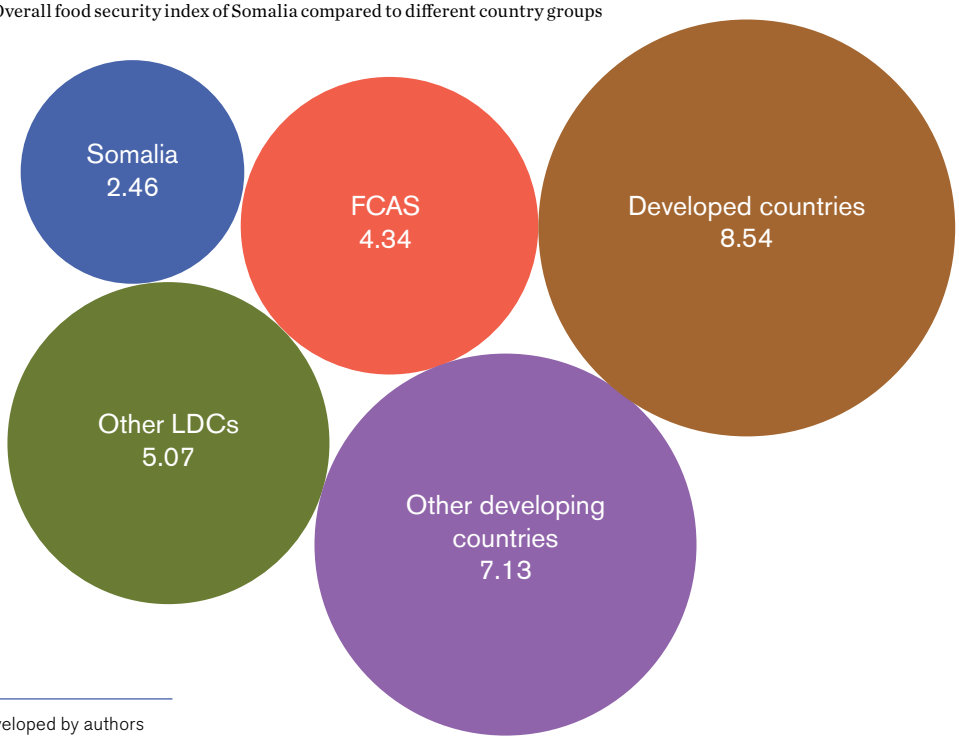
xiii $\beta 2 = -0.513$, $p < 0.01$
xiv $\beta 1 = 0.166$, $p < 0.01$
xv $\beta 3 = -0.328$, $p < 0.1$
xvi $R^2 = 0.703$
xvii $\beta 1 = 0.168$, $p < 0.01$

Figure 18. Map showing the food security index per country



Source: Authors' own calculations based on secondary data

Figure 19. Overall food security index of Somalia compared to different country groups



Source: Developed by authors

is strong evidence to support the effect observed. In this analysis, $p < 0.01$ indicates highly significant relationships, reinforcing the reliability of the findings.

In contrast, climate risks[xviii] significantly undermine food security, as a one-unit increase in climate risks corresponds to a 0.541-unit decrease, driven by the disruptive effects of climate-related events like droughts, floods and temperature extremes on agricultural productivity and food supply chains.

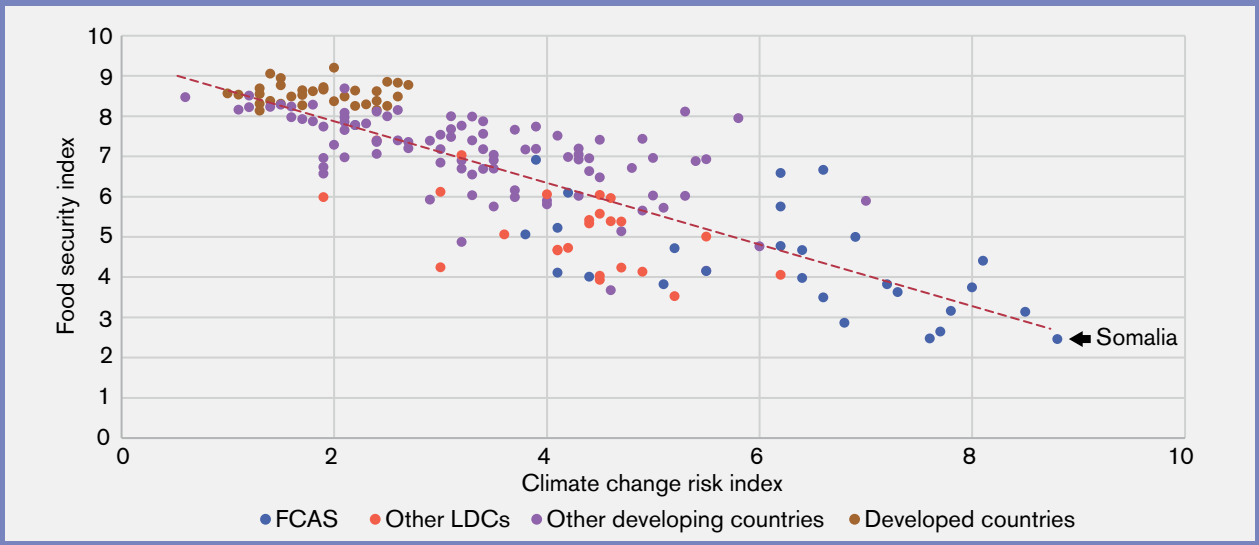
Additionally, Somalia's status as a FCAS[xix] further exacerbates food insecurity, with a one-unit increase in fragility associated with a 0.853-unit decline in food security. Fragility intensifies the impacts of conflict, weak institutions and governance challenges, compounding climate risks and economic stressors.

The findings underscore the need to strengthen Somalia's economic resilience, scale up climate adaptation efforts and adopt conflict-sensitive approaches to enhance food security. Moreover, the country's high debt burden constrains public investment in social protection, climate adaptation and food system resilience, deepening the food security crisis. Debt relief measures could help unlock

BOX 3. SOMALIA'S EXTREME VULNERABILITY: THE LINK BETWEEN CLIMATE RISKS AND FOOD SECURITY

Figure 20 illustrates the correlation between the climate change risk index and the food security index, showing how climate risks negatively impact food security across different country categories. The trend line shows a clear downward slope, indicating that higher climate risks are associated with lower food security levels.

Figure 20. The link between climate change risk index and overall food security index of Somalia compared to different country groups



Countries classified as developed economies tend to cluster at the upper left of the graph, where food security is high and climate risk is low. Developing countries and LDCs are spread across the middle of the distribution, showing greater variability. However, FCAS, including Somalia, exhibit the most severe food insecurity levels, particularly those with high climate risk exposure.

Somalia is positioned at the extreme lower-right corner of the graph, with one of the highest climate risk levels and the lowest food security scores among all observed countries. This underscores the compounded vulnerability Somalia faces, where climate-related disasters such as droughts, floods and erratic rainfall have devastated agricultural productivity, disrupted food supply chains and increased dependency on external assistance.

The steep correlation between climate risks and food security seen in the graph reinforces the urgency of climate adaptation measures in fragile states. For Somalia, this means enhancing resilience through improved climate forecasting, investing in drought-resistant agriculture, strengthening social protection systems and ensuring debt relief to free up resources for food security interventions. Without targeted climate and financial interventions, Somalia's food security crisis will continue to deepen in the face of escalating climate risks.

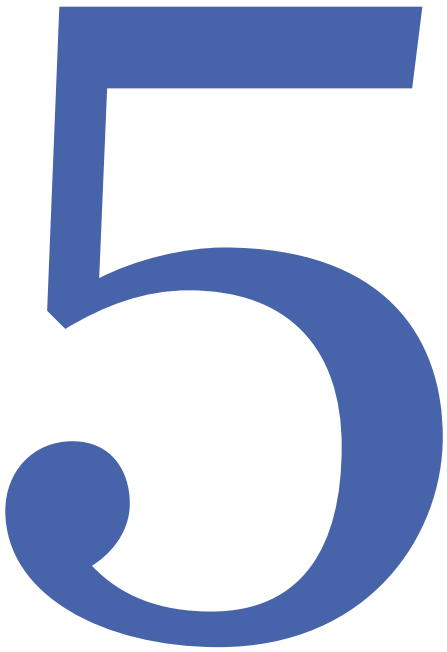
xviii $\beta 2 = -0.541$, $p < 0.01$
xix $\beta 3 = -0.853$, $p < 0.01$

much-needed fiscal space for targeted interventions to build a more stable and food-secure future.

This analysis demonstrates that food security in Somalia is influenced by a complex interplay of economic resilience, climate risks and fragility. While economic growth offers some protection, the significant negative impacts of climate risks and governance challenges emphasise the urgent need for targeted investments in climate adaptation, social protection, resilience building and governance reforms. Crucially, comprehensive debt relief is necessary to address the fiscal constraints that undermine investments in food security and climate resilience, particularly given the outsized role of climate risks in driving debt-related vulnerabilities. Addressing these systemic vulnerabilities is crucial to improving food security outcomes across all dimensions — availability, accessibility, utilisation and sustainability — and ensuring sustainable improvements in Somalia's food systems. These findings, drawn from a comprehensive global dataset, provide a foundation for evidence-based policies and interventions tailored to Somalia's unique challenges.

Recommendations

The analysis presented in this paper highlights the urgent need for a comprehensive and integrated approach to addressing Somalia's worsening food security crisis, driven by the compounding effects of climate change, debt distress and fragility. The findings underscore how climate-related disasters have intensified food insecurity, while economic challenges — particularly high debt burdens and limited fiscal space — have constrained the government's ability to respond effectively. Additionally, governance weaknesses and persistent conflict have further disrupted agricultural production, damaged food supply chains and restricted market access, making food security increasingly precarious. Without targeted interventions, these crises will continue to reinforce one another. The proposed recommendations focus on strengthening economic resilience, enhancing climate adaptation, expanding social protection, improving governance and securing comprehensive debt relief.



Promoting locally led adaptation to support climate resilience and adaptive peacebuilding in Somalia

Somalia's vulnerabilities to climate change, economic distress and food insecurity require adaptation strategies that are rooted in local knowledge and community-driven governance. The regression analysis confirms that climate risks, conflict and low economic resilience significantly undermine food security, making conventional, externally driven interventions ineffective. Locally led adaptation (LLA) offers a viable and scalable approach by ensuring community ownership of adaptation measures, strengthening local governance structures and addressing underlying socioeconomic vulnerabilities. Given the high debt burden limiting Somalia's fiscal capacity to invest in climate resilience, LLA provides a cost-effective, sustainable pathway to build adaptive capacity while advancing peace and social cohesion, where funds and decision making are devolved directly to community-level institutions.

The Somalia government must create an **enabling policy framework for LLA**, ensuring that resource allocation is transparent and local institutions are strengthened. This aligns with the government's National Transformation Plan (NTP) 2025–2029, specifically pillar one on inclusive governance and peacebuilding, which targets strengthening local governance and community-led initiatives to foster resilience and peace, aiming to increase participatory projects by 30% by 2029.

This also involves integrating LLA into national adaptation plans and aligning these efforts with broader resilience strategies. Philanthropic organisations and international donors should prioritise long-term, flexible funding mechanisms to support community-driven initiatives, ensuring that financing reaches the most vulnerable populations. Climate finance, such as the Green Climate Fund (GCF) and newly launched Funds for Responding to Loss and Damage (FRLD) should allocate dedicated resources for capacity building and community-based adaptation programmes. Local communities and civil society organisations (CSOs) can lead the design and implementation of adaptation projects, drawing on traditional knowledge and fostering solutions that are inclusive and context specific.

LLA can strengthen **economic resilience** by diversifying livelihoods, promoting climate-smart agricultural practices and improving financial access for vulnerable households. Somalia's reliance on rainfed agriculture and external food imports makes its economy highly susceptible to climate shocks. The government should facilitate the development of financial tools such as microfinance schemes and support the establishment of cooperatives to empower households to invest in diversified livelihoods. Philanthropic organisations and international donors can fund projects focused on drought-resistant crops, solar powered irrigation and small-scale enterprises, which can provide alternative income sources and reduce food insecurity. Local cooperatives and informal savings groups can engage communities to enhance financial resilience against climate shocks.

Strengthening **social cohesion** through LLA is essential in Somalia, where conflict-driven displacement has fuelled tensions over land and water resources. The government must enable community-led agreements on resource sharing, such as pastureland governance and water management systems, while integrating customary governance systems into national frameworks. At the same time, philanthropic organisations and civil society actors should create platforms for dialogue and collaboration between displaced and host communities, fostering trust and cooperation.

Resilience building measures must address Somalia's high exposure to climate shocks by improving water management systems and promoting climate-adaptive agricultural techniques. The government should work with donors to integrate early warning systems into national and local frameworks, ensuring communities have access to timely and actionable climate data. Donors and multilateral institutions need to provide funding for community-led investments in water harvesting, soil conservation and reforestation efforts, reducing vulnerability to recurring droughts and floods.

Given Somalia's weak institutional capacity and governance challenges, LLA can enhance the **legitimacy of local institutions** by formalising land rights, supporting transparent resource allocation and strengthening local dispute resolution mechanisms. The government must implement gender-inclusive policies, ensuring that women, youth and marginalised groups have an active voice in adaptation planning. Philanthropic organisations and donors would need to fund such capacity building initiatives that empower these groups to participate effectively in decision making processes.

Figure 20 on page 32 underscores the direct relationship between climate risk and food insecurity in Somalia, which highlights the urgency of **targeted adaptation measures** to prevent a worsening humanitarian crisis. It will therefore be important to avoid the recurrence of climate-related vulnerabilities through a longer-term focus on sustainable land use planning and disaster risk reduction. The government should prioritise integrating community-led watershed management and disaster risk reduction initiatives into national strategies. Donors and international institutions must finance locally managed contingency funds to enable communities to respond proactively to climate shocks.

Table 1. Pathways for LLA to support climate resilience and adaptive peacebuilding

KEY PATHWAYS	EXAMPLES OF LLA INTERVENTIONS	CONTRIBUTION TO ADAPTIVE PEACEBUILDING
Addressing underlying vulnerabilities	Climate-resilient farming, solar-powered irrigation, small-scale enterprises and access to microfinance	Reduce economic dependency on climate-sensitive livelihoods, mitigating food insecurity and reducing conflict over scarce resources
Strengthening social cohesion	Community-led natural resource management projects, shared water access programmes and dialogue platforms to address community grievances	Promote trust, solidarity and collaboration between social groups, reducing potential conflict triggers
Promoting resilience and adaptive capacity	Introduction of drought-resistant crops, sustainable livestock management, construction of community water harvesting systems and rehabilitation of degraded farmland	Strengthen communities' ability to withstand environmental shocks and reduce reliance on harmful coping mechanisms, enhance food security and reduce dependence on humanitarian aid
Enhancing legitimacy and trust in local institutions	Transparent resource allocation, capacity building for local governance, formalisation of land rights, participatory climate planning and support for customary governance structures	Improve governance credibility and promote institutional trust among communities
Promoting inclusive decision making	Empowering women and marginalised groups in leadership roles, establishing youth committees and ensuring participation in community governance structures	Build equitable and gender-inclusive community structures, ensuring diverse representation and reducing marginalisation-related grievances
Preventing recurrence of climate shocks	Ecosystem restoration projects, integrated watershed management, construction of resilient infrastructure, disaster risk reduction measures and establishment of early warning systems for climate shocks	Reduce exposure to recurring risks and ensure long-term sustainability and resilience

Source: Adapted from Bharadwaj and Karthikeyan (2023)[99]

In Table 1 we have summarised these pathways to explain how LLA can support climate resilience and adaptive peacebuilding in Somalia. By embedding local leadership and decision making at the core of adaptation strategies, LLA can provide a pathway to strengthening food security, enhancing economic stability and building peace in Somalia.

Strengthening climate information systems and risk management tools for local-level decision making in Somalia

In Somalia, where climate risks are among the highest in the world and disaster intensity has increased sixfold since 1990, timely and context-specific climate data is critical for strengthening social protection programmes, resilience-building measures and anticipatory response mechanisms. However, Somalia faces significant challenges in climate data capabilities, limited access to hydro-meteorological services and weak institutional frameworks for climate information dissemination.[100] These gaps result in poorly functioning early warning systems, delayed disaster response and a reactive rather than proactive approach to managing climate risks.

International donors, philanthropic organisations and multilateral institutions must collaborate with local governments, CSOs and research institutions to **strengthen climate information and risk management systems**. Investments should focus on improving climate projections across different geographies and timescales, integrating risk assessments into local decision making and enhancing community participation in climate information systems. Given Somalia's high exposure to drought, early

identification of vulnerable populations through pre-registration and pre-targeting mechanisms will allow more efficient and equitable allocation of relief and resilience-building resources.

Strengthening early warning systems will require both top-down and bottom-up approaches to ensure data accuracy, inclusivity and local relevance. The top-down approach should focus on enhancing hydro-meteorological services, improving climate modelling capabilities and integrating multi-hazard early warning systems with national planning processes. This will enable the government to anticipate risks and allocate resources proactively. However, large-scale climate assessments often fail to capture community level vulnerabilities, localised risk drivers and socioeconomic factors influencing adaptive capacity. To bridge this gap, bottom-up approaches must be reinforced through participatory climate data collection processes that integrate traditional knowledge, community-led risk mapping and real-time monitoring of climate hazards. In Somalia, where social capital and informal governance structures play a significant role in resilience building, integrating community-driven data into broader climate information systems will lead to more targeted and context specific interventions. By strengthening local knowledge systems and ensuring that climate data is accessible and actionable at the grassroots level, interventions can be better aligned with the specific needs of different communities, particularly those in regions affected by displacement.

Building local-level technical capacity will be essential to ensure that climate information is not only collected but also effectively utilised. Local government officials, agriculture extension workers[xx] and community-based organisations can be trained and equipped with the necessary tools, skills and guidance to interpret and apply climate data effectively. This will require investments in user-friendly climate data platforms, mobile-based early warning dissemination tools and training programmes tailored to different stakeholders, including pastoralists, farmers and urban communities.

Strengthening Somalia's climate information and risk management systems will help build the foundation for improving food security, enhancing resilience to climate shocks, and ensuring more effective disaster response mechanisms. By embedding local knowledge and participatory governance into climate adaptation planning, these interventions will support long-term climate resilience while enhancing the capacity of Somalia's institutions to manage environmental risks.

Integrating anticipatory and shock-responsive mechanisms into social protection programmes to strengthen food security in Somalia

Anticipatory social protection provides an opportunity for Somalia to address food insecurity through proactive, climate-responsive interventions. These interventions will ensure timely, targeted and effective responses to climate shocks, preventing hunger, reducing economic distress and building long-term resilience. However, these interventions must address all four dimensions of food security: availability, accessibility, utilisation and stability.

Enhancing food availability

Climate change is disrupting agricultural production in Somalia, reducing crop yields, damaging fisheries and livestock productivity, and accelerating land degradation. As seen in the food availability index (see Figure 14), Somalia ranks significantly lower than other FCAS in ensuring a stable food supply. Some of the ways in which social protection programmes can integrate anticipatory risk responsiveness to enhance food availability are:

1. Develop early warning systems and risk mapping for food production: Somalia must prioritise the development of climate risk maps and early warning systems that assess drought, flood and extreme temperature risks across different agricultural zones. These systems must integrate seasonal forecasts, remote sensing data and community-based monitoring to anticipate food shortages and enable proactive intervention. Governments in Bangladesh[101] and Ethiopia[102] have successfully used early warning systems to trigger anticipatory food assistance, safeguarding household nutrition before climate shocks escalate into crises.

2. Integrate climate-risk-based triggers into food assistance programmes: anticipatory social protection can embed predefined climate risk triggers in cash transfers, food aid and public works programmes. For example, Ethiopia's Productive Safety Net Programme (PSNP) scales up assistance in response to early drought indicators.[103] Somalia can adopt a similar threshold-based system where, once pre-identified climate stressors (such as declining rainfall or rising temperatures) reach critical levels, food and cash transfers can be expanded before food crises intensify.

xx Extension workers support rural communities by creating awareness and providing technical assistance, training and resources to improve agricultural output.

3. Promote sustainable agricultural and livestock management through public works: Somalia's pastoral and smallholder farming communities remain highly vulnerable to climate shocks. Public works programmes linked to social protection could focus on climate-resilient agricultural investments, such as small-scale irrigation projects, drought-resistant crop cultivation, soil restoration and sustainable livestock management. Ethiopia's PSNP[104] has successfully increased food availability by supporting household food production through climate-adaptive farming techniques. Adopting a similar model in Somalia could reduce dependence on food imports and create more sustainable domestic food production systems.

4. Develop anticipatory insurance schemes for farmers and pastoralists: given Somalia's high disaster intensity and repeated drought cycles, introducing parametric weather-indexed insurance schemes[xxi] can protect farmers and livestock herders from climate shocks. Such a scheme could prevent livestock depletion and food shortages during climate-related crises.

5. Strengthen water and land management through social protection: anticipatory social protection should integrate environmental conservation activities that improve water retention, soil fertility and rangeland management. Programmes like India's Mahatma Gandhi National Rural Employment Guarantee Scheme use cash transfers to incentivise afforestation, water harvesting and sustainable land-use practices.[105] A similar approach in Somalia could enhance agricultural resilience, stabilising food production amid worsening climate risks.

Improving food accessibility

Somalia ranks among the lowest globally in food accessibility due to high poverty rates, limited infrastructure and conflict-driven displacement. The food accessibility index (see Figure 15) highlights severe economic and physical barriers to food access. Anticipatory social protection can address these challenges by ensuring vulnerable populations receive timely support to access food before crises unfold.

1. Strengthen pre-identification of vulnerable households: Somalia needs a transparent, climate-informed beneficiary registry that pre-targets vulnerable populations based on multidimensional risks. Programmes like Malawi's Social Cash Transfer Programme use community-based vulnerability assessments to prioritise high-risk households.[106] Establishing a universal digital registry that maps climate exposure, poverty and displacement trends will ensure that food assistance reaches those most at risk, particularly female-headed households, pastoralists and IDPs.

2. Ensure social protection benefits are portable for displaced populations: climate-related displacement in Somalia has surged, with disaster-related displacement affecting over 11% of the population in 2023. Anticipatory social protection must include portable benefits for migrants, displaced households and pastoralists, who frequently move in search of food and water. India's One Nation One Ration Card initiative allows food entitlements to be accessed nationwide, ensuring that migrants do not lose assistance.[107] Somalia can develop mobile-based food distribution and cash transfer systems to maintain food access regardless of displacement.

3. Introduce shock-responsive cash and food transfers: anticipatory approaches must enable rapid disbursement of emergency food assistance and cash transfers before food crises escalate. In Kenya, the Hunger Safety Net Programme automatically increases cash transfer values and coverage during climate shocks.[108] Somalia must develop similar flexible financing mechanisms to expand food assistance during droughts, ensuring that vulnerable communities maintain purchasing power before food prices soar.

4. Leverage digital payment systems for food assistance: digital platforms like mobile banking and e-vouchers can ensure rapid and corruption-free delivery of food and cash assistance. Cambodia's mobile payment system efficiently reaches poor households, reducing administrative delays.[109] Somalia can integrate mobile-based food subsidy programmes to facilitate timely access to nutrition assistance.

Enhancing food utilisation

Climate change undermines nutritional outcomes by affecting water quality, sanitation and healthcare services. Somalia's food utilisation index (see Figure 16) reveals severe deficiencies in health infrastructure and dietary diversity. Social protection programmes must enhance nutritional support, water access and healthcare services to improve food utilisation.

1. Integrate nutrition assistance into social protection: programmes like Brazil's Bolsa Família have improved child nutrition by linking cash transfers to dietary support.[110] Somalia should introduce conditional cash transfers that provide incentives for purchasing diverse and nutritious foods, ensuring that vulnerable groups, particularly children and pregnant women, receive adequate nutrition.

2. Expand climate-resilient school feeding programmes: school feeding programmes improve nutrition while stabilising food access. Ghana's School Feeding Programme provides climate-smart meals, integrating local, drought-resistant crops into food distribution.[111] Expanding Somalia's school

xxi This is a type of insurance that will pay out when a loss-causing event meets a certain predefined threshold or parameter.

feeding programmes can improve dietary quality while supporting local agricultural supply chains.

3. Invest in clean water and sanitation infrastructure: poor sanitation exacerbates malnutrition and disease burdens, reducing the effectiveness of food aid. Somalia must integrate water, sanitation and hygiene investments into anticipatory social protection. Malawi's climate-sensitive health programmes have successfully reduced disease burdens linked to food insecurity.[112]

Building long-term food sustainability

Food sustainability in Somalia is threatened by recurring climate shocks, economic fragility and conflict. The food sustainability index (see Figure 17) shows Somalia's high exposure to instability compared to other FCAS. Social protection must focus on reducing economic volatility and strengthening resilience mechanisms.

1. Diversify livelihoods and strengthen economic resilience: expanding livelihood diversification programmes, vocational training and small business financing can stabilise income sources for food security. Ethiopia's PSNP invests in micro-enterprises and infrastructure to reduce food instability.[113] Somalia could adopt similar anticipatory livelihood strategies to cushion communities from food crises.

2. Develop contingency funds for food assistance: disaster response financing must be pre-arranged to prevent delays. Uganda's Disaster Preparedness Fund allows rapid food assistance.[114] Somalia could establish climate contingency funds linked to anticipatory food security interventions.

By embedding shock-responsive and anticipatory mechanisms into Somalia's social protection system, government can transform its approach to food security from reactive crisis management to proactive resilience building. However, achieving this transformation will require substantial climate finance from the GCF and FRLD as well as support from philanthropic organisations and international donors.

Enhancing finance for resilience-building efforts through Debt Sustainability Support Services

Somalia's debt distress severely limits its capacity to allocate resources toward long-term development and resilience building efforts. On average, FCAS spend only 0.86% of GDP on social protection, compared to 1.34% in non-FCAS countries, underscoring the financial limitations that prevent adequate investment in resilience-building measures.[115] Somalia's debt-to-GDP ratio, which exceeded 88% as of 2020, further highlights the urgent need for debt relief mechanisms to free up fiscal space for critical investments.

Somalia's ability to invest in resilience is further limited by the global inequity in climate finance allocations. Despite contributing only 2.7% of global greenhouse gas emissions, the 14 countries identified by the International Rescue Committee as being at the "epicentre of crisis" — because they face climate vulnerability, extreme poverty and armed conflict — accounted for 44% of those affected by natural disasters over the past three years.[116] Yet, our analysis shows that the GCF allocated just US$2.1 billion to all FCAS between 2014 and 2024, compared to US$4.61 billion for LDCs and US$1.8 billion for SIDS. These funding disparities are particularly evident in Somalia, where adaptation finance remains far below the levels required to address the impacts of climate shocks on food security, infrastructure and livelihoods. This chronic underfunding highlights the climate injustice faced by Somalia and similar FCAS, further deepening their vulnerability.

Addressing the compounded vulnerabilities of climate risks, conflict and economic fragility in Somalia requires comprehensive and sustained financial support. Like other FCAS, Somalia faces severe fiscal constraints, driven by weak domestic resource mobilisation, competing priorities and unsustainable debt burdens. These challenges are further exacerbated by recurring climate shocks, which disrupt economic activity, reduce revenue and increase public spending on emergency responses.

The DSSS initiated by SIDS[xxii] offers a framework for tackling unsustainable debt burdens while enabling countries to invest in resilience building and climate adaptation. Expanding DSSS to include Somalia and other FCAS and LDCs would address the unique challenges faced by fragile economies. This supports pillar two of the Somalia government's NTP 2025–2029, which focuses on economic transformation and resilience building. This prioritises debt management to reduce the debt-to-GDP ratio below 50% by 2029, enabling investments in climate-resilient agriculture and infrastructure.

The DSSS emphasises a layered approach to debt sustainability, insurance protection and resilience investments, which is critical for addressing the multidimensional risks of fragility, conflict and climate vulnerability in Somalia.

xxii For more information about the DSSS, see: Bharadwaj, R (2024) Global Small Island Developing States (SIDS) Debt Sustainability Support Service: a new financial compact for resilient prosperity. IIED, London.

1. Apply debt sustainability efforts to create fiscal space: Somalia's high debt-to-GDP ratio and limited fiscal space make it impossible to invest in resilience building without debt relief. Expanding DSSS to Somalia would involve debt restructuring mechanisms that create fiscal space for climate-smart investments. For example, debt swaps could be used to fund investments in irrigation systems, disaster risk reduction infrastructure and early warning systems. Additionally, parametric insurance linked to DSSS could provide immediate payouts during climate disasters, reducing Somalia's reliance on costly post-crisis borrowing.

2. Scale up finance for resilience investments: expanding DSSS to Somalia could focus on increasing international climate finance allocations for adaptation and resilience. Through DSSS, Somalia could promote sustainability-linked bonds, such as green bonds and resilience bonds, to attract private sector investment for financing community-based adaptation initiatives, climate-resilient agriculture and sustainable infrastructure projects. However, to achieve this, enhanced support from the GCF, FRLD and other international climate finance mechanisms is critical. These investments would reduce the cost of future crises while enhancing food security and livelihood stability, enabling Somalia to address its unique vulnerabilities.

3. Provide capacity building for debt management and climate resilience: DSSS could provide capacity building support to improve Somalia's institutional capacity for debt management and climate risk governance. Strengthening Somalia's ability to negotiate favourable debt terms, improve fiscal transparency and manage climate funds would ensure that investments are sustainable and aligned with national priorities. International donors and multilateral agencies must contribute technical assistance to enhance Somalia's fiscal systems and prepare the country for scaling up climate adaptation financing.

4. Integrate regional support mechanisms for FCAS: like SIDS, Somalia and other FCAS could benefit from regional hubs under DSSS to provide tailored support. These hubs would facilitate knowledge sharing, risk pooling and technical assistance for FCAS, ensuring that their unique challenges are addressed through context-specific solutions.

The DSSS represents a transformative opportunity to address the interconnected challenges of debt, climate vulnerability and underfunded resilience in Somalia. By expanding this framework to FCAS, the international community can ensure that Somalia receives the tailored support it needs to break free from the cycles of fragility and vulnerability.

The DSSS would provide Somalia with the financial tools to address its unsustainable debt, unlock critical adaptation financing and build the institutional capacity needed for long-term resilience. By aligning debt relief with resilience investments and international climate finance from mechanisms such as the GCF and FRLD, the DSSS can enable Somalia to transition from reactive crisis management to proactive resilience building, ensuring a more stable and food-secure future.

6. Looking forward

Somalia stands at the crossroads of interlinked crises: climate change, debt distress and food insecurity. These challenges, compounded by fragility and conflict, have entrenched cycles of vulnerability that threaten its stability and development. As the analysis in this paper highlights, climate risks and economic fragility dramatically undermine food security, leaving millions in urgent need of sustainable solutions. Without transformative approaches, Somalia's vulnerabilities will deepen, perpetuating poverty, hunger and displacement.

To overcome these compounding crises, Somalia must embrace a multipronged strategy that integrates LLA, anticipatory social protection and debt sustainability frameworks. LLA provides a cost-effective and community-driven pathway to strengthen resilience, address resource conflicts and build trust in institutions. Scaling up anticipatory social protection systems can transform food security outcomes by delivering timely, targeted support and reducing reliance on reactive crisis management. At the same time, expanding the DSSS to include Somalia offers a crucial opportunity to address the fiscal constraints caused by unsustainable debt, unlocking resources for long-term resilience investments.

International collaboration will be critical in this process. Climate finance mechanisms such as the GCF and FRLD, along with philanthropic organisations and bilateral donors, must prioritise FCAS like Somalia. Equally, the Somalia government must demonstrate strong leadership by integrating climate adaptation, debt management and social protection policies into national development plans. Nongovernmental organisations, CSOs and private sector actors must also play a proactive role in designing and implementing solutions that reflect Somalia's unique socioeconomic and cultural context.

The lessons from Somalia's challenges are globally relevant. Many FCAS face similar pressures from climate change and economic vulnerability. The integrated approaches outlined in this paper offer scalable models for other countries grappling with these crises. By promoting collaboration, increasing investment and aligning policies with local needs, the global community can support Somalia and similar states in transitioning from fragility to resilience.

In conclusion, the urgency to act cannot be overstated. With the right investments, policies and partnerships, Somalia can not only manage its current crises but also lay the foundation for a more stable, food-secure and climate-resilient future. The strategies proposed in this paper offer a roadmap for breaking cycles of vulnerability and advancing sustainable development, not just for Somalia but for all countries striving to overcome the challenges of climate change, debt distress, food insecurity and fragility.

Annex 1. Regression analysis model

To explore the drivers of food security in Somalia, particularly the roles of climate change and economic factors, a regression analysis was conducted using the following model:

$y = \beta_o + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \varepsilon$

Where:

- y: Food security index (or its components: availability, accessibility, utilisation or stability)
- x_1: GDP per capita (proxy for economic resilience and financial strength of households)
- x_2: Climate change risk index (proxy for exposure to climate-related shocks, such as droughts and floods)
- x_3: Country category (binary variable: 1 if FCAS, 2 for other countries)
- β_o: Intercept
- β_1, β_2, β_3: Regression coefficients indicating the strength and direction of the relationships, and
- ε: Error term capturing unexplained variability.

Variables and justification

Dependent variable (y): The food security index reflects Somalia's performance across four key dimensions: availability, accessibility, utilisation and stability. Each dimension is essential to understanding the broader challenges of food security in the region.

Independent variables (x_1, x_2, x_3):

- x_1: GDP per capita serves as an indicator of economic resilience, representing the financial capacity to afford food and invest in agricultural inputs
- x_2: Climate change risk index captures the extent of exposure to climate-related risks, which directly impact food production, supply chains and household stability, and
- x_3: Country category accounts for Somalia's status as a FCAS, reflecting heightened vulnerability due to conflict, institutional fragility and compounded development deficits.

This regression model aims to analyse how economic factors, represented by GDP per capita, and environmental factors, represented by the climate change risk index, along with the country's fragility status, influence food security. The GDP per capita has been included in the model to increase the 'effect size', in other words the strength of the relationship between the independent and dependent variables. It serves as a proxy to represent the economic and financial strength of the countries, which is particularly relevant given the economic repercussions of debt crises.

The climate change risk index captures the vulnerability of food systems to climate variability and extreme weather events, which are increasingly relevant in the context of global warming and its impact on agriculture. The country category variable differentiates between FCAS and others, acknowledging that conflict and governance issues significantly affect food security dynamics.

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Somalia is one of the world's most fragile states, facing intersecting crises of intense climate change, conflict, debt distress and mounting food insecurity. This calls for an urgent integrated and multipronged response. Exploring the structural drivers of food insecurity, this paper assesses the linkages between these crises that underscore the unique challenges Somalia confronts. Building resilience and targeted and strategic investment will be key to breaking the cycle of vulnerability and securing a stable future. The paper provides comprehensive recommendations around locally led adaptation, social protection and building sustainable food systems, which offer a roadmap for Somalia and other fragile and conflict-affected states in the region.

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