

THEMATIC SERIES

No matter of choice: Displacement in a changing climate

This thematic series explores the scale, patterns drivers and impacts of internal displacement associated with slow-onset environmental change and disasters to inform policies and practices for managing and reducing displacement risk



ADDRESSING INTERNAL DISPLACEMENT IN THE CONTEXT OF CLIMATE CHANGE

ACKNOWLEDGEMENTS

IDMC's research on internal displacement in the context of climate change is supported by the Robert Bosch Stiftung.



This report benefited from the dedication of Nishita Agrawal, Lisa Carroll, Desideria Benini, Phillippa Denney, Leanne Digney, Camille Harland, Jan Kreibich, Minoli Malka, Devika Manish, Camila Miranda, Femi Ogunnigbo, Isha Patel, Avanti Roy-Basu, Roberta Rusciano, Leonie Schaefer, Dzebo Semir, Ky de Silva, Zefitre Tabera, Renata Trisilawati, Loes Van Der Graaf and Chhour Vongdarareach who supported IDMC's research through the UN Online Volunteering Programme.

Author: Christelle Cazabat with contributions from Pablo Cortés Ferrández, Marine Franck, Alesia O'Connor, Chloé Sydney and Louisa Yasukawa.

Editor: Steven Ambrus

Design and layout: Gregory van der Donk

Cover photo: Somalia is experiencing its worst drought in 20 years, following two consecutive seasons of poor rainfall. People are dying of malnutrition. In the worst affected areas, we have seen crops wiped out, livestock killed, and families forced to sell their belongings for food. Photo credit: Norwegian Refugee Council / Adrienne Surprenant Date: April 2017

**ADDRESSING INTERNAL
DISPLACEMENT IN THE
CONTEXT OF CLIMATE CHANGE**

TABLE OF CONTENTS

Executive summary	7
Introduction	8
Climate change as a driver of displacement	10
Preventing and preparing for displacement in the context of climate change	15
Responding to and addressing the impacts of displacement in the context of climate change . .	19
Towards better informed interventions	24
Notes.	26

EXECUTIVE SUMMARY

The slow onset effects of climate change, such as desertification, glacial retreat, increasing temperatures, land and forest degradation, loss of biodiversity, ocean acidification, salinization and sea level rise are increasing.¹ Under certain circumstances, these effects can lead to displacement, but the scale of this phenomenon is unknown.

Internal displacement in the context of climate change is particularly challenging to identify and monitor.² But evidence is beginning to emerge from an increasing number of cases around the world that both confirm that displacement is rising and that point to ways to address it.³

A first step in addressing internal displacement in the context of climate change is to better understand its drivers, triggers and impacts. With this in mind, IDMC has been developing a typology of such displacement events, a framework that enables their in-depth analysis as well as the identification of options to prevent and respond in a more systematic manner. This report is an introduction to this framework.

Slow-onset disasters combine with socioeconomic and governance factors to set the stage for specific triggers of displacement. These include loss of land, livelihoods, food and water. Sudden-onset disasters are also made more frequent and intense by climate change.⁴

As slow-onset disasters unfold, their impacts and outcomes are not only shaped by the hazards themselves. They are largely determined by people's vulnerability and the effectiveness of investments in disaster risk reduction, climate change adaptation and sustainable development.

Each combination of drivers, triggers and impacts creates a specific displacement situation for which tailored measures can be taken. A reality of climate change displacement is that much can be done, at every stage, to mitigate the issue.

Expanding the availability of information and analysis on displacement linked with climate anomalies and slow-onset disasters can help assess the scale of the issue and the resources needed to address it. Identifying solutions that have been successfully applied in different regions of the world may provide examples that can be adapted to similar displacement cases. Such a framework may also help identify conditions that put a population at risk of future displacement and support better planning for prevention in the short and longer term. Ultimately, this typology is intended to inform interventions and policy making at the local, national, regional and global levels, building on a growing collection of displacement data and analysis of successful practices in different contexts.

INTRODUCTION

As climate change increases the frequency and intensity of disasters, understanding the scale, risk and impacts of the associated displacement becomes ever more essential.⁵

Knowledge of disaster displacement has advanced considerably in the past few years. The estimated 30.7 million new displacements recorded in 2020 as a result of disasters, however, may only be the tip of the iceberg.⁶

The slow-onset effects of climate change, such as desertification, glacial retreat, increasing temperatures, land and forest degradation, loss of biodiversity, ocean acidification, salinization and sea level rise can force people to flee their homes and will likely have an increasing impact in the future.⁷

Internal displacement associated with slow-onset disasters is particularly difficult to monitor.⁸ As of today, the scale of this phenomenon is unknown (Box 1).

Data on displacement linked with drought in 2020 was only available for four countries: Brazil, Somalia, Ethiopia and Burundi. Drought affected other countries, but IDMC lacked sufficient information to quantify the resulting population movements or characterise them as “displacement”.⁹ As drought displacement is difficult to monitor, it is often excluded from disaster-loss databases.¹⁰

Evidence is beginning to emerge from an increasing number of cases around the world, however, that confirm that the problem is growing, while pointing to ways to address it.

This report proposes an approach to understanding the phenomenon by analysing the circumstances under which it occurs, its likely impacts and how they may be averted.

This analytical framework, or typology, can help identify, report on and monitor slow-onset displacements to assess their scale and the resources needed to address them. Such a typology may also be used to identify the conditions that put a population at risk of future displacement.

It is intended to guide planning and policymaking at the local, national, regional and global levels, building on a growing collection of displacement data and analysis of successful practices in different contexts.

In each of these situations, displaced people, and sometimes their communities of origin and refuge, face different impacts on their livelihoods, health, security, housing conditions, social life, education and environment. Figure 1 illustrates the linkages between these drivers, triggers and impacts and highlights the types of policy actions that can be taken at each stage.

BOX 1: the challenge of measuring internal displacement associated with slow-onset disasters

The slow-onset nature of climate change's effects makes it more difficult to identify incidents of displacement associated with them than displacement resulting from a sudden-onset disaster or a conflict. This type of displacement is usually the result of a combination of factors, many of which are shaped by human action and decision making. This makes it all the more challenging to link population movements to the slow-onset effects of climate change and to distinguish displacement from voluntary migration.

Displacement in the context of climate change may only become visible when the situation has transformed into a significant crisis, or when it occurs as a result of exceptional weather-related events. A widely used proxy is displacement resulting from the loss of livelihood or the food and water insecurity linked with drought, which can be exacerbated by rising temperatures and desertification.

Displacement crises resulting from climate change are not inevitable, and different types of interventions can be used, depending on the context, to prevent them or mitigate their negative consequences.

The human influence on the slow-onset effects of climate change, such as the rise in temperatures or the acidification of oceans, is now well documented.¹¹ The first type of policy action that can be used to address climate change displacement is therefore climate change mitigation, including sustainable land management, water conservation, and the reduction of greenhouse gas emissions.¹²

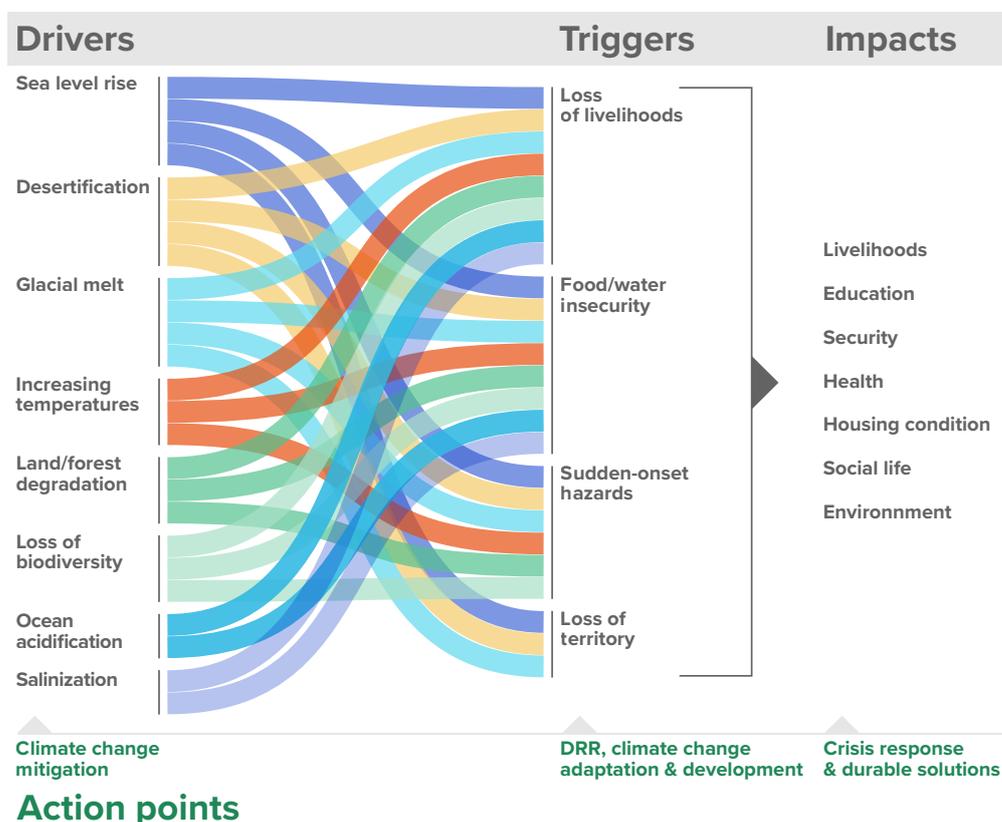
Even as climate change's slow-onset effects are unfolding, disaster risk reduction plans and climate change adaptation strategies can play a role in preventing or delaying displacement. Investing in socioeconomic development is another way to influence the way climate change plays out. Supporting the livelihoods of vulnerable groups of people, as well as their human capital, can strengthen their ability to cope with changes in their environment or migrate safely.

When preventative measures are not enough and displacement has already occurred, there are still things that can be done to mitigate its negative consequences.

Measures are being taken in all of these areas and are highlighted throughout this report. Examples from every region of the world demonstrate that addressing displacement associated with climate change is within our reach as long as there is enough information, planning and implementation capacity at the local, national and international levels.

When displacement cannot be avoided, understanding the various impacts it can have on people's lives, on peace and stability, as well as on economies, is important to the design of more inclusive and comprehensive responses. Some people are particularly vulnerable to displacement associated with slow-onset disasters or to some of its negative consequences: for example, pastoralists and people in rural areas, indigenous communities, women, children and people with disabilities. Measuring these impacts and identifying those who may require dedicated support is crucial to designing inclusive interventions. So is including these people in the planning and implementation of responses.

FIGURE 1: Linkages between drivers, triggers and impacts of internal displacement in the context of climate change, and policy action points



CLIMATE CHANGE AS A DRIVER OF DISPLACEMENT

Each of the eight slow-onset effects of climate change recognized by the UN Framework Convention on Climate Change can have repercussions that will eventually force people to leave their home, as can their compounding and cascading impacts.¹³

Desertification, glacial retreat, increasing temperatures, land and forest degradation, loss of biodiversity, ocean acidification, salinization and sea level rise can gradually render areas uninhabitable and reduce the opportunities to earn a living and find food and water. They can also increase the risk of extreme weather events, such as drought, tsunamis, floods or storms, that also can lead to displacement.

This section highlights how each slow-onset disaster can result in displacement through some or all of these effects.

SEA LEVEL RISE

Globally, sea level has risen by 20 cm since the start of the twentieth century, mostly because of the thermal expansion of the oceans and the melting of glaciers and ice caps.¹⁴ It is likely to rise further, between 0.3 and one metre by 2100, with a possible rise of up to two metres in some areas.¹⁵

Low-elevation coastal zones – less than 10 metres above sea level – including deltaic regions and small islands, are among the most densely populated regions in the world, especially in South and South-East Asia.¹⁶ Small Island Developing States are particularly affected because of their low elevation, limited land area and high dependence on natural resources and subsistence agriculture.

There is abundant evidence of loss and damage resulting from sea level rise. This includes the salinization of soils and reduced crop yields in cultivated areas, the

lowering of the quality of drinking water from salinity intrusion into coastal aquifers, the loss of fish habitat, reduced fish production and the loss of territory.¹⁷ The degradation of coastal and marine ecosystems resulting from sea level rise also contributes to the weakening of protections against floods, storms, tsunamis and typhoons, leaving populations more exposed to the risks of displacement.^{18,19}

A rise in sea level of only 0.5 metres in Alexandria, Egypt, would, for instance, expose nearly two million people to displacement.²⁰ In Senegal, where around 70 per cent of the population are threatened by sea level rise, small communities, such as the villages of Mbambara and Doun Baba Dieye, have already been displaced.²¹

Even without the added impact of rapid-onset hazards, slow-onset events can progressively decrease the habitability of an area until a tipping point is reached that leads to displacement. With surrounding sea levels rising, it has been predicted that Kiribati will become uninhabitable in 30 to 60 years.²²

DESERTIFICATION

Desertification is a non-reversible reduction in the productivity of drylands. Climate change and human activities degrade the soil until plants can no longer grow. Overgrazing and deforestation can contribute to desertification, as can changing rainfall patterns, higher temperatures and drought.

Desertification is unfolding on all continents except Antarctica and is considered to be one of the most serious environmental problems.²³ Six hundred and thirty million people live in dryland areas affected by desertification.²⁴ This figure is expected to increase with global warming.



Flooding in Irrawaddy Delta, Myanmar. Photo: NRC, 2016

The most affected regions are South and East Asia, the Middle East and the circum Sahara region, extending from Algeria, Libya and Egypt to Mali, Niger, Chad, Somalia and Sudan.²⁵ The American continent is also exposed to desertification.²⁶

Desertification contributes to food and nutritional insecurity by generating losses in agricultural productivity and income. It also decreases both the quantity and quality of water, thus reducing the availability of this resource to meet water, sanitation, and hygiene (WASH) as well as production needs. Studies also show that desertification-related dust storms, which are increasing in intensity and frequency, produce damaging effects on human health while undermining the functioning of both energy and transportation infrastructures.

As a result, crop production declines and livestock can no longer use pasture.²⁷ People who used to rely on these activities for food and income are then forced to find other sources of livelihood, often in another area.

Desertification can also act as a threat multiplier for drought.²⁸ Repeated, severe droughts may force people to abandon their pastoralist or agro-pastoralist lifestyle as it becomes unviable. Many then seek refuge in urban areas. Between 2008 and 2020, IDMC recorded 2.4 million new internal displacements linked with drought.

In extreme cases, desertification can lead to loss of territory through the encroachment of sand dunes: An estimated 23 hectares of land are lost to desertification per minute.²⁹ The capital of Mauritania, Nouakchott, is at the forefront of this challenge. Several houses there are buried in sand each year, forcing its inhabitants to move. People across the country are losing their fields and livelihoods to this phenomenon, forcing them to search for alternative livelihoods in urban centres. In order to fight this, Mauritania has implemented several strategies, including replanting trees and stabilising sand dunes around cities endangered by desertification.

GLACIAL RETREAT

Rising temperatures and pollution can cause glaciers to melt and retreat. This can eventually decrease the level of river flows, affecting food, water and energy production in mountain and lowland areas.³⁰

Nearly three-quarters of the global mountain population live in rural areas and depend on natural resources for their livelihood.³¹ Losing these resources can force them to move, as has been reported in the Andes.

Glacial melt can also cause the sudden release of water from a glacial lake, otherwise known as glacial-lake outburst flooding. This can result in displacement.

In parallel, permafrost at high altitudes is melting because of rising temperatures.³² Polar regions are significantly altered by permafrost melt, which is causing the sinking of the earth's surface, or subsidence, as well as coastal erosion. Indigenous populations are heavily affected in these regions.

INCREASING TEMPERATURES

The combined land and ocean temperature has been increasing at an average rate of 0.18°C per decade since 1981.³³ High temperatures increase evaporation and affect soil moisture, eventually leading to desiccation, nutrient loss and surface soil erosion.³⁴ Changes in temperatures also affect the timing of biological events, such as fertilization, blooming and fish spawning, changing ecosystems' ability to regenerate.

These effects negatively influence crop production and the quality and availability of pasture land for livestock, affecting the people who depend on them and sometimes forcing them to move. Increasing temperatures also affect food security. Each 1°C increase reduces global wheat production by six per cent.³⁵

Higher sea surface temperatures affect the physical, chemical and biological state of the marine environment, leading to coral bleaching and fish mortality, among other impacts.^{36, 37} As many coastal economies depend on fisheries and coral reef tourism, this can jeopardize people's livelihoods and push some of them into displacement.³⁸

Increasing temperatures also set the stage for more frequent and severe heat waves and wildfires. Between 2008 and 2020, IDMC recorded 1.1 million new internal displacements linked with extreme temperatures and 3.4 million displacements linked with wildfires.³⁹ Rising temperatures also increase the risk of other hazards such as glacial melt.

A recent study shows that the observed trend towards warmer and drier conditions in southern Europe will likely continue in coming decades. This could lead to a substantial expansion in fire-prone areas.⁴⁰ Using different climate scenarios, ranging from 1.5°C to 3°C of warming, the evidence indicates that the higher the warming level, the larger the increase in burned area, with estimates from around 40 per cent to around 100 per cent across different scenarios.

LAND AND FOREST DEGRADATION

The rapid expansion and unsustainable management of crop and grazing lands are key factors behind deteriorating land quality. Climate change, however, is also exacerbating existing degradation processes with extreme weather events such as droughts, cyclones and floods. Deforestation disrupts watershed processes, including the infiltration of precipitation into soils.

The fundamental influence of people in land degradation is great. This includes the growing consumption of land-based resources through deforestation, monocultures, intensive agriculture and cropland expansion, intensified by population growth.⁴¹ Land and forest degradation severely affects crop and livestock production systems. The Food and Agriculture Organization (FAO) estimates that a quarter of the world's agricultural land is highly degraded, some irreversibly.⁴² In Africa, up to two-thirds of productive land area is affected by land degradation.⁴³ Climate change and worsening land quality could see crop yields halve in some regions by 2050.⁴⁴

Degraded lands and forests become less resilient to rapid-onset events. During periods of limited rainfall, soils dry out. When heavier rains then fall, increasing flooding, erosion and loss of soil nutrients results.⁴⁵ Land and forest degradation can increase the exposure of human settlements to weather-related disasters and trigger subsequent displacement.

LOSS OF BIODIVERSITY

Increasing temperatures and altered precipitation patterns are affecting the structure, composition and functions of ecosystems, causing biodiversity loss and reductions in the ecosystem services that support human wellbeing.⁴⁶

Land-use change, such as the overexploitation of animals, plants and other organisms via harvesting, logging, hunting and fishing, is another driver of biodiversity loss.⁴⁷ So is pollution, including greenhouse gas emissions; untreated urban and rural waste; pollutants from industrial, mining and agricultural activities; oil spills and toxic dumping. Since 1980, plastics pollution

in the marine environment has affected at least 267 species, including 86 per cent of marine turtles, 44 per cent of seabirds and 43 per cent of marine mammals.⁴⁸

There was an overall decline of 60 per cent in the size of vertebrate populations between 1970 and 2014, with South and Central America suffering the most dramatic declines, at 89 per cent. Freshwater species numbers have fallen by 83 per cent since 1970.⁴⁹

Ecosystems benefit humans in many ways. They provide, among others, food, water, timber and fibre; regulate climate, floods, diseases and water quality; offer recreational, aesthetic and spiritual benefits; and support soil formation, photosynthesis and nutrient cycling.

Biodiversity plays a key role in providing for food security. It delivers plant, animal and microbial genetic resources necessary for food production and diversified, balanced diets. It enables vital ecosystem functions such as soil fertilization, nutrient recycling, pest and disease regulation, erosion control and crop and tree pollination.

Through the continuous recycling of water, biodiversity maintains ecosystem services needed to sustain drinking water supplies.⁵⁰

Disruption of biodiversity may lead to the loss of livelihoods for people who are highly dependent on the environment, making them more vulnerable to displacement. Loss of biodiversity may also expose populations to sudden-onset hazards. In Sri Lanka, for instance, coastal wetlands play a significant role in reducing flood risks.⁵¹

OCEAN ACIDIFICATION

Ocean acidification refers to changes in ocean chemistry that have occurred as a result of the ocean's absorption of carbon dioxide emissions. It could have seriously negative impacts on marine ecosystems.^{52, 53}

Many coastal communities are traditionally dependent on fisheries for subsistence and income. The livelihoods



A woman using watering can to nurture her vegetables in Maiduguri. Photo: Chima Onwe/NRC, 2018.

and food security of many communities are likely to be highly affected by ocean acidification. This is particularly the case for communities with limited options for income diversification and alternative food sources.⁵⁴

The loss of shell-forming species, coral reefs and reef-dependent fisheries affects food security, trade and tourism. Tropical reefs support an estimated 25 per cent of marine fish species. They provide food and livelihood security for some 500 million people worldwide.⁵⁵ Many of these people could be at risk of displacement should these marine ecosystems continue to deteriorate.

SALINIZATION

Storm surges and the passing of waves over natural and man-made structures (wave overtopping) result from sea level rise. These phenomena causes salt water intrusion on productive coastal lands and freshwater aquifers.. Increasing evaporation of sea water on land and unsustainable land-use practises aggravates the salinization rate and affects the food and water security of coastal communities.⁵⁶

Excessive salinization of soils can inhibit seed germination and plant growth, reducing crop yields. In low-lying coastal areas and islands, water and soil salinization increasingly undermines arable land and fresh water, affecting food and water security for populations whose livelihoods are environmentally dependent. This leaves them more vulnerable to displacement.⁵⁷

In Bangladesh alone, about 20 million people in coastal areas are affected by the salinity of drinking water.⁵⁸ Salinity caused by rising sea levels is likely to force about 200,000 farmers a year to move from Bangladeshi coasts.⁵⁹

TAKING ACTION: CLIMATE MITIGATION STRATEGIES

As highlighted in this section, climate change's slow-onset effects result from, or are aggravated by, human actions. Overgrazing can contribute to deforestation, pollution can cause increasing temperatures and ocean acidification. Just as humans can degrade their environment, however, they can also take action to limit climate change and its negative consequences, including internal displacement.

The UN Framework Convention on Climate Change identified concrete ways to limit climate change. These include sustainable land management and community-based natural resource management, as well as water conservation programmes and the reduction of greenhouse gas emissions.⁶⁰

By reducing the intensity of the slow-onset effects of climate change, all these measures would reduce the need for affected people to leave their homes. Most of the measures, however, need time to be adopted and implemented in an effective manner. Mitigating the effects of climate change is likely the only sustainable solution to climate displacement, but other interventions must be taken to address it in the shorter term.

Such interventions can prevent internal displacement altogether or limit its scale by addressing its triggers. They can also be implemented after displacement has occurred to mitigate climate change's impacts on people's lives.

PREVENTING AND PREPARING FOR DISPLACEMENT IN THE CONTEXT OF CLIMATE CHANGE

Climate change can lead to displacement through loss of territory, loss of livelihoods, food and water insecurity, and the increased frequency and intensity of sudden-onset hazards. These effects do not inevitably trigger displacement, however. Displacement results from the fact that people affected by climate change do not have any other option but to flee.⁶¹

People exposed to the effects of climate change may be forced to move when they perceive that staying represents a higher risk than leaving.⁶² This perception of risk depends on the individuals, households and communities' pre-existing conditions.⁶³ Displacement is the result of the combination of exposure and vulnerability, as well as the intensity of climate change's slow-onset effects.

Preventive measures can be adopted to reduce this exposure and vulnerability and generate options other than displacement. These measures include reducing disaster risk, investing in sustainable development and ensuring safe and voluntary migration.

REDUCING THE RISK OF DISASTERS

Disaster risk reduction strategies rely on a solid understanding of how displacement comes about in a context of climate change. As knowledge of the issue grows, they become more efficient.

Early warning systems have become more sophisticated and accurate at forecasting weather, rainfall and other factors that potentially lead to disaster displacement.

They identify most exposed areas and households at risk of being displaced by integrating demographic information and vulnerability assessments into hazard risk mapping.

Models based on this type of information can help anticipate the impacts of climate change, such as erosion and sea level rise, and help plan for the displacement that would result. More longitudinal and comprehensive data on climate change is needed, however. Full implementation of the Sendai Framework for Disaster Risk Reduction should contribute to addressing this gap as it calls for improved monitoring of disasters, including those linked to the slow-onset effects of climate change at the local and national levels.⁶⁴

The risk of disasters can also be reduced through innovations that counter the effects of climate change on livelihoods and on food and water insecurity. Different varieties of crops can be selected or developed to resist drought. Specific breeding and farming techniques can be used to improve management of livestock and fisheries.

New technologies, however, are not always necessary. Long-known and sometimes forgotten historical practices can often be just as effective. Local food banks can be organized to support people and livestock in difficult years. Sustainable water, land and natural resource management can go a long way towards slowing the effects of climate change or even reverting some of them. Crop diversification can help ensure yields and limit diseases, while the restoration of centuries-old ecosystems can be a turning point in minimizing displacement risk.



Inside the cave where 8 families took shelter during the cyclone and are still living there while they are in the process of rebuilding their homes that were damaged by the cyclone. April 2020, © UNICEF/UNI324747/Shing

BOX 2: Vanuatu's Disaster Risk Reduction framework

Vanuatu has one of the more comprehensive Disaster Risk Reduction and mobility policy schemes worldwide. Its National Policy on Climate Change and Disaster-Induced Displacement not only seeks to address the needs of people displaced by disasters. It also addresses those at risk of becoming displaced and those wishing to move from high-risk areas. Further considerations regarding mobility have been included in Vanuatu's Climate Change and Disaster Risk Reduction Policy 2016-2030. This establishes evacuation protocols and safeguards to protect people displaced by sudden-onset disasters.

INVESTING IN SOCIOECONOMIC DEVELOPMENT

Several factors influence the ability of a family to withstand the effects of climate change and stay in their home. Some families may be able to purchase food and water elsewhere if nearby sources have become depleted. They may be able to find other sources of income if their former livelihood is no longer sustainable. They may have the means to repair a damaged home after a sudden-onset hazard.

These abilities are linked with their financial capital, income and educational levels. They are also related to the support they receive from their social networks and the options they have locally and through the government for work, vocational training, supplies and transportation.

Investing in economic development, decent work, education, health, food security, water and sanitation, infrastructure and virtually every sustainable development goal can therefore have a direct impact on reducing the risk of displacement by increasing people's capacity to adapt to climate change locally.

In a context of climate change, certain groups of people are at a higher risk of being displaced and experiencing severe impacts to their wellbeing and welfare. These groups include rural, indigenous, pastoralist, nomad, islander and coastal communities, and, more broadly, people who depend on their environment for food, water or income, including those involved in agriculture and tourism.

Identifying, in each context, those communities at higher risk can help governments and their partners prioritize investments into their socioeconomic advancement and the development of new livelihood opportunities that match their resources and interests before crises break out.

ENSURING SAFE AND VOLUNTARY MIGRATION

When disasters cannot be avoided and local adaptation to climate change is impossible, the only remaining solution is to move to another area. This move need not be forced and unplanned. With appropriate preparation and support, it can be safe and voluntary.

When managed properly, migration can not only save the lives of those affected by climate change. It can prove beneficial to their welfare and wellbeing, as well as to those of their host community. Under the right circumstances, such as adequate legislation and support in adapting to new areas and new lives, migration can improve migrants' access to decent livelihoods and basic services. It can also enrich their host community with an increased workforce and consumer market, and with new skills and cultures.

Some people are more likely than others to enjoy these benefits. Households with greater financial resources, educational levels and social networks, and with better access to support programmes, are more likely to migrate in favourable conditions.⁶⁵ Others may face risks such as exploitation and abuse, violations of human rights and threats to physical safety.

The slowly unfolding nature of climate change's consequences may afford governments and other stakeholders time to plan for safe migrations that benefit all.⁶⁶ Useful measures include agreements between countries to allow for international migration; capacity building to help communities develop new skills; and programmes to create adequate jobs for migrants. Kiribati's migration strategy, for instance, focuses on equipping its nationals with the skills they need to find work and settle abroad autonomously.⁶⁷

Planned relocation can be another alternative to displacement. Led or supported by the government, it is undertaken pre-emptively, and people are provided with the conditions for rebuilding their lives in a new location.⁶⁸ It can be a useful tool to protect those at higher risk of displacement. Ill-planned relocations, however, can have serious negative consequences on people's rights and wellbeing and should occur only when there is no other option.⁶⁹

Identifying the areas prone to displacement linked with climate change is a first step in planning relocations. There is, for instance, rising awareness of the vulnerability of certain urban areas to flooding. About 40 million people in both high- and low-income countries are already exposed to the phenomenon in large coastal cities. Their number is likely to increase because of sea level rise and population growth.⁷⁰

BOX 3: Peru's legislation on displacement in a context of climate change

Peru is particularly affected by glacier retreat, which affects the availability of water and jeopardizes the livelihoods of indigenous communities living in mountain areas. The Peruvian legislation on related displacement is often cited as an example of good practice.

Law n°29869, enacted in 2012, establishes the resettlement of people living in high risk regions and protects those seeking voluntary and involuntary resettlement. The Legislative Decree on Migrations (Decreto Legislativo de Migraciones) (2017) recognizes the rights of people affected by disasters and climate change, granting them protection and the right to move to other territories.

Peru in April 2018 became the first country in South America to pass a climate change law. This increased funding to the Ministry of the Environment and enabled the monitoring of greenhouse gases. The law also acknowledges the voice of indigenous groups and civil society in adaptation and mitigation measures.

Peru's laws and policies include other instruments that focus on sustainable development, prevention of displacement, disaster risk reduction, nature conservation, climate change adaptation and mitigation. This makes the country home to one of the most comprehensive sets of climate and disaster legislation in the world.

INVESTING IN THE PREVENTION OF CONFLICTS RELATED TO CLIMATE CHANGE

With increasing pressure on natural resources, climate change can not only result in displacement. It can also fuel tensions and conflicts that result in further displacement.⁷¹ Ninety-five per cent of the new conflict displacements recorded in 2020 worldwide occurred in countries that are vulnerable or highly vulnerable to climate change impacts.⁷²

For example, the emergence of Boko Haram in the Lake Chad region has been linked to natural resource scarcity exacerbated by drought and desertification.⁷³ Evidence also suggests that the extended drought that impoverished rural households in Syria played a role in the Arab Spring uprising and subsequent civil war.⁷⁴

Several countries recognize the link between conflict and climate change in their national policies (see Box 4).

BOX 4: Integrating conflict and climate change in displacement policies

With increased competition for dwindling natural resources, several countries are experiencing an increase in conflict among communities as a result of climate change. Some of them even address conflict displacement associated with climate change in their national policies and plans.

The National Climate Change Action Plan in Kenya recognises the link between resource scarcity, climate-induced migration, historical land conflicts, and displacement.⁷⁵

South Sudan's National Adaptation Plan requires that adaptation projects promote conflict resolution and peacebuilding, recognising that the impacts of climate change and the resulting competition for limited natural resources may contribute to conflict between communities.⁷⁶ It also acknowledges that ongoing conflict exacerbates the vulnerability of affected communities to climate change.

Sudan's National Adaptation Programme of Action highlights the risk of conflict among communities as a result of climate-induced displacement and competition for scarce resources.⁷⁷ It specifically identifies conflict and tension between farmers, herders and nomads, acknowledging the need to strengthen policies to address food security and water resource management to avoid further conflict.

Effective policies should take into account the various ways in which climate change can lead to displacement, including, when relevant, its link to conflicts and violence.

RESPONDING TO AND ADDRESSING THE IMPACTS OF DISPLACEMENT IN THE CONTEXT OF CLIMATE CHANGE

While preventing internal displacement from happening is the best option, it is not always possible. The only intervention left for affected communities, governments and aid providers is then to try and limit its negative consequences by supporting those affected. Evidence from displacement situations in various contexts can again help in planning for more comprehensive and inclusive responses.

Internal displacement associated with climate change, like all displacement, can affect the lives of IDPs, their communities of origin and their host communities in different ways. The most frequently recorded impacts relate to their livelihoods, housing conditions, health, education, security, social life and environment.⁷⁸

Certain groups of people can be affected more severely than others, or face different challenges in displacement. Children, women, people with disabilities, indigenous communities and pastoralists are among those who will likely require tailored support. The following sections highlight some of their specific needs.

CHILDREN

Their youth and limited resources mean that children are often less able to adapt to a changing climate and are often considered the most vulnerable group during displacement.⁷⁹ It is estimated that nearly 160 million children live in areas of extreme or high-risk drought and

500 million children live in areas of high-risk flooding.⁸⁰ Displacement threatens children's education, health and wellbeing and exposes them to new security risks.⁸¹ The availability of quality education is limited in displacement settings, and the movement of large populations can put a strain on already struggling education systems.⁸² Studies of people displaced by river erosion in Bangladesh and drought in Somalia highlight that financial difficulties are a significant barrier to education during displacement.⁸³ Damage to school infrastructure, shortages of teachers, loss of documentation and stigmatisation can also lead to reduced school enrolment rates during displacement.⁸⁴

Internally displaced children are at risk of malnutrition. They can be particularly vulnerable to diseases such as measles, malaria and respiratory infections that thrive in overcrowded conditions and emergency shelters.⁸⁵ Displacement can also cause children psychological distress. This can increase their need for psychosocial support and have long-term repercussions on their ability to learn.⁸⁶ Three years after Hurricane Katrina struck the United States, more than a third of the children who had been displaced or severely affected were found to be a year or more behind in school.⁸⁷ In addition to facing barriers in accessing healthcare and other services, children are exposed to a heightened risk of violence, exploitation and trafficking during displacement, particularly if they are separated from their families.⁸⁸

WOMEN AND GIRLS

Gender inequalities and social, economic and cultural factors make women and girls especially susceptible to the negative repercussions of climate change.⁸⁹ In some communities, women may be more dependent for their livelihoods on natural resources that are directly affected by slow-onset processes.⁹⁰ Limited property ownership, access to land and formal employment may also heighten women's exposure to the impacts of slow-onset events, potentially leading to displacement.⁹¹

Women and girls are at higher risk of violence during displacement and tend to face greater barriers in accessing education and finding decent work.⁹² For example, economic hardship has been linked to a rise in child marriages among people displaced by drought in Afghanistan and Somalia.⁹³ Women and girls also have specific health needs that may be difficult to meet in displacement situations. The reasons for this include the limited availability of sexual and reproductive health services, a lack of child-friendly and gender-sensitive information, and limited financial capacity.⁹⁴

IDPS WITH DISABILITIES

People with disabilities have been identified as one of the groups most severely impacted by the adverse effects of climate change.⁹⁵ Higher poverty rates among people with disabilities, inadequate housing, discrimination, and barriers in accessing services heighten their exposure and vulnerability to slow- and sudden-onset events. This can increase their risk of displacement.⁹⁶ In some cases, economic, physical, and informational obstacles prevent people with disabilities from leaving their communities of origin.⁹⁷ As a result, they may be forced to remain in degraded environments or may be unable to escape the threat of sudden-onset disasters, heightening their risk of death.⁹⁸

People with disabilities face unique challenges in displacement, but often encounter difficulties in accessing tailored support.⁹⁹ They are frequently excluded from early warning systems and evacuation processes. They are also at risk of being separated from carers and assistive devices while fleeing.¹⁰⁰ An assessment after Cyclone Pam struck Vanuatu in 2015 found that people with disabilities were more than twice as likely

to suffer cyclone-related injuries than those without them.¹⁰¹ Limited knowledge of evacuation processes, a lack of accessible evacuation shelters, and delays in fleeing because of functional difficulties were all cited as contributing factors. In addition to facing barriers in accessing livelihoods and inclusive housing, healthcare, and education, people with disabilities displaced during the 2011 famine in Somalia were at risk of forced evictions, violence and exploitation.¹⁰²

More needs to be done to ensure that people with disabilities are included in climate adaptation and disaster risk reduction, but examples of promising practices are emerging (Box 5).

INDIGENOUS COMMUNITIES

Changing environmental conditions have affected indigenous communities for decades. Many live in particularly sensitive ecosystems, such as the Arctic, arid and semi-arid regions, and tropical forests. They are also heavily reliant on natural resources.

Knowledge of the way internal displacement affects them is scarce. Climate change exacerbates the difficulties they face, including political and economic marginalization, the loss of land and resources, human rights violations, discrimination and unemployment.

In the Pacific Islands, there are fewer and fewer opportunities for indigenous communities to adapt in situ to environmental threats such as coastal erosion and sea level rise.¹⁰⁷ Relocation is often the only solution, as is the case for the community of Biausevu in the South of Viti Levu Island and the community of Solodamu on Kadavu Island.¹⁰⁸

Indigenous peoples should receive dedicated support in displacement, but they should not only be considered as victims. They are also among the people best positioned to foster sustainable solutions (Box 6).

PASTORALISTS AND RURAL COMMUNITIES

Pastoralists are heavily affected by droughts, desertification, land degradation and deforestation that can jeopardize their traditional routes and gradually undermine

BOX 5: Including people with disabilities in prevention and response to displacement in a context of climate change

Promising examples are emerging of how to build more resilient and inclusive communities and assist people with disabilities in coping with the effects of climate change.

A project in Gaibandha, Bangladesh, provides targeted support to people with disabilities in flood-prone areas so they have access to livelihood opportunities and can register for social protection from the government.¹⁰³ The additional income reduces their risk of displacement by enabling them to buy materials to fortify their homes and protect their water supplies. Self-help groups of people with disabilities and community-run disaster management committees also work with the government to promote disability inclusion in disaster risk reduction.

In drought-affected communities in Niger, the establishment of climate-sensitive gardens provides people with disabilities, as well as their families, with produce to eat and sell.¹⁰⁴ By enhancing their food security and fostering their socioeconomic inclusion, the project provides the means and incentives so that people with disabilities do not have to move.

Steps have also been taken to include people with disabilities in responses to disaster displacement. In the Philippines, early warning evacuation systems incorporate both sound and visual signals to improve accessibility.¹⁰⁵ Humanitarian actors and government officials in Nepal have received training on disability-inclusive shelter arrangements, including the need for shelters to have ramp access and sanitation facilities located on the ground floor.¹⁰⁶

As people with disabilities are best placed to identify the type of support they require, their meaningful participation in climate change mitigation, disaster risk reduction and responses to displacement is essential to ensuring they are not left behind.

BOX 6: Indigenous communities as agents of change

There is increasing awareness that indigenous communities are agents of environmental conservation, adaptation and mitigation.¹⁰⁹

Indigenous peoples have cultivated nature-based knowledge systems and recognize the complex interdependence of all life forms. This is key to the preservation of sustainable resources and ecosystems. For generations, they have observed the effects of climate change and have developed effective practices for biodiversity conservation as well as climate adaptation and mitigation.¹¹⁰

In Alaska, integrating indigenous knowledge and science to grasp the rate of environmental change is essential.¹¹¹ Inuit Tapiriit Kanatami, the national representative organisation for Inuit in Canada, released the National Inuit Climate Change Strategy in 2019. It is the only comprehensive Arctic-focused climate change strategy in the country.¹¹² The four-year plan seeks to respond to climatic changes in the Arctic and sets out coordinated policies and actions that include the Inuit.

Much can be learned from the indigenous communities' strategies, culture and practices around climate change.¹¹³ But the adaptive capacity of indigenous peoples will only be successful if integrated with other components, such as disaster preparation, land-use planning, environmental conservation and national plans for sustainable development.

their nomadic lifestyle.¹¹⁴ Internal displacement results when pastoralist livelihoods reach a critical threshold and become unsustainable. It results when access to food and water becomes too restricted, when adaptive migration is no longer possible and coping capacities are largely exhausted.¹¹⁵ Impacts on displaced pastoralists can be severe, and their ability to survive without support, limited.

For pastoral communities in the Doolo zone of the Somali region of Ethiopia, the 2015 to 2017 drought was the worst in living memory.¹¹⁶ Families were forced to move to peri-urban areas in search of clean water and humanitarian assistance and became heavily reliant on that assistance. Most displaced households lived in makeshift shelters, vulnerable to gender-based violence, child abuse, psychosocial distress and other protection issues.

Other rural communities, including farmers and herders, also face significant threats to their livelihoods from climate change.

ENCOURAGING PARTICIPATORY APPROACHES

Internal displacement resulting from climate change tends to affect certain groups of people, like pastoralists and indigenous communities, more than others. These groups are at higher risk because of their relationship to nature, but their particular knowledge of and relationship with it also puts them in a strong position to take action against climate change's consequences.

For this reason, and because the participation of affected groups is essential to the effectiveness and durability of humanitarian and development interventions, communities displaced by climate change should be involved in planning prevention and response.

People from marginalised groups are often the most likely to be displaced as a result of climate change or suffer its most severe effects. Their participation in decision-making cannot be taken for granted. Dedicated efforts to empower them and increase their capacity to take action may be necessary.¹¹⁷ Participatory data collection, planning and implementation of projects can not only ensure their contribution and buy-in but also help tailor interventions to the context and allow for mutual learning.¹¹⁸

ENSURING INCLUSIVE AND COMPREHENSIVE RESPONSES

Displacement associated with climate change evolves slowly. Because of this, governments and aid providers have time to plan ahead and ensure more inclusive and comprehensive responses when displacement cannot be avoided. Improving data and projections on the location and on the scale of future displacement can allow them to prepare years in advance, giving them enough time to mobilize the necessary resources.

This is rarely the case, however, because data is still lacking and awareness of the risk of displacement linked with climate change is insufficient. Other more pressing issues frequently take precedence. The compound events and cascading impacts of climate change are not considered in planning. Most humanitarian response plans, for instance, focus on crises linked with conflict and violence or disasters.

Some people displaced by the effects of climate change may well have to depend on humanitarian and development assistance for their survival but may be left out entirely. They may not benefit from the legal protections offered in response to sudden-onset disasters, conflicts and violence.

This is a missed opportunity. It is also a significant gap in humanitarian assistance in some of the most severe displacement situations affecting highly vulnerable groups. In addition to triggering displacement, the effects of climate change can magnify the risks IDPs face by further limiting their access to food, clean water and livelihood opportunities and exposing them to ill health and extreme poverty.

REACHING DURABLE SOLUTIONS

Emergency response plans and life-saving interventions in the initial stages of a displacement crises must be complemented with longer-term solutions. This is particularly true in a context of climate change. Interviews with pastoralists displaced by the 2017 drought in Somalia and discussions with the humanitarian

actors supporting them highlighted the need to plan for local integration in the host area and invest in new infrastructure, services and vocational training to ensure that IDPs could transition to work guaranteeing sustainable livelihoods.¹¹⁹

Displacement linked with climate change cannot always end with a return to the area of origin. The land and resources may have been damaged so that food, water or livelihood opportunities have been reduced or eliminated. The territory may have disappeared. It may be more frequently and severely affected by sudden-onset disasters. All these things would mean that IDPs were risking their lives going back.

Integrating into a new home is therefore the only durable solution for most people displaced by climate change. Two surveys conducted in 2019 and 2020 of pastoralists displaced by drought in the Somali

region of Ethiopia showed that all of them preferred local integration to returning.¹²⁰ This reality must be taken into account by policymakers. Efforts to address this type of displacement must consider longer-term investments to ensure successful relocations. That includes infrastructure development in the IDPs' areas of refuge and capacity building to help them find new sources of income if necessary.

The linkages between humanitarian interventions, development investments and peacebuilding are particularly relevant in this context. Identifying solutions to successfully integrate IDPs into their new home requires the involvement of both the displaced and the host communities. It also requires specific information on their situation, needs and resources. Community engagement initiatives have shown positive results in certain displacement contexts, for instance, in Cox's Bazar (Box 7).

BOX 7: Involving IDPs and host communities in solutions to displacement

In Cox's Bazar in Bangladesh, an initiative recently highlighted the key role of communities in managing the complex interactions between hazards, exposure, vulnerability and capacities.¹²¹ The International Organization for Migration (IOM) and Mercy Corps conducted a participatory Rapid Strategic Humanitarian Resilience Assessment. This included a Community-Based Disaster Risk Reduction (CBDRR) toolkit, piloted in Rohingya refugee camps and displacement sites in Cox's Bazar and then rolled out as a core component of IOM's programming. Through participatory focus group discussions, communities defined and mapped risks and resources at household and block level. In the process, they built consensus on community actions to reduce risks and strengthen resilience capacities for prevention, preparedness, response and recovery.

Community risk and resilience mapping also served as a key forum to mitigate inter-community conflict and identify common solutions. For example, Rohingya and Bangladeshi woman-headed households had identified common challenges related to the safety of their children. They were particularly concerned with the open pits and ponds that flood during heavy rains. After the workshops, the community felt a sense of shared achievement and greater social cohesion. The workshops also proved useful in ensuring the integration and active contribution of groups that are often overlooked in disaster risk reduction and responses, such as women and people with disabilities.

Such efforts may seem like drops in the ocean, but they are practical ways to engage at-risk communities and build a relationship of trust, support, motivation, and participation. The capacities of communities to learn, cope, adapt and transform in the face of shocks and stresses should be better harnessed to feed into the design, development and implementation of national disaster risk reduction and climate change adaptation plans and strategies.¹²²

TOWARDS BETTER INFORMED INTERVENTIONS

This report builds on a growing body of evidence from displacement situations worldwide. This evidence allows for a better understanding of the drivers, triggers and impacts of displacement linked with climate change, and for an initial identification of successful responses and preventative measures. More information is needed to present policy makers and aid providers with a list of options they can use, depending on the displacement situation they face.

Assessments of the drivers of displacement should include specific questions to assess whether climate change played a role in the decision to move. At present, this type of assessment often records only the trigger:

loss of livelihoods, food insecurity, a sudden-onset disaster, violence or a conflict which was linked with climate change but not reported as such. This leads to a systematic underestimate of the number of people displaced as a result of climate change.

Survey-based assessments can be complemented with technology-based sources. These include drones and satellite images, data generated by mobile phones, and other applications. The expansion of this type of information and analysis holds promise that the actual scale of displacement linked with climate change can be grasped (Box 8).

BOX 8: Improving estimates on the number of IDPs in the context of climate change

The increasing amount of data being collected on climate change and human mobility can also help improve projections on related displacement. Models that attempt to forecast displacement depend on a variety of assumptions, including about the climate system, the effects of its changes on ecosystem services, how those affect people, and how people adapt to the impacts.¹²³

For the moment, much uncertainty remains as to the number of people who will eventually be internally displaced as a result of climate change. Whether people's mobility will be internal or cross-border, voluntary, forced or a mix of both, is rarely defined. Estimates tend to indicate the number of people at risk of facing adverse impacts from climate change, rather than those who are likely to migrate. Most estimates also fail to take into account the non-linear and non-gradual interactions of different factors leading to displacement.¹²⁴

The NASA Earth Science Division used computer simulations to estimate the number of people that could be displaced by the impacts of sea level rise, based on 23 years of sea level data.¹²⁵ Without mitigation and adaptation interventions, more than a billion people might have to move because of sea level rise caused by ice sheet collapse from 2100 onwards.¹²⁶

The World Bank's 2018 Groundwell report focused on slow-onset events, internal displacement and development in sub-Saharan Africa, South Asia, and Latin America. Its model applied demographic and socioeconomic data as well as impact data for slow-onset events at the level of a 14-square kilometre grid cell to model likely shifts in population within countries. It did so according to three climate change and development scenarios. In the worst-case scenario, the number of IDPs could reach more than 143 million (around 86 million in sub-Saharan Africa, 40 million in South Asia, and 17 million in Latin America) by 2050.¹²⁷

Better estimates of the number of people displaced in the context of climate change are essential to raise awareness on the need to address the phenomenon. They are needed to spur the investment of greater resources into climate change mitigation and adaptation, socioeconomic development, disaster risk reduction, humanitarian assistance and other efforts to prevent displacement and respond to its negative consequences. Such estimates, however, will not be enough to inform policy action. More displacement

data and further analysis of the linkages between climate change's effects, other drivers and triggers of displacement, and the way climate displacement affects people's lives, is needed. So is more quantitative and qualitative data from displacement situations that remain almost entirely invisible in research today, such as displacement linked with sea level rise, coastal erosion, temperature rise and other slow-onset disasters.



The heavy monsoon rains flooded the northern and north-eastern districts of Bangladesh. Earlier, during the last week of June 2020.
WFP/Mehedi Rahman

NOTES

- 1 IPCC, [Climate Change 2014, Synthesis Report: Summary for Policymakers](#), 2014.
- 2 IDMC, [Global Report on Internal Displacement 2020 : Methodological Annex](#), April 2020.
- 3 WIM Task Force on Displacement, [Synthesizing the state of knowledge to better understand displacement related to slow onset events](#), 2018.
- 4 WIM Task Force on Displacement, [Synthesizing the state of knowledge to better understand displacement related to slow onset events](#), 2018.
- 5 IDMC, [No matter of choice: displacement in a changing climate, Research agenda and call for partners](#), December 2018.
- 6 IDMC, [Global Report on Internal Displacement 2021](#), May 2021.
- 7 WIM Task Force on Displacement, [Synthesizing the state of knowledge to better understand displacement related to slow onset events](#), 2018.
- 8 IDMC, [Global Report on Internal Displacement 2020 : Methodological Annex](#), April 2020.
- 9 IDMC, [Global Report on Internal Displacement 2020 : Methodological Annex](#), April 2020.
- 10 UNDRR, [GAR Special Report on Drought](#), 2021.
- 11 IPCC, [Climate Change 2014, Synthesis Report: Summary for Policymakers](#), 2014.
- 12 UNFCCC, [Slow onset events](#), 2012
- 13 A. AghaKouchak et al., [“Climate Extremes and Compound Hazards in a Warming World”](#), Annual Review of Earth and Planetary Sciences, 2020 48:1, 519-548
- 14 WMO, [Statement on the State of the Global Climate in 2016](#), 2017.
- 15 IPCC, [Climate Change 2014, Synthesis Report: Summary for Policymakers](#), 2014.
- 16 IOM, [The Atlas of Environmental Migration](#), 2017.
- 17 UNFCCC, [Slow onset events](#), 2012
- 18 D.L. Passeri, 2015, The dynamic effects of sea level rise (SLR) on low-gradient coastal landscapes
- 19 WMO, [Statement on the State of the Global Climate in 2016](#), 2017.
- 20 El-Raey, M., et al. “Potential Impacts of Accelerated Sea-Level Rise on Alexandria Governorate, Egypt.” Journal of Coastal Research, 1995, pp. 190–204. JSTOR, www.jstor.org/stable/25735708.
- 21 Thomson Reuters Foundation, [As Senegal's coast crumbles, residents ponder move to safer ground](#), 26 May 2017.
- 22 WMO, [Statement on the State of the Global Climate in 2016](#), 2017.
- 23 Glantz, M. H. 2019. The UN and desertification: Dealing with a global problem. In: Glantz, M. H. (ed) Desertification: environmental degradation in and around arid lands. CRC Press, no pagination.
- 24 Mirzabaev, A. et. al, Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems. IPCC, pp. 294-343.
- 25 Saier, M. H. 2010. Desertification and migration. Water, Air, and Soil Pollution. 205(1), pp. 31-32.
- 26 Leighton, M. 2006. Desertification and migration. In: Johnson, P. M., Mayrand, K., & Paquin, M. (eds.) Governing global desertification: linking environmental degradation, poverty and participation. London: Ashgate Publishing, pp. 43-58.
- 27 IOM, 2015, Migration, Environment and Climate Change: Training, module 3
- 28 UNDRR, [GAR Special Report on Drought](#), 2021.
- 29 Inter Press service, 2017. The High Cost of Desertification, <https://reliefweb.int/report/world/high-price-desertification-23-hectares-land-minute>
- 30 IOM, 2015, Migration, Environment and Climate Change: Training, module 3
- 31 IOM, 2015, Migration, Environment and Climate Change: Training, module 3
- 32 IPCC, [Climate Change 2014, Synthesis Report: Summary for Policymakers](#), 2014.
- 33 NOAA 2019 Global Climate Summary
- 34 IOM, 2015, Migration, Environment and Climate Change: Training, module 3
- 35 N. Watts and al, 2017, The Lancet Countdown on health and climate change: from 25 years of inaction to a global transformation for public health
- 36 WMO, [Statement on the State of the Global Climate in 2016](#), 2017.
- 37 Australian Bureau of Meteorology, Climate and Oceans Support Program in the Pacific (COSPPac).
- 38 UNFCCC, [Slow onset events](#), 2012
- 39 IDMC, [Global Report on Internal Displacement 2021](#), May 2021.
- 40 Turco, M., Rosa-Cánovas, J.J., Bedia, J. et al. [“Exacerbated fires in Mediterranean Europe due to anthropogenic warming projected with non-stationary climate-fire models”](#), Nat Commun 9, 3821, 2018.
- 41 IPBES. 2018. Assessment Report on Land Degradation and Restoration [Montanarella, L., R. Scholes., and A. Brainich. (eds.)]. Bonn: Secretariate of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services.
- 42 FAO, 2015, Status of the World’s Soil Resources
- 43 UNCCD, 2014, The Land in Numbers : Livelihoods at a Tipping Point
- 44 Intergovernmental Science-Policy. Platform on Biodiversity and Ecosystem Services (IPBES), 2018, Summary for policymakers of the thematic assessment of land degradation and restoration
- 45 UNFCCC, [Slow onset events](#), 2012
- 46 UNFCCC, [Slow onset events](#), 2012
- 47 IPBES, [Global Assessment Report on Biodiversity and Ecosystem Services](#), 2019.
- 48 D.W. Laist, "Impacts of marine debris: entanglement of marine life in marine debris including a comprehensive list of species with entanglement and ingestion records," in Coe, J.M. Rogers, D.B. (eds), Marine Debris: Sources, Impacts, and Solutions: Springer-Verlag, New York, (1997) 99-139.
- 49 WWF, [Living Planet Report - 2018: Aiming Higher](#), 2018.
- 50 UNICEF, Why biodiversity is important for children: five things you need to know, 2020.
- 51 ADB, United Nations Economic and Social Commission for Asia and the Pacific and UNEP, 2012, Green Growth, Resources and Resilience: Environmental Sustainability in Asia and the Pacific
- 52 IPCC, [Climate Change 2014, Synthesis Report: Summary for Policymakers](#), 2014.

- 53 UNEP, 2010, Emerging Issues: Environmental Consequences of Ocean Acidification: A Threat to Food Security
- 54 IOM, 2017, The Atlas of Environmental Migration.
- 55 UNEP, 2010, Emerging Issues: Environmental Consequences of Ocean Acidification: A Threat to Food Security.
- 56 UNFCCC, [Slow onset events](#), 2012
- 57 IOM, 2017, The Atlas of Environmental Migration.
- 58 Khan AE, Ireson A, Kovats S, et al., Drinking Water Salinity and Maternal Health in Coastal Bangladesh: Implications of Climate Change, *Environ Health Perspect*. 2011;119(9):1328-1332. doi:10.1289/ehp.1002804
- 59 Chen, J., Mueller, V. Coastal climate change, soil salinity and human migration in Bangladesh. *Nature Clim Change* 8, 981–985 (2018). <https://doi.org/10.1038/s41558-018-0313-8>
- 60 UNFCCC, [Slow onset events](#), 2012
- 61 IDMC, [No matter of choice: displacement in a changing climate. Research agenda and call for partners](#), December 2018.
- 62 H. Upadhyay, I. Kelman, Lingaraj G J, A. Mishra, C. Shreve, R. Stojanov, (2015) Conceptualizing and contextualizing research and policy for links between climate change and migration", *International Journal of Climate Change Strategies and Management*, Vol. 7 Issue: 3, pp.394-417, <https://doi.org/10.1108/IJCCSM-05-2014-0058>
- 63 A. Randall, [Understanding a slow disaster: getting to grips with slow-onset disasters, and what they mean for migration and displacement.](#)
- 64 UNISDR, 2015, Chart of the Sendai Framework for Disaster Risk Reduction.
- 65 K. Warner, T. Afifi , 2014, Where the rain falls: Evidence from 8 countries on how vulnerable households use migration to manage the risk of rainfall variability and food insecurity, *Climate and Development*
- 66 UNDP, ODI, 2017, Climate change, migration and displacement The need for a risk-informed and coherent approach
- 67 [Fiji Supports Kiribati On Sea Level Rise](#) [Press Release], 11 February 2014.
- 68 UNHCR, Brookings Institution, Georgetown University, [Planned relocation guidance](#), 2015.
- 69 H. Graeme, 2012, Climate Change-Induced Mobility and the Existing Migration Regime in Asia and the Pacific, in *Climate Change and Displacement: Multidisciplinary Perspectives*, Hart Publishing, Oxford, p. 10.
- 70 OECD, [Ranking of the World's Cities Most Exposed to Coastal Flooding Today and in the Future](#), 2007.
- 71 UNHCR and UNU, "Climate change, vulnerability and human mobility: perspectives of refugees from the East and Horn of Africa", 2012; UNHCR, ["Quick Guide, Climate Change and Disaster Displacement"](#), 2017.
- 72 IDMC, [Global Report on Internal Displacement 2021](#), May 2021.
- 73 IDMC, ["Understanding the root causes of displacement: towards a comprehensive approach to prevention and solutions"](#), 2015.
- 74 IDMC, [A decade of displacement in the Middle East and North Africa](#), 2020.
- 75 Republic of Kenya, [National climate change action plan 2018-2022](#), Volume I.
- 76 Republic of South Sudan, [National Adaptation Programme of Actions \(NAPA\) to climate change](#).
- 77 Republic of the Sudan, [National Adaptation Programme of Action](#).
- 78 IDMC, [Multidimensional impacts of internal displacement, October 2018](#).
- 79 UN HRC, ["Analytical study on the promotion and protection of the rights of persons with disabilities in the context of climate change: Report of the Office of the United Nations High Commissioner for Human Rights"](#), A/HRC/44/30, 22 April 2020.
- 80 UNICEF, ["Climate mobility and children"](#), 2020.
- 81 UNICEF, ["Children uprooted in the Caribbean: How stronger hurricanes linked to a climate change are driving child displacement"](#), December 2019; UNICEF, ["No place to call home: Protection children's rights when the changing climate forces them to flee"](#), April 2017.
- 82 IDMC, ["Twice invisible: accounting for internally displaced children"](#), November 2019
- 83 IDMC, ["Measuring the costs of internal displacement on IDPs and hosts: Case studies in Eswatini, Ethiopia, Kenya and Somalia"](#), January 2020; UNICEF, ["No place to call home: Protection children's rights when the changing climate forces them to flee"](#), April 2017; Rahman, Sadequr, M., Gain, A., 'Adaptation to river bank erosion induced displacement in Koyra Upazila Bangladesh, *Progress in Disaster Science*, 5, 2020, available at: <https://reader.elsevier.com/reader/sd/pii/S2590061719300559?to-ken=8EF88E89EC87E279479C5DBE8A37DB-D1C289E49C15BA8C387B923E3299BA-84F818384952708A64AE5B8C4ADD17328F3A>
- 84 IDMC, ["Twice invisible: accounting for internally displaced children"](#), November 2019
- 85 UNICEF, ["Children uprooted in the Caribbean: How stronger hurricanes linked to a climate change are driving child displacement"](#), December 2019; Charchuk, Rhianna et al. 'Burden of malaria is higher among children in an internal displacement camp compared to a neighbouring village in the Democratic Republic of the Congo', *Malaria Journal*, 15 (431), 25 August 2016, available at: <https://malaria-journal.biomedcentral.com/articles/10.1186/s12936-016-1479-z>; Mason, [Child Acute Malnutrition and Mortality in Populations Affected by Displacement in the Horn of Africa](#), 1997–2009, *International Journal of Environmental Research and Public Health*, 2012.
- 86 Reed et al., [Mental health of displaced and refugee children resettled in low-income and middle-income countries: risk and protective factors](#), *Lancet*, 2012.
- 87 Abramson, D.M. et al., 'Children as bellwethers of recovery: dysfunctional systems and the effects of parents, households, and neighborhoods on serious emotional disturbance in children after Hurricane Katrina'. *Disaster Med Public Health Preparedness*, 4, 2010, available at: <https://pubmed.ncbi.nlm.nih.gov/23105031/>
- 88 IDMC, ["Twice invisible: accounting for internally displaced children"](#), November 2019; UNICEF, ["Children uprooted in the Caribbean: How stronger hurricanes linked to a climate change are driving child displacement"](#), December 2019.
- 89 UN Chronicle, ["Women... In the Shadow of Climate Change"](#), N.D.
- 90 UNHRC, ["Report of the Special Rapporteur on the human rights of internally displaced persons internal displacement in the context of the slow-onset adverse effects of climate change"](#), A/75/207, 21 July 2020.
- 91 UNHRC, ["Report of the Special Rapporteur on the human rights of internally displaced persons internal displacement in the context of the slow-onset adverse effects of climate change"](#), A/75/207, 21 July 2020.
- 92 IDMC, ["Women and girls in internal displacement"](#), March 2020.
- 93 REACH, ["Drought and Protection Concerns in IDP Sites"](#), April 2018; World Vision, ["As Water Levels Drop, Early Marriage is On the Rise"](#), September 2018.
- 94 IDMC, ["Women and girls in internal displacement"](#), March 2020.

- 95 WHO, '[World Report on Disability](#)', 2011; UN Human Rights Council, Panel discussion on promoting and protecting the rights of persons with disabilities in the context of climate change: Report of the Office of the United Nations High Commissioner for Human Rights, A/HRC/46/46, 22 December 2020;
- 96 Stough, L. & D. Kang, 'The Sendai Framework for Disaster Risk Reduction and Persons with Disabilities', International Journal of Disaster Reduction and Persons with Disabilities, 2015, 6, pp.140-149, available at: <https://link.springer.com/article/10.1007/s13753-015-0051-8>; UN HRC, '[Analytical study on the promotion and protection of the rights of persons with disabilities in the context of climate change: Report of the Office of the United Nations High Commissioner for Human Rights](#)', A/HRC/44/30, 22 April 2020.
- 97 UN HRC, '[Analytical study on the promotion and protection of the rights of persons with disabilities in the context of climate change: Report of the Office of the United Nations High Commissioner for Human Rights](#)', A/HRC/44/30, 22 April 2020.
- 98 UN HRC, '[Analytical study on the promotion and protection of the rights of persons with disabilities in the context of climate change: Report of the Office of the United Nations High Commissioner for Human Rights](#)', A/HRC/44/30, 22 April 2020; UNISDR, '[Living with Disability and Disaster](#)', 2014.
- 99 IDMC, '[Disability, disasters and displacement](#)', March 2021.
- 100 Shivji, Aleema, 'Disability in displacement', Forced Migration Review 35, July 2010, pp.4-7, available at: <https://www.fmreview.org/sites/fmr/files/FMRdownloads/en/disability/FMR35/04-07.pdf>; Stough, L. & D. Kang, 'The Sendai Framework for Disaster Risk Reduction and Persons with Disabilities', International Journal of Disaster Reduction and Persons with Disabilities, 2015, 6, pp.140-149, available at: <https://link.springer.com/article/10.1007/s13753-015-0051-8>; UNISDR, '[Living with Disability and Disaster](#)', 2014.
- 101 CBM-Nossal Institute Partnership for Disability Inclusive Development, Oxfam, VSPD, DPA et al. '[Disability Inclusion in Disaster Risk Reduction](#)', 2017.
- 102 Refugee International, '[Disable and Displaced: The Plight of Somalia's Most Vulnerable](#)', 2 February 2016.
- 103 CBM, Humanity & Inclusion, & IDA, '[Inclusion of persons with disabilities in humanitarian action](#)', 2019.
- 104 CBM, '[Technical brief for the post-2015 consultation process. Disability, sustainable development and climate change](#)', 2012.
- 105 CBM, Humanity & Inclusion, & IDA, '[Inclusion of persons with disabilities in humanitarian action](#)', 2019.
- 106 IFRC, '[All Under One Roof: Disability-inclusive shelter and settlements in emergencies](#)', 2015.
- 107 SPREP, '[Pacific Adaptation to Climate Change](#)', 2009.
- 108 Gharbaoui, D. and Blocher, J., '[The Reason Land Matters: Relocation as Adaptation to Climate Change in Fiji Islands](#)', 2016.
- 109 Etchart, L., '[The role of indigenous peoples in combating climate change](#)', 2017.
- 110 IWGIA, '[The Indigenous World 2020](#)', 2020.
- 111 Robin, B., '[Usteq: integrating indigenous knowledge and social and physical sciences to coproduce knowledge and support community-based adaptation](#)', 2019.
- 112 Inuit Tapirit Kanatami, 'National Inuit Climate Change Strategy', 2019.
- 113 The International Work Group for Indigenous Affairs, Conference on Indigenous Peoples and Climate Change, 2008.
- 114 IOM, 2017, The Atlas of Environmental Migration.
- 115 IDMC, '[On the margin: Kenya's pastoralists. From displacement to solutions, a conceptual study on the internal displacement of pastoralists](#)', 2014. IDMC, '[Assessing drought displacement risk for Kenyan, Ethiopian and Somali pastoralists](#)', 2014.
- 116 IDMC, '[Nothing to put in your mouth. Seeking durable solutions to drought displacement in Ethiopia](#)', 2019.
- 117 UNFCCC, 2015, Synthesis of relevant information, good practices and lessons learned in relation to Pillar 3: Enhancing Action and Support, WIM EXCOM and IOM technical meeting.
- 118 UNHCR and UNU, 2012, Climate change, vulnerability and human mobility: perspectives of refugees from the East and Horn of Africa
- 119 IDMC, '[Recommendations for addressing drought displacement in Somalia](#)', April 2021.
- 120 IDMC, '[From basic needs to the recovery of livelihoods: Local integration of people displaced by drought in Ethiopia](#)', March 2021.
- 121 Henly-Shepard, S. (2018) Planting Seeds of Resilience in Humanitarian Settings: Rapid Strategic Resilience Assessment Report for the Rohingya Crisis, Cox's Bazar, Bangladesh. https://www.mercycorps.org/sites/default/files/2019-12/Mercy_Corps-IOM_Rapid_Strategic_Resilience_Assessment_Report.pdf
- 122 Megan Denise Smith, International Organization for Migration (IOM) Bangladesh and Sarah Henly-Shepard, Ph.D., MPH, Mercy Corps, '[Disasters and Displacement in Bangladesh: Re-conceptualising Strategies of Risk Reduction and Resilience, background paper to the GRID 2021](#)'.
- 123 UNFCCC, '[Synthesis of relevant information, good practices and lessons learned in relation to Pillar 1: Enhancing Knowledge and Understanding](#)', 2016.
- 124 H. Upadhyay, I. Kelman, Lingaraj G J, A. Mishra, C. Shreve, R. Stojanov, (2015) Conceptualizing and contextualizing research and policy for links between climate change and migration", International Journal of Climate Change Strategies and Management, Vol. 7 Issue: 3, pp.394-417, <https://doi.org/10.1108/IJCCSM-05-2014-0058>
- 125 NASA, '[NASA Science Zeros in on Ocean Rise: How Much? How Soon?](#)', 2015.
- 126 N. Watts and al, 2017, The Lancet Countdown on health and climate change: from 25 years of inaction to a global transformation for public health
- 127 K.K. Rigaud, A. de Sherbinin, B. Jones, J. Bergmann, V. Clement, K. Ober, J. Schewe, S. Adamo, B. McCusker, S. Heuser, and A. Midgley. 2018. [Groundswell: Preparing for Internal Climate Migration](#). Washington, DC: The World Bank.



Every day, people flee conflict and disasters and become displaced inside their own countries. IDMC provides data and analysis and supports partners to identify and implement solutions to internal displacement.

The Internal Displacement Monitoring Centre
3 rue de Varembé, 1202 Geneva, Switzerland
+41 22 552 3600 | info@idmc.ch

 www.internal-displacement.org
 www.facebook.com/IDMC.Geneva
 www.twitter.com/IDMC_Geneva