

OVERLAPPING VULNERABILITIES

The impacts of
climate change on
humanitarian needs

Norwegian Red Cross © 2019

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TABLE OF CONTENTS

FOREWORD	5
Climate action today or unimaginable suffering tomorrow	
AT A GLANCE	8
Vulnerabilities	8
Humanitarian Needs	8
HUMANITARIAN CONSEQUENCES OF CLIMATE CHANGE	9
Introduction	9
Observed and projected climate change	12
Vulnerabilities	13
Weak institutions	13
Political and economic marginalization	14
Vulnerabilities caused by conflict	18
Climate change and effects on humanitarian needs	19
Livelihoods	19
Health	24
Migration and displacement	29
Political instability and violent conflict	33
Conclusion	37
REFERENCES	38

FOREWORD

Climate action today or unimaginable suffering tomorrow

When the climate changes, it affects nature, animals, and humans. With this report we present the broad humanitarian consequences of global warming, with the aim to inform humanitarian actors across different fields. It is the first of its kind and it highlights the short-term impacts of climate change that will be the most relevant within a 10-year timeframe. The findings correlate perfectly with what Red Cross and Red Crescent volunteers experience all over the world: We now live in a world where the impacts of manmade climate change are hitting harder, more often and intensely.

The evidence put together is as overwhelming as it is daunting. To name a few of the consequences presented in the following pages: Climate change has severe negative impact on crops, water quality and livelihoods and it can aggravate existing larger-scale conflicts. Climate change will harm those who are already subject to poverty, conflict, and violence the most. Overall, Africa and Asia are expected to be the most vulnerable regions in terms of humanitarian consequences of climate change.

More than 40 percent of the countries experiencing a food crisis in 2017 faced the double burden of climatic shocks and conflict. Conflicts harm the structures and systems that are necessary to facilitate adaptation to climate change. The report does not find evidence of climate change being an important *cause* of large-scale armed conflict but confirms that it may aggravate and prolong existing conflicts.

In 2019, the conflict in Syria entered its ninth year, but protracted conflicts are not a new phenomenon. The International Committee of the Red Cross (ICRC) has worked to protect and assist those affected by armed conflicts in Afghanistan for more than 30 years, and in South Sudan for almost 40 years. Contexts which are not unique in the way that access to the affected populations is challenging and security concerns make it difficult for development actors to be present and provide needed services. What is new is the knowledge documented in this report that climate change will make the direct and indirect humanitarian

Dried out water source (lake) in Mabalane district, Mozambique, September 2016.

Photo © Aurélie Marrier d'Unienville/IFRC



consequences of armed conflict even worse. And, furthermore: That climate change will negatively impact possibilities to end conflicts.

The changing climate and the scale of the consequences is a manmade problem and can be solved by man, but only if we are able and willing to act before it is too late. The longer we fail to act, the greater the challenge will become. The Intergovernmental Panel on Climate Change (IPCC) has stressed that it requires rapid and far-reaching transitions the next decade in land, energy, industry, buildings and cities to limit global warming to 1.5°C. Put differently, the IPCC has warned that the world has until 2030 to change its course to prevent climate collapse.

Knowledge is the first step to action. All over the world, the impact of climate change is becoming ever more evident. But so is the awareness among people, organisations, institutions and governments. Youth all over the world have joined forces and engaged in regular climate strikes, demanding that political leaders take actions that should have been taken years ago.

As the world's largest humanitarian movement, the Red Cross and Red Crescent Movement needs to respond too, both by adjusting the humanitarian assistance to match the needs, limiting our own climate footprint and by contributing to a change in global climate policy. The results in this report alone leave no doubt about the scale of commitment that is now required: States and civil society must increase their efforts in disaster risk reduction. Also, donors must ensure increased and predictable funding and recognise the need to provide both humanitarian and development assistance to people who struggle to survive in protracted conflicts. And finally, we must all take responsibility to eliminate the causes of climate change if we are to have any chance of meeting current and future humanitarian needs. If we fail, the consequences will be greater human suffering and larger humanitarian needs than we can ever hope to meet, no matter the responses.

This report gives a clear overview of the challenges that lie ahead. The need for action is imminent:

- Organisations and donors must prioritise preventive measures to save lives. The consequences of climate change will increase, and they pose a risk for events of immeasurable proportions that the world does not have the capacity to respond to.
- Climate change aggravates and prolongs the humanitarian consequences of armed conflict. The possibility for traditional development organisations to have long term access to the affected populations becomes limited and humanitarian organisations and donors must therefore ensure the provision of development aid in addition to emergency assistance.
- The causes of climate change must be eliminated. The Red Cross and Red Crescent Movement must, like other organisations and institutions, respond to the clear message from the IPCC and step up its efforts to both reduce its own climate footprint and influence policy- and decision makers around the world.



A handwritten signature in black ink that reads "Bernt G. Apeland". The signature is fluid and cursive.

Bernt G. Apeland
Norwegian Red Cross Secretary General

At a glance

Climate change alters weather patterns, disaster frequency, and water and food provision, and impacts on humanitarian needs in relation to health, migration, political (in)stability and livelihoods. The degree and extent of climate-related humanitarian needs depend on existing vulnerabilities of affected populations. Needs and vulnerabilities are interrelated – making particular groups and regions more vulnerable to the aggravating stressors of climate change.

Vulnerabilities

Climate change has serious consequences that, generally, affect poor people and societies with limited resources and mobility the most. Natural hazards turn into disasters more frequently where people are already vulnerable. Where people are marginalized, institutions are weak and/or conflict has stretched people’s coping capacities, the humanitarian consequences of climate change increase.



WEAK INSTITUTIONS

Weak governance and institutions limit individuals’ and societies’ coping capacities in the face of climate change. In the absence of strong institutions, the negative impacts of climate change are worse.



MARGINALIZATION

Systematic findings highlight the particular structural challenges that make women, indigenous people, and children more vulnerable to climate change than other parts of the population, even where institutions are generally strong.



CONFLICT

Conflicts (especially protracted conflicts) erode and challenge institution-building, and states’, groups’, and individuals’ ability to handle, adapt to and plan for climate change.

Humanitarian needs

When climate change affects people and areas already subjected to weak institutions, political and socio-economic marginalization, and conflict, it has profound humanitarian consequences – particularly in terms of its effect on livelihoods, health, and migration.



LIVELIHOODS

Global warming impacts on agriculture and fishing livelihoods, by causing shorter crop cycles, reduced yields, insect pest production, deteriorating coastal ecosystems, and extreme weather events that can damage life, property, and live-stock.



HEALTH

By increasing food insecurity, water stress, morbidity, mortality, and the likelihood of water- and vector borne diseases, while decreasing nutritional contents in food, climate change threatens to undermine the last fifty years of progress in public health.



MIGRATION & DISPLACEMENT

Climate change can drive rural-to-urban migration but can also hinder the mobility of the poorest households. Global warming reduces income for people whose livelihood depend on natural resources and thus constrains the opportunity to migrate.

HUMANITARIAN CONSEQUENCES OF CLIMATE CHANGE

CHRISTIE NICOSON and NINA VON UEXKULL*

Introduction

The Intergovernmental Panel on Climate Change (IPCC) states unequivocally that anthropogenic activity clearly impacts the climate. That is, human influence on the climate is real, and the resulting changes increasingly have widespread impacts on both people and nature. The climate has been steadily warming since the 1950s and the last three decades have successively been the hottest on record since 1850.¹ Human influence has already led to warmer surface and ocean temperatures, and human activity is likely to have contributed to observed changes in weather events such as storms, heat waves, droughts, floods, and wildfires.²

It is clear that these changes in the climate already impact humans across the globe. Various fields of study have examined how climate change impacts on humanitarian needs – pertaining to livelihoods, health, migration, and security. Climate change impacts do not operate in silos: impacts in one humanitarian area often have bearing on other areas. Understanding the full extent of climate impacts on society requires a broad perspective that illuminates the complex linkages between issues. To date, few studies address the multiple human security fields through an integrated lens. The IPCC's 2014 report highlights key climate challenges for a wide variety of human security concerns, and a study by Mora et al. have synthesized findings from diverse fields for a more holistic picture of

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climate impacts on humans.³ Adding to these, this report addresses the broad humanitarian consequences and specifically seeks to inform humanitarian actors across different fields. Here, we highlight findings from interdisciplinary research, draw connections between fields, and importantly, highlight vulnerabilities of greatest relevance for humanitarian concern.

HUMANITARIAN NEEDS IN THE CONTEXT OF CLIMATE RESEARCH

At its core, humanitarian action seeks to protect and respond to the needs of people "in times of peril and emergency," guided by humanitarian principles of humanity, impartiality, independence and neutrality.⁴ In the context of climate research, 'humanitarian needs' is linked with human security, "a condition that exists when the vital core of human lives is protected, and when people have the freedom and capacity to live with dignity."⁵

This report provides an overview of the observed and anticipated humanitarian consequences of climate change in four thematic and interrelated areas of particular relevance: livelihoods, health, migration, and conflict situations. The report focuses on the findings of leading authorities in each field of research, prioritizing studies that are cited more frequently, published in highly recognized outlets, are recently published, and/or are most relevant to the topic, such as case studies on a specific impact of climate change. While the effects of climate change will increase in the coming decades, we highlight the short-term impacts that will be most relevant within a 10-year timeframe.

Summarizing the scientific literature on these topics, key findings are:

- People with less access to power and resources – such as economically and politically marginalized women, indigenous people, and children – face greater risks of climate change.
- The presence of weak institutions and experience of armed conflict may intersect with challenges of marginalization to compound vulnerabilities to climate change.
- Climate change may aggravate existing larger-scale conflicts and affect lower-scale communal violence but is not an important cause of armed conflict outbreak.
- People dependent on agricultural and fishing livelihoods face higher risks from climate change, particularly smallholder farmers that rely on rainfall. Livelihoods may further suffer as work capacity decreases due to climate impacts such as higher temperatures.

- Climate change will have an overall negative impact on food and freshwater quality and availability. There will be higher morbidity and mortality rates as climate changes affect food and water quality and availability, and from complications resulting from of higher temperatures.
- Climate change may motivate domestic rural to urban migration but is less likely to lead to international migration.

Although these impacts are often highly context specific, some regional trends emerge. Humanitarian consequences of climate change are expected to be most severe in poorer countries, in large part due to weaker coping capacity and structural challenges. Overall, Africa and Asia are expected to be the most vulnerable regions in terms of humanitarian consequences of climate change. The impacts on smallholder farms are more pronounced in arid and semi-arid areas, and rising sea level particularly threatens farms in the low-lying coastal plains of Southeast Asia. Moreover, Africa and southern Asia emerge as highly vulnerable regions for food insecurity. Climate-motivated migration trends of rural to urban domestic movement are especially pronounced in south Asia, east Africa, and Central America.

KEY TERMS

CLIMATE CHANGE

Climate change is "a change in the mean and/or the variability of [the climate's] properties and ... persists for an extended period, typically decades or longer... due to natural internal processes or external forcings" and as "attributed directly or indirectly to human activity... in addition to natural climate variability."⁶

NATURAL HAZARD

A natural hazard is "a process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation."⁷

NATURAL DISASTER

A natural disaster is the result of human factors interacting with natural events, composed of a natural hazard, human exposure and vulnerability.⁸ Further, "a disaster is a sudden, calamitous event that seriously disrupts the functioning of a community or society and causes human, material, and economic or environmental losses that exceed the community's or society's ability to cope using its own resources."⁹

VULNERABILITY

Herein, vulnerability refers to “the propensity or predisposition to be adversely affected.... including sensitivity or susceptibility to harm and lack of capacity to cope and adapt”¹⁰ and further “the diminished capacity of an individual or group to anticipate, cope with, resist and recover from the impact of a natural or man-made hazard”.¹¹

COPING CAPACITY

Coping capacity refers to “the ability of people, institutions, organizations, and systems, using available skills, values, beliefs, resources, and opportunities, to address, manage, and overcome adverse conditions in the short to medium term.”¹²

INSTITUTIONS

Institutions refers to the “rules and norms held in common by social actors that guide, constrain, and shape human interaction. Institutions can be formal, such as laws and policies, or informal, such as norms and conventions.” Within this report, institutions are largely referred to as organizations and bodies, either formal or informal, which act and deliver services within these frameworks.¹³

Observed and projected climate change

Climate change includes both rapid events with immediate and short-term impacts and slow changes that will have growing and long-term impacts. According to the IPCC, which provides an authoritative summary of the scientific knowledge on observed and projected climate change, both global land and ocean surface temperatures have shown a gradual warming trend, with the period from 1983–2012 being the warmest in the last 800 years. The strongest warming is occurring in central and eastern North America, central and southern Europe, the Mediterranean region, western and central Asia, and southern Africa. This trend is projected to continue, with the greatest changes in temperature expected at high northern latitudes and the most extreme warming in the tropics. In addition to temperature warming, ocean acidification and sea level rise are occurring at the fastest rate recorded in the past two millennia. The Arctic and Antarctic are losing ice sheet mass and glaciers are shrinking worldwide. Snow cover in the northern hemisphere has and will continue to shrink, while permafrost warms and thaws.¹⁴ These changes may create feedback loops, where one event impacts another to further global warming.**

** Carbon dioxide and other greenhouse gases cause warming, which leads to further carbon release from the land and ocean, forming a positive feedback loop between the carbon cycle and climate change. See Friedlingstein, endnote 14.

Climate change also alters precipitation patterns and the occurrence of weather-related natural hazards. Heavy precipitation is expected to intensify globally. Losses from weather-related disasters have increased in recent decades, and projections show more frequent and intense heavy precipitation, droughts, storm surges, coastal and inland flooding, and extreme heat, with variation in other natural phenomena like El Niño and La Niña.¹⁵ Some of the largest increases in heavy precipitation are shown in western and eastern coasts of Canada, eastern North America, northern Europe, northern and eastern Asia.¹⁶ Within the next 10 to 30 years, decreased river flow is projected in northern South America, southern Europe, and southern Africa; while, to a lesser extent, there will be increased river flow in the boreal regions of North America, Eurasia, western Africa, and southern Asia.¹⁷ Drought risks are predicted to be largest in the Mediterranean region and southern Africa. To the extent that some climate hazards will overlap, small island states face particular risks.¹⁸

Vulnerabilities

The magnitude of climate changes' humanitarian impacts is largely determined by the context affected, including people's vulnerability to climate change. Of the many factors contributing to vulnerability, this report highlights three: the weakness of institutions, political and economic marginalization, and the presence of armed conflict. Alongside economic dependence on agriculture, highlighted below as a sector that is particularly exposed to adverse climate impacts, these three interrelated vulnerability factors are important for identifying where climate change has the most severe humanitarian consequences.

Weak institutions

Governmental and informal institutions in general play an important part in shaping climate vulnerability and coping capacity. "Failed" governments are often unable to meet basic standards of human security for citizens and struggle to provide support or response to crises or disasters, especially for more marginalized people. Corruption also hinders effective adaptation policies and crisis response strategies. Cases from Somalia, Ethiopia, Afghanistan, and Haiti demonstrate examples of governments that have struggled to deal with droughts, storms, or floods, with ensuing negative humanitarian consequences.¹⁹

Institutions factor into the distribution of both risks and benefits related to climate and natural hazards. They can incentivize adaptation responses and they may mediate the success of interventions. An analysis of the United Nations database on climate adaptation found that local institutions emerged as necessary facilitators of (especially rural) household and societal capacity for adaptation by either structuring the intervention or cooperating with external interventions.²⁰ In disaster response, strong informal institutions can be an important component of successful disaster risk reduction for areas with unclear territorial control, as may be the case in conflict-affected areas.²¹ Furthermore, strong institutions emerge as an important factor in contributing to or diminishing the risk of conflict, including through their capacity to impact response.²²



Airview of area left by Cyclone Idai,
Mozambique, March 15, 2019.

Photo © Denis Onyodi
/IFRC/DRK/Climate Centre.-

Political and economic marginalization

Although climate effects will impact all people, those with limited access to power and resources face greater vulnerabilities. Even where institutions are generally strong, populations that are actively discriminated or excluded are more vulnerable to climate change. For instance, state-led disaster risk reduction policies and resiliency programs have been shown to have varying impacts in the context of poverty and social marginalization due to power relations that favour some groups over others.²³ Evidence from Asia and Africa show that where groups are agriculturally dependent, drought increases the likelihood of sustained conflict for groups that are politically marginalized and residing in countries with low socio-economic development.²⁴ A similar effect emerges for precipitation. For example, erratic rainfall in Sub-Saharan Africa is found to impact communal conflict in societies where a group is economically or politically marginalized.²⁵ Political marginalization often goes hand in hand with economic marginalization, which again increases vulnerability. According to the World Bank, areas with increased socio-economic inequality overlap with areas of compound climate risk.²⁶ In the wake of disasters, those living in poverty tend to have reduced coping capacity and increased vulnerability.



In terms of these intersections of political and economic marginalization on the one hand, and climate change adaptation capacity and vulnerability on the other, there are systematic findings highlighting the particular structural challenges that women, indigenous people, and children face:

Gender is a particularly strong factor influencing individuals' access to power. Access to power influence individuals' structural vulnerabilities.²⁷ Although there has been some progress globally, women are still more likely to live in poverty, they hold fewer positions in decision-making bodies, and have less property, income, education, and access to information than their male counterparts.²⁸ These conditions make women less likely to have the means to protect themselves against the humanitarian consequences of climate change or to adapt to changing conditions. Findings related to physical security alone show that these factors make women more likely to die or to be exposed to violence after climate events.²⁹ Women can face particular vulnerability in

disasters due to marginalization in social structure, mobility, and access to finance and other resources.³⁰

Indigenous peoples are also facing particular challenges in maintaining access to food, mobility, and culture – including connection to their lands, identities, communities, and livelihoods. Indigenous people have been found to have less involvement in government decision-making processes, as well. While a wide body of literature highlights the potential benefits of traditional or indigenous knowledge for adaptation and resiliency, this is often not included in planning or decision-making, including in climate-related negotiations.³¹

Importantly, **youth and children** experience particular vulnerabilities to climate change. Youth and children living in high flood occurrence or drought severity zones will suffer immediate risks, while those exposed to slow onset climate events will see their development gains and livelihood options weakened. Extreme weather events can impact children negatively by destroying water, food systems, and infrastructure such as schools that are critical to their development and participation in society. The health impacts of climate alone, for example undernutrition and diarrheal diseases, pose a greater danger for children than for adults.³²

AFGHANISTAN

IN FOCUS:

Multiple vulnerabilities

Afghanistan's topography and climate make the country particularly prone to natural hazards, and climate change is increasing hardship for people across the country. The combination of decades of conflict, agricultural dependency, and severe socio-economic hardship often turn hazards into disasters.³³ Combined with infrequent earthquakes, climate-related disasters such as floods, flash floods, avalanches and heavy snowfalls on average affect 200,000 people every year, causing massive losses of lives, livelihoods and properties.³⁴ Following three years of drought, however, more than 250,000 Afghans were affected by natural disasters from mid-January to mid-April in 2019 alone.³⁵ While land degradation and desertification caused by drought lead to massive crop failures, it also limits the ground's ability to absorb heavy and erratic rainfall – another consequence of increasing temperatures. When heavy rain and snow fell on soil flash floods hit 21 out of 34 provinces, killing 141,³⁶ and affecting more than 240'000 Afghans.

“The floods should be the wake-up call that triggers a massive investment to help people who at the moment are out of sight in an underestimated, silent crisis with limited access by humanitarian agencies or media,” says Ariel Kestens, International Federation of Red Cross and Red Crescent Societies (IFRC) Head of Country Office for Afghanistan.

“They are out of reach because of conflict and out of scope because this is a large, slow-onset disaster”

ARIEL KESTENS, Head of IFRC
Country office in Afghanistan

Afghan Red Crescent Secretary General Dr. Nilab Mobarez states that “the floods are the latest disaster to bitterly test the resilience of people already stretched to breaking point by drought”.³⁷ Across many parts of the country, people lack safe water, proper sanitation and healthcare, which along with crop failures contribute to catastrophic levels of malnutrition. A longer-term resilience-oriented approach will address some of the underlying causes of people's vulnerability. As underlines Mobarez: “Millions of people need both immediate, life-saving humanitarian assistance and a way out of this protracted crisis.”



After years of drought, flash floods in March 2019 caused deaths and damage across many provinces. The picture is from Sar Asyaab village, Chimtaal district, Balkh province, Afghanistan, April 2019.

Photo © Meer Abdullah Rasikh/Afghan Red Crescent Society.

Vulnerabilities caused by conflict

While we will address the effects of climate change on conflict and conflict patterns below – the most significant and corroborated finding from research on this relationship concerns the reverse: that conflicts negatively impact climate vulnerability.

Armed conflict harms or destroys infrastructure, causes death, decreases financial stability, and has negative impacts on foreign investment or interventions.³⁸ Globally, conflicts tend to concur in warmer climate zones, where farming is a common and dominant livelihood. Conflicts also tend to go hand in hand with a larger dependence on the agricultural sector, which is particularly sensitive to climate shocks, as discussed below. More than 40 percent of the countries that experienced a food crisis in 2017 faced the double burden of climatic shocks and conflict.³⁹

Conflicts (especially protracted conflicts) erode and challenge institution-building, and states', groups', and individuals' ability to handle, adapt to and plan for climate change.⁴⁰ Importantly, armed conflict often leads to a conflict trap – a negative spiral where violence leads to both increased vulnerabilities and renewed violence as fundamental causes of conflict persist.⁴¹ This emphasizes the importance of responding to climate-related challenges in ongoing conflicts.

Importantly, different forms of vulnerabilities often intersect and produce compound vulnerabilities for particular populations in climate-affected areas. For example, Figure 1 illustrates countries in Africa and south Asia where several of vulnerability factors overlap. Countries in oranges have experienced armed conflict in the past five years and have particularly high reliance on the agricultural sector, with over 40 percent of the working population in agriculture; red indicates countries that meet these criteria and also have governmental institutions marginalizing at least a fifth of the population. In areas where these structural vulnerabilities overlap, countries can face compound risks for humanitarian challenges in the context of climate change.

FIGURE 1
Countries in Africa and South Asia with multiple vulnerabilities resulting from recent conflict experience and agricultural dependence (orange) and additional marginalisation of a large part of the population (red).⁴²



Climate change and effects on humanitarian needs

Climate change leads to altered weather patterns, disaster frequency, and water and food provision. These environmental changes have profound humanitarian consequences – in particular through their impact on livelihoods, health, migration, and political instability. Each of these areas are related to and will impact on the others, as will the presence and intersection of marginalization, weak institutions, and conflict history impact on the scale and depth of humanitarian needs brought about by climate change. This contextual relationship is illustrated in Figure 2 below.

Livelihoods

People whose livelihoods are tied to natural resources, particularly through agriculture or fishing, face great risks from climate change. Temperature and precipitation changes from climate change are expected to have an overall negative impact on agricultural yields and temperature and ocean changes will contribute to changed habitats and declined fishing, having a detrimental effect on these livelihood sectors.⁴³ Key findings in this section include:

- People with livelihoods dependent on agriculture and fisheries face disproportionately higher risks from climate impacts.⁴⁴
- Within the agricultural sector, smallholder farmers reliant on rainfall instead of irrigation are likely to face the most severe negative impacts.⁴⁵
- Climate impacts, such as increased temperatures, may lead to lowered work capacity, particularly affecting livelihoods related to agriculture.⁴⁶

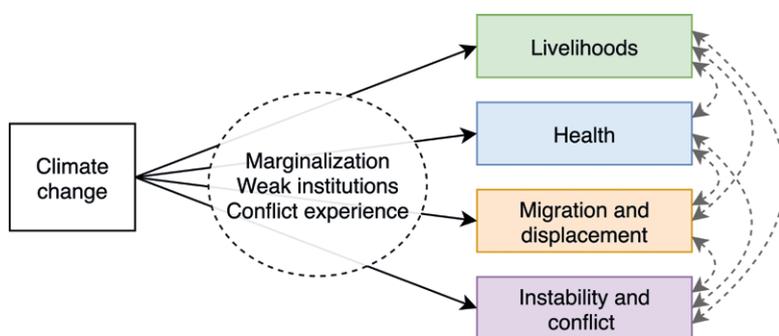


FIGURE 2
Climate change impacts on humanitarian needs related to livelihoods, health, displacement and conflict. Where people are marginalized, institutions are weak and/or conflict has stretched people's coping capacities, the humanitarian consequences of climate change increase.

SYRIA IN FOCUS:

How conflict negatively impacts climate vulnerability

In its ninth year, the Syrian crisis represents the 21st century deadliest conflict and remains one of the largest and most complex humanitarian crises in the world. Millions of Syrians are reliant on humanitarian relief to meet their basic needs, yet humanitarian access in the country remains a challenge. According to the United Nations Office for Coordination of Humanitarian Affairs (OCHA), 11.7 million people in Syria will need humanitarian assistance in 2019, of which five million are in acute need. Many Syrians have fled the country and the UN estimates that 6.2 million people are internally displaced, living in host communities and camps.⁴⁷

Conflict affects groups' and individuals' ability to handle, adapt to and plan for climate change. Syria is an example of how humanitarian needs are affected by the double burden of climatic shocks and conflict. The millions of people living in camps are particularly vulnerable to climate shocks such as heavy rain and flooding. The April 2019 flooding that followed unusually heavy rains in the Al Hassakeh region illustrates how humanitarian needs of internally displaced people are heavily impacted by climate incidents. According to the IFRC, the floods far exceed anything experienced in the region in over a decade and come at a time when heavy and intense rains are very unusual, impacting livelihoods and food security. Initial assessments estimated that 118,000 people was affected. Their homes were flooded, damaged or destroyed; their household items damaged or destroyed, and their food supplies, clothes and bedding ruined. The escalation of hostilities in northeast Syria during the first quarter of 2019 sparked a relocation of thousands of people to communities and camps in the flood affected areas of Al Hassakeh. The floods caused further distress on people that recently fled violence and who had very limited coping abilities for new disasters.⁴⁸

The flooding also impacted livelihoods through the large loss of livestock and flood-damaged agricultural land.⁴⁹ Conflicts tend to go hand in hand with a larger



SARC dispatched 5 aid trucks to Tal-Hamis area in Rural Qamishli in Al Hasakeh in April 2019.

Photo © Syrian Arab Red Crescent



“The flooding is unlike anything this region has seen in years and is occurring on top of what is already a humanitarian crisis [and] push people beyond their ability to cope.”

PAULA FITZGERALD,
Head of IFRC Country office in Syria

dependence on the agricultural sector, which is particularly sensitive to climatic shocks. According to the Food and Agriculture Organization of the United Nations (FAO), more than 40 percent of the countries that experienced a food crisis in 2017 faced the double burden of climatic shocks and conflict.⁵⁰ Before the conflict in Syria, the agricultural sector accounted for some 18 percent of the gross domestic product and provided employment and livelihood opportunities to roughly half of the Syrian population.⁵¹ In 2019, OCHA estimates that 6.5 million Syrians are food insecure. As a consequence of the protracted conflict, millions are reliant on food and livelihood assistance,⁵² which has undermined the country’s socio-economic base and agricultural production.⁵³ To mitigate the impact of the combined effects of conflict and climate shocks, humanitarian organisations work in Syria to provide livelihood opportunities and combat food insecurity.

Agriculture and fisheries

The agriculture sector will be affected by a number of climate impacts. As outlined above, precipitation and temperature changes will mean altered or limited access to water for irrigation. Global irrigation production is expected to decline, mainly in the United States, north Africa, and south Asia, though rain-fed crops are likely to be more negatively impacted than irrigated crops.⁵⁴ This will impact which crops can be grown and the extent of productivity with consequences for crop yields as well as livestock production. Further, global warming will impact agriculture through crop fire, heat stress on animals and human labour, and insect pest production.⁵⁵ For example, arid and semi-arid areas with rising temperatures will have shorter crop cycles and reduced yields.⁵⁶ Extreme weather events may cause loss or damage to property and livestock, impacting farmers' incomes. Pollutants that contribute to climate change will also lower crop yields.⁵⁷ In the long-term, sea level rise may threaten farmers as well. For instance, many smallholder farms in south and southeast Asia are located in low-lying coastal plains, where sea level rise can reduce arable land and increase salinity of freshwater and fields, reducing crop yields.⁵⁸ These findings stem from recent observations and indicate both short- and long-term climate consequences, though the impacts are generally expected to increase over time. Temperature changes in particular are expected to be an issue long-term, by 2050.

Fishing livelihoods are also expected to face challenges. Fishing productivity is expected to decline, as extreme weather events, temperature rise, ocean acidification, and other changes will likely result in an overall reduction of biodiversity, changed species distribution, increased variability of catches, and changed seasonality of production as a result of warming and acidification.⁵⁹ Findings from the Pacific show that as climate change alters the abundance and distribution of fish, people have to shift their livelihoods so as to catch different kinds of fish and implement careful fishery management to maintain productivity.⁶⁰ Further, extreme weather events can damage infrastructure, cause more dangerous expeditions at sea, change or destroy navigation routes, and flood communities, negatively impacting livelihoods.⁶¹

Work capacity

Beyond changing the productivity of crops and fisheries, climate change will affect livelihoods through impacts to human health and capacity for work. There is projected to be an overall decrease in work productivity due to climate change. For example, higher temperatures as well as extreme weather events will pose risks for the occupational health of outdoor workers. It is estimated that heat stress has already lowered labour capacity by 5.3 percent between 2000 and 2016 as result of decreased individual rural worker productivity worldwide.⁶²



Several poor rainy seasons in a row resulted in severe drought in Somalia in 2017. For pastoralists, livestock provide a lifeline without which they cannot get food or earn an income. The threat of another famine generated large-scale humanitarian operations.

Photo © Pedram Yazdi/ICRC

SOMALIA IN FOCUS: Climate change is not the only culprit

About 60 percent of Somalia's population are pastoralists, and their livelihoods revolve around rainfall and the two rainy seasons.⁶³ The last three decades of conflict, coupled with a parallel change in drought and rain patterns, has affected pastoral life in devastating ways.⁶⁴ Natural and climate change-related hazards such as droughts, cyclones and flooding increase the Somali population's vulnerability to chronic food insecurity, disease outbreaks, and malnutrition. Moreover, it results in inadequate access to safe drinking water, sanitation and basic health care services. Currently, one third of the population in Somalia is in need of humanitarian assistance,⁶⁵ and the situation represents one of the most complex and long-standing humanitarian crises in the world.

While the food insecurity crisis is more or less chronic, and the more frequent drought patterns in Somalia can be linked to climate change⁶⁶ – climate change alone is not the cause of high food insecurity levels. Rather, the history of Somalia illustrates how climate change, conflict and the lack of institutions combined add up to food insecurity and humanitarian crises. Importantly, famines can "be prevented, or the impact minimized, if institutions and mechanisms of good governance are in place."⁶⁷ While droughts are intensifying, they are not new to pastoralist life in Somalia. Their humanitarian consequences change, however, with the power and will of institutions to prevent and respond to them. While humanitarian aid is necessary to save lives, it does not prevent the next disaster. In order to help the millions of people that permanently live on the brink of starvation, the combination of driving forces that cause food insecurity must be addressed.⁶⁸

Health

The World Health Organization has warned that climate change threatens to undermine the last fifty years of progress in public health.⁶⁹ Through direct and indirect consequences of changing temperatures, water availability, and extreme weather events, climate change poses a health burden by impacting food security, disease outbreaks, and risks of mortality. Although there will be some benefits of climate change, such as reduction of disease incidence in areas experiencing colder weather, it is well established that the overall impacts will be negative.⁷⁰ The findings reflect observed occurrences and trends that are anticipated to continue in the immediate future. Key findings include:

- A decline in agricultural and fishery productivity will compound food insecurity through both decreased food availability and decreased nutritional content.⁷¹
- Higher temperatures as a result of climate change are projected to lead to higher morbidity and mortality.⁷²
- Increased precipitation and related water contamination will increase the likelihood of water-borne diseases. These factors combined with changing temperatures increase the likelihood of vector-borne diseases.⁷³

Food insecurity

There is expected to be an overall reduction in agriculture and fishing productivity and increase in food prices, though the severity of these changes within the next 10 to 30 years vary depending on climate scenarios.⁷⁴ Diminishing outcomes for crop yields and anticipated rising prices for key food crops will likely compound food insecurity.⁷⁵ Food security is essential to good health and includes people's physical, social, and economic access to sufficient, safe, and nutritious food. In 2017, an estimated 821 million people were undernourished, and 10 percent of the world population suffered severe food insecurity. Countries with high exposure to climate change were estimated to have more than twice as many undernourished people as other countries.⁷⁶ For example, arid and semi-arid areas with rising temperatures will have shorter crop cycles and reduced yields.⁷⁷ Projections into the future for the dry climate of the African Sahel region show increasing chronic malnutrition and an associated rise in stunting rates in children.⁷⁸ Declines in coral reef fish in the Pacific region, combined with demands of population growth, could harm food security in these communities.⁷⁹ Declines in agricultural and fishery productivity may mean a loss in staple foods and decreased quality and accessibility of food resources.⁸⁰ Already in the next 10 years, and with more pronounced effects in thirty years and beyond, cereal grains, sugar cane/beet, and wheat are expected to be most affected by climate change; less so vegetables, fruits, or nuts.⁸¹ Food insecurity is likely to be impacted not only through the amount of food available, but also through interaction with livelihood effects. For example, there is evidence that the climate impacts on livelihoods in the African Sahel will result in anaemia and underweight effects.⁸²

“Climate change is happening now. It affects our generation and those to come. It is our duty not only as humanitarians but as the human race to work together to reduce emissions and promote environmental awareness” says Tabitha Elizabeth Berg from Cook Island Red Cross, who participated at the Red Cross Pacific Youth Climate Change Forum in Kiribati, October 2017.

Photo © Hanna Butler/IFRC Pacific.



Beyond the impacts on productivity, climate change poses challenges for the nutritional content of food, as well. Extreme temperatures are shown to reduce the nutrient content of some crops. For example, the protein content of wheat is found to decrease in higher temperatures.⁸³ Drought is also linked to inadequate nutrition, micronutrient deficiencies, and mortality.⁸⁴ The increase in ocean temperature may lead to a decline in nutrient supply as reproduction declines for fish that cannot tolerate higher temperatures.⁸⁵ Malnutrition can also stem from other health complications, such as diarrheal disease – which can also be linked to climate change as discussed below.⁸⁶

MOZAMBIQUE IN FOCUS: Humanitarian efficiency

When Cyclone Idai made landfall in March 2019, the coordinated humanitarian response showed how efficient and strong the international humanitarian system can be when it works in a prepared and coordinated way. The reaction was quick, both in advance of and after the disaster. Prepositioning of relief items enabled the relief distribution to start as soon as possible. Field hospitals and epidemic alert systems helped limit the spread of cholera and ensured health care for the most vulnerable. None the less, over 600 deaths were recorded a month after the disaster.⁸⁷

Six weeks after Idai, Cyclone Kenneth struck the region again. Cyclone Kenneth is only the second recorded cyclone of its strength to make landfall over mainland Africa.⁸⁸ While it is difficult to prove a direct causal link from climate change to any single cyclone, the two cyclones illustrate what scholars have insisted on: climate change is affecting weather patterns in a way that results in more frequent and stronger extreme weather incidents.

Humanitarian aid is crucial to save lives, but despite a massive response, Idai also showed the limitations of humanitarian aid. The catastrophe persists long after landfall. For many farmers, cyclone Idai destroyed the crops only a few weeks before the harvest period began. Six weeks later Cyclone Kenneth devastated crops in the midst of the harvest season and in April 2019 a hard-hit population is preparing for food shortages. While tropical cyclones are a regular occurrence in Mozambique, it is also among the countries most vulnerable to extreme weather events. The majority of the population lives along river basins or the coastline.⁸⁹ About 50 percent lives below the poverty line.⁹⁰ In contexts



**A volunteer carries blankets for distribution
on Praia Nova Beach in the aftermath of
Cyclone Idai, Mozambique, March 2019.**

Photo © Denis Onyodi/IFRC/DRK/Climate Centre



such as these, natural hazards turn into disasters more frequently because poor infrastructure and economic marginalization leads to greater destruction. To prevent future disasters, long-term political, economic, and infrastructure development, is necessary to help the population becoming more resilient to natural hazards.

Disease and poor health

Aside from climate-linked food security, climate change will impact health through a number of other pathways. Observed and predicted temperature change is linked directly and indirectly to malnutrition, diarrhoea, and cardiorespiratory and infectious diseases including vector-borne diseases (those spread by organisms such as mosquitos or ticks). It is expected that heat waves will increase morbidity and mortality rates by worsening pre-existing conditions such as heart failure, heat stress (illness or death caused by exposure to heat), heatstroke, and effects of a greater burden on health services.⁹¹ Higher temperatures and water stress likely will also lead to increased dehydration, which can cause acute kidney injury.⁹²

Climate change will mean changes for disease vectors and is associated with decreased air quality. A rise in mosquito reproduction, parasite development, and bite frequencies make vector-borne diseases such as malaria, tick-borne illnesses, and dengue fever more widespread.⁹³ Burning of fossil fuels emits pollutants that contribute to climate change as well as air pollution, and global warming itself can lead to decreased air quality through for example wildfires, dust storms as a result of a drier climate, or changing distribution of airborne allergens.⁹⁴ This degraded air quality results in airborne and dust-related diseases, illness related to exposure of toxins, and a greater incidence of allergies.⁹⁵ Already, air pollution is the second leading cause of non-communicable diseases globally.⁹⁶

Extreme weather events also pose complications for human health through risk of injury and death, particularly if natural hazards escalate to disasters. Asia is most affected by weather-related disasters due in part to its population and area. Between 1990 and 2016, over 505,000 people in Asia died due to weather-related disasters such as droughts, floods, and storms.⁹⁷ Beyond mortality, extreme weather events pose probable loss or contamination of potable water that could lead to more diseases, food shortages, poor nutrition or malnutrition. Disease outbreaks may also result from storms. For example, Hurricane Mitch resulted in outbreaks of leptospirosis (an infectious disease that can lead to meningitis, kidney failure, or other severe complications) and increased malaria, dengue fever, and cholera in Nicaragua, Honduras, and Guatemala in 1998. Extreme weather events can cause infrastructure breakdowns that damage water supply, sanitation, and drainage.⁹⁸ They can also have a detrimental effect on mental health, contributing to depression and anxiety.⁹⁹ As previously noted, such extreme weather events as hurricanes are expected to become more intense and frequent with climate change, posing higher risk for health impacts.

Some groups are expected to face particular health burdens. Low-income countries, people living in poverty, elderly, children, traditional societies, subsistence farmers, coastal and urban populations, and people with pre-existing respiratory diseases, are highlighted as being in positions of particular vulnerability to the health impacts of climate change. For example, loss of healthy life is expected to be 500 times greater for people in poor countries in Africa than in Europe, due both to regional variation in climate change as well as underlying vulnerabilities pertaining to food stress, exposure to disease, or lowered coping capacity.¹⁰⁰

Water-borne diseases and water stress

Water systems impacted by climate change pose further challenges for human health. Climate change is projected to impact clean water supply, sanitation, and drainage, which can lead to diarrheal and other diseases both by biological and chemical contamination.¹⁰¹ As clean water, sanitation, and drainage decline, water- and vector-borne disease outbreaks become more probable, as explained above.¹⁰²

There are also health risks posed by water stress in connection with climate change. For example, in the Mediterranean, southern and central Africa, Europe, and the southern United States, annual rainfall is projected to decrease, while populations will increase. This combination of factors makes it likely that water stress will increase for more people. Increased precipitation in some regions poses health benefits, but only with good sanitation and drainage capacity and if there is the ability to store the additional runoff.¹⁰³

Migration and displacement

While there have been several attempts at quantifying environmental migration, the combination of factors that impact people's decision to migrate are often complex. An environmental event may not necessarily impact people affected in the same way because of the various factors that shape people's decision to move, including their financial means or the immediacy of the event's onset. It is thus difficult and contentious to make projections and attribute migration patterns to environmental change.

QUANTIFYING ENVIRONMENTAL DISPLACEMENT?

Environment-related mobility is categorized in three main types: "Migration infers a degree of choice in how and when to move. Displacement is forced as it means that persons have been pushed out of their homes either by isolated or repeated environmental events. Planned relocation is resettlement in a new area as staying in place is no longer viable."¹⁰⁴

Estimates for how many people may be displaced by environmental change range from 150 to 300 million people by 2050.¹⁰⁵ The Internal Displacement Monitoring Centre's 2015 Global Estimates reported that approximately 26.4 million people have been displaced by natural hazards each year since 2008, approximately one person per second.¹⁰⁶ These numbers are, however, based on vastly differing and imprecise definitions, and in some instances have been shown to have little evidence base at all.¹⁰⁷ Due to these inconsistencies, it is difficult to say how many people are expected to be displaced due to climate change.

PACIFIC ISLANDS IN FOCUS: Trapped populations



In 2015, tropical Cyclone Pam displaced about 50 percent of the population of Tuvalu.¹⁰⁸ In addition to extreme weathers, rising sea levels is another effect of climate change that will drastically impact small Pacific island state such as Tuvalu and Kiribati, and put pressure on the populations to migrate. Both atoll islands are situated just a few meters above water. In Kiribati, a recent survey found that 94 percent of households had been affected by natural hazards in the last ten years. Similarly, 81 percent reported that their household were affected by sea level rise in the same period.¹⁰⁹ More than 70 percent of the households in Kiribati and Tuvalu report that migration is a likely response if droughts, sea level rise or floods worsened. Many citizens will not, however, have the means to do so.

The financial cost of migration presents an overwhelming hurdle for many households. While islanders recognize that migration may be a necessary adaptation measure in response to the worsening effects of climate change, only 25 percent of households surveyed across Kiribati, Nauru, and Tuvalu believe they will have the financial means to migrate if need be. The situation on these small

Pacific Red Cross youths planting mangroves as part of climate change adaption activity during the 2017 Red Cross Pacific Youth Climate Change Forum in Kiribati, October 2017.

Photo © Hanna Butler/IFRC Pacific.



island states illustrates how global environmental and climate change can be a driver for migration, while at the same time they may also impact on livelihoods and income-generating activity in such a way that people no longer have the opportunity to generate the financial means they need to be able to migrate.¹¹⁰

The number of people who migrates internally in Kiribati is more than five times the number who migrates internationally, reflecting the difficulty and costs of cross-border migration for the climate-affected population.¹¹¹ Importantly, those who migrate internally tend to move to over-populated capital cities where people are already experiencing high unemployment and water insecurity. In both Kiribati and Tuvalu such internal migration puts added pressures on scarce resources in the capitals and increase the population's vulnerability both to sudden natural disasters and slower environmental effects of climate change. Moreover, parts of the populations of the small island states in the Pacific are at risk of becoming 'trapped,' as they cannot adapt to climate changes through migration.¹¹²

There are some key findings on the connection between climate change and migration, most importantly:

- Environmental change correlates with internal migration more than with international.¹¹³
- Slow-onset natural hazards, such as climate-induced sea level rise, are less likely to drive migration since people have the time to adapt.¹¹⁴
- Climate change may motivate more rural to urban migration, in part due to negative climate impacts on agricultural livelihoods.¹¹⁵
- Migration can be an important adaptive strategy to climate change. However, climate changes may also trap poor people, who are not only particularly vulnerable to the negative impacts of climate changes, but also have limited mobility and resources available to adapt.¹¹⁶

Impact of extreme weather events and slow-onset natural hazards

Extreme weather events, such as floods or storms, have been found to both facilitate and prevent migration. Findings suggest that rapid-onset events are linked to temporary and short-distance internal migration, rather than permanent or international migration.¹¹⁷ Furthermore, natural hazards and disasters can also constrain movement, resulting in a decrease in migration. For example, storms might leave little to no time for families to plan a move, especially for international migration.¹¹⁸

Gradual changes such as sustained drought or sea level rise also have diverse impacts on people's motivation to migrate. Research from Vietnam shows that slow-onset events are likely to have less of an immediate impact on individuals' well-being and are less likely to motivate migration.¹¹⁹ In part, this could be because people can adjust to slow-onset events over time. Adaptation to slow-onset climate changes and natural hazards include efforts such as diversifying local economies, investing in irrigation systems, or opting for drought-resilient crops.¹²⁰

Migration patterns

The decision to migrate either domestically or internationally in response to a climate-related event is largely dependent on the cost of movement and the nature of the climate shocks.¹²¹ Domestic movement may be preferable for the lower cost.¹²² Extended droughts, for example, have been linked with internal migration.¹²³ In south Asia, east Africa, and Central America, domestic movement is prominent in areas with better conditions for agriculture and where cities provide better livelihood opportunities.¹²⁴ Meanwhile, international migration is found to be more likely for inhabitants of low-lying cities, coastal areas vulnerable to sea level rise, and especially in the most agriculture-dependent countries.¹²⁵ The agricultural sector is one of the most affected by climate variations. At the same time, this sector is a main source of income in rural areas of many poor countries; negative climate impacts on livelihoods could therefore motivate people to move in search of alternative livelihoods.¹²⁶

Research shows the more common pattern of migration related to temperature shocks is internally from rural to urban areas.¹²⁷ Yet, natural disasters such as floods, droughts, and extreme heat also may motivate international migration from poor countries to OECD member states.¹²⁸

Climate change affects the permanence of stay, and also capacities to adapt. Long-term migration or permanent migration may occur if people fear repetition of the climate events that first motivated them to move or if their home was completely destroyed.¹²⁹ Migration can, thus, provide an important adaptation pathway for people facing challenges of climate change. However, not all people have the ability or possibility to adapt. For instance, sea level rise may damage or destroy property and infrastructure and reduce household income, which in turn diminishes people's ability to implement necessary adaptation measures. Negative impacts of climate on livelihoods may leave people with low incomes that constrain and limit their mobility.¹³⁰ Poorer households can lack the option to migrate, as they may be 'trapped' in circumstances that leave them both more vulnerable to climate change but also less able to move.¹³¹ For example, higher temperatures have been shown to increase urban and international migration in middle-income countries, but not in poorer countries.¹³²

Political instability and violent conflict

Whereas the impact of conflict on climate change vulnerability is well established, the impact of climate change on armed conflict is hotly debated. While systematic research has only been conducted in the past 10–15 years, some key findings on climate and violent conflict include:

- Climate change can aggravate existing larger-scale conflicts, and also affect the dynamics of lower-scale communal violence.¹³³
- Climate change is not, however, an important cause of the outbreak of armed conflicts as experienced to date.¹³⁴ Where climatic changes play a role, they are a contributing factor, rather than a main cause.
- Several factors that increase probability for conflict, or affect conflict levels, are also sensitive to climate changes – such as poverty, inequality, food (in)security, and to some degree migration.

Poverty is one relatively well-established factor that makes it more likely that individuals join rebel groups.¹³⁵ As climate negatively impacts income through decreased agricultural production or as a result of a disaster, it may lower opportunity costs of a rebellion and could increase grievances.¹³⁶ Whether poverty is a dominant motivation for participation in organized violence varies across individuals and contexts. Studies on participants in conflict often find multiple motivations present in the same context and the same individual. Motivations related to poverty are frequent, but it is not always and not necessarily the poorest that take up arms.¹³⁷

Another link between climate, conflict, and social disruptions is via food (in) security linked to spikes in food prices. Evidence shows that dry conditions increase food prices, which are in turn linked to more violence.¹³⁸ This is not to say that food insecurity is a main driver of violence. Indeed, overall social protest and rebellion seem to result more as reactions to policies, corruption, repression, or market failure, than as a result of food price changes.¹³⁹ Further, existing studies emphasize that state capacity may be a moderating factor, where a strong government would prevent violent uprisings.¹⁴⁰

Similarly, there is mixed evidence on the question of climate-related migration and conflict. Some findings suggest that disaster-induced migration could increase the risk of conflict due to upticks in unplanned settlements, land disputes, livelihood reduction and ethnic tension.¹⁴¹ It is also suggested that migration could lead to tensions between the host and newcomer communities, or to so-called identity conflicts.¹⁴² Though some studies suggest that migrants will bring conflict with them, research demonstrates that the risk of migrants importing large-scale sustained violence is low.¹⁴³ Research on another type of movement, pastoral mobility, suggests that when pastoralists' routes change due to climate events or fluctuations, they may enter communities with whom they do not share common conflict resolution mechanisms. This may, in turn, lead to tensions and clashes.¹⁴⁴

While there are several potential pathways from climate factors to conflict, research overall suggests that climate change is not an important driver for the onsets of armed conflict at present. While there is a lot of uncertainty about future developments, it is not expected that this will change in the near-term. Where other conditions are absent – such as poverty, inefficient institutions, or failed states – the correlation between climate and armed conflict is insignificant. However, climate variability still impacts conflict dynamics and human suffering in relation to conflict. For example, drought may sustain ongoing ethnic conflict if the affected community or society is mainly dependent on agriculture for livelihood.¹⁴⁵ This exemplifies that the degree to which climate changes impact instability or violent conflict depends on a variety of factors and do not occur in social, political, or economic vacuums – the impact of climate change on conflict situations is contingent on other processes of marginalization, existing institutional, socioeconomic and political conditions, and the history of violence in the affected area.

COLOMBIA IN FOCUS:

Violence and climate change in Tumaco

In 2018, the humanitarian impact of the protracted crisis in Colombia reached and surpassed the figures of the last five years – despite the peace agreement signed in 2016 between Revolutionary Armed Forces of Colombia (FARC-EP) and the Government.¹⁴⁶ Violence associated with armed groups increased, as did mass displacements – a first indicator of the deterioration of the humanitarian situation.¹⁴⁷ In 2018, more than 30,000 displaced Colombians were registered, the highest number since 2013.¹⁴⁸ Adding to the direct threat and experience of violence, displacement severely affects people's access to basic health services, drinking water, nutrition and jobs.

Climate change adds to these challenges. Colombia has a high exposure to natural hazards: More than 80 percent of the population has been subjected to at least two hazards, including flooding at the coastlines, floods and droughts at river banks and basins, cyclones, landslides, avalanches, earthquakes, and volcanoes.¹⁴⁹ At and near the coast, Colombians experience the consequences of a rising sea level, salt water penetration, hurricanes and a deterioration of coastal ecosystems. These changes impact on the fishing sector, which again impact on income generating activities for people living by and depending on the sea.¹⁵⁰

Tumaco is a city of 200.000 inhabitants at the South West Pacific Coast in Colombia. Tumaco exemplifies how climate changes affect already vulnerable populations. Most of the cocaine produced in Colombia is exported from Tumaco – and coca production remains a main driver for the conflict in the area. After the peace agreement, new rivalling criminal gangs took control of large parts of the city, and at present young people are killed on a weekly basis. Due to the rivalling gangs, movement within Tumaco is very restricted. Inhabitants report that even seeking health care or fetching water in a neighbourhood controlled by a different gang than the one you live in can be



Houses on poles to stand the tide but not designed for a permanent rise in sea level, Tumaco, October 2018.

Photo © Norwegian Red Cross.

very dangerous. As educational opportunities are almost non-existent, young people are often left to choose between joining the criminal gangs or cultivate coca leaves for survival, according to local Red Cross sources. ***

Already, the health authorities are unable to provide basic health and sanitation services, and access to drinking water is scarce. Climate pressures from floods, and droughts add to the challenges already present and a rise in sea level would force people to move to higher ground. For most people in Tumaco, however, migration is not a realistic option. Poor infrastructure, poverty, violence, and limited job opportunities make migration both dangerous and out of reach for many.

*** Conversations with Red Cross Staff in Tumaco, October 2018.

Conclusion

Climate and climatic changes impact on humanitarian needs related to health, migration, political (in)stability and livelihoods, and they do so in numerous, various and complex ways – some directly, others more indirectly. Importantly, vulnerabilities and needs are interrelated, and compound – making particular groups and regions more vulnerable to the aggravating stressors of climate change. Climate change can have serious consequences that, generally, affect poor people and societies with limited resources and mobility the most. Marginalized communities, whether due to demographics or to socioeconomic status, and people whose livelihoods and survival are closely tied to agriculture are highly vulnerable to the projected impacts of climate change. While climate change does not cause weak governance or the onset of large-scale armed conflict as experienced to date, conflict and weak governance limit individuals' and societies' coping capacities in the face of climate changes.

There are some regional hotspots that emerge when considering these contextual factors as well as the geographic variation of climate change events. As shown, smallholder farms are particularly vulnerable to the impacts of climate change; this is expected to be more pronounced in arid and semi-arid areas including the African Sahel region, and for farms in low-lying coastal plains of Southeast Asia. Health concerns related to food insecurity, similarly, are expected to be most extreme for people in Africa and southern Asia. Migration patterns emphasize the likelihood of urban migration in south Asia, east Africa, and Central America. Each of the themes surveyed herein is built on a field of research that explores more nuanced and complex connections and effects between humanitarian needs, risks and climate changes. Future research should engage more directly with humanitarian policy and practice. At the intersection of many of these issues, such as for example climate and migration, knowledge gaps remain. Research, policies, and interventions that not only integrate these issues, but also account for key conditions of vulnerability, have the potential to foster stronger, more effective interventions which can alleviate the harm caused by – and aggravated by – climate change.

REFERENCES

- 1 IPCC (2014), "Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the *Fifth Assessment Report of the Intergovernmental Panel on Climate Change*" [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)], Geneva: IPCC.
- 2 IPCC (2014), supra note 1; Stott, P.A., N. Christidis, FEL Otto, Y. Sun, et al. (2016), "Attribution of Extreme Weather and Climate-Related Events: Attribution of Extreme Weather and Climate-Related Events," *Wiley Interdisciplinary Reviews: Climate Change* 7(1): 23–41, <https://doi.org/10.1002/wcc.380>
- 3 IPCC (2014), supra note 1; Mora, C., D. Spirandelli, EC. Franklin, et al. (2018), "Broad Threat to Humanity from Cumulative Climate Hazards Intensified by Greenhouse Gas Emissions," *Nature Climate Change*, 8: 1062–1071, <https://doi.org/10.1038/s41558-018-0315-6>.
- 4 Bernard, V. (2015), "The Humanitarian Ethos in Action," *International Review of the Red Cross* 97(897–898): 7–18, <https://doi.org/10.1017/S1816383115000831>; see also Pictet, J. (1979), "The Fundamental Principles of the Red Cross," *International Review of the Red Cross* 19(210): 130–149, <https://doi.org/10.1017/S0020860400019872>
- 5 Adger, W. N., J. M. Pulhin, J. Barnett, et al. (2014), "Human Security," in C. B. Field, V. R. Barros, D. J. Dokken, et al. (eds.) *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel of Climate Change*, Cambridge & New York: Cambridge University Press. 755–91.
- 6 IPCC (2014), "Glossary," in C. B. Field, V. R. Barros, D. J. Dokken, et al. (eds.) *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel of Climate Change*, Cambridge & New York: Cambridge University Press. 1757–1766.
- 7 UNISDR (2017), "Terminology," United Nations Office for Disaster Risk Reduction. Available at www.unisdr.org/we/inform/terminology#letter-d%20, accessed November 12, 2018.
- 8 Slettebak, RT. (2012), "Don't Blame the Weather! Climate-Related Natural Disasters and Civil Conflict," *Journal of Peace Research* 49(1): 163–76. <https://doi.org/10.1177/0022343311425693>.
- 9 IFRC (na), "What is a Disaster?" Available at <https://www.ifrc.org/en/what-we-do/disaster-management/about-disasters/what-is-a-disaster/>, accessed November 12, 2018.
- 10 IPCC (2014), supra note 6.
- 11 IFRC (na), "What is Vulnerability?" International Federation of the Red Cross and Red Crescent Societies. <https://www.ifrc.org/en/what-we-do/disaster-management/about-disasters/what-is-a-disaster/what-is-vulnerability/>, accessed November 12, 2018.
- 12 IPCC (2014), supra note 6.
- 13 IPCC (2014), supra note 6.
- 14 IPCC (2018), *Global warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty* [V. Masson-Delmotte, P. Zhai, H. O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J. B. R. Matthews, Y. Chen, X. Zhou, M. I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, T. Waterfield (eds.)]; Friedlingstein, P. (2015), "Carbon Cycle Feedbacks and Future Climate Change," *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences* 373(2054), <https://doi.org/10.1098/rsta.2014.0421>
- 15 IPCC (2014), supra note 1.
- 16 IPCC (2018), supra note 14.
- 17 Calzadilla, A., K. Rehdanz, R. Betts, et al. (2013), "Climate Change Impacts on Global Agriculture," *Climatic Change* 120(1): 357–74. <https://doi.org/10.1007/s10584-013-0822-4>.
- 18 IPCC (2018), supra note 14.
- 19 Oppenheimer, M., M. Campos, R. Warren, et al. (2014), "Emergent Risks and Key Vulnerabilities" in C. B. Field, V. R. Barros, D. J. Dokken, et al. (eds.) *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel of Climate Change*, Cambridge & New York: Cambridge University Press, 1039–1099.
- 20 Agrawal, A. & N. Perrin (2009), "Climate Adaptation, Local Institutions and Rural Livelihoods," in W.N. Adger, I. Lorenzoni, & K.L. O'Brien (eds.) *Adapting to Climate Change: Thresholds, Values, Governance*, Cambridge & New York: Cambridge University Press, 350–67.
- 21 Walch, C. (2018), "Disaster Risk Reduction amidst Armed Conflict: Informal Institutions, Rebel Groups, and Wartime Political Orders," *Disasters* 42(S2): 39–64. <https://doi.org/10.1111/disa.12309>

OVERLAPPING VULNERABILITIES 2019

- 22 Busby, J. (2018), "Taking Stock: The Field of Climate and Security," *Current Climate Change Reports* 4(4): 338–346, <https://doi.org/10.1007/s40641-018-0116-z>; Busby, J., & N. von Uexkull (2018), "Climate Shocks and Humanitarian Crises: Which Countries Are Most at Risk?" *Foreign Affairs*, November 29. Available at <https://www.foreignaffairs.com/articles/world/2018-11-29/climate-shocks-and-humanitarian-crises>, accessed May 3, 2018
- 23 Walch, C. (2018), "Typhoon Haiyan: Pushing the Limits of Resilience? The Effect of Land Inequality on Resilience and Disaster Risk Reduction Policies in the Philippines," *Critical Asian Studies* 50(1): 122–35, <https://doi.org/10.1080/14672715.2017.1401936>
- 24 Uexkull, N. von, M. Croicu, H. Fjelde, & H. Buhaug (2016), "Civil Conflict Sensitivity to Growing-Season Drought." *Proceedings of the National Academy of Sciences* 113(44): 12391–96, <https://doi.org/10.1073/pnas.1607542113>
- 25 Fjelde, H. & N. von Uexkull (2012), "Climate Triggers: Rainfall Anomalies, Vulnerability and Communal Conflict in Sub-Saharan Africa," *Political Geography* 31(7): 444–53. <https://doi.org/10.1016/j.polgeo.2012.08.004>.
- 26 Oppenheimer et al. (2014), supra note 19.
- 27 FAO, IFAD, UNICEF, WFP, & WHO (2018), *The State of Food Security and Nutrition in the World 2018*. Rome: FAO, 2018.
- 28 Alston, M. (2013), "Introducing Gender and Climate Change: Research, Policy and Action," in Alston, M. & K. Whittenbury (eds.) *Research, Action and Policy: Addressing the Gendered Impacts of Climate Change*, New York: Springer, 3-16.
- 29 Alston, M. (2013), see supra note 28; Oswald Spring, Ú. (2018), "Human, Gender and Environmental Security at Risk from Climate Change," in M. Marván & E. López-Vázquez (eds.) *Preventing Health and Environmental Risks in Latin America*, Cham: Springer, 2018.
- 30 Sellers, S. (2016), *Gender and Climate Change: A Closer Look at Existing Evidence*, Washington, DC: Global Gender and Climate Alliance.
- 31 Adger, W. N., J. M. Pulhin, J. Barnett, et al. (2014), supra note 5.
- 32 UNICEF (2015), *Unless We Act Now: The Impact of Climate Change on Children*, New York: UNICEF.
- 33 The World Bank (2017), *Disaster Risk Profile: Afghanistan*, Washington, DC: The World Bank; Buchanan-Smith, M. & I. Christoplos (2004), "Natural disasters amid complex political emergencies" *Humanitarian Exchange* 7: 36–38.
- 34 Ranghieri, F. & A. Nagar (2019), *Building a more resilient Afghanistan*, Washington, DC: The World Bank. Available from <https://reliefweb.int/report/afghanistan/building-more-resilient-afghanistan-0>, accessed May 3, 2019.
- 35 IFRC Newswire, 2nd April 2019; USAid (2019), *Afghanistan – Complex Emergency. Fact sheet #1*, February 14, 2019. Available from: https://www.usaid.gov/sites/default/files/documents/1866/afghanistan_ce_fs01_02-14-2019.pdf, accessed May 3, 2019.
- 36 OCHA (2019), *Afghanistan: Overview of Natural Disasters (as of 29 April 2019) Natural disaster events from 14 January 2019 to 18 April 2019* [Natural Disasters Interactive Dashboard]. Available from <https://www.humanitarianresponse.info/en/operations/afghanistan/natural-disasters-0>; accessed April 30, 2019.
- 37 IFRC (2019), *Afghanistan: Ten million Afghans face severe hardship after extreme weather*. Press release available from <https://media.ifrc.org/ifrc/press-release/afghanistan-ten-million-afghans-face-severe-hardship-extreme-weather/?platform=hootsuite>, accessed April 30, 2019.
- 38 Gates, S., H. Hegre, H. Mokleiv Nygård, & Håvard Strand (2012), "Development Consequences of Armed Conflict," *World Development* 40(9): 1713–22. <https://doi.org/10.1016/j.worlddev.2012.04.031>
- 39 FAO et al. (2018), supra note 27.
- 40 Adger, W. N., J. M. Pulhin, J. Barnett, et al. (2014), supra note 5.
- 41 Hegre, H., NW. Metternich, H. Mokleiv Nygård, et al. (2017), "Evaluating the Scope and Intensity of the Conflict Trap," *Journal of Peace Research* 54(2): 243–61. <https://doi.org/10.1177/0022343316684917>; Hegre, H. & N. Sambanis (2006), "Sensitivity Analysis of Empirical Results on Civil War Onset," *Journal of Conflict Resolution* 50(4): 508–35. <https://doi.org/10.1177/0022002706289303>.
- 42 Image adapted from Busby & von Uexkull (2018), supra note 22.
- 43 Calzadilla, A., K. Rehdanz, R. Betts, et al. (2013), see supra note 17; Bell, JD., A. Ganachaud, PC. Gehrke, et al. (2013) "Mixed Responses of Tropical Pacific Fisheries and Aquaculture to Climate Change," *Nature Climate Change* 3(6): 591–99. <https://doi.org/10.1038/nclimate1838>.
- 44 IPCC (2018), supra note 14.
- 45 Ayeb-Karlsson, S., K. van der Geest, I. Ahmed, et al., (2016), "A PeopleDcentred Perspective on Climate Change, Environmental Stress, and Livelihood Resilience in Bangladesh," *Sustainability Science* 11(4): 679–94. <https://doi.org/10.1007/s11625-016-0379-z>; Cohn, AS., P. Newton, JDB. Gil, et al. (2017), "Smallholder Agriculture and Climate Change," *Annual Review of Environment and Resources* 42(1): 347–75. <https://doi.org/10.1146/annurev-environ-102016-060946>.
- 46 FAO et al. (2018), supra note 27.
- 47 OCHA (2019), *2019 Humanitarian Needs Overview Syria*, available from: <https://hno-syria.org/#home>, accessed April 24, 2019.
- 48 IFRC (2019), *Emergency Appeal: Syria Floods* [17 April 2019], available from: <https://media.ifrc.org/ifrc/appeal/syria-floods/appeal>, accessed April 24, 2019.
- 49 IFRC (2019), supra note 48.

OVERLAPPING VULNERABILITIES 2019

- 50 FAO et al. (2018), supra note 27.
- 51 FAO Representation in Syria (2016), *Plan of Action for Syria, Towards Resilient Livelihoods for Sustainable Agriculture, Food Security and Nutrition. 2016–2017*. Cairo: FAO. Available from: http://www.fao.org/fileadmin/user_upload/rne/docs/plan_of_action_syria_2016_2017.pdf, accessed April 24, 2019.
- 52 OCHA (2019), supra note 47.
- 53 FAO & WFP (2019), *Monitoring food security in countries with conflict situations* (Issue # 5), available from: <http://www.fao.org/3/ca3113en/CA3113EN.pdf>, accessed April 24, 2019.
- 54 Calzadilla, A., K. Rehdanz, R. Betts, et al. (2013), supra note 17; Ayeb-Karlsson, S., K. van der Geest, I. Ahmed, et al., (2016), supra note 45.
- 55 Cohn, AS., P. Newton, JDB. Gil, et al. (2017), supra note 45.
- 56 Calzadilla, A., K. Rehdanz, R. Betts, et al. (2013), supra note 17.
- 57 Ayeb-Karlsson, S., K. van der Geest, I. Ahmed, et al., (2016), supra note 45.
- 58 Cohn, AS., P. Newton, JDB. Gil, et al. (2017), supra note 45.
- 59 Rosegrant, MW., R. Valmonte-Santos, T. Thomas, et al. (2015), *Climate Change, Food Security, and Socioeconomic Livelihood in Pacific Islands*, Manila: Asian Development Bank, International Food Policy Research Institute.
- 60 Bell, JD., A. Ganachaud, PC. Gehrke, et al. (2013), “Mixed Responses of Tropical Pacific Fisheries and Aquaculture to Climate Change,” *Nature Climate Change* 3(6): 591–99. <https://doi.org/10.1038/nclimate1838>.
- 61 Rosegrant, MW., R. Valmonte-Santos, T. Thomas, et al. (2015), supra note 59.
- 62 Watts, N., M. Amann, S. Ayeb-Karlsson, et al. (2018), “The Lancet Countdown on Health and Climate Change: From 25 Years of Inaction to a Global Transformation for Public Health.” *The Lancet* 391(10120): 581–630. [https://doi.org/10.1016/S0140-6736\(17\)32464-9](https://doi.org/10.1016/S0140-6736(17)32464-9).
- 63 ICRC (2017), *Somalia: Failed rains threaten nomad way of life*. Available from: <https://www.icrc.org/en/document/somalia-drought-food-hunger-conflict-rains-nomad>, accessed April 24, 2019.
- 64 UNEP (2018), *Mapping the devastation of Somalia’s drought*. Available from <https://www.unenvironment.org/news-and-stories/story/mapping-devastation-somalias-drought>, accessed April 30, 2019; Tierney J.E., CC. Ummenhofer, & PB. deMenocal (2015), “Past and future rainfall in the Horn of Africa,” *Science Advances* 1(9). DOI: 10.1126/sciadv.1500682.
- 65 OCHA (2019), *2019 Humanitarian Needs Overview Somalia*, available from: https://reliefweb.int/sites/reliefweb.int/files/resources/Somalia_2019_HNO.PDF, accessed March 30, 2019.
- 66 Tierney J.E., CC. Ummenhofer, & PB. deMenocal (2015), supra note 64.
- 67 Abdi, H. (2017), “Somalia conflict and famine: the causes are bad governance, not climate change,” *The Conversation*, October 4th. Available from <http://theconversation.com/somalia-conflict-and-famine-the-causes-are-bad-governance-not-climate-change-84166>, accessed April 30, 2019.
- 68 IFRC (2011), *Drought in the Horn of Africa: Preventing the next disaster*, Geneva: IFRC. Available from: <https://www.ifrc.org/PageFiles/90410/1203800-Drought%20in%20the%20Horn%20of%20Africa-Preventing%20the%20next%20disaster-EN-LR.pdf>, accessed April 30, 2019.
- 69 Watts, N., M. Amann, S. Ayeb-Karlsson, et al. (2018), supra note 62; WHO (2018), *COP24 Special Report: Health and Climate Change*, Geneva: World Health Organization.
- 70 Costello, A., M. Abbas, A. Allen, et al. (2009), “Managing the Health Effects of Climate Change,” *The Lancet* 373(9676): 1693–1733. [https://doi.org/10.1016/S0140-6736\(09\)60935-1](https://doi.org/10.1016/S0140-6736(09)60935-1).
- 71 FAO et al. (2018), supra note 27.
- 72 IPCC (2018), supra note 14.
- 73 WHO (2018), supra note 69.
- 74 Calzadilla, A., K. Rehdanz, R. Betts, et al. (2013), supra note 17.
- 75 Costello, A., M. Abbas, A. Allen, et al. (2009), supra note 70.
- 76 FAO et al. (2018), supra note 27.
- 77 Calzadilla, A., K. Rehdanz, R. Betts, et al. (2013), supra note 17.
- 78 Jankowska, MM., D. Lopez-Carr, C. Funk, et al. (2012), “Climate Change and Human Health: Spatial Modeling of Water Availability, Malnutrition, and Livelihoods in Mali, Africa,” *Applied Geography*, 33 (April): 4–15. <https://doi.org/10.1016/j.apgeog.2011.08.009>
- 79 Bell, JD., A. Ganachaud, PC. Gehrke, et al. (2013), supra note 60.
- 80 De Schutter, O. (2009), “International Trade in Agriculture and the Right to Food,” *Dialogue on Globalization*, 46: 1–52. Geneva: Friedrich Ebert Stiftung.
- 81 Calzadilla, A., K. Rehdanz, R. Betts, et al. (2013), supra note 17.
- 82 Jankowska, MM., D. Lopez-Carr, C. Funk, et al. (2012), supra note 78.
- 83 Cohn, AS., P. Newton, JDB. Gil, et al. (2017), supra note 45.
- 84 Ebi, KL., & K. Bowen (2016), “Extreme Events as Sources of Health Vulnerability: Drought as an Example,” *Weather and Climate Extremes*, 11(March): 95–102. <https://doi.org/10.1016/j.wace.2015.10.001>
- 85 Rosegrant, MW., R. Valmonte-Santos, T. Thomas, et al. (2015), supra note 59.
- 86 FAO et al. (2018), supra note 27.

OVERLAPPING VULNERABILITIES 2019

- 87 OCHA (2019), “Cyclones Idai and Kenneth,” available at <https://www.unocha.org/southern-and-eastern-africa-rosea/cyclones-idai-and-kenneth>, accessed May 6, 2019. [Date na].
- 88 Le Page, M. (2019), “Cyclone Kenneth is one of the strongest storms to hit mainland Africa,” *New Scientist*, April 26, 2019. Available at <https://www.newscientist.com/article/2200925-cyclone-kenneth-is-one-of-the-strongest-storms-to-hit-mainland-africa/>, accessed May 6, 2019.
- 89 IFRC (2019), “Tropical Cyclone Idai impacts Mozambique,” March 14. Available at <https://www.forecast-based-financing.org/2019/03/14/tropical-cyclone-idai/>, accessed May 6, 2019.
- 90 Lundell, MR. (2016), “Picking up the Pace of Poverty Reduction in Mozambique,” December 21. Opinion piece, the World Bank. Available at: <http://www.worldbank.org/en/news/opinion/2016/12/21/picking-up-the-pace-of-poverty-reduction-in-mozambique>, accessed May 6, 2019.
- 91 Costello, A., M. Abbas, A. Allen, et al. (2009), supra note 70; FAO et al. (2018), supra note 27.
- 92 FAO et al. (2018), supra note 27.
- 93 Costello, A., M. Abbas, A. Allen, et al. (2009), supra note 70.
- 94 WHO (2018), supra note 69.
- 95 Ebi, KL., & K. Bowen (2016), supra note 84.
- 96 WHO (2018), supra note 69.
- 97 Watts, N., M. Amann, S. Ayeb-Karlsson, et al. (2018), supra note 62.
- 98 Costello, A., M. Abbas, A. Allen, et al. (2009), supra note 70.
- 99 Costello, A., M. Abbas, A. Allen, et al. (2009), supra note 70; Ebi, KL., & K. Bowen (2016), supra note 84.
- 100 Costello, A., M. Abbas, A. Allen, et al. (2009), supra note 70.
- 101 Costello, A., M. Abbas, A. Allen, et al. (2009), supra note 70.
- 102 WHO (2018), supra note 69.
- 103 Costello, A., M. Abbas, A. Allen, et al. (2009), supra note 70.
- 104 Oakes, R., A. Milan, & J. Campbell (2016), *Kiribati: Climate change and migration – Relationships between household vulnerability, human mobility and climate change*. [Report No. 20]. Bonn: United Nations University Institute for Environment and Human Security (UNU-EHS).
- 105 Gemenne, F. (2011), “Why the Numbers Don’t Add up: A Review of Estimates and Predictions of People Displaced by Environmental Changes,” *Migration and Global Environmental Change – Review of Drivers of Migration* 21(1): 41–49. <https://doi.org/10.1016/j.gloenvcha.2011.09.005>
- 106 UNHCR (2015), *UNHCR, the Environment, and Climate Change*. Geneva: UNHCR.
- 107 Gemenne, F. (2011), supra note 105.
- 108 Climate Council (2015), “Climate Council Briefing Statement: Damage from Cyclone Pam was Exacerbated by Climate Change,” March 22. Available from <https://www.climatecouncil.org.au/uploads/417d45f46cc04249d55d59be3da6281c.pdf>, accessed May 6, 2019
- 109 Oakes, R., A. Milan, & J. Campbell (2016), supra note 104.
- 110 Foresight (2011), *Migration and Global Environmental Change: Future Challenges and Opportunities*, London: The Government Office for Science; Oakes, R., A. Milan, & J. Campbell (2016), supra note 104.
- 111 Oakes, R., A. Milan, & J. Campbell (2016), supra note 104.
- 112 IFRC (2018), *Disasters and Displacement in a Changing Climate, The Role of Asia Pacific National Societies*, Geneva: IFRC.
- 113 Koubi, V., G. Spilker, L. Schaffer, & T. Bernauer (2016), “Environmental Stressors and Migration: Evidence from Vietnam.” *World Development* 79 (March): 197–210. <https://doi.org/10.1016/j.worlddev.2015.11.016>.
- 114 Devine-Wright, P. (2013), “Think Global, Act Local? The Relevance of Place Attachments and Place Identities in a Climate Changed World,” *Global Environmental Change* 23(1):61–69. <https://doi.org/10.1016/j.gloenvcha.2012.08.003>.
- 115 Foresight (2011), supra note 110; Rigaud, KK., A. de Sherbinin, B. Jones, et al. (2018), *Groundswell: Preparing for Internal Climate Migration*. Washington, DC: World Bank. <https://doi.org/10.1596/29461>.
- 116 Foresight (2011), supra note 110.
- 117 Bohra-Mishra, P., M. Oppenheimer, & SM. Hsiang (2014), “Nonlinear Permanent Migration Response to Climatic Variations but Minimal Response to Disasters,” *Proceedings of the National Academy of Sciences*, 111(27): 9780–9785. <https://doi.org/10.1073/pnas.1317166111>
- 118 Foresight (2011), supra note 110.
- 119 Koubi, V., G. Spilker, L. Schaffer, & T. Bernauer (2016), supra note 113.
- 120 Devine-Wright, P. (2013), supra note 114.
- 121 Falco, C., F. Donzelli, & A. Olper (2018), “Climate Change, Agriculture and Migration: A Survey” *Sustainability* 10(5): 5 (May 3, 2018): 1405. <https://doi.org/10.3390/su10051405>.
- 122 Foresight (2011), supra note 110; Beine, M., & C. Parsons (2015), “Climatic Factors as Determinants of International Migration: Climatic Factors as Determinants of International Migration,” *The Scandinavian Journal of Economics* 117(2): 723–67. <https://doi.org/10.1111/sjoe.12098>.
- 123 Falco, C., F. Donzelli, & A. Olper (2018), supra note 121.
- 124 Rigaud, KK., A. de Sherbinin, B. Jones, et al. (2018), supra note 115.

OVERLAPPING VULNERABILITIES 2019

- 125 Cai, R., S. Feng, M. Oppenheimer, & M. Pytlikova (2016), "Climate Variability and International Migration: The Importance of the Agricultural Linkage," *Journal of Environmental Economics and Management* 79 (September): 135–51. <https://doi.org/10.1016/j.jeem.2016.06.005>; Rigaud, KK., A. de Sherbinin, B. Jones, et al. (2018), supra note 115.
- 126 Falco, C., F. Donzelli, & A. Olper (2018), supra note 121.
- 127 Foresight (2011), supra note 110.
- 128 Foresight (2011), supra note 110; Falco, C., F. Donzelli, & A. Olper (2018), supra note 121.
- 129 Black, R., WN. Adger, NW. Arnell, et al. (2011), "The Effect of Environmental Change on Human Migration," *Global Environmental Change* 21: S3–11. <https://doi.org/10.1016/j.gloenvcha.2011.10.001>.
- 130 Falco, C., F. Donzelli, & A. Olper (2018), supra note 121.
- 131 Foresight (2011), supra note 110.
- 132 Cattaneo, C., & G. Peri (2016), "The Migration Response to Increasing Temperatures," *Journal of Development Economics* 122 (September): 127–46. <https://doi.org/10.1016/j.jdevco.2016.05.004>.
- 133 Uexkull, N. von, M. Croicu, H. Fjelde, & H. Buhaug (2016), supra note 26; Raleigh, C. & D. Kniveton (2012), "Come Rain or Shine: An Analysis of Conflict and Climate Variability in East Africa," *Journal of Peace Research* 49(1): 51–64. <https://doi.org/10.1177/0022343311427754>; Maystadt, JF. & O. Ecker (2014), "Extreme Weather and Civil War: Does Drought Fuel Conflict in Somalia through Livestock Price Shocks?" *American Journal of Agricultural Economics* 96(4): 1157–82. <https://doi.org/10.1093/ajae/aau010>.
- 134 Theisen, OM. (2017), "Climate Change and Violence: Insights from Political Science," *Current Climate Change Reports* 3(4): 210–21. <https://doi.org/10.1007/s40641-017-0079-5>; Buhaug, H. (2015), "Climate–Conflict Research: Some Reflections on the Way Forward," *Wiley Interdisciplinary Reviews: Climate Change* 6(3): 269–75. <https://doi.org/10.1002/wcc.336>.
- 135 Humphreys, M. & JM. Weinstein (2008), "Who Fights? The Determinants of Participation in Civil War," *American Journal of Political Science* 52(2): 436–55. <https://doi.org/10.1111/j.1540-5907.2008.00322.x>; Blattman, C. & J. Annan (2016), "Can Employment Reduce Lawlessness and Rebellion? A Field Experiment with High-Risk Men in a Fragile State," *American Political Science Review* 110(1): 1–17. <https://doi.org/10.1017/S0003055415000520>.
- 136 Busby, J. (2018), supra note 22.
- 137 Berman, E., M. Callen, JH. Felter, & JN. Shapiro (2011), "Do Working Men Rebel? Insurgency and Unemployment in Afghanistan, Iraq, and the Philippines," *Journal of Conflict Resolution* 55(4): 496–528. <https://doi.org/10.1177/0022002710393920>.
- 138 Raleigh, C., HJ. Choi, & D. Kniveton (2015), "The Devil Is in the Details: An Investigation of the Relationships between Conflict, Food Price and Climate across Africa," *Global Environmental Change* 32(May): 187–99. <https://doi.org/10.1016/j.gloenvcha.2015.03.005>.
- 139 Buhaug, H., TA. Benjaminsen, E. Sjaastad, & OM. Theisen (2015), "Climate Variability, Food Production Shocks, and Violent Conflict in Sub-Saharan Africa," *Environmental Research Letters* 10(12): 125015. <https://doi.org/10.1088/1748-9326/10/12/125015>.
- 140 Jones, BT., E. Mattiacci, & BF. Braumoeller (2017), "Food Scarcity and State Vulnerability: Unpacking the Link between Climate Variability and Violent Unrest," *Journal of Peace Research* 54(3): 335–50. <https://doi.org/10.1177/0022343316684662>.
- 141 Bureau for Crisis Prevention and Recovery (2011) *Disaster-Conflict Interface: Comparative Experiences*, New York: UNDP.
- 142 Raleigh, C. (2010), "Political Marginalization, Climate Change, and Conflict in African Sahel States," *International Studies Review* 12(1): 69–86. <https://doi.org/10.1111/j.1468-2486.2009.00913.x>.
- 143 Gleditsch, NP., R. Nordås, & I. Salehyan (2007), "Climate Change and Conflict: The Migration Link," *Coping with Crisis Working Paper Series*. New York: International Peace Academy.
- 144 De Juan, A. (2015), "Long-Term Environmental Change and Geographical Patterns of Violence in Darfur, 2003–2005," *Political Geography* 45 (March): 22–33. <https://doi.org/10.1016/j.polgeo.2014.09.001>; Linke, AM., J. O'Loughlin, JT. McCabe, et al. (2015), "Rainfall Variability and Violence in Rural Kenya: Investigating the Effects of Drought and the Role of Local Institutions with Survey Data," *Global Environmental Change* 34(September): 35–47. <https://doi.org/10.1016/j.gloenvcha.2015.04.007>.
- 145 Uexkull, N. von, M. Croicu, H. Fjelde, & H. Buhaug (2016), supra note 24.
- 146 OCHA (2018), *Colombia: Boletín Humanitario Mensual – Número 74 | Diciembre 2018*, available from: <https://reliefweb.int/report/colombia/colombia-bolet-n-humanitario-mensual-n-mero-74-diciembre-2018>, accessed April 12, 2019.
- 147 Human Rights Watch (2018) *Colombia. Eventos de 2018*, available from: <https://www.hrw.org/es/world-report/2019/country-chapters/326041>, accessed April 12, 2019.
- 148 OCHA (2018), supra note 146.
- 149 Global Facility for Disaster Reduction and Recovery (2017), *Colombia*, available from: <https://www.gfdr.org/en/colombia>, accessed May 6, 2019.
- 150 US Aid (2017), Climate Risk Profile: Colombia. [Fact Sheet] Available from: https://www.climatelinks.org/sites/default/files/asset/document/2017_USAID%20CCIS_Climate%20Risk%20Profile_Colombia.pdf, accessed May 6, 2019.

