

The Cost of War and Conflict to the Environment and Food Security



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Acronyms

CCP	Climate and Community Project
EHRC	Ethiopian Human Rights Commission
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GRFC	Global Report on Food Crises
HAZ	Height-for-Age Z Score
IMF	International Monetary Fund
IOM	International Organization for Migration
IPC	Integrated Food Security Phase Classification
KSOE	Kyiv School of Economics
OHCHR	Office of the U.N. High Commissioner for Human Rights
SCPR	Syrian Center for Policy Research
SDG10	Reduced Inequality
SDG13	Climate Action
SDG14	Life Below Water
SDG15	Life on Land
SDG16	Peace, Justice, and Strong Institutions
SDG2	Zero Hunger
SDG3	Good Health and Well Being
SDG4	Quality Education
SDG5	Gender Equality
SDG8	Decent Work and Economic Growth
SDGs	Sustainable Development Goals
TCDD	2,3,7,8 - Tetrachlorodibenzo-p-dioxin
UK	United Kingdom
U.N.	United Nations
UNDP	United Nations Development Programme
UNHCR	United Nations High Commissioner for Refugees
UNIAN	Ukrainian Independent Information Agency
U.S.	United States
USAID	United States Agency for International Development
WAZ	Weight-for-Age Z Score
WEF	World Economic Forum
WHO	World Health Organization
WWII	World War II

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Author's Note



Dr. Mohamed Irfaan Ali

President of the Co-operative Republic of Guyana

The consequences of armed conflicts are manifold, ranging from loss of life and displacement of populations to the destruction of infrastructure, including agricultural global land and machinery. This destruction disrupts food supply chains, leading to food shortages and price hikes, further aggravating food insecurity. Conflict also impairs the human environment.

This comprehensive study examines the effects of war and other forms of armed conflict. The study is divided primarily into four sections: the first examines the overall effects of armed conflict; the second analyses the effects of conflict on food security; the third extends this analysis to the environment; and the fourth provides case studies of the effects of conflict in Haiti, Vietnam, Iraq and Ukraine.

The study finds that global food insecurity is exacerbated by conflict, climate change, and economic shocks. It highlights the significant increase in acute food insecurity due to armed conflict, with millions facing difficulties in accessing nutritious food. The interplay

between armed conflict and hunger underscores the need for stability if the global community is to achieve the goal of zero hunger.

War and conflict threaten several United Nations Sustainable Development Goals (SDGs), including Zero Hunger (SDG2), Good Health and Well-Being (SDG3), and Peace, Justice, and Strong Institutions (SDG16).

Since 1800, it is estimated that 37 million persons have perished due to conflict. Conflict has also led to the forcible displacement of persons. The United Nations Refugee Agency (UNHCR) estimated that as of September 2023, a total of 114 million persons were displaced. In less than four months, 85 per cent of the population of Gaza had been displaced because of the conflict with Israel.

The economic cost of war is substantial, with ten affected countries alone incurring losses equivalent to 41% of their GDP in 2019. The effects of armed conflicts are further compounded by climate events like droughts and floods that devastate food supplies and inflict environmental costs.

- **Conflict and food security**

Armed conflicts exacerbate food insecurity globally. Approximately 80% of the 155 million stunted children worldwide and 60% of those undernourished reside in conflict-affected countries. A total of 117 million persons faced acute food insecurity due to armed conflict.

Conflict-induced shocks to food security disproportionately affect smallholder farmers, exacerbating existing challenges such as income uncertainty and weather shocks. Conflict creates a circular relationship with food insecurity, as the latter increases the likelihood of conflict outbreaks, perpetuating a cycle of instability and hunger.

Over the past decade, the rise in conflict events has undermined progress in improving food security and nutrition, with millions at risk of famine in conflict-affected regions. Conflict

not only hampers access to food but also disrupts production, trade, and market efficiency, negatively impacting economic growth and exacerbating food insecurity globally.

Violent conflicts invariably result in physical destruction, impacting vulnerable populations and worsening hunger. Agricultural sectors bear the brunt of such destruction, as bombings, landmines, and other weaponry contaminate farmland and infrastructure, forcing farmers to abandon their cultivation and leading to large-scale displacement, seen notably in conflict zones like the Democratic Republic of the Congo, Afghanistan, Nigeria, and Sudan. Displacement perpetuates environmental degradation and food insecurity in resettled areas, marked by deforestation, water scarcity, and unsustainable production practices.

- **Conflict and the environment**

Conflicts, such as those in Iraq, Afghanistan, and Pakistan, have profoundly harmed the environment through extensive military operations, resulting in significant greenhouse gas emissions and air pollution, which adversely affect civilian health.

The environmental toll of warfare extends globally, with the U.S. Department of Defense ranking as the world's largest institutional consumer of oil and a top greenhouse gas emitter. In 2019 alone, the U.S. military emitted 59 million tons of CO₂, with the war in Iraq generating over 141 million tons of CO₂ emissions in four years – the equivalent of CO₂ emission from 25 million cars in one year.

These findings underscore the significant contribution of global military activities to greenhouse gas emissions, highlighting the urgent need for environmental considerations in conflict resolution and military operations.

- **Case Studies**

These and other social effects of war and conflict are amplified through case studies of the effects of conflict – both internecine and interstate – in Haiti, Vietnam, Iraq and Ukraine. These case studies provide a vivid illustration of the human economic and social costs inflicted by conflict within States.

This study makes a compelling case as to why organs such as the United Nations Security Council should pay greater attention to the human, social and economic dimensions of conflict between and within States.



Mia Mottl

Prime Minister of Barbados

In 2015, the world came together under the umbrella of the United Nations to launch an ambitious plan that would universally end poverty, protect the planet and, in so doing, ensure that by 2030, all people who call this planet home could enjoy peace and prosperity.

Nine years later, we regrettably are further away from reaching the 17 Sustainable Development Goals (SDGs) than when we started. Today, despite all of our technological advancements, hundreds of millions of people across the globe are literally starving. The **2023 Global Report on Food Crises**¹ estimated that 257.8 million people in 58 countries were at a crisis point as it related to their food security. This was a staggering increase from 2018, where 112.9 million people in 53 countries were at a similar point.

¹ FSIN and Global Network against Food Crises. (2023). Global Report on Food Crises. Rome. Available at: [https://www.fsinplatform.org/sites/default/files/resources/files/GRFC 2023-hi-res.pdf](https://www.fsinplatform.org/sites/default/files/resources/files/GRFC%2023-hi-res.pdf).

The Climate Crisis, the COVID-19 Pandemic, and economic shocks have all converged and played a substantial role in exposing the most innocent and vulnerable to the very things the SDGs sought to address.

Yet, if those crises were already difficult enough to navigate, we are now faced with the reality that increasingly, nations around the world are seeking to resolve their issues through war. While the loss of human life from conflicts has been truly heartbreaking; they also have a disastrous impact on our environment. Once fertile fields are now occupied, and critical infrastructure is damaged, in some cases irreversibly so, by bombs and artillery.

The reality is that whether directly or indirectly, war and conflict have made our world more food insecure and further impacted our environment. If we are to save our world, our people and our future, we cannot waste a single moment; we must recognise the impact these actions are having and face up to the uncalculated and ignored consequences of war and conflict.

That is the aim of this report. It successfully analyses the core issues surrounding the cost of war and conflict to the environment and food security and seeks to bring awareness to the simple fact that the SDGs, in particular, SDGs Two (Zero Hunger), Three (Good Health and Well-Being) and 16 (Peace, Justice and Strong Institutions), can never be reached without stability.

There are no winners in war, only losers. As the world's powers fight, children starve. As missiles strike, the environment suffers. We cannot allow this to continue unchecked. At the very least, we face the prospect of not reaching our SDGs. At the very worst, we quite literally face death.



Tony Blair

Executive Chairman, Tony Blair Institute for Global Change

Around 700 million people face hunger in our world today and conflict is making the problem worse. The conflicts in Ukraine, in Gaza, especially resulting in the attacks on Red Sea shipping, are devastating for global food security. When we add to conflict the challenges of weather extremes and inflation, we have a situation that is intolerable and requires urgent action.

Of course, we need to resolve the conflicts. But we also need to drive change in the agriculture sector. Technology offers the opportunity to transform farming, with reduced use of water and higher yields.

So, we advocate emergency relief for the populations harmed by conflict, but we also urge a revolution in the way we produce food, distribute it and consume it.



Ivan Duque Marquez

Former President of Colombia 2018-2022

Armed conflicts and Wars around the world are key triggers of poverty, food insecurity, lack of investor confidence and may become the most severe danger to any form of human development indicator. The evidence shows that the intensity of violence derived from conflicts is making countries fall in an exclusion trap that generates a massive destruction of institutional capacities, the effective provision of services and rapidly eliminates the exercise of individual liberties.

The countries that are described in this report clearly demonstrate that intense armed conflicts also create massive migration crisis that vanish long term human capital investments thus creating a tremendous socioeconomic loss that turns into an exponential deterioration of countries GDP. The domino effect that armed conflicts create can also represent an expansion of disease due to the limited health service provision in distant geographical areas. It is crucial to understand that the cost of war in the last year in terms of economic loss can be one of the highest since the tragedy of WWII, primarily driven by the war in Ukraine.

Another devastating effect of wars has to do with the environment and the weakening of any form of climate action. Levels of emissions increase, biodiversity loss are exacerbated, crucial ecosystems are at risk and rivers, wildlife and primary forest suffer in a way that also has an unquantifiable price.

The cases of Haiti, Vietnam, Iraq and recently Ukraine that are evaluated in this report make us reflect on the efforts that the international community has to assume to prevent conflict but more substantially the actions that are needed for reconstruction and recovery once the war has come to an end. There is also a postwar state of crisis that can derive in the path to state failure that must be avoided but that is dependent on the capacity to create strong institutions.

I highly recommend to read and debate the thesis and findings that this report puts before us because we face as humanity the challenges of Climate Change, Cyber Transformations and also the raising dangers of conflicts that suddenly can become unexpected states of war.

Message



Nana Addo Dankwa Akufo-Addo
President of the Republic and Commander-in-Chief of the Ghana Armed Forces

As leaders of nations facing similar challenges and opportunities, it is imperative that we recognise the interconnectedness of our regions and the shared vulnerabilities we confront. The past four years have starkly illustrated how conflicts, disasters, and pandemics originating beyond our borders can disproportionately affect developing countries, especially, the Caribbean, and Africa. The repercussions of wars, global supply chain issues, and environmental degradation reverberate through our communities, impacting negative on livelihoods and our efforts to enhance the quality of life of our people.

Within such a short time, the COVID-19 pandemic and the war on Ukraine, and the disruptions caused to the global supply chains all combined to unleash one of the harshest global costs of living crisis ever. What they underscored was the vulnerability of developing nations to external crises. Despite their origins elsewhere, these events permeated our borders, disrupting economies, straining healthcare systems, and exacerbating existing inequalities. But these crises also proved to us our collective capacity to handle such situations. The onset of vaccine nationalism during the pandemic highlighted the importance of collective action. The African Union's initiative, supported

by institutions like Afrexim Bank, to procure vital vaccines for both Africa and the Caribbean exemplifies the power of collaboration in mitigating such crises.

Recognising the Caribbean as the sixth region of the African Union, underscores our shared goals and potential synergies. With Africa holding 65% of the world's remaining uncultivated arable land and Guyana, for instance, possessing vast stretches of arable land, water and climate, we can significantly contribute to global food security through agricultural harnessing and intra-regional trade. Strengthening food resilience to global shocks requires our regions to reduce reliance on imports, use modern methods to make our farmers produce more and earn more, and foster structural economic transformation by attracting greater investment in agribusiness value chain.

President Mohamed Irfaan Ali's leadership in Guyana exemplifies the proactive approach necessary to ensure regional stability, food security and prosperity. By prioritising agricultural self-sufficiency and diversification, Guyana sets an example for other developing nations. Building capacity in sectors crucial to our economies, such as agriculture, not only enhances food security but also creates opportunities for peace, sustainable growth and development.

As leaders, we must remain vigilant against emerging threats and conflicts that jeopardise the stability and prosperity of our regions. By investing in our capacity to mitigate crises and fostering closer collaboration, we can build a more resilient future for Africa, the Caribbean, and beyond. Let us heed the lessons of the past and embrace the opportunities for collective action in securing our shared prosperity.

1. Introduction

After decades of progress made by many countries to address hunger, there has been a notable increase in food insecurity since 2018, suggesting that more individuals across the globe are finding it difficult to access adequate and nutritious food to meet their daily needs. The growing scourge of hunger and food insecurity globally since 2018 has been attributed to wars (FSIN and Global Network against Food Crises, 2023)

According to the 2023 Global Report on Food Crises, acute food insecurity increased significantly in 2022 due to conflict, extreme weather, and economic shocks. Specifically, in 2022, 257.8 million people in 58 countries were in IPC/CH Phase 3 or above or equivalent, compared to 112.9 million in 53 countries in 2018 (**Table 1**). The increase suggests that the number of people facing food insecurity more than doubled between 2018 and 2022.

Table 1 Number of people in IPC/CH Phase 3 or above or equivalent by primary drivers, 2018-2022

	2018	2019	2020	2021	2022
Conflict/insecurity	73.9	77.1	99.1	139.1	117.1
Economic shocks	10.2	24	40.5	30.2	83.9
Weather extremes	28.8	33.8	15.7	23.5	56.8
Total	112.9	134.9	155.3	192.8	257.8

Source: FSIN and Global Network against Food Crises (2023)

The report further revealed that, in 2022, 117 million or more than 63 per cent of the total number of people in the IPC/CH Phase 3 or above or equivalent came from ten war-torn countries. Conflict and threats were cited as leading causes of food insecurity. It is also noteworthy that of the seven countries currently experiencing catastrophes (IPC Phase 5), six have been plagued by protracted conflicts.

Food insecurity, which refers to the lack of access to sufficient, safe and nutritious food, has become a key area of concern for policymakers across the world. This is due to the fact

that it is closely linked to several of the Sustainable Development Goals (SDGs) such as SDG1 (No Poverty), SDG2 (Zero Hunger), SDG3 (Good Health and Well-being), SDG4 (Quality Education), SDG5 (Gender Equality), SDG8 (Decent Work and Economic Growth), SDG10 (Reduced Inequality), SDG13 (Climate Action), SDG14 (Life Below Water), and SDG15 (Life on Land).

Failure to enhance food security will not only undermine the efforts of countries to achieve the SDGs by 2030 but also result in many more individuals and families facing difficulty accessing adequate, nutritious food to meet their daily dietary requirements. The perpetuation or worsening of food insecurity will also have severe implications for the physical and mental health of affected individuals, leading to long-term negative impacts on the communities and countries they belong to.

The following report intends to provide an in-depth evaluation of the impact that armed conflicts have on both the environment and food security. By analysing the interplay between these factors, this report aims to shed light on the complex and multifaceted nature of war and its far-reaching consequences. The report delves into various aspects of the issue, including the environmental and social implications of conflicts, as well as the challenges faced in ensuring that food security is maintained even in the midst of war. Through a comprehensive analysis of the available data and the extant literature, this report provides valuable insights into the complexities of this issue and offers recommendations for addressing the challenges faced by communities affected by conflict.

2. Consequences of Armed Conflicts

Armed conflicts have both immediate and long-term implications that can affect individuals, communities, and entire nations. Scholars have categorised these consequences into two types: direct and indirect (Furst et al., 2009). Direct consequences include physical harm, destruction of infrastructure and property, displacement of people, and loss of life (Furst et al., 2009). On the other hand, indirect consequences include

economic collapse, food insecurity, environmental harm, poverty, air and water pollution (ground and surface water), soil degradation, damage to the landscape, ecological change, deforestation, among others.

Armed conflicts can also exacerbate food insecurity in countries/territories where this problem already exists (Dago, 2021; Weldegiargis et al., 2023). Numerous studies provide a wealth of evidence on how armed conflicts contribute to food insecurity, affecting not only the current generation but the future ones. The contributing factors to food insecurity in conflict-affected countries/territories are diverse and include the displacement of people, the destruction of agricultural land and infrastructure, and the disruption of supply chains. These can lead to food shortages, increased prices, and limited access to food, making it difficult for individuals and communities to meet their basic nutritional needs.

2.1 Physical injuries, loss of life and displacement of people

Physical injury that causes disabilities is one of the direct consequences of war. It, therefore, means that the proliferation of wars will contribute to the growth in the global population that lives with disabilities, referred to as the world's largest minority in crisis-affected communities. According to the World Health Organization (WHO), approximately 1.3 billion people globally live with disabilities. These individuals die younger, are twice at risk of developing health problems (such as depression, asthma, stroke, etc), and are more prone to discrimination.

Based on available data, around 37 million people died since 1800 because of wars (Herre et al., 2023). It is noteworthy that over the last decade, deaths from war have escalated (**Figure 1**). In 2022, war/conflict claimed the lives of 238,000, with approximately 43.7 per cent from Africa and 34.5 per cent from Europe due to the deadly wars in Ethiopia and Ukraine. The death toll in 2022 made that year one of the deadliest year since 1994, when the genocide in Rwanda claimed the lives of 800,000 individuals (**Figure 1**).

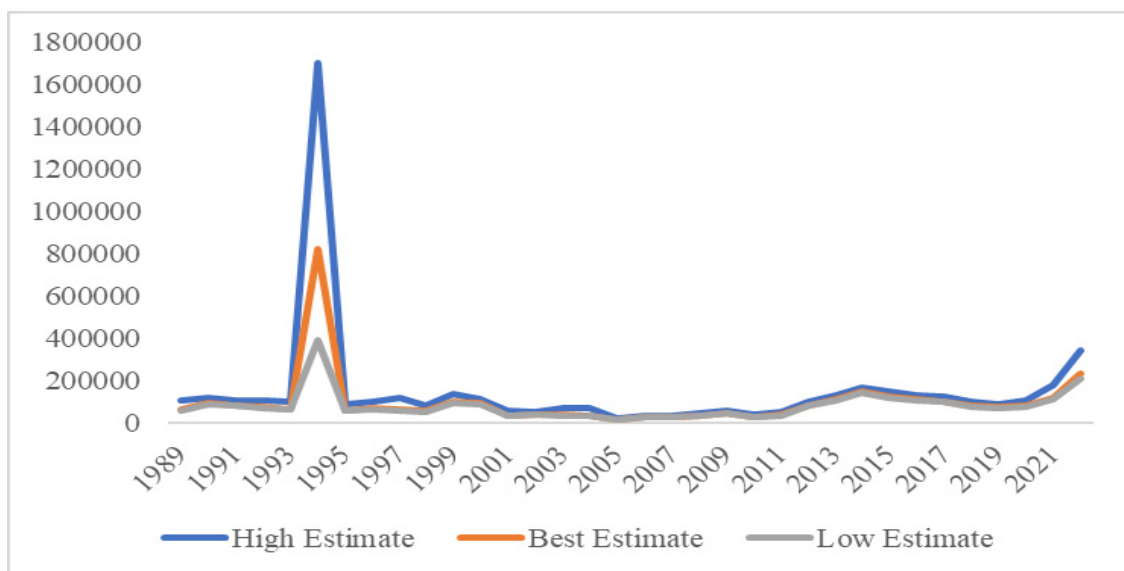


Figure 1 Number of war-related deaths, 1989-2022

Source: UCDP database

A cross-country study by Jawad et al. (2020) revealed that wars tend to increase civilian mortality across all age groups and in both genders. However, the largest relative increase in mortality was observed for children below five years old. Wars also contribute to higher infant mortality since health care facilities are usually targeted during these conflicts. Recently, it has been shown that civil wars were associated with an average increase of 5.2 per cent in infant mortality, while wars between countries caused infant mortality rate to increase by approximately 10.5 per cent on average.

The occurrence of war has also resulted in the displacement of countless individuals across the globe. From 2010 onwards, the number of individuals forced to flee their homes due to conflict has increased significantly. According to the Office of the United Nations High Commissioner for Refugees (UNHCR), the total number of individuals forcibly displaced worldwide as of 2022 is over 108 million (UNHCR, 2023), as represented in **Figure 2**. Most disconcerting is the fact that approximately 67 per cent of this group have been displaced for a minimum of five years, and there is no definitive indication regarding their eventual return to their homelands.

Equally alarming is the fact that children, women, and girls are disproportionately represented in the global refugee crisis. According to the UNHCR (2023), in 2022, children constituted 41 per cent of all forcibly displaced people, while women and children represent more than half of all refugees forcibly displaced.

In 2023, the number of displaced individuals increased to 114 million, the highest number ever recorded by the UNHCR since collecting data in 1975. This translates to one in every 74 people in the world being a victim of forced displacement. Among the leading causes include the Ukraine war, conflict in Sudan, the Democratic Republic of the Congo and Myanmar, drought, floods, and insecurity in Somalia, as well as a humanitarian crisis in Afghanistan.

As revealed by the United Nations High Commissioner for Refugees (UNHCR), the majority of those forcibly displaced from their homes due to conflict or persecution are hosted by their neighbouring countries, which are predominantly low and middle-income nations. These countries accommodate approximately 75 per cent of all refugees and other individuals who require international protection. However, the situation has created significant challenges for the host nations, as they have limited resources and infrastructure to manage the influx of displaced individuals.

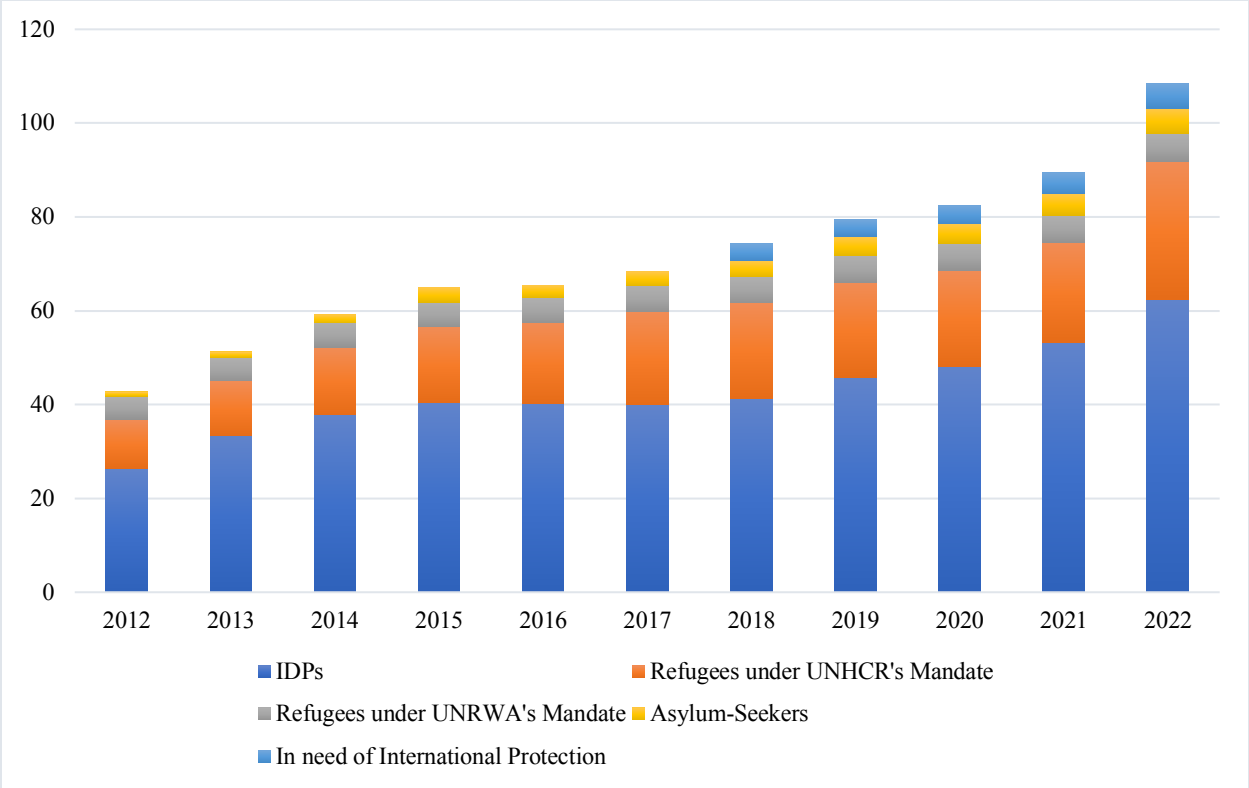


Figure 2 People forced to flee worldwide 2012-2022

Source: UNHCR Refugee Data Finder

It is often difficult for displaced citizens to find shelter and access basic necessities, even when they move within their own countries. For example, during the Israel-Gaza conflict, approximately 1.0 million people, or 85 percent of the country's population, were displaced within four months. Among them, 1.72 million, or 90.5 percent, were forced to seek refuge in overcrowded facilities. The remaining individuals sought shelter in schools, hospitals, community centres, and even open areas near the shelters.

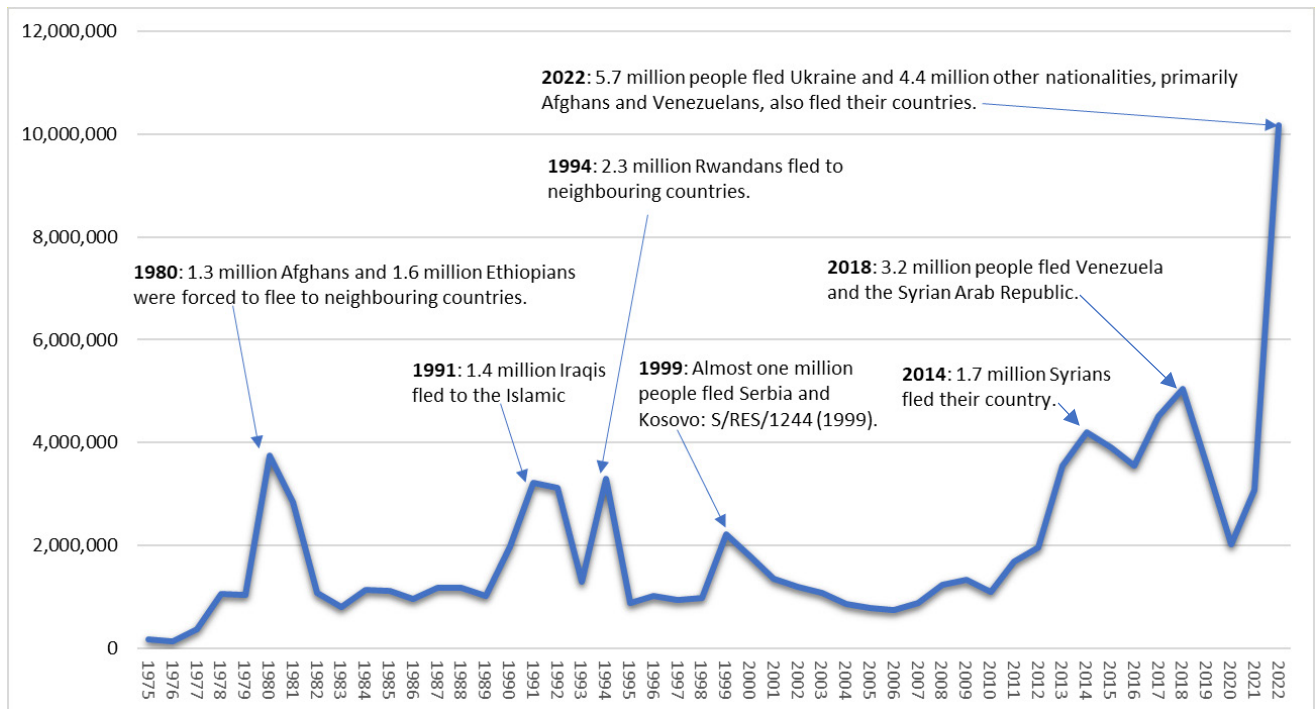


Figure 3 Refugees, asylum-seekers and others in need of international protection displaced each year, 1975-2022

Source: UNHCR Global Trends 2022

2.2 Destruction of Economic and Social Infrastructure

Another direct consequence of war is the widespread destruction of social and economic infrastructure. Available data on some of the deadliest wars of the 21st century, such as the Russia-Ukraine war, the Syrian conflict, and the recent Israel-Gaza war, demonstrate the extent of the financial burden of rebuilding such infrastructure. According to the Kyiv School of Economics, the total damage to Ukraine's infrastructure (residential buildings, educational institutions, roads, bridges, highways, and other infrastructure) due to the Russia-Ukraine conflict was \$151.2 billion as of September 2023. According to a report published by the Institute for Economics and Peace in 2021, since the start of the Syrian civil war, 17.5 per cent of the nation's housing has been destroyed. The estimated cost of damage to the country's infrastructure was US\$117.7 billion (IEP, 2021).

Meanwhile, the bloody conflict between Ethiopian government forces and rebels from the northern Tigray region destroyed a 300-megawatt hydroelectric project, telecommunication infrastructure, manufacturing and industrial facilities, schools, universities and health institutions and other facilities costing billions to replace, according to the Ethiopian Human Rights Commission (EHRC) and the Office of the U.N. High Commissioner for Human Rights (OHCHR).

While it is difficult to estimate the cost of damage to infrastructure caused by the Israel-Gaza war, preliminary estimates indicate that the cost of replacing the damaged infrastructure is no less than \$40 billion. According to a statement issued by the World Bank last December, approximately 60 per cent of information and telecommunication infrastructure, health and educational facilities in Gaza were destroyed or damaged by the Israel-Gaza war as of mid-November 2023. The World Bank estimated that 90 per cent of commerce-related infrastructure and almost all the primary, secondary and tertiary roads in Gaza were damaged or destroyed during the same period.

The destruction of infrastructure often leads to widespread humanitarian and development crises. The educational facilities destroyed by wars deprive millions of citizens, especially children, of access to education and, therefore, represent an attack on their future. Wars also inflict both short and long-term devastating impacts on the mental health and the well-being of citizens generally, particularly children. The medical facilities destroyed in war also deny citizens access to health services. Meanwhile, the attack on farmlands and agricultural facilities forces millions of citizens worldwide into hunger and poverty.

3. War Disrupts the Agriculture Sector

Regrettably, the agricultural sector is one of the most severely affected industries during times of conflict. This can have dire consequences for those who are reliant on agricultural activities for their livelihoods. During conflict, agricultural land is often subject to damage

or made unusable due to bombings, landmines, or other violent activities. Agricultural infrastructure, including irrigation systems, storage facilities, and processing plants, are frequently targeted and destroyed during wars, leading to further disruptions in the supply chain. Agricultural machinery, such as tractors, harvesters, and other equipment, is also frequently targeted or seized by armed groups, leaving farmers without the necessary tools to cultivate their land and harvest their crops. The negative consequences of war adversely affect the livelihoods of those who depend on agricultural activities, primarily farmers and rural communities. Additionally, these negative consequences reduce agricultural output.

Wars also affect the sector by disrupting the global food supply chain and can cause food shortages, escalation of food prices, and even famine. In some instances, food may be used as a weapon of war, with military forces blocking food supplies to certain regions or using foods as a bargaining chip in negotiations. Because of these consequences, war invariably contributes to food insecurity.

Using farm-level data in East Africa and Colombia, several studies have shown that agricultural production, including livestock and other crops, dropped substantially in regions affected by conflicts due to a decline in labour supply, difficulty accessing land and credit, and even destruction and theft of equipment and machinery (Nillesen, 2007; Verpoorten, 2009; Blattman and Miguel, 2010; Rockmore, 2015; and Munoz-Mora, 2016). Weezel (2018) employs country-level data for 106 countries in Africa, Asia, and Central and South America between 1961 and 2011 and found that violent armed conflicts were associated with reduced food supply levels and contributed towards food insecurity. The study revealed that conflict was responsible for reversing the progress made by countries in improving food security. Notably, the number of undernourished people in 2016 was 815 million, 185 million lower than a decade before and 200 million below the 1991-1992 estimate.

The Russia-Ukraine war also provides vivid illustrations of all these consequences. The Kyiv School of Economics (KSOE) reports that the Russia-Ukraine conflict caused damages to farmland, infrastructure and agricultural machinery to the tune of \$4.29 billion.

According to KSOE, half of the damage from the war was associated with direct physical damage to the fertile soil layer from artillery shellings and missile strikes, as well as occupation, military action and mining pollution of farmland that prevented farmers from accessing their harvest. Damages were also done to tractors, trucks, and farm equipment, estimated at \$926.1 million to repair or replace. Meanwhile, the cost of storage facilities and livestock destroyed by the war was estimated at \$272 million and \$136 million, respectively. The Russia-Ukraine conflict affected six critical global food supply chain areas (Jagtap et al., 2022). The disruption impacted the majority of economies across the globe, especially those in Europe and Africa.

Zhang et al. (2023) also examined the impact of the Russia-Ukraine conflict on access to food and fertilisers for all the trading partners of these countries. It has been shown that the conflict affected, to varying degrees, access to food supplies in 279 countries and territories, of which 24 countries were extremely dependent almost entirely on food imports from the two countries. Meanwhile, the conflict disrupted access to fertilisers in 136 countries and territories, especially in Estonia, Mongolia, Kazakhstan, Brazil, the United States, China, and India.

The disruption in the global food chain caused by the Russia-Ukraine conflict triggered a surge in international prices for food, fuel, and fertiliser, and this, in turn, contributed to price hikes and food scarcity in many low- and middle-income countries. Trade restrictions and export bans imposed by major exporters of agricultural products after the full-scale invasion of Ukraine by Russia made it even more difficult to obtain essential food supplies, resulting in further price hikes and scarcity of food in many countries worldwide.

3.1 Interplay Between War and Food Security

The interplay between food security and armed conflict is a complex and multifaceted issue that has been extensively researched and documented. As previously explained, conflict

and violence can disrupt food systems, leading to food shortages, increased prices, and reduced access to nutritious food. In 2022, Shemyakina conducted a comprehensive study on the effects of armed conflict on food security. Her research provides a succinct summary of the channels through which armed conflict influences food security. It also categorised the diverse ways into two broad classifications shown in Table 2.

The supply factors are those that can reduce the supply of agricultural output and threaten food security. They include the destruction of agricultural infrastructure, equipment, and land, as well as an increase in prices for agricultural inputs, among others. On the other hand, the demand factors are those that can make agricultural output or food more difficult and expensive to access, thereby threatening food security. These factors can include lower household income, high food inflation, and other similar issues.

Table 2 Consequences of armed conflict for food security

Supply factors	Demand factors
<ul style="list-style-type: none"> • Destruction of human and physical capital, infrastructure, supply chains, and networks • Land that becomes difficult and unsafe to cultivate • Restrictions on movement and challenges to safety that affect both the ability to trade and labour mobility • Production focus has changed to subsistence methods in agriculture, implying change in crop types and potentially a decline in the nutritional value of food • Destruction and theft of livestock • Increase in input prices for farmers that translates to higher prices for consumers • Increase in loss aversion 	<ul style="list-style-type: none"> • Lower employment opportunities due to travel restrictions and/or displacement • Ability to pay is affected as incomes decline, resulting in less and lower quality of food purchased • Restrictions on movement • Reduced travel to markets • Impact on one’s ability to shop for food at lower prices • Increased consumption of home-produced or locally-produced food that may be of lower nutritional quality

Source: Shemyakina (2022, p. 317) ²

² <https://www.annualreviews.org/doi/full/10.1146/annurev-resource-111920-021918>

While war engenders food insecurity, it is also true that food insecurity can lead to an escalation of conflict and violence as people struggle to meet their basic needs and compete for scarce resources. In this regard, there is a vicious feedback loop between war and food insecurity. Indeed, historical accounts indicate that rising food prices, which cause food insecurity deterioration, often lead to violent conflicts such as insurgencies, wars, and revolutions. For example, evidence of this is seen in contemporary Africa with the ‘Arab Spring’ uprising in response to international food price shocks.

The impact of food price shocks on conflict has been comprehensively documented by scholars over the years. Based on a survey of the literature, a common argument is that higher food prices (not food price volatility) tend to cause unrest (Jean-Francois and Ecker, 2014). This may be the case since higher food prices create economic constraints and sentiments of deprivation, leading to conflict. Bagozzi (2016), for instance, found evidence that armed conflict in Africa between 1997 and 2009 was due to concerns about food insecurity since violence (via competition for land) was more prevalent in areas with a larger share of cropland. De Winne and Peersman (2021) also found that an increase in food prices contributes to the incidence and intensity of conflict in food-producing regions in Africa. According to De Winne and Peersman, the positive relationship between conflict and increases in food inflation is consistent with the predation and deprivation theory, which suggests that higher food processes increase food deprivation and contribute to conflict. According to Bellemare (2015), the food crisis that commenced towards the end of 2010 witnessed an increase of over 40 per cent in food prices between January 2010 and February 2011. This price hike subsequently triggered famine in the Horn of Africa. Using data at the global level between 1990 and 2011, Bellemare (2015), argued that rising food inflation causes social unrest.

4. Development consequences of war

Apart from the direct consequences of war previously described, war creates many developmental challenges. Gates et al. (2012), for instance, found that war negatively affects education, undernourishment, life expectancy, GDP per capita, infant mortality rates, access to potable water, and gender parity as measured by the female-to-male life expectancy ratio. Specifically, Gates et al. (2012) demonstrated that a medium-sized conflict caused undernourishment to increase by 3.3 per cent, reduced life expectancy by approximately one-year, increased infant mortality by 10 per cent and denied 1.8 per cent of the population access to potable water. In their study, Kumar and Roy (2018) contended that SDG16 (Peace, Justice, and Strong Institutions) is the most important SDG that must be achieved if the others are to be realised (**Figure 4**). Jiang et al. (2023) argued that wars have profound impacts on all the Sustainable Development Goals (SDGs), not only for the countries in which they occur but also for adjacent and distant countries. Mhlanga and Ndhlovu (2023) demonstrated how the Russia-Ukraine war affected poverty and hunger in Africa by causing food and energy shortages, spiralling inflation, and escalation in commodity prices.



Figure 4 Goal 16 Peace and justice is central to all other SDGs.

Source: Kumar and Roy (2018, p. 1115)

War and malnutrition. As explained earlier, war causes food insecurity, which in turn contributes to malnutrition, which manifests in various forms, including wasting, stunting, being underweight, and deficiencies in vitamins and minerals. According to the FAO et al. (2017), one in every four children under the age of five, or 155 million children worldwide, was stunted in 2016. While there has been a slight decline in 2022 to 149 million children worldwide, as reported by The World Health Organization (WHO), about 60 per cent of reside in countries affected by conflict.

The harmful impact of the nutritional status of individuals, as measured by anthropometric outcomes such as height conditional on age and gender (HAZ scores) and weight

conditional on age and gender (WAZ score), have also been reported by a plethora of scholarly articles. Bundervoet, Verwimp, and Akresh (2009), for instance, demonstrated that children aged 0-5 born in conflict-affected regions have significantly lower HAZ (Height-for-Age Z) scores than those born in more peaceful regions in Burundi. The inverse relationship between the HAZ score and conflict was found in other countries (see, for instance, Arcand, Rodella, and Rieger 2015; Duque 2016; Minoiu and Shemyakina 2014; Akresh, Lucchetti, and Thirumurthy 2012; Akresh, Caruso, and Thirumurthy 2016; Tranchant, Justino, and Müller 2014; Guerrero-Serdan 2009; Nasir 2016). Violent conflict also seems to have affected the WAZ score in Angola (Arcand et al., 2015) and Iraq (Guerrero-Serdan (2009). Apart from these short-term impacts on the nutritional status of individuals, conflicts also affect long-term physical and cognitive development outcomes (de Walque 2006; Alderman, Hoddinott, and Kinsey 2006; Akbulut-Yuksel 2014; Domingues and Barre 2013).

War and economic growth. War is costly and results in a significant decline in Gross Domestic Product (GDP) and GDP per capita when the war occurs in a nation's own territory. According to recent data from the Institute for Economics and Peace, World Bank, and the IMF, almost US\$128.7 billion in goods and services were lost in 2019 among the top ten countries with the highest cost of violence (Fig. 5). On average, the economic cost of war among these countries was equivalent to 41 per cent of their Gross Domestic Product (GDP) in 2019.

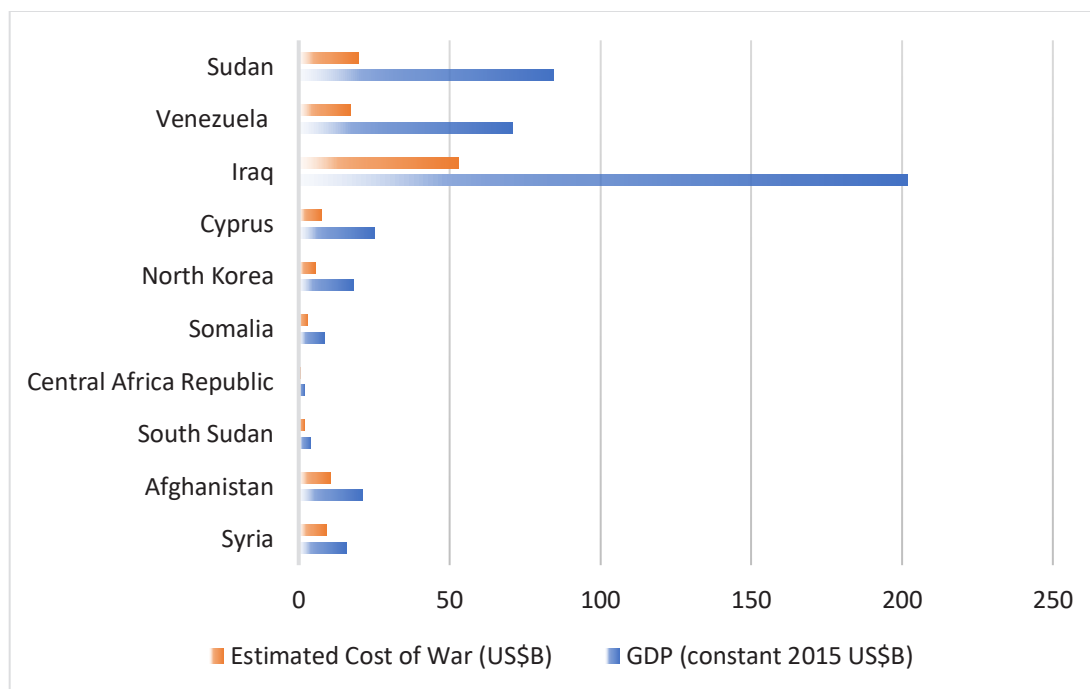


Figure 5 The ten countries with the highest economic cost of violence (2019)

Source: World Bank, IMF, the Institute for Economic and Peace

Recent conflicts have illustrated the debilitating effects of warfare on economic growth. In the first year of the Russia-Ukraine conflict, it is estimated that Ukraine's economy lost between 30 and 35 per cent of its GDP, the largest single decline in the country's history. In other parts of the world, the U.N. reported that in just one month after the outbreak of the Israel-Gaza conflict, the Palestinian's GDP fell by 4.2 per cent. Notably, the Palestinian economy was also projected to decline by 4 to 12 percent in 2023 and 4 to 9 percent during 2024.

There is a consensus among academics that wars affect GDP adversely (Bida and Iryna, 2022). Murdoch and Sandler (2004), who investigated the impact of civil wars on economic growth, found an inverse relationship between civil wars and GDP per capita. Polachek and Sevastianova (2010) revealed that civil war reduces annual economic growth by 0.01 to 0.13 percentage points, while high-intensity interstate conflict causes economic growth to decline by 0.18 to 2.77 percentage points. Using a unique database of almost 400 wars,

Chupilkin and Kóczán 2022, found that GDP per capita declined because of wars that occurred on territory. Specifically, they showed that wars on territory cause GDP per capita to decline by more than seven percentage points.

War and Poverty. Since war disrupts livelihoods, reduces the earnings of citizens and denies citizens access to basic necessities in conflict-affected countries, it is understandable that war is considered a potent fuel for exacerbating poverty. Evidence of the nexus between war and poverty is abundant. In his study, Stewart (2002) argued that war is a major cause of poverty and underdevelopment in poor countries since eight out of ten of the world's poorest countries suffered from large-scale violent conflict. Corral et al. (2020) reported that 43 countries in the world with the highest poverty rates are in fragile and conflict-affected situations (FCS). This study revealed that citizens in FCS are more likely to suffer multiple deprivations than those in non-FCS countries. It also found that FCS countries lag behind non-FCS countries in all aspects of human capital, health, education and skills. The International Rescue Committee (IRC), in its report titled “*The new geography of extreme poverty: how the World Bank can deliver for communities impacted by conflict*”, contended that conflict-affected countries are emerging as the epicentre of extreme poverty. According to the report, extreme poverty grew by 82 per cent in conflict affected Least Developed Countries (LDCs) between 1990 and 2022. These countries accounted for almost a quarter of the people living in extreme poverty worldwide. The protracted war in Yemen saw the poverty rate of the country increase from 47 per cent of the population in 2014 to 75 per cent by the end of 2019.

War and access to Health, Education, Clean Water and Sanitation.

The evidence of war on education is clear, with over 240 million children globally having had their access to education disrupted because of war and violent conflict. Many children's futures in war-torn countries are stolen either because they have been killed or

because of the direct implication of violence. Those children who are exposed to violence are disproportionately at higher risk of dropping out of school and under-performing. According to one of the latest empirical findings, children exposed to conflict have a higher probability of grade repetition and school dropout than those who face no conflict.

In conflict-driven areas, access to school is also limited since most are destroyed or occupied. According to the U.N., over 400 million children reside in conflict zones, suggesting that many children are finding it difficult to access learning. A case in point is Syria. Over the past decade, millions of children have lost access to education because of, among others, the destruction of schools, poor sanitation, lack of electricity and even little or no teachers. The decline in education could cost the future generation all the benefits of improved education, including access to health, income, equity and economic well-being. Not benefiting from these crucial elements of upbringing could likely boost the perpetual cycle of poverty.

Attacks on water and sanitation facilities have also put the lives of millions of children at risk. In nine war-torn countries in the Middle East, Africa, Asia and Europe, almost 48 million people, many of whom are children, are in need of safe water and sanitation services.

According to the UNICEF Director of Emergency Programmes Manuel Fontaine:

“Attacks on water and sanitation infrastructure are attacks on children. When the flow of water stops, diseases like cholera and diarrhoea can spread like wildfire, often with fatal consequences. Hospitals cannot function, and rates of malnutrition and wasting increase. Children and families are often forced out in search of

water, exposing them, particularly girls, to an increased risk of harm and violence.”³

Nonetheless, attacks on water and sanitation infrastructure continue unabated. For example, in Eastern Ukraine, since the start of 2021, there have been four attacks on water infrastructure, with a total of 380 attacks since 2017, leaving 3.2 million people in need of water and sanitation services. Similarly, in Yemen, between March 2015 and February 2021, 122 airstrikes were recorded on the country’s water infrastructure, leaving around 15.4 million people in urgent need of safe water and sanitation services to help combat the cholera pandemic that affects thousands of children. The situation in the State of Palestine has been no different. Almost 95 attacks on 142 water and sanitation infrastructures have left more than 1.6 million people without access to basic services, endangering the lives of thousands, including children.

War and Inequality.

Some recent work has suggested the presence of a crucial link between war and inequality, with the latter exacerbating through internal conflicts.⁴¹ In order to fully comprehend the relationship between war and inequality, it is imperative to understand the detrimental social and economic repercussions of war. Scholarly research reveals that conflict has a negative impact on economic growth (Collier 1999, Gates et al. 2012), healthcare services (Urdal and Che 2013, Iqbal 2010), poverty and food security (Gates et al. 2012) and education (Gates et al. 2012, Lai and Thyne 2007). The findings demonstrate that the impact of war extends beyond the battlefield, causing a ripple effect that disrupts the economic growth of a country, compromises healthcare services, exacerbates poverty and

³ <https://www.unicef.org/press-releases/new-unicef-report-highlights-scale-and-impact-attacks-water-and-sanitation#:~:text=%E2%80%9CAttacks%20on%20water%20and%20sanitation,of%20malnutrition%20and%20wasting%20increase.>

hunger, and restricts access to education and health services. The most vulnerable populations, particularly women and youths, suffer relatively more than others.

In a recent study, and building on the above findings, Bircan, Brück and Vothknecht (2017) examine the nexus between armed conflict and vertical inequality (inequality between individuals). Based on the results, vertical inequality tends to grow in tandem with armed conflicts because of the disruption of economic activities that affect the poorest segment of society. At the macro level, these disruptions tend to affect physical and human capital, causing the prices of capital-intensive goods to increase, reducing wages in the process and causing demand for unskilled labour to fall. In the end, the induced conflict may also reduce social spending due to lower tax revenue (as unemployment soars coupled with lower consumption levels) and poor economic performance. Thus, the poorest households would likely suffer the most, causing inequality to increase even further.

It is important to note that addressing the issue of food insecurity in war-torn countries would require support from international humanitarian organisations, bilateral and multilateral corporations, and even international law. Some of the major internal challenges that may require pragmatic solutions include higher food prices, inflation, and even displacement of civilians. Driving changes to help boost food supply and ensure food security would require tailored support for the most vulnerable, such as safety nets and social protection. Boosting food production levels would also require investment in capital and technology and carved-out fiscal incentives. **Figure 6 provides a diagrammatic overview of the proposed sustainable food security system that may serve to address food insecurity problem.**



- Geopolitical Conflicts
- War
- Transnational Crime
- Illegal Trade of Arms
- Gang-Related Violence

- International Humanitarian Organizations
- Bilateral and Multilateral Corporation
- International Law

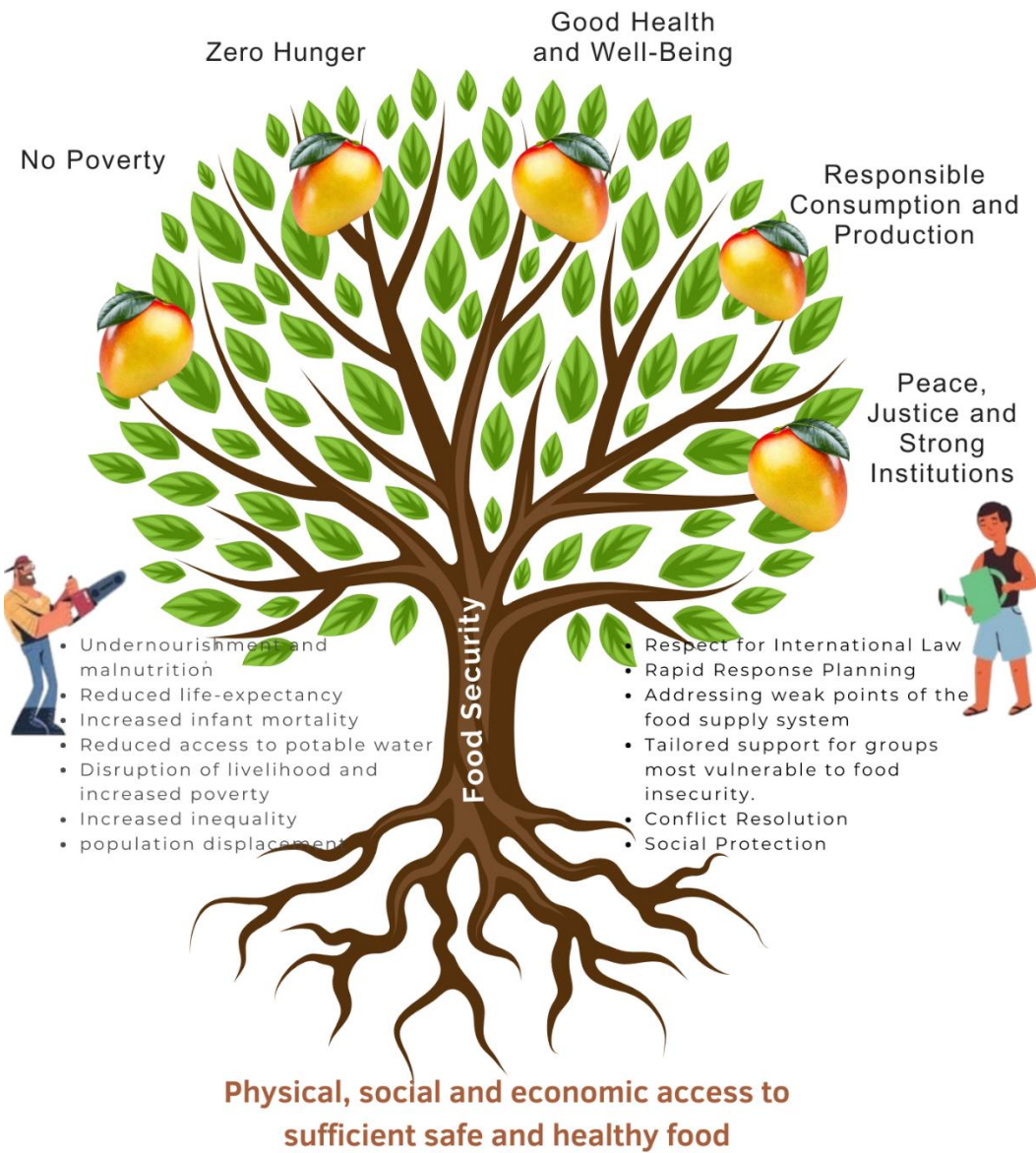


Figure 6 The Tree Analogy: The Effect of War and Violent Conflict on Food Security

5. The Effect of Conflict and War on the Environment

War affects the environment in various ways. Firstly, military activities from war are known for producing significant amounts of greenhouse gases. According to a recent study, emissions from the first 60 days of the Israel-Gaza were greater than the annual carbon footprint of more than 20 countries that are extremely vulnerable to climate change. Meanwhile, a report published by the US-based Climate and Community Project (CCP) and the U.K. think-tank Commonwealth contended that militaries are the world's largest fossil fuel consumers, accounting for approximately 5.5 per cent of global emissions and ranking fourth in global greenhouse gas emissions.

Given the level of carbon emission from military activities, it is not surprising that the U.S. armed forces, which account for at least three-quarters of the international military presence globally, are one of the largest emitters of greenhouse gases. The emissions generated by the U.S. military are so significant that they eclipsed those from industrialised nations such as Portugal and Denmark. In 2017, the U.S. armed forces purchased approximately 269,230 barrels of oil daily. In 2019, the U.S. Air Force alone used US\$4.9 billion in fuel, while the U.S. military was responsible for emitting 59 million tons of CO². Similarly, the military of the United Kingdom accounts for 50 per cent of the country's total emissions (Belcher *et.al.*, 2019).

Other harmful environmental impacts associated with wars include air and water pollution (ground and surface water), soil degradation, damage to the landscape, ecological change, deforestation, etc. These environmental impacts are well documented in the extant literature. Watson Institute (2019), for instance, reported that the movements of the heavy military vehicles and ammunition/weapons used in the conflict in Iraq and Kuwait played a key role in air pollution. Jiang et al. (2023) revealed that frequent bombing during wars had led to wildfires, marine pollution, chemical leaks and pollutant emissions that contaminated soil, water and air. More recently, Hryhorczuk et al. (2024) examined the environmental impact of the Russia-Ukraine war and found that the conflict caused \$56.4

billion in environmental damage, causing widespread air, water and soil contamination, landscape destruction, deforestation, and pollution that adversely affected one-third of Ukraine's protected areas.



Figure 7 Ukrainian soldiers fire a cannon near Bakhmut, an eastern city where fierce battles against Russian forces have been taking place, in the Donetsk region, Ukraine, May 15, 2023 (A.P. Photo/Libkos, File)

In other parts of the world, as in the case of DRC, Afghanistan, Nigeria, and even Sudan, bombing and the use of land mines and chemical weapons have forced farmers to abandon their land altogether, provoking displacement on a large scale. This kind of conflict-induced displacement of populations can result in irreversible negative changes in land use patterns. Displaced people may resort to unsustainable practices such as illegal logging, poaching, or land clearance for agriculture, further weakening environmental degradation. In the Caribbean, particularly in the case of Haiti, where land resources are limited and vulnerable to degradation, such changes can have significant implications for future food security and ecosystem resilience.

Addressing the challenges of war and conflict on the environment would require a structured and dynamic approach and a collective effort from all major stakeholders, including international partners. Affected countries must strengthen their emergency response capacity while strictly adhering to international laws that protect the environment, as illustrated in the analogy below.



- Geopolitical Conflicts
- War
- Transnational Crime
- Illegal Trade of Arms
- Gang-Related Violence

- International Environmental Organizations
- Bilateral and Multilateral Corporation
- International Law



Figure 8 The Tree Analogy: The Effect of War and Violent Conflict on Environment

6. The Effect of Conflict and War on Food Insecurity and the Environment: Various Case Studies

6.1 Haiti



Haiti has been categorised as one of the nations grappling with food insecurity. In accordance with the 2023 Global Report on Food Crises, Haiti is among the nine nations that face the risk of starvation, and five nations, including Haiti, have more than 10 per cent of their population classified as being in IPC 4 (Emergency).

Haiti, one of the poorest countries in the Western Hemisphere, has been grappling with many problems for decades, such as political instability, social injustice, natural disasters, and economic downturns. These crises have hindered the country's development and weakened its ability to respond to future challenges. The country's lack of infrastructure, inadequate healthcare and education systems, and rampant corruption have made it difficult for Haiti to progress. As a result, the country finds itself in a precarious situation, where crises have become a recurrent theme, hindering its progress towards a stable and prosperous future.

In 2019, a fuel crisis sparked protests, violence and food shortages. The country was so unstable that even Aid organisations found it difficult to assist citizens due to the blockades. Together, these events negatively affected over half of the country's population, most of whom were living below the poverty line.

As of 2021, almost 4.4 million Haitians suffered from food insecurity, with another 1.4 million facing emergency levels of food insecurity. With other factors, such as climate change, food prices have risen rapidly by 30 per cent yearly due to inflation. Compared to the Latin America and Caribbean region, Haiti's consumer prices of major food products were 30 to 70 per cent higher. Based on a recent World Food Programme report, an average working Haitian spends around 35% of their monthly income on one meal, equivalent to someone living in New York having to pay US\$74 for lunch. In one of its latest surveys, Mercy Corps shows that nearly 98 per cent of families in Haiti are grappling with severe hunger, with women facing the brunt of the crisis.

These underlying factors have contributed to the increase in extreme poverty, creating a vicious cycle of dissatisfaction, deprivation, and desperation, leading to violence and conflict. Presently, gangs control much of Haiti's territory, given the absence of the state, leading to economic stagnation and poverty.

The country's prolonged humanitarian crisis continues to diminish its people's quality of life. The urban population is trapped by armed violence, families are displaced due to conflicts, marginalised communities outside the capital suffer from food insecurity, and repatriated migrants face numerous challenges. Haitians living in the capital face daily risks of kidnapping, injury, or death in street clashes between gangs, civilian self-defence brigades, and the police.



Figure 9 Anger mounted over fuel shortages that have deepened because of gang violence (Haiti, 2022)

Source: Ralph Tedy Erol/Reuters

Exacerbating the issue is the outbreak of cholera within the country, which is threatening the health of thousands of people, many of whom lack access to clean water, sanitation facilities, and primary healthcare. Additionally, over 150,000 women and girls have fled homes, living in makeshift shelters without essential services, leaving them vulnerable to sexual exploitation and abuse. Haiti's healthcare system is near collapse, with hospitals lacking capacity and supplies.

Compounding these hardships was the July 2021 assassination of President Jovenel Moïse, resulting in even more political turmoil and widespread violence across the country. U.N. agencies reported that as of September 2023, over 300 criminal groups controlled 80% of Port-au-Prince, Haiti, with many linked to political, economic, and policy elites.

The overall effect of the ongoing violence has been detrimental to the country's food security agenda and even the environment. According to an Integrated Food Security Phase Classification (IPC) analysis conducted in March 2023, approximately 4.9 million

Haitians, or nearly half the country's population, are experiencing high levels of food insecurity, resulting in high levels of acute malnutrition and excess mortality. Additionally, from January 2022 to July 2023, nearly 195,000 Haitians were internally displaced by violence, with many others leaving the country on dangerous journeys. This displacement has predisposed many Haitians to further violence and abuse, leading to a surge in poor sanitation and food insecurity. In rural areas, many Haitians turned to the forest for fuelwood and charcoal because of the lack of infrastructure, reliable energy supply, and high poverty levels. In Haiti, almost 70 per cent of the country's energy is met by burning wood. This has resulted in widespread deforestation, soil erosion, landslides, flooding, and loss of fertile agricultural land, resulting in food insecurity.

6.2 Vietnam



The Vietnam War occurred between 1955 and 1975. During this war, the U.S. military carried out extensive aerial bombing, dropping bombs almost three times the amount that was dropped during World War II, twice the number of bombs dropped in both World War II and the Korean War combined, and nearly 15 times more than those dropped during the Korean War.

During the war, the Vietnamese sought refuge in the rainforest to protect themselves from the U.S. soldiers. Not being able to survive and adapt in the rainforest, the U.S. soldiers became highly dependent on Agent Orange, a type of chemical they introduced to destroy crops and forest canopy. Over 73 million litres of chemicals were sprayed, destroying the rainforest, rice production, and other crops. Specifically, over 25,000 square kilometres of land was defoliated.



Figure 10 A U.S. UH-1D helicopter from the 336th Aviation Company sprays a defoliation agent on a dense jungle area in the Mekong delta, Vietnam, date unknown. REUTERS/Courtesy U.S. Department of Defense.

During the production of Agent Orange, a toxic byproduct was formed: dioxin TCDD. A 2019 article from the University of Illinois discussed how dioxin continues to affect the soil, water, fish, food supply, and Vietnamese health. The authors argued that dioxin TCDD can remain in the environment for decades or even centuries once discharged. Results obtained indicate that dioxin TCDD made its way into nearby streams, rivers, and lakes by clinging to sediment particles. Bottom-feeding fish and shrimps consumed these contaminated sediments and were eaten by larger fish that are part of the Vietnamese diet.

While fishing is illegal in most areas where dioxin TCDD is found, enforcement remains challenging. As a result, dioxin TCDD still enters the food supply of many Vietnamese.



Figure 11 By product of Agent Orange continues to pollute Vietnam's environment.

Source: Lauren Quinn (2019)

Several decades after the war, it's devastating effects are still lingering. For instance, more than 50 percent of the mangroves on the coast were destroyed. These plants played a critical role in absorbing carbon from the atmosphere and protecting the coastal regions. Other consequences include the loss of habitats for wildlife in Vietnamese forests, depletion of nutrients, and soil erosion due to excessive shelling. The war also led to a shortage of food estimated at 1 to 2 million tons per year, causing scarcity of essential foods and prolonged nutritional deficiencies.

6.3 Iraq (2003-2011)



The war that began with the United States' invasion of Iraq in 2003 had a devastating impact on the country's economy. The conflict destroyed vital infrastructure, including power plants, water treatment facilities, and transportation networks. Additionally, the war contributed to the displacement of millions of Iraqis, further destabilising the economy. The conflict's aftermath saw a sharp decline in oil production, a significant revenue source for Iraq. Consequently, the country's economy collapsed, leading to high unemployment rates, widespread poverty, social unrest, and deterioration in food security that adversely affected the nutritional status of its citizens, especially vulnerable segments of the population.

Koc et al. (2007) documented some of the adverse consequences. In their study, which examined the impact of the war and sanctions in Iraq from 1990 to 2006, the authors reported:

- the displacement of 1.5 million people internally, and 1.6 million fled the country.
- the death of 657,965 Iraqis, of which 601,027 persons died from gunfire.
- the deterioration in food security due mainly to unemployment, which hovered around 60 percent, and poverty.
- high inflation that made it difficult for citizens to access fresh fruits, vegetables, and meat.

- severe destruction of water supply, sewage, and electrical systems.
- food shortages that were exacerbated by shortages of water, electricity, and fuel, and
- the increase in undernourishment and acute malnutrition amongst Iraqi children under the age of 5.

The available data leaves no doubt that the US-Iraq war caused several waves of massive displacement. The number of internally displaced people (IDPs) skyrocketed from zero in 2003 to a staggering 2.67 million by 2008. By the end of the war in 2011, the number of IDPs had decreased to 1.332 million. As of 2022, the current number of IDPs stood at 1.2 million.

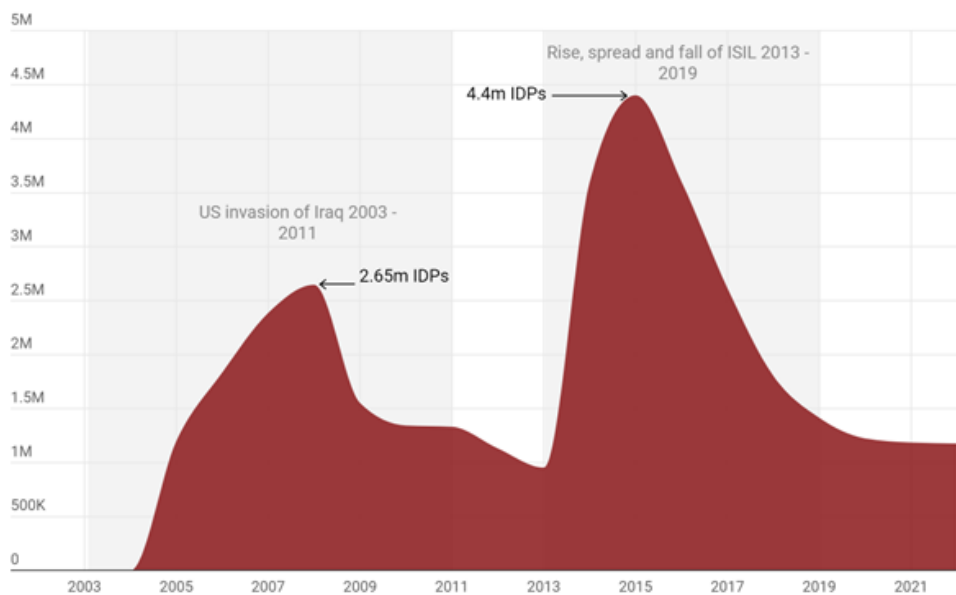


Figure 12 Number of internally displaced people, 2003-2022

Source : <https://www.aljazeera.com/news/longform/2023/4/5/iraq-war-20-years-on-visualising-the-impact-of-the-invasion>

Due to the US-Iraq war, millions of Iraqis were forced to flee their homes and seek refuge elsewhere. While some were internally displaced, a staggering number of people, amounting to 2.3 million, fled their homeland altogether. The exodus peaked in 2007, with

the majority of those who fled seeking sanctuary in neighbouring countries like Syria and Jordan.

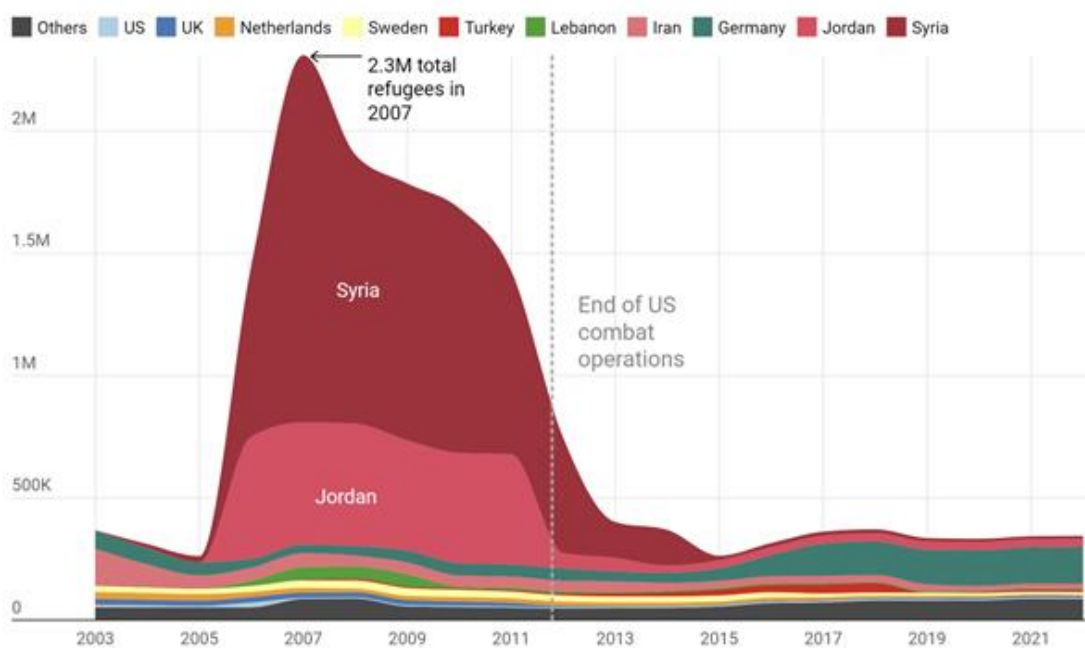


Figure 13 Number of Iraqis who fled, 2003-2022

Source : <https://www.aljazeera.com/news/longform/2023/4/5/iraq-war-20-years-on-visualising-the-impact-of-the-invasion>

During the war, the country reported high inflation rates, making it difficult for citizens to access food. Between 2005 and 2007, inflation reached double digits and peaked at 53 per cent in 2006. Tens of thousands of civilians were killed during the US-Iraq war, with the highest number of deaths recorded in 2006.

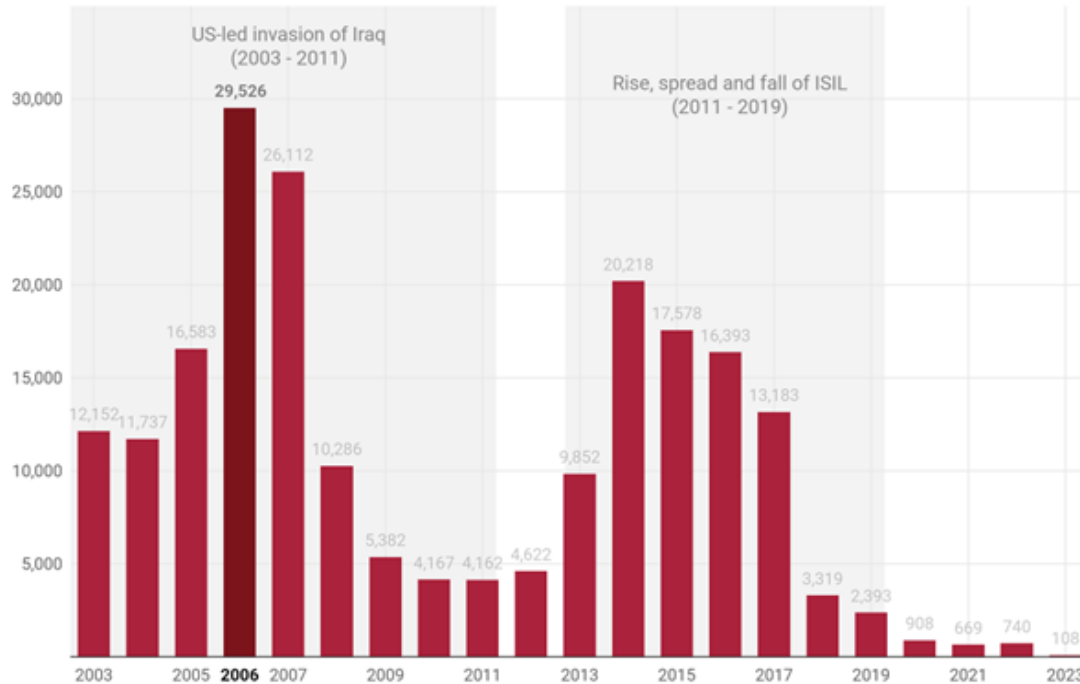


Figure 14 Iraqi civilian deaths

Source: <https://www.aljazeera.com/news/longform/2023/4/5/iraq-war-20-years-on-visualising-the-impact-of-the-invasion>

As per the findings of a survey conducted by Iraq’s Ministry of Education between June and August 2003, the country's education sector suffered immensely during the war. A staggering 80 per cent of the schools were reported to be severely or moderately damaged, signifying the devastation and loss inflicted upon the educational infrastructure. The country also suffered a significant loss of its heritage.

Even after the end of the US-Iraq war in 2011, there was still conflict within Iraq. This led to many people being forced to leave their homes, causing internal displacement, food insecurity, and poverty. As a result, the well-being of citizens was put at serious risk. In 2021, it was estimated that the poverty rate in Iraq was 24.8 percent. Furthermore, many Iraqis are suffering from food insecurity and require humanitarian aid.



Figure 15 A farmer examines soil compacted by drought in the Iraqi province of Nineveh

Source: The Arab Weekly

6.4 Ukraine



The war in Ukraine has produced devastating effects, not only on the country and its people but on the world at large. Starting in February 2022, the war broke out when the global economy was reeling from the impact of the COVID-19 pandemic. Many low- and middle-income countries were already struggling with high levels of inflation, growing debt, and dwindling fiscal space. In Ukraine, millions of people's food and nutrition security, including many of its neighbouring countries, were on the line.

The onset of the war and the subsequent closure of the Ukraine Black Sea ports, coupled with the introduction of protectionist measures, have led to a sharp decline in global staple goods supply, leading to higher prices. To put this into context, in 2021, the Russian Federation and Ukraine supplied the global market with almost 25 per cent of wheat and barley and 67 per cent of sunflower oil. By March 2022, the global food index had increased to its highest level since the FAO started to record.

Another direct effect of the war includes the surge in the prices of fertiliser and transportation, further increasing the cost of food production across the globe. In 2021, the Russian Federation was one of the top producers of nitrogen fertiliser, a byproduct of natural gas. While the U.S. sanctions did not target food or fertiliser, the import bans on Russian energy commodities, coupled with higher costs of transportation and expenses, led to higher fertiliser prices. Compounding the already abysmal scenario, Russia responded

by imposing export restrictions on food and fertilisers, causing global food prices to increase by almost 4 per cent. In response to higher prices, most countries introduced export restrictions on food and fertilisers to protect domestic suppliers and price increases, inadvertently disrupting global food supply and stoking prices even further. At the peak of the trend (ending May 2022), 17 per cent of global food exports were disrupted by the restrictions implemented by 23 countries. Many of the GRFC countries/territories, which were already under fiscal pressure and vulnerable to external shocks, were confronted with even higher food prices, inflation, and debt burdens due to the war in Ukraine.

Overall, the effect of the Russian-Ukraine war has also been detrimental to the environment. The results of a recent study indicate the presence of heavy metals (e.g., manganese, iron, cobalt, copper, cadmium) in shelled soils and a decline in vegetation greenness in areas where combats were more prevalent. While the findings are preliminary, it is important to note that shelling increases soil pollution and destroys vegetation.

According to a report by the European Parliament, since Russia carried out its full invasion of Ukraine in 2022, there have been many instances of air, water, land, and soil pollution. Damages were even inflicted on the ecosystem and, in some cases, affected neighbouring countries. In Ukraine, the war has affected the country's rich biodiversity. Explosions, deforestation, forest fires, and poisoning of the soil and water have all destroyed the wildlife and natural habitat of the country, including national parks. Estimates compiled have shown that the Russian invasion has inflicted more than US\$56.49 billion in environmental damages. This includes US\$29.1 billion in damages to air, US\$25.44 billion in damages from waste pollution, US\$1.62 in damage to water, and US\$0.32 billion in damages to the soil.



Figure 16 Consequences of an air strike in Kramatorsk. Photo: UNIAN/Anatolii Stepanov

Source: IOM UN Migration

7. Effect of war and conflict on prices and value replacement

Conflicts are often regarded as additional ‘shocks’ that affect the livelihood and well-being of many households, especially those with a high degree of income uncertainty. While the nature of these ‘shocks’ may vary across different types and intensities of armed conflicts and countries, in many cases, it will directly shape the outcome of food security. There are three levels at which the impact of conflict may affect food security: agricultural production, consumption, and nutrition.

Armed conflict affects markets by limiting producer and consumer access. Producers face challenges travelling to sell products and purchase inputs, while consumers may not have

access to essential foods or may have to pay higher prices for lower-quality products. In general, households closer to conflict areas have limited access to the market and, therefore, pay higher prices for goods. For instance, in Northern Uganda, two years after the war, consumption expenditure and food consumption of households fell due to high food prices. Similarly, in Mali, household consumption in locations close to conflict areas fell due to higher food prices.

The quality of institutions is an important factor that determines the level of impact of conflict on food security. In fragile states, that is, those that suffer from poor governance, corruption, and unwillingness of the government to pursue and implement broad base policies to improve good governance, the impact of conflict on food security tends to continue in perpetuity. Other indirect consequences include rising inflation, extreme poverty, deglobalisation, and environmental degradation.

At the macro level, many war-torn countries also continue to face mounting challenges in rebalancing fiscal priorities, especially in the face of higher social expenditure and needs. Supply chain disruptions also appear to be directly affected by war or armed violence, though there are other causal links, for example, a sudden surge in demand.

Globally, an even more significant issue is brewing but often overlooked is deglobalisation. The once-distant thought of deglobalisation is now a potential shock from conflict. According to the World Economic Forum (WEF), the disruption to global value chains caused by the COVID-19 pandemic, the Russian-Ukraine war, growing ideological differences, and the sustainable energy transition agenda have all forced governments and corporations to reconsider doing business with external partners and instead looking for trusted partners locally. Once materialised, with the ongoing global conflicts being a significant driver, deglobalisation will likely have lasting effects on the world economy. According to some of the latest estimates, the United States could see a decline in its GDP of about 2-3 per cent, with China by another 3-4 per cent. While the estimated implications depend on myriad assumptions, including the ease at which countries can substitute domestic goods for imported goods, it nonetheless holds that deglobalisation will lead to

higher markups by local monopoly suppliers, higher levels of inflation, and even less “creative destruction”.

The war between Hamas and Israel in the Middle East and the ongoing war between Russia and Ukraine have made matters worse. These conflicts have not only threatened the regions in which they are unfolding but have also been cited as some of the leading causes behind the weakening interconnectedness among the world’s largest economies. This has led to the introduction of protectionist policies by many countries in a bid to stabilise their economies, protect against foreign competition and even safeguard food security.

8. The Vicious Cycle of Food Insecurity and Conflict

An often-overlooked fact is that conflicts not only lead to hunger in the direct sense, where food scarcity and malnutrition are prevalent, but they also have a hidden consequence even in regions and conflict zones where hunger might not be as severe. This hidden consequence is the inability to access a healthy diet. Even in areas less directly affected by conflict, there are often disruptions to food systems, infrastructure, and markets. This can lead to challenges in accessing diverse nutritious foods necessary for a balanced and healthy diet. Factors such as increased food prices, limited availability of fresh produce, and disrupted supply chains contribute to this problem.

Additionally, conflicts can lead to the displacement of populations, loss of livelihoods, and economic instability, all of which contribute to difficulties in accessing healthy food options with long-term impacts on the health and well-being of individuals and communities, contributing to issues such as malnutrition, stunted growth, and increased susceptibility to numerous Non-Communicable Diseases. Furthermore, the separate but related environmental consequences of conflict, such as contamination of water sources or destruction of agricultural land, can deepen food insecurity, further contributing to humanitarian crises. Inadequate access to safe water and nutritious food can lead to

malnutrition, foodborne diseases, and other health problems, particularly affecting vulnerable populations such as children, women, and the elderly. These extended links further underscore the complex and far-reaching effects of conflicts on food security and public health.

The consequences of war have a loopback effect, resulting in the perpetuation of conflicts. For example, conflicts usually engender food insecurity, which in turn inspires future conflicts. In this regard, the consequences of war have a ripple effect on the future, as they sow the seeds of conflict that can lead to the perpetuation of violence and war. This cycle of conflict can be challenging to break and requires careful consideration and action to prevent its continuation.

9. Conclusion

The time has come for world leaders to take a stand against the proliferation of armed conflicts, which have proven irrefutably to have far-reaching and pervasive implications that extend beyond the battlefield, impacting economies, societies, and human lives in myriad ways. This report examined the nexus between war, food security, and environmental degradation. As highlighted, the deleterious effects of war are evident and manifest in various forms, including refugee crises, increased poverty, infrastructural losses, food insecurity, inequality, and environmental degradation.

The consequences of these conflicts are not only in the immediate aftermath but also in the long-term repercussions for affected communities. For instance, the displacement of individuals and families from their homes can lead to a protracted refugee crisis, while the destruction of infrastructure can lead to long-term economic consequences that may take years to recover from. The toll of war also manifests in the form of food insecurity and environmental degradation, which can have severe implications for public health and welfare.

Given these consequences, armed conflicts represent a considerable impediment to attaining the Sustainable Development Goals (SDGs), which aim to eradicate poverty, preserve the planet, and ensure prosperity for all. At this juncture, the proliferation of wars renders the SDGs very ambitious and requires global cooperation and commitment to achieve these global goals by 2030.

Hence, it is critical that global leaders take a resolute stand and vigorously advocate for peace and stability. They must collaborate to resolve conflicts, prevent the emergence of new ones, and provide humanitarian assistance to those adversely affected. Only through collective action can every country be enabled to realise the SDGs by 2030.

Additionally, global leaders should support the call for countries to implement sustainable land and resource management practices, promote conflict resolution and peacebuilding

initiatives, strengthen social safety nets to support affected populations, and invest in climate resilience and adaptation strategies to mitigate the effects of environmental changes.

In conclusion, the cessation of armed conflicts is paramount for achieving the SDGs and building a better future for all. We must all play a part in promoting peace and stability and supporting those affected by war.

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