

The Climate Crisis

Climate Change Impacts, Trends and
Vulnerabilities of Children in Sub Saharan Africa



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Vulnerabilities of Children in Sub Saharan Africa

WASH Section, UNICEF ESARO

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Acronyms

°C	degrees celsius
ANC	antenatal care
ART	anti-retroviral therapy
BMZ	Federal Ministry for Economic Cooperation and Development (Germany)
CRED	Center for Research on Epidemiology of Disasters
CO ₂	carbon dioxide
CPD	country programme document
CRC	United Nations Convention on the Rights of the Child
CSIR	Council for Scientific and Industrial Research
DRR	disaster risk reduction
EM-DAT	Emergency Events Database
ENSO	El Niño-Southern Oscillation
ESARO	Eastern and Southern Africa Regional Office
FAO	Food and Agriculture Organization of the United Nations
FEWSNET	Famine Early Warning Systems Network
GCF	Green Climate Fund
GEF	Global Environment Facility
GEWS	groundwater early warning system
GHG	greenhouse gas
GWP	Global Water Partnership
IFAD	International Fund for Agricultural Development
IFI	International financing institution
INDCs	Intended Nationally Determined Contributions
IPC	Integrated Food Security Phase Classification
IPCC	Intergovernmental Panel on Climate Change

ITCZ	Intertropical Convergence Zone
IUCN	International Union for Conservation of Nature
LDC	Least Developed Countries
LDCF	Least Developed Countries Fund
LEG	LDC Expert Group
NAP	National Adaptation Plan
NAPA	National Adaptation Programme of Action
ND-GAIN	University of Notre Dame Global Adaptation Initiative
NDCs	Nationally Determined Contributions
NDVI	Normalized Difference Vegetation Index
NGO	non-governmental organization
NYHQ	New York Headquarters
OCHA	United Nations Office for the Coordination of Humanitarian Affairs
OWNP	One WASH National Programme
RCP	Representative Concentration Pathway
SDGs	Sustainable Development Goals
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNICEF	United Nations Children's Fund
UNFCCC	United Nations Framework Convention on Climate Change
UNSDCF	United Nations Sustainable Development Cooperation Framework
WASH	water, sanitation and hygiene
WFP	World Food Programme
WWF	World Wide Fund for Nature

Foreword

COVID-19 is a seemingly relentless test of the world's ability to respond to an unprecedented crisis. Yet while global efforts confront the pandemic, we must not forget that the world is facing an even more ominous challenge: the climate crisis.

Before COVID-19 hit the continent, African children were already suffering from the effects of longer and more intense droughts, repeated floods and shifting seasons. Whilst all efforts are focused on how to respond to the pandemic and address its socio-economic impacts, climate change remains a long-term threat unlike any we have faced. In fact, it is a threat that continues to disproportionately harm children, young people and their communities across Africa. These climate impacts are causing forced displacement, disruption of schooling and increased child labour, and contributing to increased violence as availability and access to natural resources become scarce. They are directly affecting children's health due to deteriorating sanitation and compromised access to clean water, as boreholes dry up, and forcing children to fetch water in ever-more remote locations under severe exposure to heat.

Although there is no evidence of a direct correlation between climate change and COVID-19, the former may affect the pandemic response as it undermines environmental determinants of health—such as clean air, water and sanitation, and nutritious food—and puts further stress on health systems.

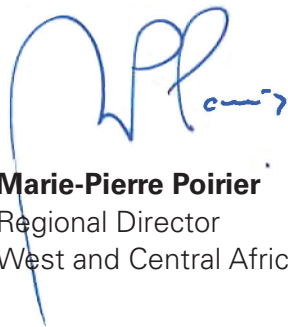
With disruptions of essential basic services, including school closures, and far-reaching socio-economic impacts, the COVID-19 crisis and its management has wrought havoc across Africa. As we move to the recovery phase, we cannot go back to business as usual, but must “build back better.” COVID-19 provides us with an opportunity to reimagine a world where children and youth are protected from various shocks and stresses including the impacts of climate change, while ensuring access to basic services such as education, health, water and sanitation, nutrition, and protection. The focus must be on at-scale investment in processes, practices and systems that are sustainable, risk-informed and inclusive, and increase our resilience and ability to respond to future crises. The message could not be starker: Africa's children depend on it.

This report identifies existing and future climactic vulnerabilities and sets out what is needed to equip communities, systems and children to cope with climate crises. Investment in climate and disaster-resilient water, sanitation and hygiene (WASH) systems; green and safe schools for resilient learning; climate-smart and disaster-resilient health services that have a minimal environmental footprint; climate-responsive social protection mechanisms; and climate-smart food systems and diets are all vital. The report also covers how UNICEF can best work with key and transformative partners to tackle climate crises with innovation, scientific evidence and creativity.

Make no mistake: the challenge has never been greater. For any of these solutions to be possible and effective, children and young people must be genuinely empowered as agents of change for climate and environmental degradation. The voices of children and young people must be heard and acted upon to make climate action responsive to the specific needs as per age and gender of a child.

As with COVID-19, tackling climate change requires national leadership implementing National Determined Commitments (NDC) to reduce greenhouse gas emissions, and to adapt to and mitigate against the impact of climate change on society, with a focus on the most vulnerable, including children. It also needs multilateralism and public-private sector collaborations and partnerships, not the least to apply technical innovation. While national and local authorities should take the lead in climate action and its financing, international partners can provide crucial support through supplementary expertise and funding.

Nobody can address these issues in isolation, so let us work together to RE-IMAGINE a healthier and safer world for our children and future generations to come. We are past the point of early action, but urgent advancements will still save lives. Further delays in responding to threats, whether from pandemics or from climate change, will only increase the human and socio-economic plight. History will judge all by their actions on this climate crisis.



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Executive summary

Children are the least responsible for climate change, yet will bear the greatest burden of its impact. Nearly 160 million children live in high drought-severity zones and 500 million (almost a quarter of the world's child population) live in extremely high flood occurrence zones. It is projected that by 2040, almost 600 million children will be living in areas of extremely high- water supply stress conditions. The objective of this report is to outline the observed and projected impacts of climate change, and the related climate hazards, risks and vulnerabilities in sub-Saharan Africa. The report highlights UNICEF's mandate as the advocate for children and women affected by the climate crisis, and demonstrates existing climate adaptation, mitigation, and communications and advocacy initiatives – including through a series of eight case studies – that UNICEF is strategically positioned to take to scale as part of the 2030 Agenda for Sustainable Development in Sub-Saharan Africa.

Sub-Saharan Africa hosts several climate change hotspots, where strong physical and ecological effects of climate change intersect with large populations of poor and vulnerable communities. Recent years have seen serious climate-related crises including the severe ongoing crisis in the Sahel region of West Africa since 2012 in which a drought, food and refugee crisis continues to affect people in Niger, Burkina Faso, Mali, Chad, Mauritania, Senegal and the Gambia; the Horn of Africa drought in 2017; Tropical Cyclone Idai and Tropical Cyclone Kenneth (the strongest storm to ever hit Africa) in 2019; and in 2020, the worst outbreak for decades of swarms of desert locusts across East Africa, with a huge threat to food security and livelihoods.

Currently, more than 11 million people are experiencing crisis or emergency levels of food insecurity in nine Southern African countries due to deepening drought and climate crisis. Climate change and environmental degradation are contributing to displacement and migration, with Sub-Saharan Africa recording 86 million internal climate migrants.

Modelling for different climate futures indicates that subtropical southern Africa could see a decrease in annual precipitation of up to 30 per cent, contributing to an increase in aridity in the region. Projected sea-level rise would increase flooding, particularly on the coasts of Kenya, Madagascar and Mozambique in eastern Africa, increasing the high socio-economic and physical vulnerability of coastal cities. In addition to the risks of flooding around coastal areas, approximately 10 million children live around Lake Victoria, which is also prone to flooding.

Impact on women and children

Climate change and its impact not only involve the natural ecosystem, but have severe implications for child rights, threatening to undo the major gains made in recent years and impede realization of the rights of children as captured in the United Nations Convention on the Rights of the Child (CRC). The implications for the region are enormous as young people make up 62.9 per cent of the population in sub-Saharan Africa. Between 2017 and 2050, the child and youth population in the region is expected to more than double to 945 million, with declines expected in other regions of the world.

Children and adolescents are estimated to make up approximately half the residents of urban poor communities. More than 6 in 10 Africans who live in urban areas reside in slums. Rapid urban population growth in Africa is happening more in coastal areas considered climate change hotspots; namely the West African coast, around Lake Victoria and Lake Tanganyika.

In addition to the inherent risks caused by the lack of adequate services in crowded slums, it is anticipated that urban areas around the world will be affected by rising sea levels, increased precipitation, inland floods, more frequent and stronger cyclones and storms, and periods of more extreme heat and cold. Due to the concentration of children in urban areas, and their level of vulnerability, children will bear the heaviest impacts.

Examples of child rights deprivations resulting from climate change include:

- Climate change can be a direct cause of malnutrition;
- Up to two-thirds of preventable illness and death from environmental hazards is experienced by children, with the burden predominantly in those aged under five years;
- As temperatures increase and water becomes scarcer, it is children who will feel the deadliest impact of water-borne diseases with thousands made sick by polluted water;
- Developmental gains in education are offset due to damage or destruction of school facilities, extended disruption of education, and limited access to schooling;
- Climate change drives inequality and creates and prolongs poverty traps, with children and adolescents particularly exposed.

Climate change impacts affect women and girls disproportionately, magnifying patterns of gender inequality. Many of the health risks due to climate change show gender differentials, with the gender-gap effects on life expectancy greater in more severe disasters, and in places where the socio-economic status of women is particularly low. For example, natural disasters such as droughts, floods and storms kill more women than men, and tend to kill women at a younger age. Additionally, women and girls disproportionately suffer health consequences of nutritional deficiencies and the burdens associated with travelling further to collect water.

Government action

Governments are expected to develop policies and frameworks that provide a clear and concise articulation of overall response priorities to climate variability and change. Through the process of development and adoption of policies and frameworks, governments can integrate climate change considerations into development planning, budgeting and implementation in all sectors and at all levels. Such policies are aimed at enhancing adaptive capacity and building resilience to climate variability and change, while promoting a low carbon development pathway. Gender considerations are critical for vulnerability risk assessments and climate policy interventions in order to implement measures that are beneficial to both women and men, girls and boys.

Examples of planning frameworks include National Adaptation Programmes of Action (NAPAs), to support least developed countries (LDCs) to address the challenge of climate change given their particular vulnerability; and the National Adaptation Plan (NAP) process to prepare countries to address climate risks in the medium term. Nationally Determined

Contributions (NDCs) are intended reductions in greenhouse gas (GHG) emissions under the United Nations Framework Convention on Climate Change (UNFCCC). However, almost 60 per cent of NDCs contain no reference to children or youth, rising to almost 80 per cent of NDCs with respect to younger children.

The contribution of countries to climate change, and their capacity to prevent and cope with its consequences, varies enormously. The UNFCCC and its Kyoto Protocol therefore foresee financial assistance from Parties with more resources to those less endowed and more vulnerable. To facilitate this, the Convention established a financial mechanism to provide funds to developing country Parties. Climate finance flows and carbon asset mechanisms present an opportunity for countries in the region to access new and additional levels of funding.

UNICEF's work

UNICEF's climate and environmental sustainability strategy is anchored around four pillars which are the basis for external advocacy, programmatic interventions, and internal greening efforts:

- Make climate/environmental policies/plans child-inclusive;
- Reduce emissions and pollution;
- Protect children from impacts;
- Educate and empower children to be agents of change.

Climate change directly impacts water resources and water services for all economic, social and environmental functions that water supports, and children require more water (by weight) than adults, so their exposure to water-borne pathogens is much higher. Water, sanitation and hygiene (WASH) is therefore a critical sector and a key entry point for addressing the range of climate-induced vulnerabilities and impacts on children. The management and protection of clean, plentiful, accessible groundwater supplies, and the management of plastic waste are very fast becoming defining child health issues for our time.

UNICEF has initially identified five areas in which it has the potential to programmatically deliver climate-related initiatives at scale in the near term – including in WASH. Each of the five programmatic areas has implications for UNICEF's work to influence policies and strategies, is designed to protect children from the impacts of climatic and environmental degradation, incorporates low-carbon development and actively involves children and young people:

- Climate-smart health centres;
- Climate-smart schools;
- Climate-resilient WASH services;
- Tackling pollution (air, soil and water); and
- Reflecting the fourth pillar above, engaging children and young people, which UNICEF sees as both a standalone area of focus, and integrated into each of the four other programmatic priorities.

These potential projects which can be developed as part of the response to climate change at a broad thematic level, sit under five broad themes of cities, agriculture, forestry, resilience of small island developing states, and energy generation and access.

UNICEF continues to support the development of NAPs and is also working with different government departments and institutions to develop fundraising proposals across the Sub Saharan Africa region in order to leverage and access the Green Climate Fund (GCF), as well as Global Environment Facility (GEF) funding in order to support adaptation and mitigation activities. UNICEF also holds an accreditation as a GCF readiness delivery partner and is undergoing accreditation for smaller to medium sized projects with the GCF. UNICEF continues to work with governments to prepare and deliver GCF projects under readiness and small to medium size projects.

UNICEF continues to strengthen dialogue and partnerships with other organizations on climate change and children, especially at country and regional level including multilateral development banks, other UN agencies, bilateral development agencies, and environmental non-governmental organizations (NGOs).

UNICEF is actively utilizing and promoting renewable energies as energy sources for its programmes. For example, through equipping many schools, health centres, water supply schemes, and irrigation systems with solar energy facilities.

Climate change and related environmental and energy issues should be incorporated throughout the country programme cycle through integrating issues related to climate change under UNICEF's outcome areas (education, health, WASH, etc.) and developing and implementing new initiatives that specifically focus on addressing climate/environment/energy issues affecting children.

The way forward

Leveraging UNICEF's unique advocacy strengths could create an enabling environment for children to become visible in climate change mitigation, advocacy and adaptation processes. In particular, there is an urgent need to address the near total absence of information and data on children most at risk from the impacts of climate change, the measures required to address their specific needs, and mechanisms to support their full and meaningful participation in climate-related policy discussions and initiatives. Filling these gaps would build Government capacity to better understand the needs and opinions of children, to direct funding accordingly, and to meet their commitments under the CRC and the Paris Agreement on climate change in a coherent manner.

UNICEF is calling for a paradigm shift in the economic development model to provide opportunities for future generations without destroying the natural environment. This will require drastic changes in individual behaviours, regulations, and business practices.

The participation of young people is a necessity and part of their fundamental rights. Children should be recognized as co-creators of solutions to climate change. Their concerns and ideas need to be heard, political space for them created, and economic opportunities linked to environmental sustainability made the new normal. UNICEF will elevate the voices of children and young people in the global climate discourse, encourage their environmental activism and promote their involvement in activities that combine environmental sustainability and economic development.

“

Every child survives and thrives;
Every child learns;
Every child is protected from violence and exploitation;
Every child lives in a safe and clean environment;
Every child has an equitable chance in life and that
we have an environment fit for children and future
generations.

1 Introduction

The population in sub-Saharan Africa is predominantly comprised of children and youth aged 0–24 years. Young people make up 62.9 per cent of the population in the region, and 1 in 5 of the world’s young people are from the region (19 per cent). Notably, sub-Saharan Africa is the only region in the world that is projected to experience a positive increase in the child and youth population by 2050, with declines expected elsewhere. By 2017, there were 628 million children and youth in sub-Saharan Africa. This is projected to rise to 945 million by 2050 – a 51 per cent increase.¹



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A girl carries her baby sibling through a haze of dust in Sidi Village, in Kanem Region. Chad, 2010

1 UNICEF and UN Habitat, Analysis of Multiple Deprivations in Secondary Cities in Sub-Saharan Africa, March 2020 www.unicef.org/esa/reports/analysis-multiple-deprivations-secondary-cities-sub-saharan-africa

Sub-Saharan Africa hosts several climate change hotspots, where strong physical and ecological effects of climate change intersect with large populations of poor and vulnerable communities. Some recent examples of climate related events in these hotspots include:

- The severe Horn of Africa drought in 2017, which ravaged at least 17 million people in need of assistance across Djibouti, Eritrea, Ethiopia, Kenya, Somalia, South Sudan and Uganda.
- In early 2019, southern Africa was hit by two subsequent cyclones – Tropical Cyclone Idai and Tropical Cyclone Kenneth. Cyclone Kenneth is the strongest storm ever to hit Africa and is the first time in recorded history that two strong tropical cyclones hit Mozambique in the same season². The cyclone affected over 1.85 million people in Mozambique – 1 million of them children – and left more than 1,300 people dead and many more missing.
- Since the beginning of 2020, East Africa is battling the worst outbreak for decades of swarms of desert locusts, with a huge threat to food security and livelihoods. Studies have linked a hotter climate to more damaging locust swarms, leaving Africa disproportionately affected.³
- Currently, more than 11 million people are experiencing crisis or emergency levels of food insecurity in nine southern African countries (Angola, Eswatini, Lesotho, Madagascar, Malawi, Mozambique, Namibia, Zambia and Zimbabwe) due to deepening drought and climate crisis.

In addition, occasional flooding is also experienced in countries surrounding Lake Victoria – Kenya, Tanzania and Uganda, putting the lives of over 10 million children living there at risk.

In West Africa, climate risks, food insecurity and metastasizing violence are all set to intensify in the Sahel region. The Sahel region⁴ of West Africa continues to be ravaged by a drought, food and refugee crisis caused by a combination of erratic rainfall, failed harvests, soaring market prices and insecurity. Vulnerable people in Niger, Burkina Faso, Mali, Chad, Mauritania, Senegal, and The Gambia were at risk of severe hunger. Climate scientists believe that temperatures in this region, could rise between 3–5°C warmer by 2050, and this in a region with monthly averages of 35°C. Rainfall is already erratic, and wet seasons are shrinking. There are lean times ahead. Still reeling from the food crisis of 2012, more than 33 million people in the Sahel are classified as food insecure.

Trends indicate continued increases in scale, frequency and affected populations in future. In response, UNICEF in the Sub Saharan Africa region (ESAR and WCAR) requires a systematic and rapid scale-up of climate resilient services and investments for children, women and affected communities.

The objective of this report is to outline the observed and projected impacts of climate change, and the related climate hazards, risks and vulnerabilities in sub-Saharan Africa. It examines the strength of a systemic approach to climate action with its interlinkages between health, education, gender, traditional knowledge and children recognizing the potential for investing in resilience building adaptation and mitigation measures in a given local and specific context.

2 OCHA, Cyclones Idai and Kenneth, www.unocha.org/southern-and-eastern-africa-rosea/cyclones-idai-and-kenneth accessed 25 May 2020

3 UNEP, Locust swarms and climate change, 6 February 2020 www.unenvironment.org/news-and-stories/story/locust-swarms-and-climate-change accessed 25 May 2020

4 <https://www.un.org/africarenewal/magazine/december-2013/sahel-one-region-many-crises>



Climate change may be particularly dangerous for children in developing countries. Even today, many developing countries experience a disproportionate share of extreme weather, and they are predicted to suffer disproportionately from the effects of climate change in the future. Moreover, developing countries often have limited social safety nets, widespread poverty, fragile health care systems, and weak governmental institutions, making it harder for them to adapt or respond to climate change.

“And the fact that many developing countries have high birth rates and high ratios of children to adults (known as high dependency ratios) means that proportionately more children are at risk there than in the developed world.”

Hanna and Oliva, 2016

UNICEF has strengthened its focus on urgent adaptation actions to invest in leveraging long-term, sustainable, low-carbon and climate-resilient communities whilst engaging with the most vulnerable population groups such as children and youth who are the agents of change and future decision makers in these communities. The report highlights UNICEF’s mandate as the advocate for children and women affected by the climate crisis, and demonstrates existing climate adaptation, mitigation, and communications and advocacy initiatives that UNICEF is strategically positioned to take to scale as part of the 2030 Agenda for Sustainable Development in sub-Saharan Africa.

To this end, ten climate related case studies from Sub Saharan Africa are included:

- **Case study 1:** Madagascar – Developing a climate-informed country programme.
- **Case study 2:** South Sudan – Reducing the carbon footprint of UNICEF operations through prepositioning critical supplies.
- **Case Study 3:** Cote d’Ivoire – Innovation and circular economy approaches in West Africa
- **Case Study 4:** Somalia – UNICEF–World Food Programme (WFP) Joint Resilience Programming for food security.
- **Case Study 5:** Ethiopia – Climate-resilient WASH.
- **Case Study 6:** Mauritania – Building resilience in the Sahel through Multi sectoral programming.
- **Case Study 7:** Kenya – Social protection to strengthen resilience of mothers and children.
- **Case study 8:** Madagascar – Building resilience through inclusion of disaster risk reduction (DRR) in the education system.
- **Case study 9:** Southern Africa – Impact of the 2015–2016 El Niño on child health.
- **Case study 10:** Eastern and Southern Africa – UNICEF–Scout Movement partnership for youth engagement on climate change.

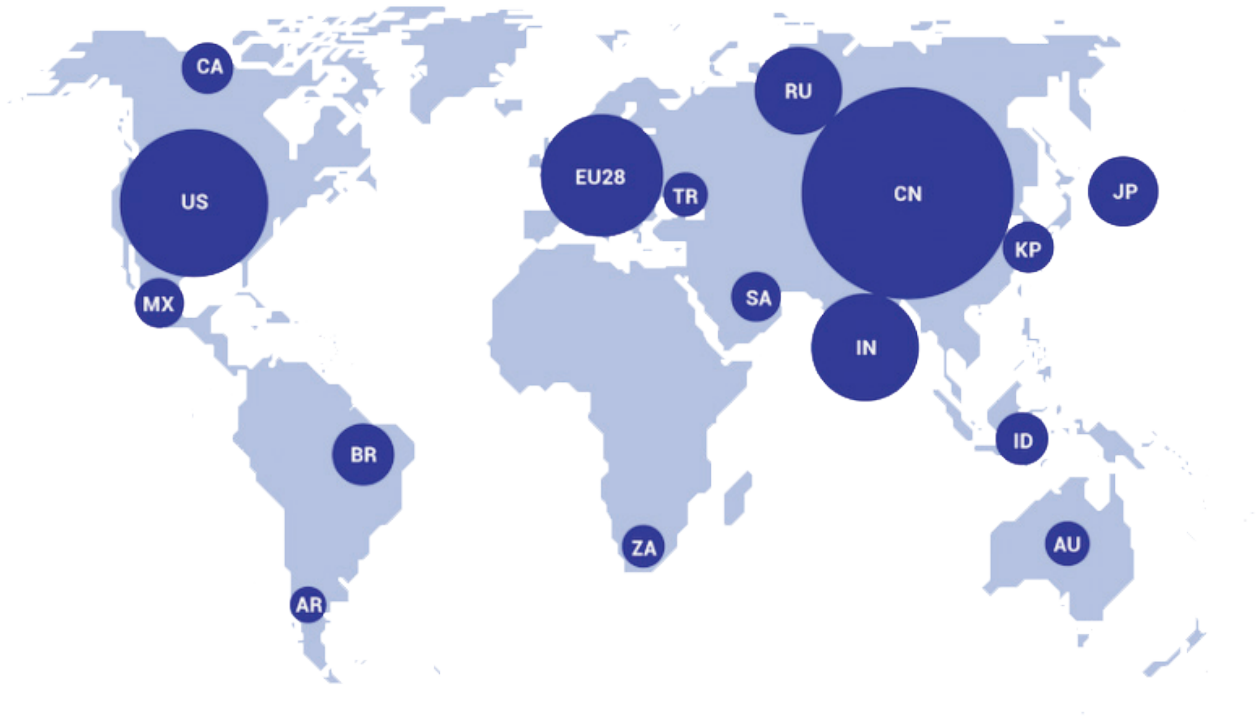
The case studies demonstrate UNICEF’s response and expertise, with a view that partnerships are developed, expanded and strengthened in order to generate the maximum impact from programme interventions. UNICEF education, WASH and other programmes monitoring systems have started to include tracking, monitoring and evaluation of climate /environment and disaster risk reduction initiatives and their impacts, whilst strengthening citizen science in the form of youth participating and engagement. In addition, programmes are also looking at tracking climate finance and activities for vulnerable populations, quantifying and comparing this to related financial flows with respect to subgroups such as children.

1.1 Greenhouse gas emissions and climate change

The Intergovernmental Panel on Climate Change (IPCC) (2014) indicates that if GHG emissions continue to rise at their current pace, the world will be negatively affected by a rise in sea levels, shifts in growing seasons, loss of biodiversity and increased frequency and intensity of extreme weather events, such as heat waves, storms, floods and droughts. World Bank estimates indicate that carbon dioxide (CO₂) emissions per capita are lower in Africa than in developed countries.

According to the Emissions Gap Report 2020, the G20 nations collectively account for 78 per cent of all emissions, but only five G20 members have committed to long-term zero emission targets, of which three (the European Union, and Germany and Italy, as part of the European Union) are currently in the process of passing legislation and two (France and the United Kingdom) have recently passed legislation. The top four emitters (China, European Union, India and the United States of America) contribute to over 55 per cent of the total emissions over the last decade, excluding emissions from land-use change such as deforestation. The map below shows the sources for emissions worldwide. Though Africa has a low level of GHG emissions, the worst impacts of climate change will be experienced on the continent.

Figure 1: Sources of emissions



Source: UNEP Emissions Gap Report 2019

In fragile states and low-income countries, particularly those in sub-Saharan Africa, the poor and marginalized will be the hardest hit. Those in low-income quintiles of society – and particularly children, women and the elderly who are less capable of coping with the negative effects of climate change – will be the most severely affected.

Since the 1880s, the Earth's near-surface temperature has increased by 0.85°C due to the increase in heat-trapping gases, referred to as GHGs. The globally averaged combined land and ocean surface temperature data as calculated by a linear trend show a warming of 0.85⁵ [0.65 to 1.06] °C over the period 1880 to 2012. The IPCC (the United Nations–sponsored scientific body on climate change) predicts the following global climate change trends:

- The average air temperature between 2090 and 2099 will be 1.8°C to 4°C higher than it was between 1980 and 1999.
- The increase in surface temperature will be greater over land than over the ocean.
- Sea ice and snow cover will continue to contract and shrink because of melting due to high temperatures (increased ocean temperatures have been recorded at depths of at least 3,000m since 1961).
- The sea level will rise by 1.8–3.1 mm per year between 1990 and 2100.
- Droughts will become longer and more intense due to higher temperatures and reduced precipitation.
- Precipitation levels will become more variable.
- Extreme events – such as heat waves, tropical cyclones, heavy precipitation and high temperature extremes – will become more frequent.



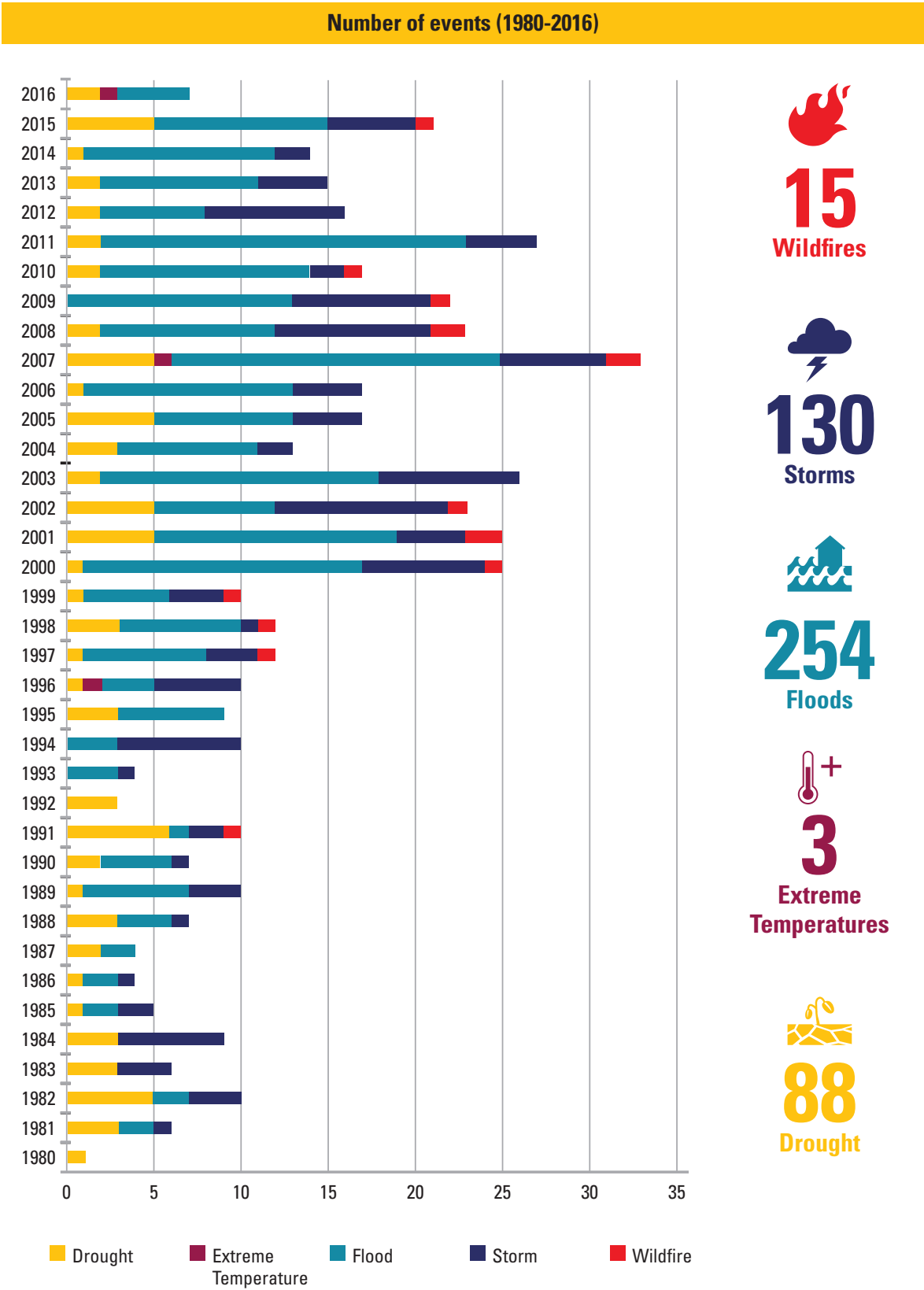
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Vanessa Nhleya (17) head of the Nhleya Family at the drying up dam where they fetch water. Zimbabwe, 2016.

In addition, evidence shows an increased number of climate-related events over southern Africa since 1980. The result is that climate change is having devastating impacts on communities and, in particular, children.

5 https://www.ipcc.ch/site/assets/uploads/2018/02/AR5_SYR_FINAL_SPM.pdf

Figure 2: Number of recorded climate-related events over southern Africa since 1980



Source: Emergency Events Database (EM-DAT) Center for Research on Epidemiology of Disasters (CRED), 2016

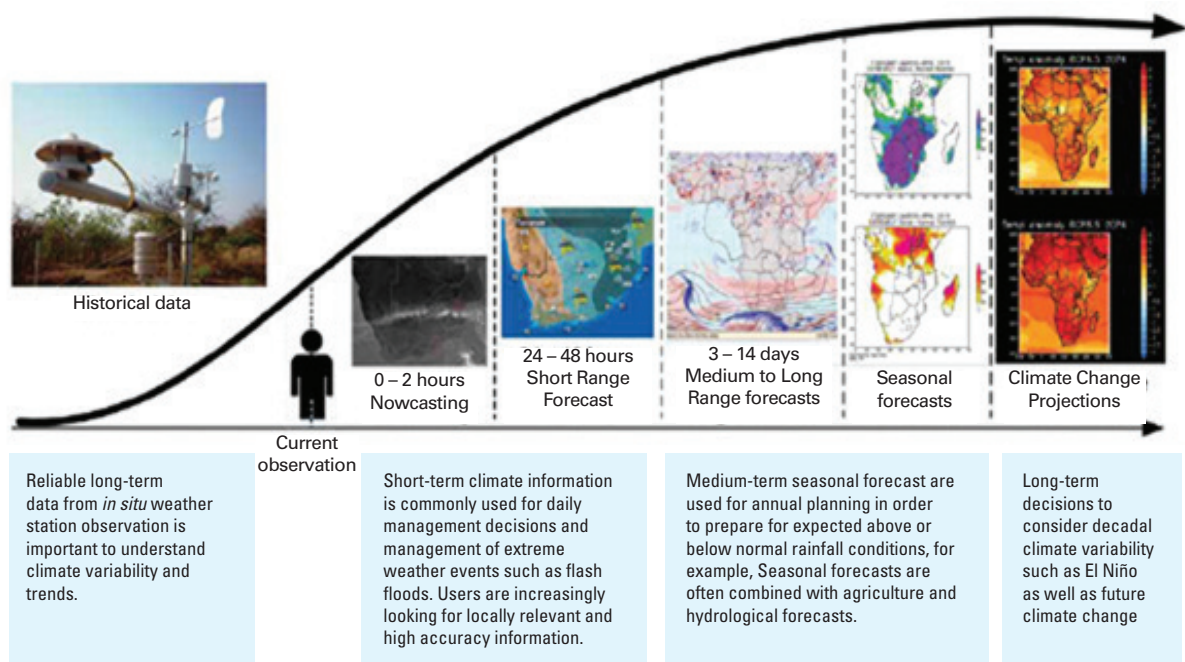
1.2 Definition of key terminologies

Climate information: Climate information refers to the collection and interpretation of weather- and climate-related data. Climate information – including observations, analysis and forecasts at different time scales – is important for assessing impacts and planning associated adaptation in various socio-economic sectors. Weather and climate data are mostly derived and predicted on three different time scales, namely observational (meteorological monitoring), short-term (daily to seasonal forecasts) and long-term (climate variability and climate change projections) (Figure 3).

Climate information is becoming increasingly available, and the gap between climate providers and the information requirements of decision-makers is narrowing due to a number of programmes across Africa and the sub region. Key information challenges include:

- Improving the quality of climate data products;
- Interpretation and application of climate information (seasonal forecasts and climate change projections);
- Increasing the regularity and added value of information disseminated;
- Enhancing the accessibility of climate information; and
- Making the spatial scale of information finer, as required for small-scale studies.

Figure 3: Types of climate information



Source: Council for Scientific and Industrial Research (CSIR) Climate Risk and Vulnerability: A Handbook for Southern Africa 2017

Climate rationale: To understand the impact of climate change one needs to carefully interpret available data for the specific location and link these to the related climate impacts, actions and benefits: this is referred to as the climate rationale. A climate rationale provides the scientific underpinning for evidence-based climate decision making. It ensures that the linkages derived between climate impacts, climate action and societal benefits are fully grounded in the best available climate data and science.

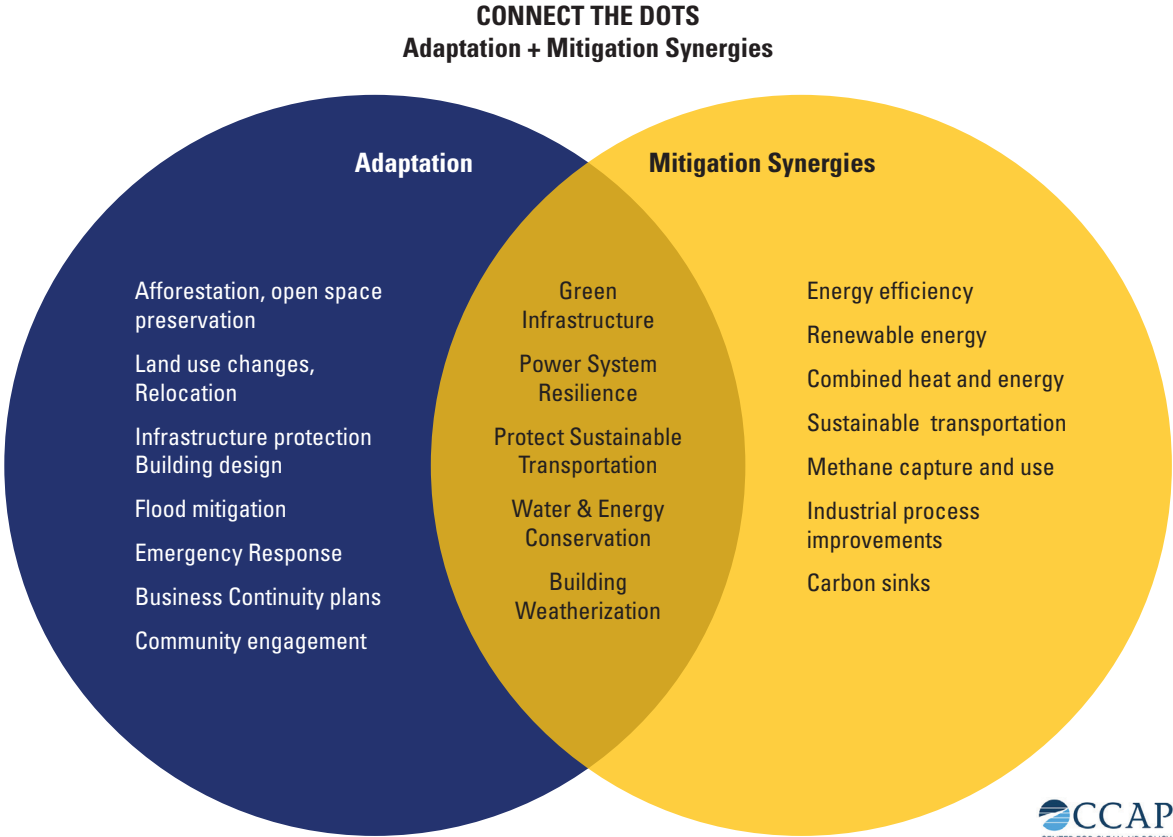
Vulnerability: The degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes.

ND-GAIN Index: This index summarizes a country’s vulnerability to climate change and other global challenges in combination with its readiness to improve resilience. It aims to help businesses and the public sector better prioritize investments for a more efficient response to the immediate global challenges ahead.

Responses to climate change: Responses to climate change include adaptation and mitigation. Figure 4 summarizes potential mitigation or adaptation measures.

Resilience to climate change impacts: Climate resilience is defined as the capacity for a socio-ecological system to: (1) absorb stresses and maintain function in the face of external stresses imposed upon it by climate change and (2) adapt, reorganize, and evolve into more desirable configurations that improve the sustainability of the system, leaving it better prepared for future climate change impacts

Figure 4: Adaptation and mitigation approaches to climate change



Source: Centre for Clean Air Policy

As one implements climate responses through climate adaptation or mitigation, it is important to join the dots. This approach aims to understand how the ecosystem, infrastructure, land development, policy and investment decisions affect GHG emissions and vulnerability or resilience to climate change impacts. It requires that the links between climate mitigation and climate adaptation, and implementation of policies and measures both reduce GHG emissions and enhance resilience to climate change impact. UNICEF approach as a Systemic approach providing systemic shifts for society.

Climate change adaptation: Adaptation is an adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, in order to moderate harm or exploit beneficial opportunities. Adaptation can be achieved through initiating activities impacting livelihoods, health, food and water security, ecosystems and provision of ecosystems services, as well as the built environment.

Climate change mitigation: Mitigation in the context of climate change is a human intervention to reduce the sources of or enhance the sinks of GHGs. Examples include using fossil fuels more efficiently for industrial processes or electricity generation, switching to solar energy or wind power, improving the insulation of buildings, and expanding forests and other “sinks” to remove greater amounts of CO₂ from the atmosphere.

2 Climate change scenarios and projections for Africa

Many factors have to be taken into account when predicting how future global warming will contribute to climate change. The IPCC's Fifth Assessment Report (AR5) in 2014 adopted a new set of scenarios called Representative Concentration Pathways (RCPs), which describe different climate futures. Four pathways have been selected for climate modelling and research, all of which are considered possible depending on what GHG volumes are emitted in the years to come. The RCPs are labelled after a possible range of radiative forcing values⁶ in the year 2100:

- RCP2.6: Assumes that global annual GHG emissions (measured in CO₂ equivalents) peak between 2010 and 2020, with emissions declining substantially thereafter.
- RCP4.5: Emissions peak around 2040, then decline.
- RCP6: Emissions peak around 2080, then decline.
- RCP8.5: Emissions continue to rise throughout the 21st century.

According to AR5 and the Potsdam Institute for Climate Impact Research and Climate Analytics Turn Down the Heat report, the following climate changes will be observed on the African continent:

Temperature

- Under RCP8.5, by the end of the century warm nights are expected to occur about 95 per cent of the time in tropical West and East Africa and about 85 per cent of the time in southern Africa, with only limited inter-model spread.
- By 2100, the multi-model mean of RCP8.5 projects that 75 per cent of summer months would be hotter than five standard deviations and substantially higher than the global average.

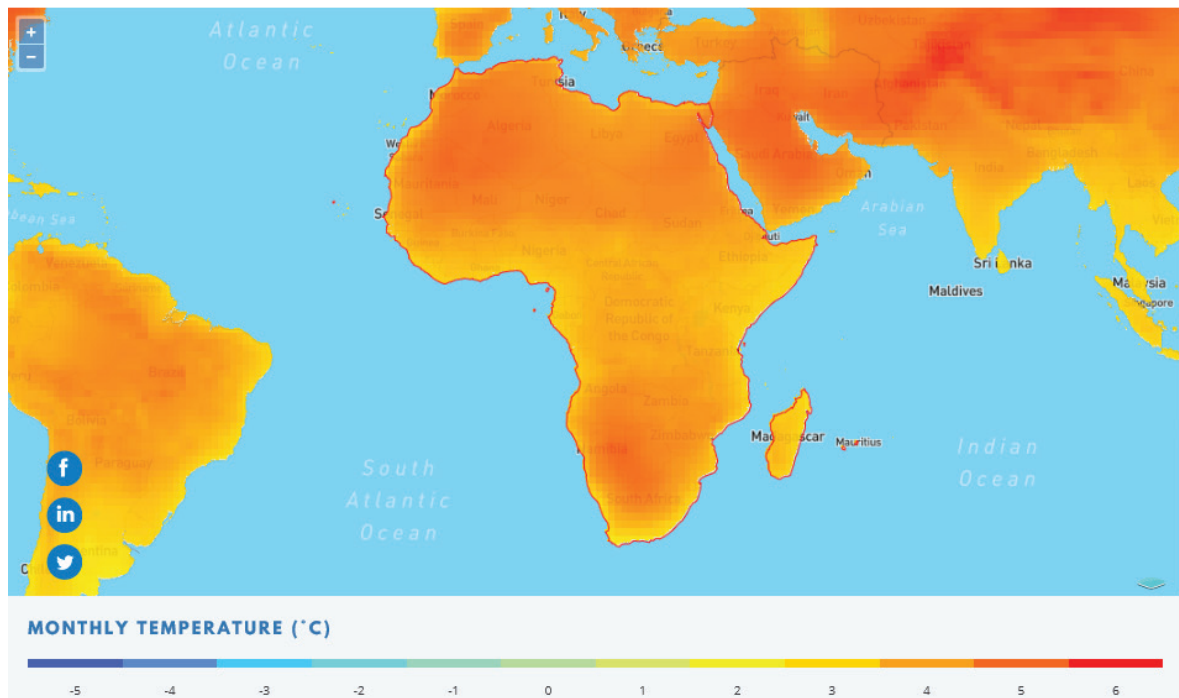


©UNICEF/UN051656/Rich

A water reservoir depleted by drought in Chicualacuala district, some 20 kilometres from Mapai, Gaza. Mozambique, 2010

6 Positive radiative forcing means Earth receives more incoming energy from sunlight than it radiates to space, causing warming. Negative radiative forcing means that Earth loses more energy to space than it receives from the sun, which produces cooling.

Figure 5: Projected change in monthly temperature of Africa for 2080-2099 (Compared to 1986-2005)



Source: IPCC Fifth Assessment Report

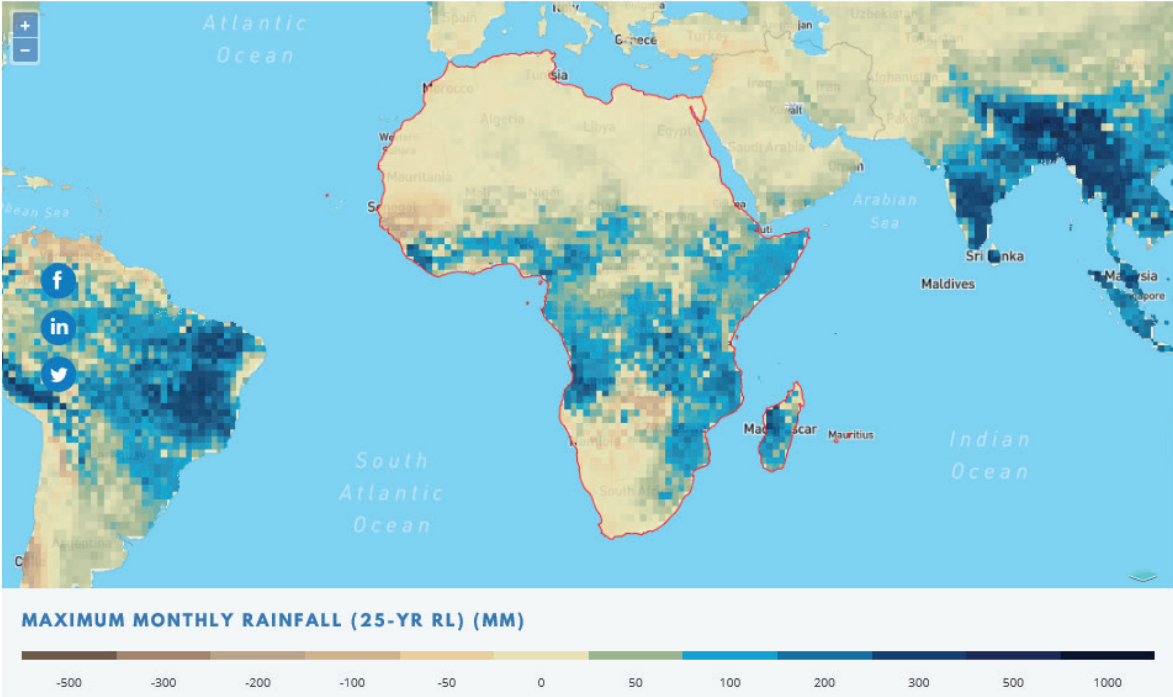
Flooding and droughts

- Subtropical southern Africa could see a decrease in annual precipitation of up to 30 per cent, contributing to an increase in aridity in this region.
- The wetting of tropical East Africa occurs predominantly during the austral summer (December–February), whereas the drying of southern Africa occurs predominantly during the austral winter (June–August).
- The overall area of hyper-arid and arid regions is projected to grow by 10 per cent under RCP8.5 by 2080–2100 relative to 1986–2005.



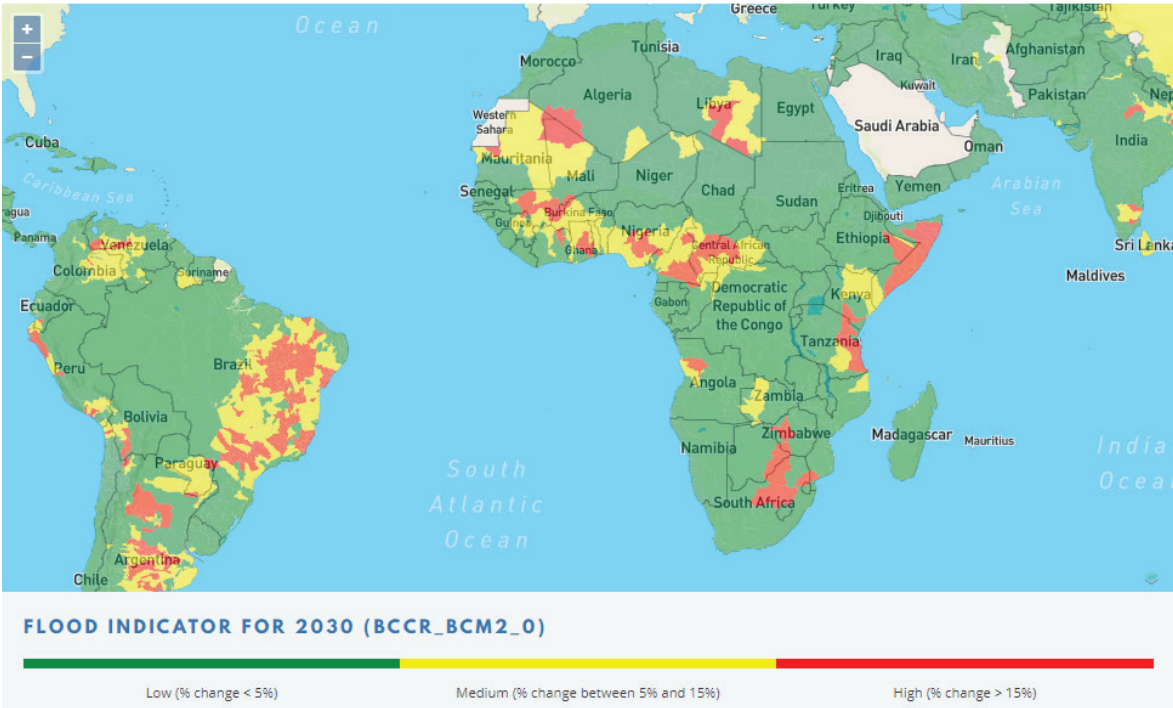
Residents of Beledweyne, Hiraan region, walking in flood water along the streets of the town. Somalia, 2018.

Figure 6: Projected Change in Maximum Monthly Rainfall (25-yr RL) of Africa for 2080-2099 (Compared to 1986-2005)



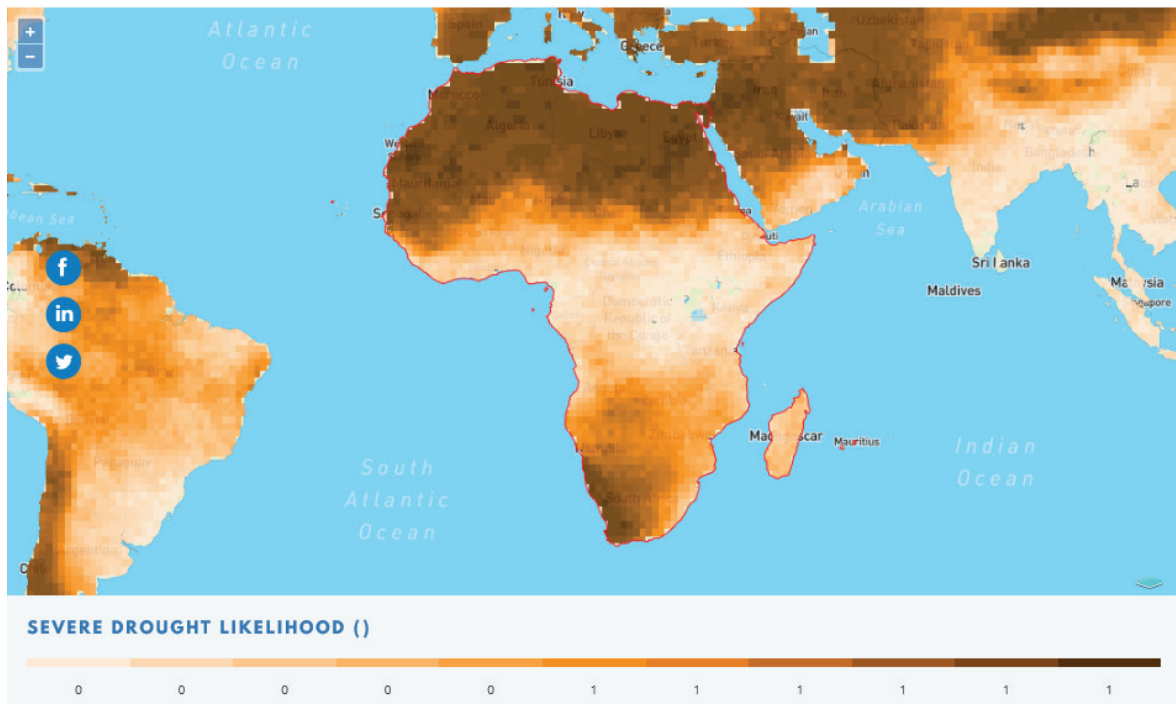
Source: IPCC Fifth Assessment Report

Figure 7: Flood indicators for 2030



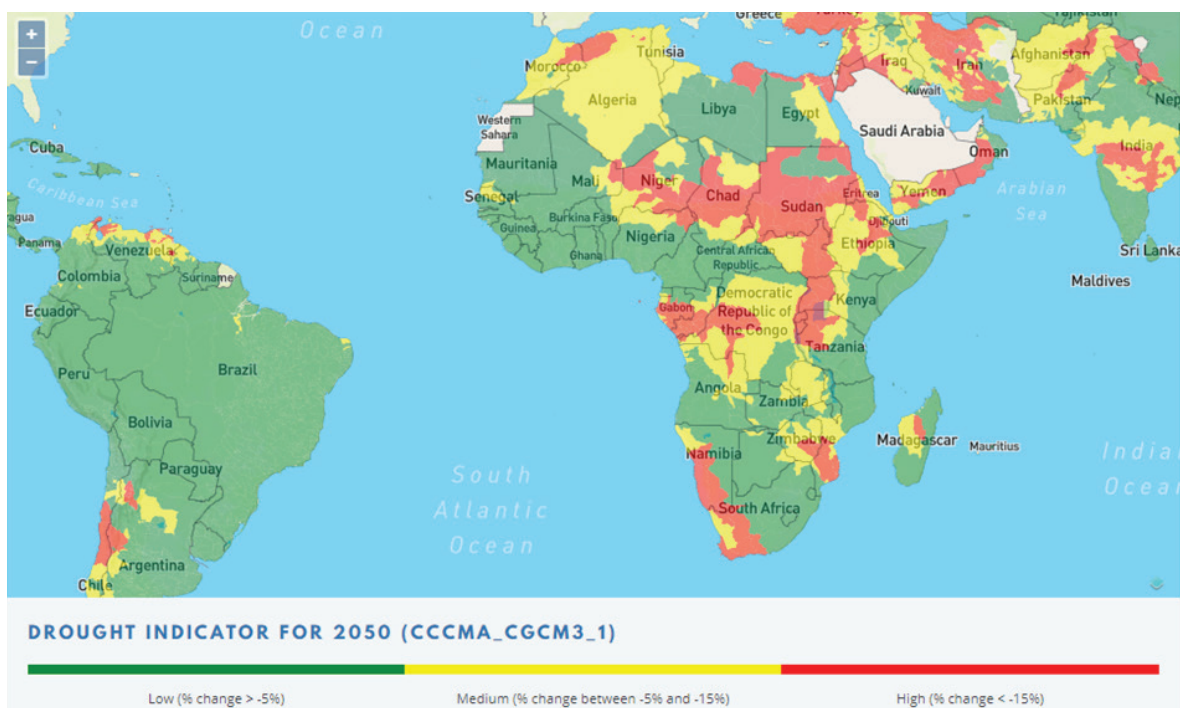
Source: World Bank Climate Change Knowledge Portal <https://climateknowledgeportal.worldbank.org/>

Figure 8: Projected change in likelihood of severe drought in Africa for 2080-2099 (compared to 1986-2005)



Source: IPCC Fifth Assessment Report

Figure 9: Drought indicator for 2050



Source: World Bank Climate Change Knowledge Portal <https://climateknowledgeportal.worldbank.org/>

2.2 Sub-regional impact of climate change

2.2.1 West Africa

West Africa has wet and dry seasons resulting from the interaction of two migrating air masses. The first, is the hot, dry tropical continental air mass of the northern high pressure system, which gives rise to the dry, dusty, Harmattan winds which blow from the Sahara over most of West Africa from November to February; the maximum southern extension of this air mass occurs in January between latitudes 5° and 7°N. The second, is the moisture-laden, tropical maritime or equatorial air mass which produces southwest winds. The maximum northern penetration of this wet air mass is in July between latitudes 18° and 21°N. Where these two air masses meet is a belt of variable width and stability called the Intertropical Convergence Zone (ITCZ). The north and south migration of this ITCZ, which follows the apparent movement of the sun, controls the climate of the region.

The lowland climates of West Africa are characterized by uniformly high sunshine and high temperatures throughout the year; mean annual temperatures are usually above 18°C. Areas within 10° of the equator have a mean annual temperature of about 26°C with a range of 1.7 – 2.8°C; the diurnal range is 5.6 – 8.3°C. Between latitudes 10°N and the southern part of the Sahara mean monthly temperatures can rise to 30°C, but the annual range is 9°C and diurnal range 14° to 17°C. In the central Sahara temperatures in the shade in July may be as high as 58°C during the day and as low as 4°C at night; mean annual temperature ranges from 10° – 35°C. West Africa has three distinct climatic zones which impact the lengths of the growing season for crops that is the arid, semi-arid and sub humid zones.

The Arid Zone includes the Sahel or Sahelian zone and has up to 750mm of rain in a single short rainy season and 90 Days of Growing Period (DGP) with an extended dry season of up to 10 months. The dry season sometimes extends into years causing severe droughts. This zone includes northern parts of Senegal, parts of Mali, Upper Volta, Niger and Cameroon. The vegetation is mostly grassland and large numbers of zebu cattle, sheep and goats are raised by pastoralists. The main food crops grown are millet, sorghum and groundnuts and cotton; which are the principal cash crops.

The semi-arid zone roughly includes the Sahelo-Sudan zone which covers the southern parts of Senegambia, Mali, Upper Volta, Niger, Chad and upper parts of Guinea-Bissau, Guinea, Togo, Benin, Nigeria, Cameroon and the Central African Republic. The average annual rainfall, 750mm to 1250mm, falls in one season followed by a long dry season. The vegetation is mainly grassland with some shrubs and acacia trees. The zone supports large numbers of livestock, mostly zebu and zebu-Shorthorn crosses, sheep, goats and a few pigs. The main crops are millet, sorghum, groundnuts, cotton, beans and rice; plantation crops are mango, cashew and kapok.

The sub-humid zone includes Guinea-Bissau, upper parts of Guinea, the southernmost parts of Mali and Upper Volta and the northern parts of Ghana, Ivory Coast, Cameroon, Sierra Leone, Benin and the central parts of Nigeria. The average annual rainfall is between 1250mm and 1500mm in one season with 180–270 DGP which supports a basically grass and shrub vegetation which is widely tsetse infested. Cattle, as well as sheep and goats, are raised but crop farming is the main agricultural occupation. Crops include maize, sorghum, rice, millet, yam, cotton, groundnuts and pulses, and the plantation crops are mango, kapok and cashew. Forests are confined to the river valleys in the southern parts of the zone.

According to the IPCC, projections show that the western Sahel region will experience the strongest drying, with a significant increase in the maximum length of dry spells. The IPCC expects Central Africa to see a decrease in the length of wet spells and a slight increase in heavy rainfall. West Africa has been identified as a climate-change hotspot, with climate change likely to lessen crop yields and production, with resultant impacts on food security.

2.2.2 Southern Africa

The climate of southern Africa varies from arid to humid subtropical regions. It is influenced by its topography and large-scale seasonal atmospheric patterns, such as sea surface temperatures in the Indian Ocean (as a result of the Agulhas current bringing additional moisture to the east coast) and the South Atlantic Ocean (as a result of the Benguela current). Rainfall is mainly driven by the migration of the ITCZ. Most of the region's rainfall comes during the summer months (November–March) except for South Africa. There is a high degree of spatial variation in rainfall across southern Africa due to the influence of ocean currents and prevailing winds. The highest amount of rainfall occurs in the tropics towards the equator and in eastern Madagascar, which can receive up to 3,100 mm per year.

Temperatures vary significantly. The highest summer temperatures are recorded in the Kalahari Desert of Namibia and Botswana exceeding 40°C during the day, and coastal regions of Mozambique. The lowest winter temperatures are recorded in the Lesotho, South Africa and the Zimbabwe highlands as a result of a latitudinal gradient, under which temperatures decrease southwards. Rainfall is highly variable across the region, with a clear east-to-west gradient ranging from very dry conditions along the western Namibian coast to much higher rainfall on the coast of Mozambique. This dynamic is highly variable from wet to dry years. Longer-term variability is closely associated with the El Niño Southern Oscillation (ENSO) phenomenon⁷, with El Niño events linked to warmer and drier conditions and La Niña events linked to cooler and wetter conditions.

Most of southern Africa has two distinct rain seasons – a wet season in the summer half of the year from roughly November to March and a dry season during winter from April to October. Areas around the equator and eastern Madagascar experience rainfall all year round. The Cape region of South Africa experiences winter rainfall due to the influence of mid-latitude cyclones. Tropical cyclones occasionally make landfall on the Mozambican and South African coastlines, bringing significant rainfall and associated flooding to Mozambique, the northern parts of South Africa, western Madagascar, and Zimbabwe.

Nicholson (2001) explains that part of the reason for the diversity in southern Africa's climate is the dependence on a wide range of distinct climate systems. The average climate is strongly determined by four main factors:

- The position of the subcontinent in relation to the major circulation patterns of the southern hemisphere (quasi-stationary high-pressure systems);
- The migration of ITCZ, which affects the timing and intensity of rainfall;
- The complex regional topography (ranging from sea level to a plateau at 1,250 metres, and mountains exceeding 3,000 metres); and

⁷ An irregularly periodic variation in winds and sea surface temperatures over the tropical eastern Pacific Ocean, affecting the climate of much of the tropics and subtropics. The warming phase of the sea temperature is known as El Niño and the cooling phase as La Niña.

- The influence of the warm Indian Ocean on the east coast and the cold Atlantic Ocean on the west coast, which leads to higher and lower rainfall respectively.

These factors interact to produce a wide variety of climate zones within the region: arid coastal desert from about 32 degrees of latitude to the border between Namibia and Angola; a semi-arid temperate climate over the interior central plateau; a humid subtropical climate over low-lying coastal regions in the southeast; and a Mediterranean climate in the southern part of South Africa. Superimposed on the sub-regional diversity of climate is the role of inter-decadal patterns of natural variability, notably ENSO, the Indian Ocean Dipole (often called the “Indian Niño” because of its similarity to its Pacific equivalent⁸), and the interdecadal Dyer-Tyson cycle⁹.

2.2.3 Eastern Africa

Eastern Africa, classically presented as a major dry climate anomaly region in the otherwise wet equatorial belt, is a transition zone between the monsoon domains of West Africa and the Indian Ocean. Its complex terrain results in a huge diversity of climatic conditions that steer a wide range of vegetation landscapes, biodiversity and human occupations. The southern rainfall gradients dominate in the west along the Nile Valley and its surroundings, where a single boreal summer peak is mostly observed. Bimodal regimes (generally peaking in April and November) prevail in the east, gradually shifting to a single austral summer peak to the south.



Climate change will make existing inequities even worse

Climate change will not affect all equally. Because of the risks associated with them, flood and drought zones often overlap with areas of high poverty and low access to essential services such as water and sanitation. This means that children and families who are already disadvantaged by poverty – those with the fewest resources for coping – are likely to face some of the most immediate dangers of climate change.

The swift seasonal shift of ITCZ and its replacement in January–February and June–September by strong meridional (along the local lines of longitude), generally diverging low-level winds (e.g., the Somali Jet), account for the low rainfall. These large-scale flows interact with topography and lakes, which have their own local circulation in the form of mountain and lake breezes. This results in complex rainfall patterns, with a strong diurnal component, and frequent asymmetry in the distribution of rainfall with respect to the major relief features.

Eastern Africa shows some of the largest interannual rainfall variations in the world. Some decadal-scale variations are also found, including a drying trend of the March–May rainy season since the 1980s in the eastern part of the region. Eastern Africa’s mean overall

8 BBC, Indian Ocean Dipole: What is it and why is it linked to floods and bushfires? 7 December 2019 www.bbc.co.uk/news/science-environment-50602971 accessed 26 May 2020.

9 (Dyer and Tyson 1977), the 18-20- year (bi-decadal) cycle has been shown to be a feature of southern African rainfall over a period of at least 600 years (Tyson et al. 2002). Malherbe J, Landman WA and Engelbrecht FA. 2014. The bi-decadal rainfall cycle, Southern Annular Mode and tropical cyclones over the Limpopo River Basin, southern Africa. *Climate Dynamics*. 42:3121-3138. doi:10.1007/s00382-013-2027-y <https://pureportal.coventry.ac.uk/files/4031265/lawliercomb.pdf>

temperature increased by between 0.7°C and 1°C between 1973 and 2013, depending on the season. Strong – sometimes non-linear – altitudinal gradients of temperature and moisture regimes also contribute to the climate diversity of eastern Africa.

Based on future climatic projections, indications point to mean temperatures increasing even further. It is likely that the region will have an overall increase in average annual rainfall. However, the southern part of eastern Africa (from the Equator) is expected to experience reduced rainfall, while the northern part is expected to receive increased rainfall (which is likely to fall intensely and over short periods). It should be noted that there are uncertainties in climate projections for eastern Africa's rainfall, as seasonal weather in the region is highly influenced by the ENSO phenomenon. Therefore, it is likely that high interannual variability will continue to be observed in the region.

2.2.4 The Eastern African Paradox

For well over a decade, the region has been experiencing an increased frequency of drought. The most recent and severe of these events (2010–2011) triggered a humanitarian crisis and prompted a major international response. For the “long rains” season (March–May), these are a manifestation of a long-term decline in rainfall totals¹⁰. There has been no such downward trend in the “short rains” (October–December), but continued year-to-year variability, which at times has exacerbated the impact of the decline in long rains. In contrast, regarding future projections, most climate models predict a notable increase in eastern African rainfall. This has been termed the East African climate paradox and has implications for developing viable adaptation policies.

2.3 Climate change and urbanization in Africa

Cities are major contributors to climate change, while at the same time, cities and towns are heavily vulnerable to climate change. Cities cover less than 2 per cent of the earth's surface but account for 71 to 76 per cent of the world's CO₂, generated from final energy use and total GHG emissions¹¹.



In 2017 approximately 300 million children, worldwide, were living in areas with the most toxic levels of outdoor air pollution – six or more times higher than international guidelines. This contributes to the deaths of around 600,000 children under the age of five every year. Even more will suffer lasting damage to their developing brains and lungs.

In addition, the world is becoming more urbanized. While urbanization rates are projected to slow down in most countries in the world, several low-income countries in sub-Saharan Africa will have increasing rates, such as Chad, Comoros, Malawi, Niger, South Sudan and Sierra Leone¹². An analysis of urban growth in Africa shows that rapid population growth is happening more in coastal areas considered climate change hotspots; namely the West African coast, around Lake Victoria and Lake Tanganyika.

10 Lyon and DeWitt 2012; Viste et al. 2013; Liebmann et al. 2014

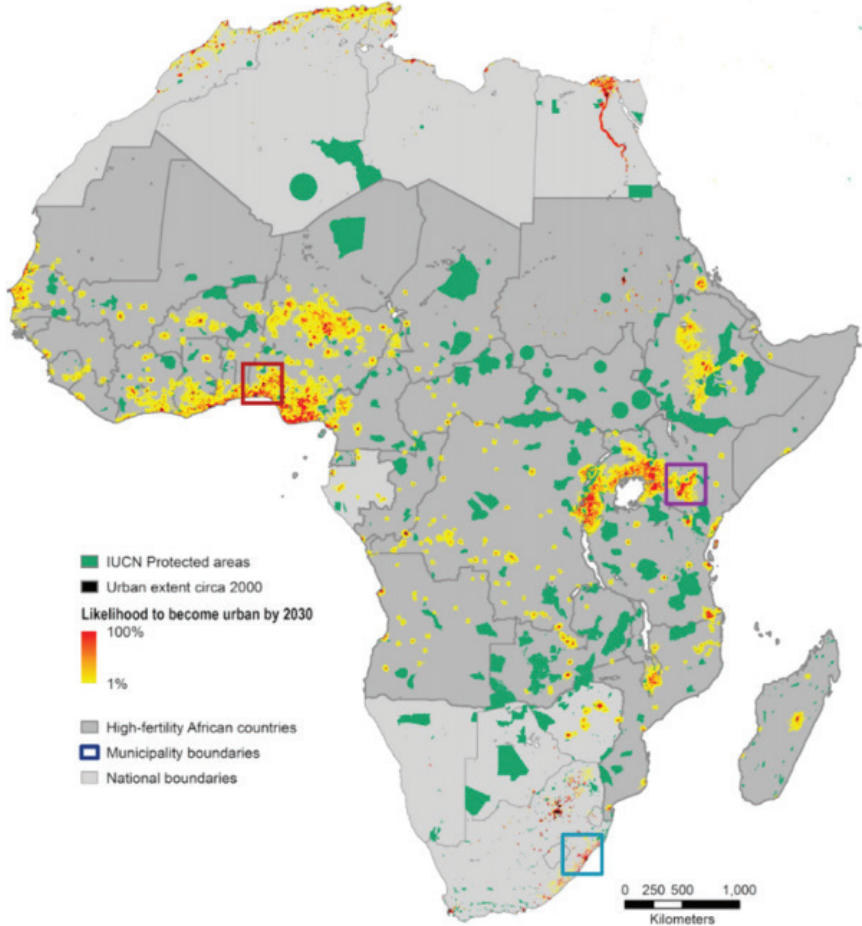
11 <https://www.un.org/en/climatechange/cities-pollution.shtml>

12 UN Department of Economic and Social Affairs (2018) World Urban Prospects 2018 Revision <https://population.un.org/wup/Publications/Files/WUP2018-Report.pdf>

More than 6 in 10 Africans who live in urban areas, reside in slums¹³, and children and adolescents are estimated to make up approximately half the residents of urban poor communities.¹⁴ Expansion in WASH service delivery is failing to keep up with urban population growth. The lack of adequate services in the crowded conditions in slums puts children at particular risk of coming into contact with excreta in the environment with resultant high rates of diarrhoea, cholera and other WASH-related diseases. When combined with other risk factors – such as industrial waste, air pollution, road traffic and crime – the result is child mortality rates in poor urban settlements that are much higher than those for the aggregate urban population and possibly higher than rates in rural areas.

In addition to these inherent risks, it is anticipated that urban areas around the world will be affected by rising sea levels, increased precipitation, inland floods, more frequent and stronger cyclones and storms, and periods of more extreme heat and cold. Due to the concentration of children in urban areas, and their level of vulnerability, children will bear the heaviest impacts of climate change. Rapid urbanization could make the world’s society and economy increasingly vulnerable to the impacts of climate change. The maps below show the areas of rapid urban growth and migration in Africa.

Figure 10: Urban extents projection to 2030

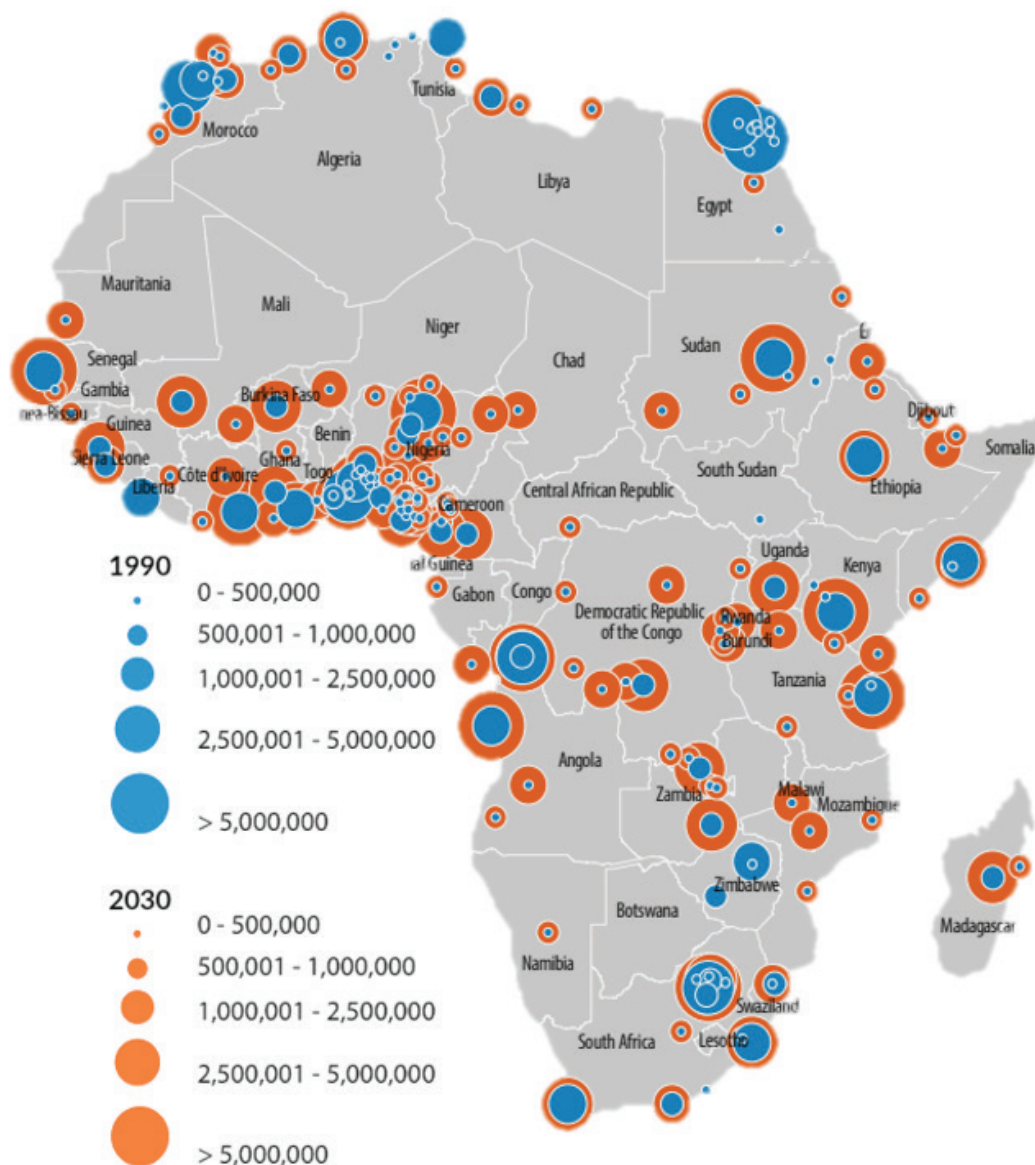


Source Güneralp et al (2018)

13 UNICEF, State of The World’s Children 2012: Children in an Urban World, 2012 www.unicef.org/sowc2012/pdfs/SOWC-2012-Main-Report_EN_21Dec2011.pdf

14 Urban Poverty, Urban Children and Some Possible Directions for UNICEF, Sheridan Bartlett, 2009, pp. 2, 6

Figure 11: Urban growth in sub-Saharan Africa 1990–2030



Source: UNECA

Sustainable climate-resilient development in villages, towns and cities is crucial for adapting to climate change, improving the well-being of people, particularly women and children, and increasing the opportunities of future generations. Initiatives at the global, regional, national and subnational levels can address the adaptation challenges of urban areas.

UNICEF should act as a technical advisor or key advocate for implementing partners to promote child-responsive urban planning and infrastructure development. In addition, given UNICEF’s role as first responder during humanitarian crises and convener of government and partners, it is strongly positioned to advocate for the needs of children in urban areas and to assist government and other partners with mitigation and adaptation measures on climate change. Adaptation measures can include adaptation-specific policies, programmes, projects and actions, or may form part of a broader resilience or sustainable development agenda that includes climate change mitigation and other environmental, economic, social and cultural objectives in a holistic manner.

Adaptation actions in urban zones are in a spectrum from nature-based to infrastructure-based solutions. The former can include vegetal cover expansion, coastal resource management, and mangrove and natural reef ecosystem protection. Infrastructure-based solutions include climate-proofing infrastructure, including storm drainage systems, water supply, storage and treatment plants, as well as protecting or relocating energy or solid waste management facilities. As UNICEF continues to advocate for safe urban spaces for children, this infrastructure can enable children to thrive and to develop well in urban settings. In coastal cities, planning for infrastructure development, safe zones and protection areas for children in the event of flooding due to sea level rises need to be a strong consideration.

In order to build resilience to climate change in urban communities, there is a need to increase sustainable access to basic infrastructure systems and services, emphasizing resilience to storms, floods, droughts, landslides and disease outbreaks. Typical resilience activities can include developing institutional capacities of national governments and local authorities to increase the resilience of human settlements and child friendly infrastructure systems; enabling communities to improve their well-being/health conditions by local institutional strengthening for enhanced local climate response; local resilience strengthening by enhancing the resilience of community-level physical, natural and socio-economic assets and ecosystems; and awareness raising, knowledge management and communication.

The link between climate change and humans is not only associated with human rights. Climate change may additionally adversely affect progress toward attaining the Sustainable Development Goals (SDGs) in settlements, as climate change can increase the pressure on economic activities, such as agriculture and fishing, and worsen the situation in urban areas located in coastal zones.

Slow progress in attaining most SDGs may reduce the resilience and adaptive capabilities of African individuals and communities.



Displaced children empty floodwater that has breached a low barrier. South Sudan, 2014.

Table 2: Possible impacts of climate change phenomena on human settlements

Climate change phenomenon	Consequences for human settlements
General warming: less intense and fewer cold days and nights; more intense and frequent hot days and nights	<ul style="list-style-type: none"> • Intensified heat island effect. • Increased energy demand for cooling. • Declining air quality in cities. • Reduced energy demand for heating. • Incidence and geographic range of vector- and water-borne diseases could change because of changes in mean temperature.
Extreme weather: heat waves and droughts	<ul style="list-style-type: none"> • Increased demand for water, compounding present strain from overexploitation and degradation. • Conflicts over resources. • Declining water quality, water stress and pressure on water-supply systems. • Evaporation of surface water. • Increased risk of heat-related mortality, especially for the elderly, chronically sick, very young and poor. • Reduction in quality of life for people without appropriate housing. • Drought stress will be exacerbated in drought-prone regions. • Susceptibility to environmental degradation for rural settlements. • Reduced crop productivity, increased pests and diseases, which could have implications for local livelihoods, food-system infrastructure and urban food security. • Undernutrition could have lifelong impacts on development and health. • Increased risk of wildfires.
Extreme weather: heavy rainfall events and violent storms	<ul style="list-style-type: none"> • Adverse effects on quality of surface and groundwater, contamination of water supply. • Increased risk of deaths; injuries; infectious, respiratory and skin diseases; water- and food-borne diseases; and post-traumatic stress disorders. • Unplanned informal settlements are particularly susceptible to floods, offering poor accessibility for emergency services. • Disruption to commerce. • Damage to or destruction of bulk and critical infrastructure. • Disruption to transport systems and traffic. • Flash floods and mudslides could destroy or damage assets, force people from their homes or lead to deaths. • Large displacement of people (who may return to the area), or distress migration to urban informal areas. • Pressure on urban and rural infrastructure, including power outages, disruption of public water supply and transport. • Loss of property and withdrawal of risk coverage in vulnerable areas by private insurers.

Climate change phenomenon	Consequences for human settlements
Sea-level rise and storm surges	<ul style="list-style-type: none"> • A threat to coastal settlement, disrupts transport systems, infrastructure and public services, especially in informal settlements. • Decreased availability of fresh water due to salt-water intrusion. • Harmful impacts to marine and estuarine environments. • Increased risk of deaths and injuries by drowning in floods and migration-related health effects. • Increased migration, which can result in human suffering, human rights violations, conflicts and political instability. • Loss of property and livelihoods, particularly in marine fisheries and tourism, and the withdrawal of risk coverage in vulnerable areas by private insurers. • Damage to real estate, decreased value of beachfront properties and decreased tourism. • Permanent erosion and submersion of land. • Costs of coastal protection versus costs of land-use relocation and damage to natural infrastructure – potential requirement for movement of populations and infrastructure.

Source: Niang et al. 2014

2.4 Climate change, migration and displacement in Africa

Climate change and environmental degradation are contributing to displacement and migration and it is foreseen that this will further escalate. In sub-Saharan Africa, 86 million people are internal climate migrants. For example, migration of fisherfolks from coastal villages in West Africa to cities because of the depletion of fish resources linked to ocean acidification, and nomadic populations in East Africa altering their traditional migration patterns to cope with the impacts of desertification¹⁵.

“

An analysis that says that climate change will automatically lead to conflict is incorrect. Climate change is a threat multiplier in a context where the conditions and the drivers for conflict already exist.”

Chitra Nagarajan.

Displacement can be temporary, for example due to a flood, or permanent due to the loss of arable land caused by desertification, or coastal erosion from sea level rise and storms. People are also temporarily or permanently migrating both domestically and internationally to find new sources of income because climate change and environmental degradation have undermined the livelihoods they had before. The scale at which climate and environment related displacement and migration is starting to unfold will be very challenging and will put many children at high risk. Government and non-government support systems and services critical to children’s health and well-being will be put under increasing pressure.

¹⁵ IOM, Climate Change and Migration in Vulnerable Countries: A snapshot of least developed countries, landlocked developing countries and small island developing States, 2019 www.unccllearn.org/sites/default/files/inventory/climate_change_and_migration_in_vulnerable_countries.pdf

The frequency, magnitude and impact of climate and environment related disasters and conflicts is already increasing and will continue to do so. This means many more children will be affected and will require support from UNICEF and other stakeholders. Climate and environmental related disasters have a multiplier effect exacerbating an already fragile situations, putting already stretched capacity and resources under even further and making children the weakest link in this vicious cycle. It also means there is a significant risk that governments and donors will relocate resources from national and local development to humanitarian situations. Whilst from a short-term perspective this “firefighting” is understandable and essential, the recurring and/or prolonged humanitarian situations will gradually undermine the socio-economic development of a country, and opportunities for children.

2.5 Climate hazards, risks, impacts and vulnerabilities in Africa

The impacts of climate change will vary between regions, from sector to sector and even within sectors. Understanding specific vulnerabilities and risks is essential for planning and implementing adaptation actions at regional level.

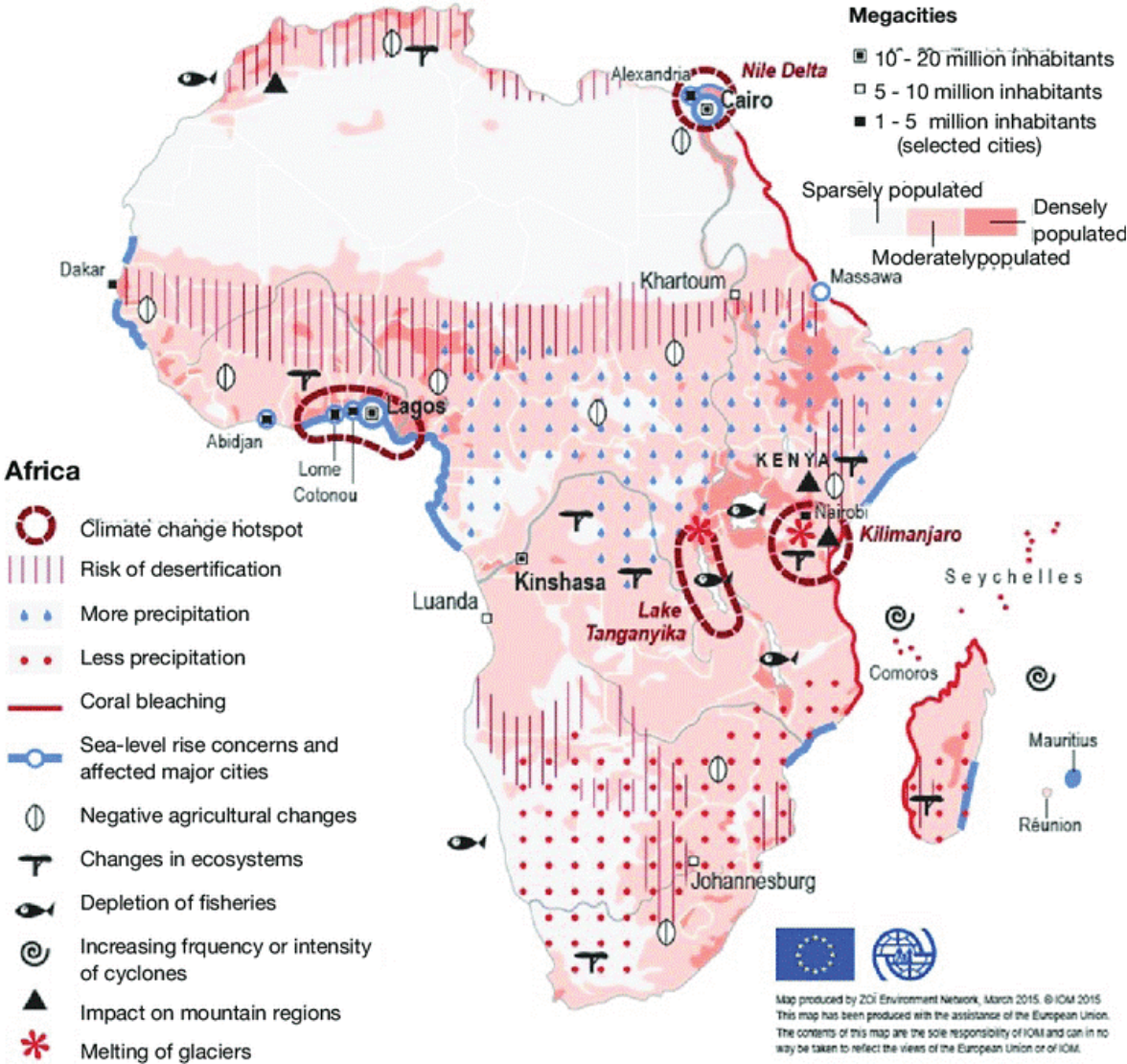
Climate change is a key driver of climate-related risks but is not the only one. The regional impacts of climate change also depend on the development of environmental, socio-economic, political and technological conditions at regional scale. For example, human vulnerability can increase because of urbanization of coastal flood plains, deforestation of hill slopes or construction of buildings in risk-prone areas. On the other hand, it can be reduced by building institutional and technical capacity to address climatic hazards.



Family displaced from their home by Cyclone Ivan walks 10 kilometres to a temporary shelter. Madagascar, 2008

©UNICEF/UNI27798/Rasoamanana

Figure 12 : Climate hazards and environmental impacts in Africa



Source: IOM, 2015

The map in Figure 12 shows that many countries in Sub Saharan Africa will have to contend with semi-arid conditions that will make agriculture challenging, and climate change and variability are likely to further compromise agricultural production and therefore food security. In southern Africa in particular, less precipitation is anticipated. Desertification is likely to increase in Angola, Botswana, southern parts of Mozambique, and South Africa, affecting food production.

“ The 2015–2016 El Niño weather phenomenon, the worst in 50 years at the time, caused intense drought in southern Africa. 15.6 million people were left in need; 8.5 million of them children. The drought compounded existing vulnerabilities, resulting in severe food shortages, particularly in Eswatini, Lesotho, Madagascar, Malawi, Mozambique and Zimbabwe.



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Children stand amidst flooded crops in Mutarara District in Tete Province. Mozambique, 2008.

The projected sea-level rise would increase flooding, particularly on the coasts of Kenya, Madagascar and Mozambique in eastern Africa, increasing the high socio-economic and physical vulnerability of coastal cities. In addition to the risks of flooding around coastal areas, approximately 10 million children live around Lake Victoria, which is also prone to flooding. Floods threaten children's survival and development. Direct impacts include injuries and death by drowning, while indirect impacts include displacement, forced migration and increased spread of water-borne diseases such as cholera and malaria. Seasonal food scarcity and climate shocks drive short-term malnutrition, morbidity, and mortality impacting child health outcomes.

Geological hazards such as earthquakes, landslides and surface collapse (e.g. sinkholes) also pose a serious threat to human life and property, and sometimes cause major economic losses and disruption. These occur predominantly along the Rift Valley but are generally less pronounced than hydro-meteorological events. Geological hazards directly affect children through loss of life, forced displacement and increased poverty.

Increasing frequency or intensity of cyclones have also affected island states and southern Africa (Malawi, Mozambique and Zimbabwe), with recent devastating events such as Cyclone Idai and Cyclone Kenneth and subsequent flooding.

2.6 The cost of inaction to climate change in Sub-Saharan Africa

Africa is arguably one of the most vulnerable regions in the world to the impacts of climate change. The majority of both bottom up and top down ('integrated assessment') studies suggest that damages from climate change, relative to population and GDP, will be higher in Africa than in any other region in the world. This is corroborated by the analysis using the Regional Integrated model of Climate and the Economy (RICE) model which suggests that climate damages in Africa, as a percentage of GDP, may be 10 per cent higher than the next most exposed region (India) and more than twice as high as in the US, Russia, Eurasia and Latin America. Breaking these impacts into specific sectors or components further illustrates these vulnerabilities, with recent studies into health, agriculture and water all demonstrating that Africa is often more vulnerable to climate change along these dimensions than any other region.

This vulnerability, coupled with the continent's negligible contribution to current and/or historic emissions, means that adaptation spending is the continent's climate investment priority. Africa accounts for less than 7 per cent of total emissions and its emissions per capita are less than half the global average. Given this, it is not surprising that last year's report by UN Secretary General's High-Level Advisory Group on Climate Change Finance concluded that adaptation spending was a priority in Africa.

The African Development Bank¹⁶, concludes that the most relevant studies suggest adaptation costs in Africa in the region of US\$ 20-30 billion per annum over the next 10 to 20 years. A wide number of estimates of the costs of adaptation in Africa have been made, using a variety of approaches. This generates considerable uncertainty with the full range of estimates spanning US\$ 2 billion to US\$ 60 billion per annum. However, most recent studies, especially those that factor in and attempt to address Africa's existing adaptation deficit converge on a range between US\$20- 30 billion over the next 10-20 years. This represents a reasonable 'approximate' estimate that can be used in the purposes of discussions on raising and allocation of international climate finance. This amount is on top of existing development and poverty alleviation needs, for the Sustainable Development Goals.

Adaptation investments have the potential to substantially reduce the hardship from climate change in Africa. Africa's immediate adaptation priority is to improve its current adaptive capacity, much of which will be operationally indistinguishable from – and needs to be fully integrated with – traditional development activities. These include investments in the health and education sectors as well as in building institutional capacity.

Beyond this more targeted adaptation investments are required, it is therefore critical to ensure that the design and location of this infrastructure, which will span over generations is climate resilient and adapted. In addition, though the policy focus in Africa is on adaptation, the global need to reduce greenhouse gas emissions remains unchanged as the costs of dealing with more aggressive climate change are less well understood but likely to be substantially higher than those related to the projections based on a 2 – 3°C change in temperature.

16 <https://www.afdb.org/fileadmin/uploads/afdb/Documents/Project-and-Operations/Cost%20of%20Adaptation%20in%20Africa.pdf>.

3 Climate change policy and financing in Africa

3.1 Nationally determined contributions

NDCs are intended reductions in GHG emissions under the UNFCCC. All countries that signed the UNFCCC are required to publish their Intended Nationally Determined Contributions (INDCs).

Almost 60 per cent of NDCs contain no reference to children or youth, rising to almost 80 per cent of NDCs with respect to younger children. UNICEF is strengthening its work with governments on development of child sensitive and child friendly NDCs as well as adaptation and mitigation strategies and plans. Sub Saharan Africa, UNICEF's work is in the formation stage but will be resourced and supported depending on the requirements for support at country level.

3.2 Country-level policy

Countries in sub-Saharan Africa are particularly vulnerable to climate variability and change. The resultant extreme weather events, such as droughts and flooding, threaten the sustainability of national development. To safeguard sustainable development, governments are expected to develop policies and frameworks that provide a clear and concise articulation of overall response priorities to climate variability and change. Through the process of development and adoption of policies and frameworks, governments can integrate climate change considerations into development planning, budgeting and implementation in all sectors and at all levels. Such policies are aimed at enhancing adaptive capacity and building resilience to climate variability and change, while promoting a low carbon development pathway.

UNICEF with its network which bridges the local and regional level allows for effective cross learning and pollination between the African region and other players such as the European Union countries and can leverage cross learning and scale up by applying regional approaches to influence country level policy and actions.

3.3 National Adaptation Programmes of Action

In implementing UNFCCC Article 4(9), the Conference of the Parties (COP)¹⁷, in 2001, established the LDC work programme, that included National Adaptation Programmes of Action (NAPAs), to support LDCs to address the challenge of climate change given their particular vulnerability. The COP also established a Least Developed Countries Fund (LDCF) to fund the preparation and implementation of NAPAs and an LDC Expert Group (LEG) to provide technical support and advice to the LDCs.

¹⁷ The parties to UNFCCC have met annually from 1995 in Conferences of the Parties (COP) to assess progress in dealing with climate change.

NAPAs provide a process for the LDCs to identify priority activities that respond to their urgent and immediate needs related to adaptation to climate change – the needs for which further delay could increase vulnerability or lead to increased costs at a later stage. The rationale for NAPAs rests on the limited ability of the LDCs to adapt to the adverse effects of climate change. In the NAPA process, prominence is given to community-level input as an important source of information, recognizing that grassroots communities are the main stakeholders. NAPAs use existing information and no new research is needed. They are action-oriented, country-driven, flexible and based on national circumstances. To effectively address urgent and immediate adaptation needs, NAPA documents are presented in a simple format, easily understood by both policy-level decision-makers and the public.

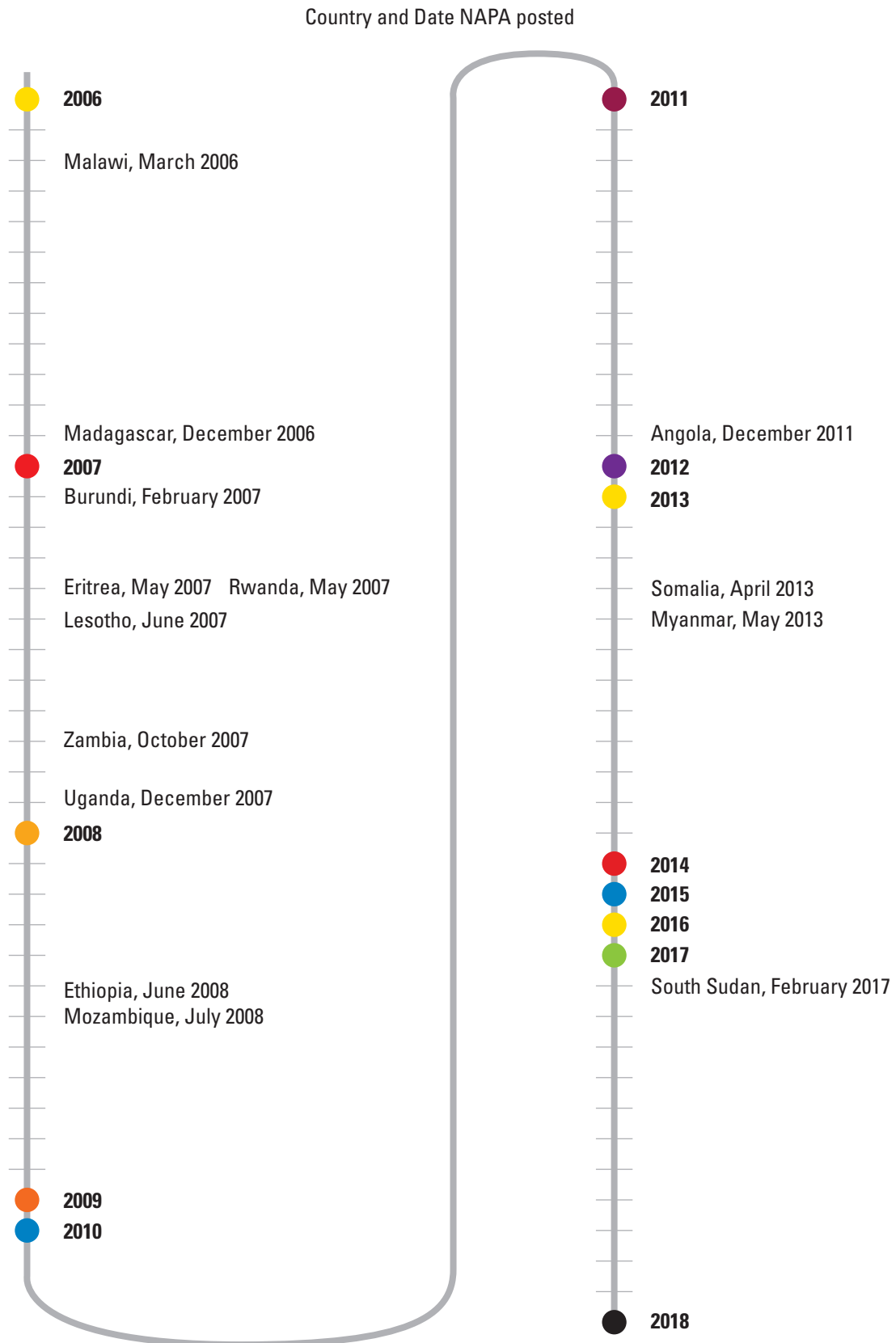
The main content of the NAPA document is a list of ranked priority adaptation activities/projects, as well as short profiles of each activity, designed to facilitate the development of project proposals for implementation of the NAPA. Priority sectors/areas addressed in the NAPAs are agriculture and food security, water resources, coastal zones, and early warning and disaster management. Most LDCs are in the process of implementing their NAPAs.

Once a NAPA has been submitted to the UNFCCC Secretariat, the LDC Party is eligible to access funding under the LDCF, which is managed by GEF, for the implementation of the NAPA. To initiate the process of accessing funding, an LDC Party prepares a concept note and requests the assistance of a GEF implementing agency to submit a project identification form and then a full project proposal to the LDCF. The GEF agency works closely with the country during each successive step of the LDCF cycle, and ultimately supports the country to implement the project.

Only 15 of the 21 countries in the Eastern and Southern Africa region have developed their NAPAs. Given that over 50 per cent of the region's population will be children by 2030, the NAPAs provide an opportunity to provide child-centred adaptation activities/projects which address child-specific needs, vulnerabilities and opportunities. The extent to which NAPAs consider child-specific vulnerabilities is not known. UNICEF will continue to advocate for child friendly adaptation plans and activities in countries.



Table 3: Status of National Adaptation Programmes of Action in Eastern and Southern Africa Countries



Source: UN Climate Change, Submitted NAPAs <https://unfccc.int/topics/resilience/workstreams/national-adaptation-programmes-of-action/napas-received>

3.5 Status of National Adaptation Plans

The NAP process was established under the Cancun Adaptation Framework (2010) to prepare countries to address climate risks in the medium term.

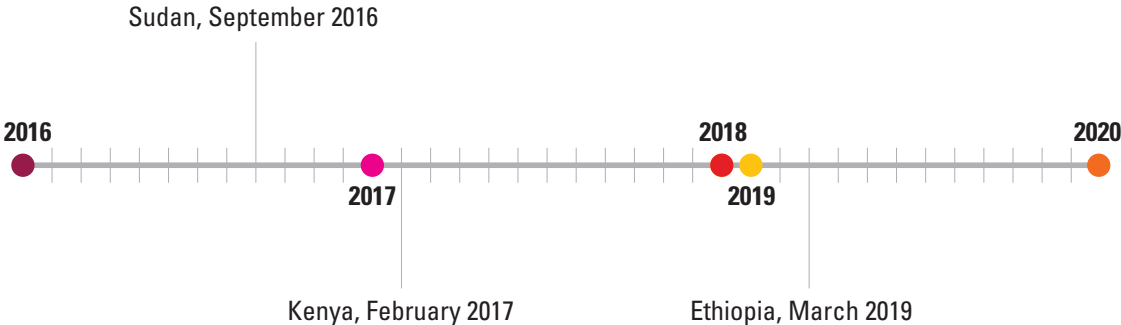
The NAPs are not a one-off investment. Rather, the process is intended to be continuous, progressive and iterative. NAPs require the building of a stronger evidence base, improving skills and capacity and adopting learning-by-doing approaches. NAPs need to be country-driven, gender-sensitive, participatory and use transparent approaches. The agreed objectives of the NAP process are:

- To reduce vulnerability to the impacts of climate change, by building adaptive capacity and resilience;
- To facilitate the integration of climate change adaptation, in a coherent manner, into relevant new and existing policies, programmes and activities, development planning processes and strategies, within all relevant sectors and at different levels, as appropriate.

The NAP allows a country to identify medium- and long-term adaptation needs, and to develop and implement projects and programmes. Under the Cancun Adaptation Framework, at least one LDC was invited to formulate and implement a NAP as a means to address these needs, and other developing country Parties were invited to employ the modalities formulated to support NAPs in their planning efforts¹⁸.

Only three countries in Eastern and Southern Africa (Ethiopia, Kenya and Sudan) have developed and published their NAPs (Table 4). The other countries have initiated the process to formulate and implement NAPs, with the exception of Namibia for which no information is available.

Table 4: Status of National Adaptation Plans in Eastern and Southern Africa Countries



Source: UNFCCC, NAPs from developing countries www4.unfccc.int/sites/NAPC/Pages/national-adaptation-plans.aspx

The UNFCCC report, National Adaptation Plans 2018¹⁹, gives information on specific country progress and process towards formulation of a NAP, including the steps of laying the groundwork and addressing gaps; preparatory elements; implementation strategies; and reporting, monitoring and review.

¹⁸ Decision 1/CP.16, paragraphs 15 and 16
¹⁹ UNFCCC, National Adaptation Plans 2018, Progress in the process to formulate and implement National Adaptation Plans, December 2018 <https://unfccc.int/sites/default/files/resource/Progress%20in%20the%20process%20to%20formulate%20and%20implement%20NAPs.pdf>

Currently, LDCs and other developing countries are accessing US\$3 million for NAP formulation under GCF Readiness and Preparatory Support Programme. Some LDCs have also successfully applied for funding for specific activities relevant to NAPs under the LDCF. Accredited delivery partners, such as the United Nations Development Programme (UNDP), the United Nations Environment Programme (UNEP) and the Food and Agriculture Organization of the United Nations (FAO) are assisting countries to access these funds.

3.6 Financing mechanisms for managing climate change

The contribution of countries to climate change, and their capacity to prevent and cope with its consequences, varies enormously. The UNFCCC and its Kyoto Protocol therefore foresee financial assistance from Parties with more resources to those less endowed and more vulnerable. Developed country Parties provide financial resources to assist developing country Parties to implement the Convention. To facilitate this, the Convention established a financial mechanism to provide funds to developing country Parties.

Parties have established four special funds: the Special Climate Change Fund and the LDCF (both managed by the GEF); the GCF under the Convention; and the Adaptation Fund under the Kyoto Protocol.

Climate finance flows and carbon asset mechanisms present an opportunity for countries in the region to access new and additional levels of funding. For governments, this means accessing international financing for ambitious climate-resilient and low-emission development programmes. For the private sector it can entail developing financial and insurance services, engaging in projects to generate carbon credits for sale in international markets, exploiting new green economy opportunities and creating green jobs. For UNICEF, this means forming strategic partnerships and alliances with organizations that would enhance its capacity to access climate finance. UNICEF is currently accredited for the GCF readiness fund and is undergoing accreditation with the GCF for small to medium sized projects and it has also participated in a number of GEF projects across the region. This will allow UNICEF to access climate finance flows and carbon asset mechanisms and deliver results for children.

4 Rationale for engagement

4.1 Rationale for UNICEF climate change interventions

At a global level UNICEFs work on environment and climate change is triangulated and guided by the Sustainable Development Goals (SDGs), Paris Agreement and Sendai framework. The Sendai Framework for Disaster Risk Reduction 2015-2030 aims to achieve the substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries, while the Paris Agreement provides a framework for dealing with greenhouse-gas-emissions mitigation, adaptation, and finance within the United Nations Framework Convention on Climate Change (UNFCCC) and the SDGs are a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity by 2030. UNICEF continues to use these global agreements to guide implementation and response activities in the area of climate change and environmental responses.

At a local level, climate change and its impact not only involve the natural ecosystem, but can have a disruptive effect on societies in general and child rights in particular, because they threaten to undo the major gains made in past years and impede realization of all the rights of children as captured in the CRC. The impact is felt in some very obvious ways, such as the rights to life, survival and development (Article 6); the right to the highest attainable standard of health (Article 24); the right to an adequate standard of living (Article 27); the right to education (Article 28); and the right to minority or indigenous culture (Article 30). Climate change also affects the right of children to be free from any form of violence or exploitation (Articles 19, 32 and 34-36), and the right of a child to recreation and play (Article 31).

UNICEF brings multiple strengths and comparative advantages to action on climate change. In many countries, UNICEF Country Programmes can provide a solid platform and delivery mechanism for addressing environment and climate related issues in the context of children's health and well-being. With UNICEF's major comparative strengths at the national, sub-national and community levels, where in the decentralized contexts the responsibilities and resources for addressing climate change are found and where support is provided to communities.

UNICEF is in a unique position, supporting work on climate change intervention during the emergency preparedness phase, throughout the emergency as well as post emergency. This allows the organisation to work at a policy level as well as contribute in terms of mitigation and adaptation. UNICEF delivers community based, inclusive and participatory projects which are inherently low carbon approaches. By investing in a child, we invest in a family as we interact with parents, caregivers and partners resulting in an investment which has multiple leveraging effect for the overall community and provides for sustainable solutions for the future. Investing in a child's healthy development within its family and community means sowing the seeds for resilience and sustainable development, as this child will be part of creating future job and market creation which in turn can contribute to reduce forced migration.

As part of a systems approach, UNICEF works to ensure improved sustainability of interventions and resources efficiency and that projects are delivered in an integrated multisectoral manner. This means going beyond standalone interventions and assessing the complementarity of the different sectors including WASH, Health, social protection, education, disaster risk reduction and preparedness and other sectors. In that sense it is essential for UNICEF to leverage partnerships with other organisations and partners such as UNEP in order to combine strengths and maximise leveraging results for an environment fit for children. UNICEF's climate and environmental sustainability strategy is anchored around 4 pillars. It is the basis for our external advocacy, programmatic interventions, and internal greening efforts.

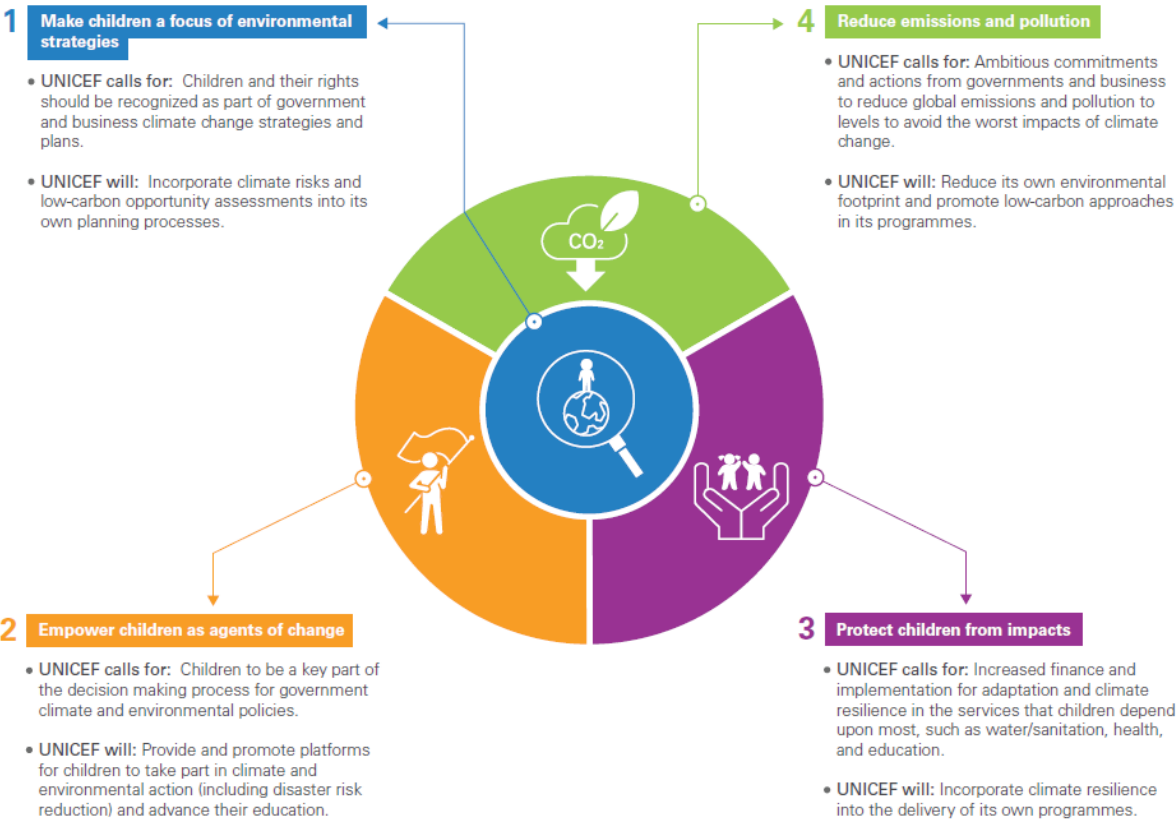
In all programme countries, UNICEF is well established and a highly respected organization in a number of key sectors affected by climate change, such as child protection, education, health, social protection and WASH. Whereas other organizations may have in-country expertise on climate change, environment and energy, UNICEF has the sector expertise,. UNICEF already has an established network and operational capacity in humanitarian and development contexts at all levels; where the actual results need to be delivered and is adept at working multisectorally; with the required thematic expertise; in an integrated manner to maximize impact. It is precisely this complementarity which invites for a multi-stakeholder partnership for effective and systemic climate action.

Country Offices have in-house expertise and experience in emergencies and disaster risk reduction DRR which is particularly relevant to climate change adaptation and resilience building. UNICEF is in a unique position to support work on climate change interventions during the emergency preparedness phase, throughout the emergency, as well as post emergency. This allows the organization to work at a policy level as well as contribute in terms of mitigation and adaptation. As UNICEF is often one of the first responders on the ground, we are well aware of the work needed to ensure that our climate change responses are effectively integrated into the development actions that build the bridge with the humanitarian emergency response. In addition, UNICEF provides added value through its regional offices such as WCAR and ESAR which work with country programmes to synergies and engage extended networks not only on the African Continent but also globally. UNICEF's climate and environmental sustainability strategy is anchored around four pillars (Figure 13) which are the basis for external advocacy, programmatic interventions, and internal greening efforts.

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Climate change threatens children's survival, development, nutrition, education, and access to health care – all of which are children's rights and enshrined in the Convention on the Rights of the Child (CRC). In addition, Article 24 of the CRC makes explicit mention of considering “the dangers and risks of environmental pollution”.

Figure 13: UNICEF’s climate and environmental sustainability strategy



Source: UNICEF Strategic Plan, 2018-2021, UNICEF Executive Board Orientation Session 2020 www.unicef.org/about/execboard/files/2020-EBO-PD_and_DAPM-EN-2020.01.16.pdf

The five goal areas identified in the UNICEF Strategic Plan 2018–2021 (Every child survives and thrives; Every child learns; Every child is protected from violence and exploitation; Every child lives in a safe and clean environment; Every child has an equitable chance in life) span a child’s life cycle and encompass antenatal care (ANC), infancy, childhood and adolescence, giving priority to the most disadvantaged children. Equity for children is both a standalone goal and a cross-cutting priority. The result areas target the key barriers that hold children and young people back, deny them the agency to shape their destinies and prevent them from accessing critical services that can save their lives and help them fulfil their potential.

Climate change negatively affects attainment of these goals and is therefore a critical aspect to be addressed in UNICEF’s work. In addition, Goal area 4: “Every child lives in a safe and clean environment” allows UNICEF to directly engage with climate change issues and enables integration of climate change responses into all UNICEF programming.

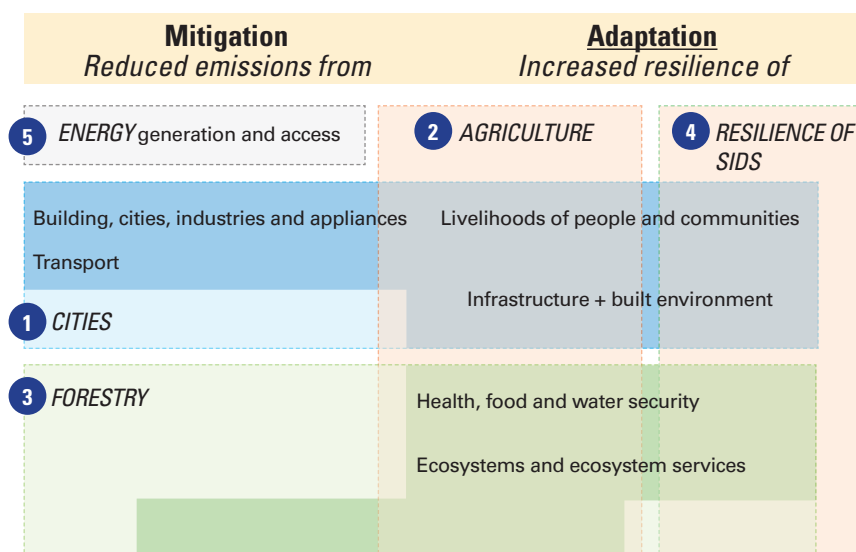
UNICEF has initially identified five areas in which it has the potential to programmatically deliver climate-related initiatives at scale in the near term. Each of the five programmatic areas has implications for UNICEF’s work to influence policies and strategies, is designed to protect children from the impacts of climatic and environmental degradation, incorporates low-carbon development and actively involves children and young people:

- Climate-smart health centres;
- Climate-smart schools;
- Climate-resilient WASH services;
- Tackling pollution (air, soil and water); and
- Reflecting the fourth pillar (Figure 13), engaging children and young people, which UNICEF sees as both a standalone area of focus, and integrated into each of the four other programmatic priorities.

The areas were selected following a global consultation and internal assessment that prioritized programmatic interventions based on the potential benefits for children, momentum in innovation and financing, and its ability to both demonstrate downstream implementation and influence upstream policy through strong relationships with governments and partners and its five decades of sector experience in humanitarian and development contexts.

In order to fully understand climate impacts, their consequences for the system and suitable responses, a holistic view is required of impacts and system interlinkages. These are particularly important when developing a programmatic approach to mitigation and adaptation actions in a system, both of which are incorporated into projects related to climate change. Figure 14 identifies potential projects which can be developed as part of the response to climate change at a broad thematic level, with UNICEF able to contribute to the themes of cities, agriculture, forestry, resilience of small island developing states, and energy generation and access.

Figure 14: Interface of mitigation and adaptation projects



Source: GIZ

The interlinkages between climate change, urbanization and cities, WASH, health, nutrition, gender and children are outlined in the next section. In order to fully develop a good climate rationale, evidence of impacts may need to be gathered at a more localized level to develop holistic programme interventions.

4.2 Climate change and children

In every crisis, children are the most vulnerable. Climate change is no exception. Ghani et al's (2017) analysis shows that up to two-thirds of preventable illness and death from environmental hazards is experienced by children, and the burden is predominantly in those aged under five years. Children are particularly vulnerable during gestation and early childhood, as critical biological systems such as the immune and central nervous system are developing. Maternal under-nutrition, infection and illness at these critical times can cause life-long damage, including physical stunting, neurological impairments and immune dysfunction. Examples of the effects of climate change and impacts on children include the following:

- Children tend to spend more time outdoors, where they can be exposed to high temperatures and where disease vectors are found, such as rodents, mosquitos and ticks.
- Children require more water (by weight) than adults, so their exposure to water-borne pathogens is much higher.
- Diarrhoeal diseases cause dehydration in children much faster than in adults. Children are more likely to develop severe infections and experience complications during recovery due to their small body size and their developing immune systems, which provide little natural immunity or resistance.



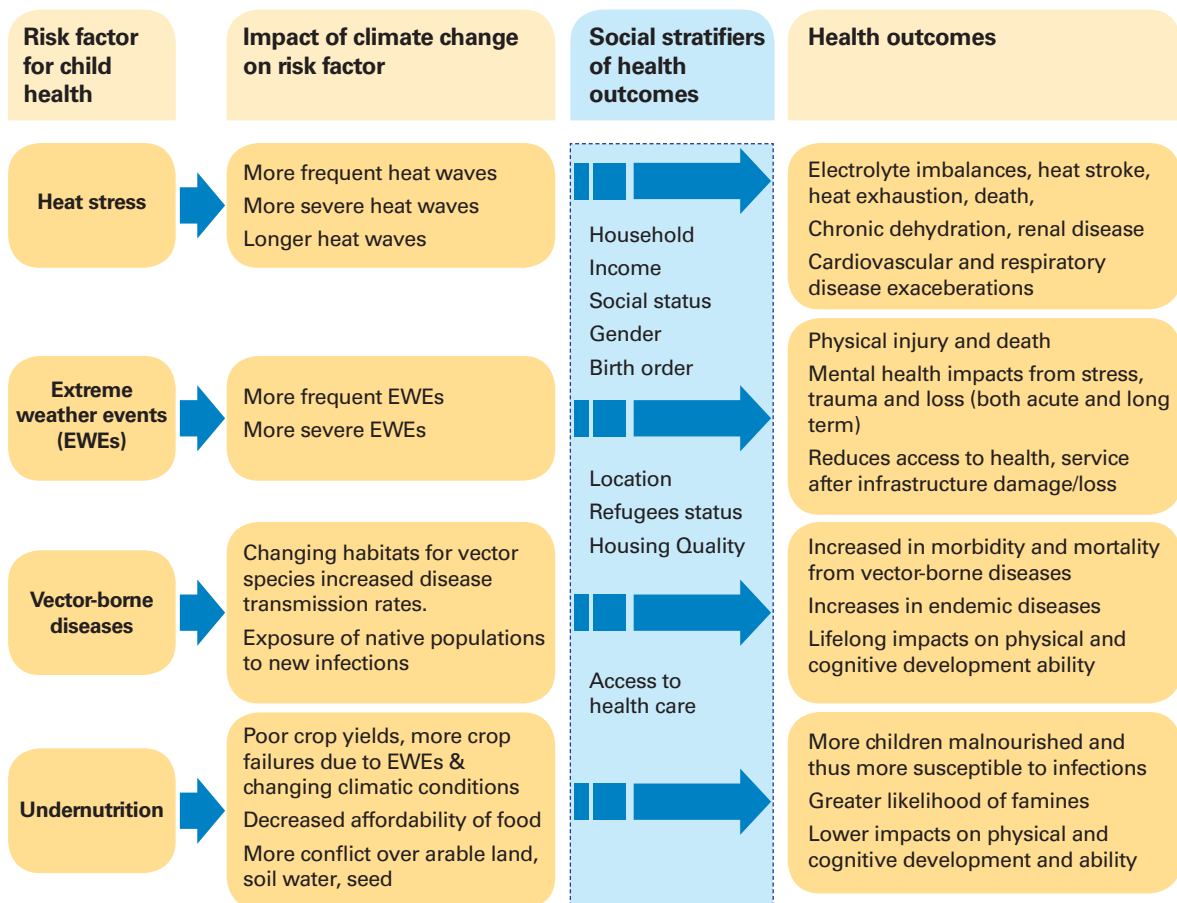
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Africa only represents 2% of global greenhouse-gas emissions but it is the continent that is expected to suffer the most from climate impacts- children as the least responsible for climate change will be the most vulnerable,”

Mafalda Duarte
(World Bank Climate Investment Fund),

Given the multisectoral impact of WASH as a mechanism for responding to child health and climate change, WASH is a key entry point for addressing the range of climate-induced vulnerabilities and impacts on children. Figure 15 shows climate-related changes such as heat stress, extreme weather events, vector-borne diseases and under-nutrition, and how they lead to differential health outcomes for children.

Figure 15: Selected environmental hazards, climate change, and health outcomes for children



Source: Ghani et al (2017)

4.3 Climate change and gender

Gender differences are likely to be exacerbated by climate change, and in adaptation and mitigation measures that can help to protect and promote health. Gender considerations are critical for vulnerability risk assessments and climate policy interventions in order to implement measures that are beneficial to both women and men.

Many of the health risks due to climate change show gender differentials, with the gender-gap effects on life expectancy greater in more severe disasters, and in places where the socio-economic status of women is particularly low. Some examples of the gender differential observed are as follows:

- Natural disasters such as droughts, floods and storms kill more women than men, and tend to kill women at a younger age.
- Health conditions exacerbated by climate change, such as undernutrition and malaria, are more prevalent in women
- Statistics show that women are more at risk, in both relative and absolute terms, of dying in heatwaves.
- During droughts in developing countries, health hazards are induced through reduced availability of water for drinking, cooking and hygiene, and through food insecurity. Women and girls disproportionately suffer health consequences of nutritional deficiencies and the burdens associated with travelling further to collect water.
- In both developed and developing countries, there is evidence that drought can disproportionately increase suicide rates among male farmers.

Women and men differ in their roles, behaviours and attitudes, and this impacts their adaptive capacities as well their ability to apply mitigation measures in response to climate change. As technology is applied as a mitigation measure, gender differences have also been identified concerning the potential health and safety risks in the use and implementation of new technologies to reduce GHG emissions. Engendered information could support development and implementation of healthier and more environmentally friendly policies.

In order to enable successful implementation of adaptation strategies, one needs to take into account women's and men's relative and different capacities, power, social resilience, vulnerabilities and resources. Annex 1 shows examples of gender dimensions, adaptive strategies and possible interventions.

5 UNICEF in action

5.1 UNICEF Advising and supporting government systems

Leveraging UNICEF's unique advocacy strengths could create an enabling environment for children to become visible in climate change mitigation, advocacy and adaptation processes. In particular, there is an urgent need to address the near total absence of information and data on children most at risk from the impacts of climate change, the measures required to address their specific needs, and mechanisms to support their full and meaningful participation in climate-related policy discussions and initiatives. Bridging data gap is particularly important to ensure appropriate, forecasting planning and adaptation in the delivery of basic services in the event of large scale climate displacement.

Filling these gaps would build governments' capacity to better understand the needs and opinions of children, to direct funding accordingly, and to meet their commitments under the CRC and the Paris Agreement on climate change in 2015 (the first-ever universal, legally binding global climate change agreement) in a coherent manner.

UNICEF continues to support the development of NAPs for example in Angola as well in other countries especially at sectoral level. UNICEF is also working with different government departments and institutions to develop fundraising proposals across the WCAR and ESA regions in order to leverage and access GCF, particularly in support of GCF's health and well-being pillar, as well as GEF funding in order to support adaption and mitigation activities. UNICEF also holds an accreditation as a GCF readiness delivery partner and works with government to prepare and deliver GCF readiness projects.

UNICEF continues to strengthen dialogue and partnerships with other organizations on climate change and children, especially at country and regional level including multilateral development banks, other UN agencies such as UNESCO, UNDP, UNEP, bilateral development agencies for instance the German development agency, GIZ, and environmental NGOs, such as the World Wide Fund for Nature (WWF) and the International Union for Conservation of Nature (IUCN).

Furthermore, UNICEF is well known for its communications and advocacy underpinned by solid data and analytical capacity. Using its network of Country Offices and National Committees, UNICEF can reach out to and work with children, governments, civil society and the private sector in all countries. Building on these strengths and complementarities, UNICEF is well positioned to step up its engagement with national governments and to strengthen its capacity to do so.

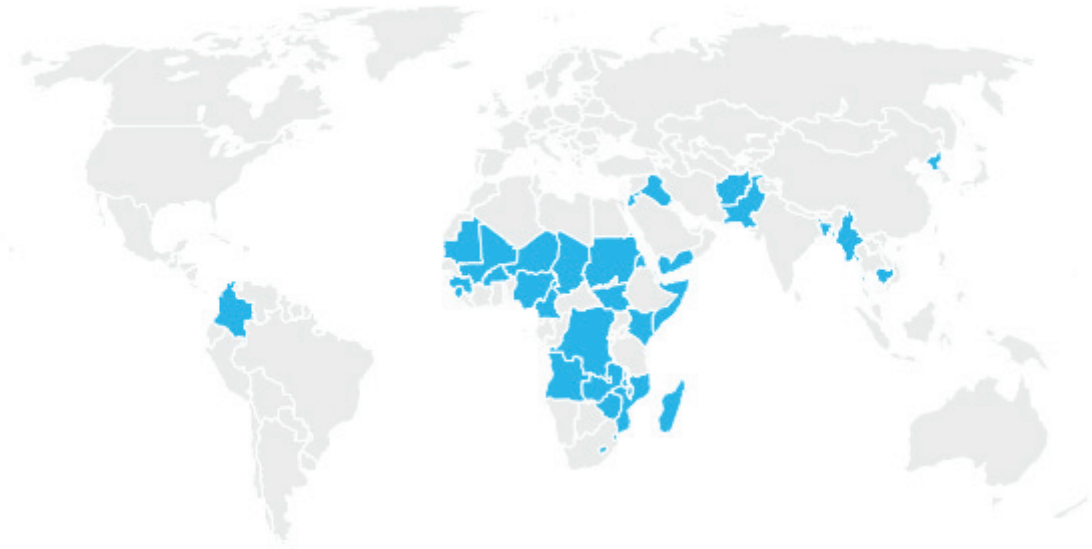
5.2 Low-carbon approaches when working with children

Many children still live without lighting and electricity in their homes, schools and health centres. Sustainable energy sources not only help address climate change but can drive better outcomes in areas such as health, water and education. Clean, affordable energy is considered a 'golden thread' – reducing indoor and outdoor air pollution; improving access to clean water through solar pumps; facilitating digital connectivity critical to young people's future prospects and learning; providing lighting in the home so that children can do their homework at night; and supporting the cold-chain for medicines and power for life-saving medical equipment, among multiple other areas critical for children's well-being and improved livelihoods.

UNICEF is actively utilizing and promoting renewable energies for its programmes UNICEF has built low-carbon, resilience building directly into its programmes. As such climate-smart health and education systems for example are more resilient not just to climate change, but to all sorts of crisis – including pandemics. For example, renewable energy improves the self-reliance of schools and health clinics, minimizing the effects of disruptions in traditional systems and infrastructure.

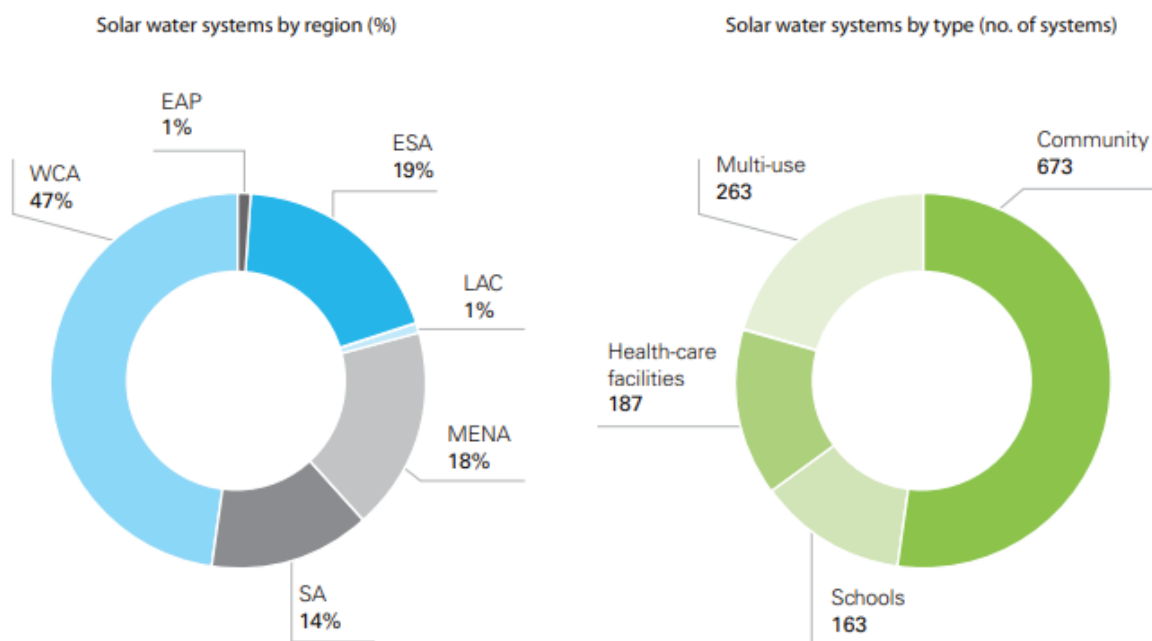
We need to continue building and strengthening resilience and disaster preparedness directly into our programmes. Resilient social protection systems are better able to manage the impacts of the variety of shocks, from climate change and natural disasters, to epidemics and economic shocks. The figure below shows the distribution and extent of solar systems installed by UNICEF in 2019.

Figure 16: Distribution and extent of solar systems installed by UNICEF in 2019



Source: UNICEF SMQs (2019).

Figure 17 : Solar water systems through direct UNICEF support, by region and by type, 2019



Source: UNICEF SMQs (2019).30 Notes: EAP, East Asia and the Pacific; ECA, Europe and Central Asia; ESA, Eastern and Southern Africa; LAC, Latin America and the Caribbean; MENA, Middle East and North Africa; SA, South Asia; WCA, West and Central Africa.

5.3 Developing a climate-informed country programme

Climate change and related environmental and energy issues should be incorporated throughout the country programme cycle in a strategic and SMART (Specific, Measurable, Achievable, Realistic and Timely) way. This is done by:

- Integrating these issues in ongoing/planned initiatives under UNICEF’s outcome areas (education, health, WASH, etc.); and
- Developing and implementing new initiatives that specifically focus on addressing climate/environment/energy issues affecting children.

Assessing climate risks “is already a requirement “in the Situation Analysis and in future programming resulting in a holistic and integrated climate action approach which can leverage the synergies between relevant sectors in a programme and or result in an environment fit for children at national and local level.

Case study 1: Developing a climate-informed country programme in Madagascar

Climate change context

Climate change is increasing the frequency of droughts and high-intensity cyclones in Madagascar. According to the 2017 University of Notre Dame Global Adaptation Initiative (ND-GAIN) index – which ranks the countries most vulnerable to climate change and the least ready to address it – Madagascar is the 13th most vulnerable to climate change and the 22nd least ready; it ranked 169th out of 181 countries and territories. Rapid degradation of the natural environment is taking place in a country known for its breathtaking biodiversity, with 86 per cent of its fauna and flora unique to the island.



The country's vulnerability is further exacerbated by the fact that Madagascar is one of the poorest countries in the world, with 77 per cent of its people living under the poverty line. Only 41 per cent of the population of 26 million have access to a reliable water supply. Recurring droughts and cyclones, aggravated by destructive natural resource management and deforestation, render management of water resources more difficult, resulting in lower agricultural and livestock production, with adverse effects for nutrition and health outcomes.

The south part of the island nation has the lowest water coverage in the country and has been particularly affected by droughts, including the adverse effects of El Niño in 2016, when 25,000 children were in need of treatment for severe acute malnutrition. At present, there is no national drought monitoring system in Madagascar.

In addition, climate change adaptation related to WASH is further hindered by: limited data on what water resources are available or needed to reinforce resilience in the country; no set criteria to launch early warnings for serious weather events; scarce water and sanitation infrastructure; and low levels of awareness of climate change impacts and potential adaptation actions among both decision makers and community members.

The UNICEF response

The new UNICEF country programme in Madagascar 2021–2025 aims to build the resilience of children and their communities to shocks related to climate change and environmental degradation and empower children and young people to play an active role in mitigating them. Thanks to extensive experience in humanitarian and development implementation across multiple sectors in Madagascar, UNICEF is well placed to undertake this work. Positioning UNICEF as a key player in climate change adaptation work is especially important in Madagascar, where the effects of climate change and environmental degradation are particularly severe and threaten to destroy the country's impressive natural wealth and hinder the life chances of millions of children.

While mitigating impacts of weather- and climate-change-related disasters such as cyclones, droughts and flooding, and building community resilience has always been an important part of the UNICEF Madagascar country programme, the Madagascar Country Office has now made this focus more explicit. This shift began in 2016, in line with a global UNICEF refocus on children and climate change.

The Madagascar Country Office is striving to raise awareness of the threat of climate change and environmental degradation in Madagascar, as well as the needs of children and their families in the country. In 2019 UNICEF published a Country Landscape Analysis for Children²⁰, sponsored research on the effects of pollution, and is an active advocate for changing the paradigm with the Ministry of Water, Sanitation and Hygiene, Ministry of the Environment, and other national stakeholders. In preparation of the new country programme, the Country Office is putting together a knowledge database of existing studies to demonstrate impact, and position UNICEF programmes as flagship climate change mitigation and adaptation initiatives.

Recognizing the role mapping and early detection of droughts can play in preventing or alleviating possible water shortages and famines, UNICEF has also developed a drought monitoring system for southern Madagascar in collaboration with the Ministry of Water, Hygiene and Sanitation and the Joint Research Centre of the European Union. The monitoring system is based on precipitation and vegetation indicators – the Normalized Difference Vegetation Index (NDVI) – derived from satellite images. This data makes it possible to differentiate various levels of severity of drought and UNICEF uses it to produce and disseminate timely, reliable information on current water resources to stakeholders, helping build a groundwater early warning system (GEWS) and distributing a monthly drought alert bulletin.

Partnerships for climate change adaptation and mitigation

Awareness raising at multiple stakeholder level is one of UNICEF's strengths, that has been an effective vehicle for raising awareness on climate change. This includes revising the national, regional, and municipal Water and Sanitation Master Plans to include climate risks and adaptation measures, as well as holding community training sessions to discuss climate change remediation measures for existing hydro-agricultural and drinking water systems.

²⁰ UNICEF, Country Landscape Analysis for Children in Madagascar, August 2019 www.unicef.org/madagascar/en/reports/climate-landscape-analysis-children-madagascar accessed 28 May 2020

For UNICEF, environmental sustainability is pivotal across all areas of work. While building community resilience and mitigating the impacts of disasters such as cyclones, droughts and floods has always been an important part of education, health, nutrition, WASH, social policy, child protection, and emergency response programming in Madagascar, one of the main challenges is that UNICEF has traditionally not been seen as a key player in addressing climate change and environmental issues and has had limited access to climate finance. The Country Office therefore recognizes the importance of building alliances and partnerships to increase the visibility of UNICEF work in this area.

UNICEF is part of the Technical and Financial Partners Platform for the Environment, and an environmental impact group developing the Common Country Analysis for the new United Nations Sustainable Development Cooperation Framework (UNSDCF) in Madagascar. UNICEF also partners with UNDP on a Global Environment Facility project, IUCN as well as with conservation groups, international experts, NGOs, young people's organizations, and national parks (Ranomafana). UNICEF works with FAO and the International Fund for Agricultural Development (IFAD) on multiple-use water service projects and cactus promotion, and with WFP and the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) on the climate-related nutrition crisis in southern Madagascar.

Mitigation and adaptation actions

Some of the mitigation and adaptation actions undertaken to date include using solar-powered refrigeration; reconstructing more climate-adapted and cyclone-proof schools; improved water management and multiple-use water schemes; innovations – including satellite monitoring of drought, buried sand reservoirs, and deep drilling; establishment of early warning systems; development of a solar-powered 184 km pipeline to lessen the impact of a seasonal aggravation of drought in the south of the island; tree planting; and promotion of cactus as an alternative crop.

The new programme cycle sees more systematic inclusion of climate and environmental considerations in programme strategy notes across all sectors, with the following likely areas of focus:

- Health – measurement and impact of pollution on children.
- Water, sanitation and hygiene – creation of a DRR and climate change unit focusing on a flagship water access, quality and management programme.
- Education – environmental education.
- Social policy – research on the impact of mining on the environment, private sector mobilization.
- Communication for development – youth mobilization, behaviour change to limit exposure to internal air pollution from cooking stoves, mobilization of private sector (cactus, artesunate – a malaria drug).
- Nutrition – advocacy and local capacity strengthening for alternative feeding and micronutrients, and models on alternative, climate-adapted crops.

The individual programme components are then evaluated jointly to ensure that the country programme is coherent and focus areas are mutually reinforcing.

The Country Office is working with the Regional Office and headquarters divisions to design programmes which reflect global and regional priorities in the Malagasy context. Good practices from the global South – such as plastic recycling in Côte d'Ivoire, or clean air approaches used in Indonesia and Mongolia – are also being explored in country programme design. Internally, staff are being trained, a 'climate marker' has been included in annual work plans, and UNICEF is reducing its own environmental footprint through a sizeable reduction in travel, restructuring of its car fleet, and cuts in electricity use.

5.4 Reducing the carbon footprint of operations

UNICEF will continue to work towards decreasing the carbon footprint and increasing the environmental sustainability of its own operations and programmes. This includes expanding efforts to 'green' UNICEF as part of a UN-wide programme that includes minimizing UNICEF's carbon footprint, purchasing offsets and seeking opportunities to increase energy efficiency, and the use of sustainable energy in UNICEF offices. It also includes incorporating sustainability into procurement processes and ensuring that projects and initiatives are screened for environmental and social impacts.

Case study 2: Reducing the carbon footprint of UNICEF operations through prepositioning critical supplies in South Sudan

Climate change context

For most of its short history, South Sudan has been engulfed in a humanitarian crisis; more than a third of its estimated population of 12.2 million remains displaced. The cumulative effects of displacement, flooding, poor macroeconomic conditions, localized insecurity, and years of conflict and asset depletion contribute to high levels of acute food insecurity and render the population more vulnerable to climate and weather events.

Average temperatures have increased by approximately 1–1.5°C since the 1970s, rainfall patterns are less predictable, and droughts and flooding have become more frequent and widespread. The Verisk Maplecroft Climate Change Vulnerability Index ranks South Sudan 3rd out of 186 countries – as one of the most affected and least prepared.

While approximately 80 percent of people rely on subsistence farming, yields are low: the 2019 cereal harvest covered only 63 per cent of demand. Insecurity incidents disrupt livelihoods and hinder access to additional food sources, while high food prices and continued currency depreciation reduce household purchasing power.

Projections for February–April 2020 suggest that 51 per cent of the population live in areas classified as Crisis, Emergency, and Humanitarian Catastrophe in terms of Integrated Food Security Phase Classification (IPC) (Phases 3, 4, and 5, respectively) and will require urgent humanitarian assistance. A total of 1.3 million children are projected to need emergency nutrition in 2020. Of those, 300,000 children are expected to present with severe acute malnutrition, and 1 million with moderate acute malnutrition.

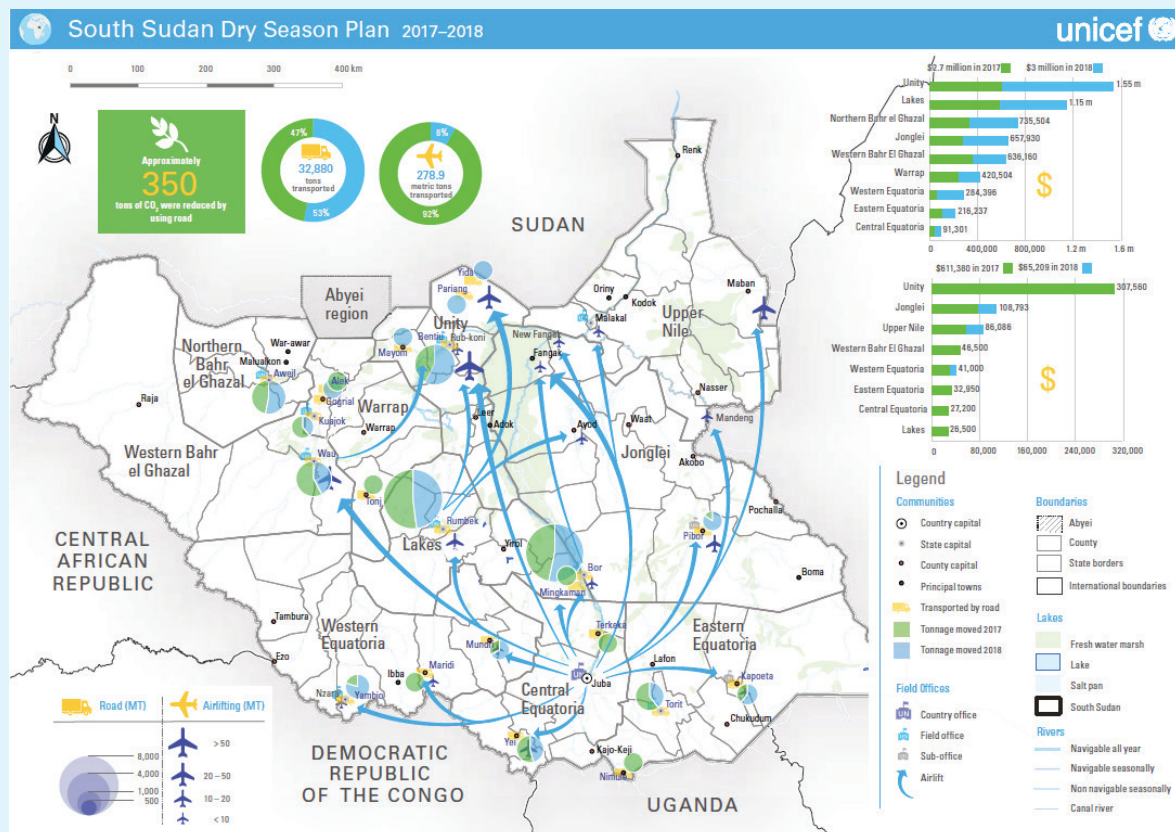
The UNICEF response

Aware of the logistical challenges in reaching children and families for half the year, in 2016 UNICEF put in place a Dry Season Plan (Figure 18) to preposition lifesaving supplies across the country during the November–April dry season, so that they could be delivered to vulnerable communities when the annual rains render 60 per cent of the country’s roads impassable. The rainy season effectively isolates communities for months at a time with no access to basics such as food, water and medicine.

Prepositioning 32,000 tonnes of emergency supplies allows children and their families to access essentials such as therapeutic food, medicine and health supplies, education kits, and WASH equipment year-round, and makes it possible to provide timely assistance to children who need it – a significant achievement in a country with poor infrastructure, frequent floods, and insecurity.

The results from the first two years are impressive. Not only has timely access to essential items improved, but UNICEF has also saved US\$12 million by using the most cost-effective means of transport. Transporting emergency supplies during the rainy season would mean relying heavily on aircraft, which is five times more expensive than distribution by road. In addition, road transport has helped the South Sudan Country Office reduce its CO2 emissions by 3,500 tonnes.

Figure 18. Supply prepositioning in South Sudan, 2017–2018



Source: UNICEF, an analysis of dry season prepositioning of critical supplies in South Sudan

5.5 Climate change, innovation and the circular economy

A circular economy is a systemic approach to economic development designed to benefit businesses, society, and the environment. In contrast to the 'take-make-waste' linear model, a circular economy is regenerative by design and aims to gradually decouple growth from the consumption of finite resources. Moving towards a more circular economy delivers benefits such as reducing pressure on the environment, improving the security of the supply of raw materials, increasing competitiveness, stimulating innovation, boosting economic growth, creating jobs.

The circular economy approach is a useful and effective way of mitigating and adapting to climate change and building community resilience. UNICEF has started to strengthen its work and participation in this area with strong programming in West Africa and a focus on scaling up in the rest of Sub-Saharan Africa.

Case Study 3: Innovation and circular economy approaches in Côte d'Ivoire

Climate change context

The Republic of Côte d'Ivoire (also known as Ivory Coast, and henceforth 'Côte d'Ivoire') is a West African country situated at the Gulf of Guinea peninsula of the Atlantic Ocean. Côte d'Ivoire is an important regional economic hub and trade port, and is bordered by Ghana to the east, Burkina Faso and Mali to the north, and by Liberia and Guinea to the west. The economy of Côte d'Ivoire is historically based on agriculture, with approximately half of the country's workforce in agriculture. Côte d'Ivoire adopted a sustainable development strategy whose main components are defined in parallel to its national plan to combat poverty. Degraded or threatened natural environments – forests, coastal areas, freshwater bodies – are the subject of particular attention, as are the causes of their degradation, i.e. bush fires, household or industrial wastes and pollution as well as insufficient capacity of sewerage systems.

The country has a high vulnerability score and low readiness score of Côte on the ND-GAIN Matrix ranked 145 overall. It has both a great need for investment and innovations to improve readiness and a great urgency for action. Côte d'Ivoire is the 48th most vulnerable country and the 33rd least ready country.

The UNICEF response

Côte d'Ivoire needs 15,000 classrooms to meet the needs of children without a place to learn. To help fill this gap, UNICEF has partnered with Conceptos Plasticos²¹ to use recycled plastic collected from polluted areas in and around Abidjan to build 500 classrooms for more than 25,000 children with the most urgent need in the next two years, with potential to increase production beyond. In addition, Ivorian school children is a lack of classrooms, and where they either don't exist, or when they do, they are overcrowded, making learning a challenging and unpleasant experience. In certain areas, for the first-time, kindergartners

21 <http://conceptosplasticos.com/>

from poor neighborhoods would be able to attend classrooms with less than 100 other students. Children who never thought there would be a place for them at school will be able to learn and thrive in a new and clean classroom.

In addition, more than 280 tonnes of plastic waste are produced every day in Abidjan alone. Approximately 5 per cent of this recycled, with the rest mostly ending up in landfill sites in low-income communities. This plastic waste pollution exacerbates existing hygiene and sanitation challenges, with improper waste management is responsible for 60 per cent of malaria, diarrhea and pneumonia cases in children – diseases that are among the leading causes of death for children in Côte d'Ivoire. UNICEF saw the existing volumes of plastic pollution as an opportunity to participate in the circular economy, reducing waste, and providing an environment through which children can thrive.

UNICEF partnered with Conceptos Plasticos to develop the first plastic brick factory in Abidjan, built in 2019 and the first of its kind in Africa. As part of this partnership, UNICEF committed to building 528 classrooms by the end of 2021 to provide a safe learning environment to 26,400 students. So far, 42 classrooms have been built. The project has three main objectives:

- Contribute to making the planet greener.
- Build schools for children²².
- Help lift women out of poverty by strengthening the plastic recycling market and the circular economy.

In 2019, UNICEF developed a communication strategy with the main objective of promoting this innovative recycled plastic brick project and giving it the highest visibility to gather support, build donor loyalty and encourage new donations. The objectives of the media strategy were to:

- Raise awareness about the project internally, nationally and globally.
- Gather support locally and nationally to be able to bring this innovation to life and to scale.
- Fundraise globally to mobilise the resources needed to build the factory in Côte d'Ivoire and construct classrooms, toilets, a health storage and so much more

The plastic brick factory would convert plastic waste collected in Côte d'Ivoire into modular plastic bricks. Production has begun, and the easy-to-assemble, durable, low-cost bricks will be used to build the much-needed classrooms in the West African country. The factory is a cutting edge, smart, scalable solutions for the major education challenges that Africa's children and communities face. When fully operational, the factory will recycle 9,600 tonnes of plastic waste a year and provide a source of income to women living in poverty in a formalized recycling market. Nine classrooms have already been built in Gonzagueville, Divo and Toumodi using plastic bricks made in Colombia, demonstrating the viability of the construction methods and materials.

²² Schools in Côte d'Ivoire:

- Press Release: <https://www.unicef.org/press-releases/unicef-breaks-ground-africas-first-its-kind-recycled-plastic-brick-factory-côte>

- Video here: <https://www.facebook.com/228735667216/posts/10157400212197217/?sfnsn=scwspwa&extid=PQjTAcBDEf4GUcZM&d=w&vh=e>

The plastic brick from the factory are made from 100 per cent plastic and are fire resistant. They are 40 per cent cheaper, 20 per cent lighter and will last hundreds of years longer than conventional building materials. They are also waterproof, well insulated and designed to resist heavy wind.

UNICEF and Conceptos Plasticos partnered on this project because of the resultant social impact. By turning plastic pollution into an opportunity, the project continues to uplift women out of poverty and leave a better world for children. Alongside investment to build in Côte d'Ivoire, plans are also under way to scale this project to other countries in the region, and potentially beyond. West and central Africa accounts for one-third of the world's primary school age children and one-fifth of lower secondary age children who are out of school.

5.6 Climate change and nutrition

Researchers have observed that the immediate causes of malnutrition are inadequate food intake (in terms of quantity or quality) and disease. However, malnutrition is influenced by a host of underlying factors related to poverty, including food insecurity, poor water, sanitation and health services, which find their roots in factors that can vary from conflict to climate change; from scarce natural resources to high and volatile food prices; from poor governance to demographic growth. Ghani et al (2017) state that climate change affects the enabling environment for malnutrition reduction. Shifting – and sometimes less predictable – rainfall and temperature patterns affect political priorities, economic growth, and inequality, because the poorest people are most vulnerable to change. Climate change can be a direct cause of malnutrition, as follows:

- Unexpected and sometimes more severe weather changes disrupt the intermediate environments required for good nutrition.
- Climate change also affects people's food consumption by influencing local and global food availability (production, storage), quality (nutritional value and food safety), access (market policies and prices), and how the body utilizes food.
- In Africa, seasonal food scarcity and climate shocks (such as droughts or floods) drive short-term malnutrition, morbidity, and mortality in vulnerable populations (especially women), and children, (mostly girls).
- Warming temperatures are expected to negatively affect global crop production, resulting in price increases for crops such as rice, wheat, maize, and soybeans. Higher feed prices will result in higher meal prices and less affordability for households.
- Climate change will also affect food quality: for example, elevated CO₂ emissions are associated with substantial declines in the zinc, iron, and protein content of wheat, rice, field peas, and soybeans, resulting in low nutritional value.
- High temperatures and extreme weather events negatively affect food safety, creating a more favourable environment for foodborne pathogens such as campylobacter and salmonella, which reduce the body's ability to absorb nutrients.

Case Study 4: UNICEF–WFP Joint Resilience Programming for food security in Somalia

Climate change context

Somalia has experienced a protracted state of crisis since the end of the 1988–1991 civil war. Conflict and violence, still pervasive across Somalia, and especially acute in the south of the country, adversely impact the coping mechanisms and resources available to communities and families, and often lead to displacement. The country lacks a system of effective governance, offers limited provision of basic services, and is subject to cyclical droughts and floods, which affect the lives and livelihoods of millions of people, eroding development gains and adding to the sense of complex and prolonged vulnerability. Somalia ranked last among 181 countries and territories in the 2017 ND-GAIN Index.

Conflict and drought have pushed hundreds of thousands from their homes, leading to high concentrations of people living in poverty in unplanned and often unhygienic conditions. This situation generates a real need for humanitarian intervention while at the same time complicating delivery of aid, with local groups controlling and sometimes denying access to particular areas. In addition, the country has a complex history of clan lineage and prejudice.

Somalia remains one of the most difficult places to be a child. The under-five mortality rate is 122 per 1,000 live births, the highest in the world. The health system is underdeveloped, and social norms hinder many women from accessing what services are available. Somalia is also one of the most food insecure countries in the world. Recent famines and food security crises occurred in 1991–1992, 2006, 2008, 2011, and 2016–2017. Child nutrition indicators remain poor even in non-crisis years. Among the causes of malnutrition in Somalia are inadequate diet and suboptimal caring practices, limited access to safe water and sanitation, and poor access to health services. Factors such as poverty, conflict, dependence on livelihoods vulnerable to climatic fluctuations, displacement, marginalization, and limited access to information and traditional sociocultural beliefs contribute to these causes.

The UNICEF response

Recognizing the failure of the traditional humanitarian system in Somalia during the 2011 famine, UNICEF, FAO and WFP committed to work together to enhance long-term resilience under a Joint Resilience Strategy launched in April 2012. The Strategy emphasizes improved coordination in resilience programming with a focus on strengthening productive sectors, improving basic social services, and establishing predictable safety nets.

The Joint Resilience Strategy recognized a key weakness in the system: many people do not routinely access facility-based care and in order to reach target populations, it is essential to provide relevant services directly to communities in a manner they can trust. One of the critical approaches is a focus on training community workers to deliver a range of services and to raise awareness and enhance care-seeking behaviours in their communities.

The UNICEF–WFP Joint Resilience Programme, possible thanks to a €86 million investment from the German Federal Ministry for Economic Cooperation and Development (BMZ) over four years, builds on the Joint Resilience Strategy and steps up collaboration around a single joint goal – building community resilience to shocks by strengthening food security.

The first phase of the programme, which ran in select districts of Banadir and Gedo regions in 2018–2020, achieved its goal of significantly reducing malnutrition rates in children thanks to an emphasis on integrated service delivery, i.e. the co-location of outpatient and facility-based therapeutic supplementary feeding services with maternal and child health, and WASH services. The programme focuses on health and nutrition support for children under five and pregnant and nursing mothers, both in their communities and at health facilities. This approach has led to efficient referrals, and an overall 95 per cent recovery rate for children with severe and moderate acute malnutrition, in line with SPHERE standards.

It is estimated that nearly 13,000 lives were saved thanks to Phase 1 of the programme. Links to the community through community workers and Community Development Committees, as well as to the Ministry of Health and the Scaling Up Nutrition (SUN) movement, have proved largely effective, and a focus on mobile outreach and mother-led screening has helped identify and treat malnourished children earlier. WASH interventions, such as provision of safe drinking water at the community level, working to eliminate open defecation, and hygiene promotion, significantly contribute to health and nutrition outcomes, reducing the incidence of diarrhoea and other illnesses, and freeing up time women previously used to fetch water.

Phase 2 of the Joint Resilience Programme aims to strengthen resilience by improving education services, as well as livelihoods and food security in 2019–2021. The education component focuses on increasing children’s participation in school, and enhancing early childhood development, foundational literacy and life skills; it includes WASH, health, and nutrition aspects.

The programme also aims to strengthen community governance and management of basic services and aligns with the Federal Government’s commitment to addressing the root causes of humanitarian disasters and improving the resilience of all Somali families, communities and institutions articulated in the National Development Plan. UNICEF and WFP are working to address the root causes of vulnerability by providing a safe, protective environment in which children can learn, develop and grow into active, resilient members of their communities.

5.7 Climate change and WASH

Water is the primary medium through which climate change influences the Earth’s ecosystem and thus the livelihood and well-being of societies.²³ The communities we work with are on the front line of these climate impacts, their already precarious water resources under threat and sanitation services damaged by extreme weather. Increasing global temperatures threaten to reverse progress made in improving access to clean water and decent sanitation over the past few decades. Climate change directly impacts water resources and water services for all economic, social and environmental functions that water supports. Therefore, the impacts reach into many sectoral interests, such as health, tourism, agriculture and industry. WASH is a critical vehicle for multifaceted response to climate change. Climate change, adaptation and mitigation are directly linked with the water supply sector in the following ways:

- Climate change affects both supply of and demand for water (quantity and quality);

²³ UN Water, *Climate Change Adaptation: The Pivotal Role of Water*, 2010 www.unwater.org/publications/climate-change-adaptation-pivotal-role-water/ accessed 28 May 2020

- Climate change can physically expose water sector assets – such as pumps, reservoirs, treatment plants, groundwater wells, electricity supply and pipelines – to climatic variability;
- Water supply requires energy, transportation (trucking) which can further contribute to increased GHG emissions. Solarization of pumping systems and more efficient energy uses are often used as appropriate mitigation measures.



As temperatures increase and water becomes scarcer it is children who will feel the deadliest impact of water-borne diseases. Today, more than half a billion children live in areas with extremely high flood occurrence and almost 160 million in high-drought severity zones. By 2040, one in four children will live in areas of extreme water stress and thousands will be made sick by polluted water. The management and protection of clean, plentiful, accessible groundwater supplies, and the management of plastic waste are very fast becoming defining child health issues for our time.

Variations in spatial distribution and intensity of rainfall, combined with increased surface temperatures (influencing evapotranspiration), are directly affecting the potential recharge of groundwater aquifers as well as increasing surface water precipitation. This impacts the climate adaptation strategies to be applied for projects or programmes. Local geology also plays a role in determining the sensitivity of rates of ground water recharge to changes in climate. The reduction in available water quantity and quality greatly affects children, who require more water (by weight) than adults.

In coastal areas, the increase in wave heights leads to shallow groundwater salinization and saline intrusion, affecting both the quality of groundwater and the productivity of the soils for food security. Angola, north-eastern areas of Ethiopia, Madagascar and Namibia are being directly affected by this phenomenon.

Table 5: Examples of impacts of hazards on the WASH sector

Climate effect	Hazard	Impact on WASH sector
Decrease in precipitation	Drought	Reduction in raw water supplies, reduced flow in rivers, less dilution / increased concentration of pollutants in water, challenges to hygiene practices.
Increase in precipitation and severe weather	Flooding	Pollution of wells, inundation of wells, inaccessibility of water sources, flooding of latrines, damage to infrastructure, landslides around water sources, sedimentation and turbidity, challenges to sustainability of sanitation and hygiene behaviour and water-borne diseases.
Increase in temperatures	Heatwaves	Damage to infrastructure, increase in pathogens in water leading to increased risk of diseases.
	Melting and thawing of glaciers, snow, sea, ice and frozen ground	Seasonality of river flows leading to a reduction in water availability in summer.
Sea-level rise	Flooding and saline intrusion into freshwater aquifers	Reduction in availability of drinking water with high impacts on quality.

Source: Global Water Partnership (GWP) and UNICEF (2014)

Table 6: Typical WASH interventions in response to climate change

Area	Examples
Water quality	Improving the resilience of protected wells to flooding; small-scale systems for treating storm water; gully protection and rehabilitation; participatory water quality testing, treating water at household level, water safety planning.
Water quantity	Increasing water storage e.g. small multi-purpose reservoirs and sand storage dams; rainwater harvesting technologies, artificially recharging aquifers, solar power water pumping, water conservation; increasing boreholes, water recycling and reuse.
Sanitation and hygiene	Raised pit latrines, septic tanks, relocation of latrines, small-scale biological systems, climate-risk-informed pre-triggering in community-led sanitation approaches
Enabling environments	Capacity building: e.g. knowledge generation and dissemination; hygiene education, decentralized management; national and local WASH sector coordination platforms that address development, disaster risk reduction (DRR) and emergency issues; integration of climate resilience into WASH sector strategies and plans; promotion of integrated water resources management.

Source: Oates et al. (2014)

Case Study 5: Climate-resilient WASH in Ethiopia

Climate change context

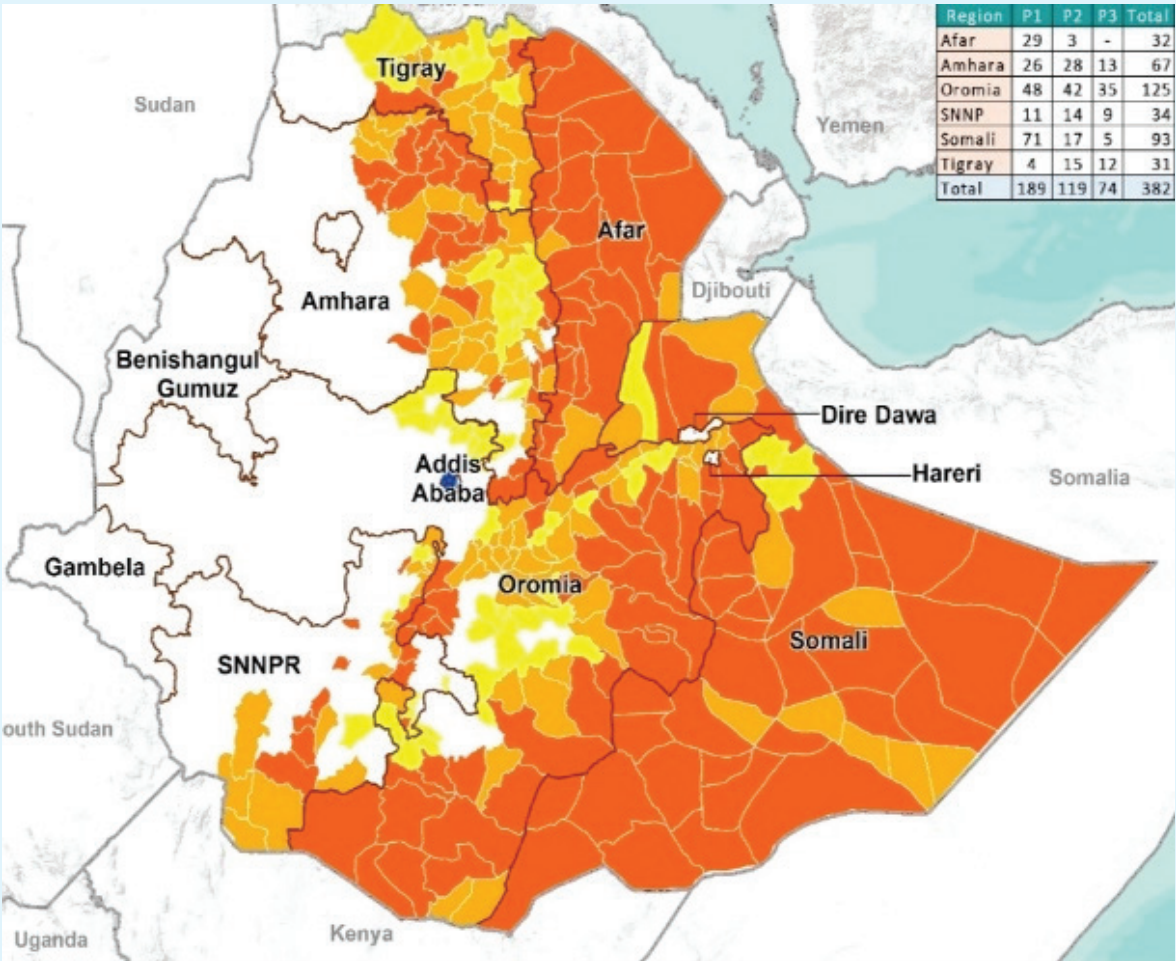
The 2017 ND-Gain Index ranked Ethiopia 163rd of 181 countries – the 23rd most vulnerable to climate change and the 30th least ready country. The country’s geographic location, heavy dependence on agriculture, and low adaptive capacity contribute to high vulnerability to climate change.

This country of 100 million people has endured decades of humanitarian crises, including recurrent droughts, floods, and intercommunal conflicts affecting an average of 7.5 million individuals per year since 2016. Approximately 3 million people are internally displaced, and the country hosts around 900,000 refugees. Water scarcity has been at the centre of recent disasters and is also a key driver of conflicts.

A 2012 Famine Early Warning Systems Network (FEWSNET) climate trend analysis showed a 15–20 per cent decline in the spring and summer rains since the mid-1970s. Low rainfall and rising temperatures compromise household access to water, the ability to maintain rain-fed crops, and the quantity and quality of lands available for pasture. Without adequate support, more frequent droughts will continue to erode livelihoods and coping capacities, further deepening vulnerabilities.

While Ethiopia has made significant progress in expanding access to water and sanitation in recent years, Ethiopians typically rely on surface water or shallow groundwater – sources highly vulnerable to drought, and often requiring significant financial outlays for water trucking at times of gaps in supply. Amid a drought in April 2017, it was reported that 95 per cent of water points in the Ethiopian Somali region dried up. An assessment by the WASH Cluster revealed that the water points that remained functional were chiefly those that sourced water from deep wells.

Figure 1. Areas most affected by drought in Ethiopia, March 2018



Source: UNICEF Ethiopia

The UNICEF response

To provide a sustainable and drought-resilient water supply to rural communities, in 2015 UNICEF partnered with the Ministry of Water, Irrigation and Electricity, the Joint Research Centre of the European Commission, and United Nations Educational, Scientific and Cultural Organization (UNESCO) to develop an open-source scientific method to identify groundwater sites of adequate quality. The new technology combines conventional hydrogeological surveys with satellite remote sensing and has improved the success rate of locating durable sources of groundwater from under 50 per cent to over 90 per cent. This work was undertaken in a participative manner, incorporating government, stakeholders and communities at the various stages of information collection, consultation and decision-making.

Once a drilling test confirms the presence of water of adequate quality and quantity, UNICEF establishes a multi-village water supply scheme, piping water to communities to provide water points for households, health facilities, schools, and livestock. This includes an electromechanical system and a storage and distribution system comprised of a pump house with a generator, reservoirs, a pressure and distribution pipeline, and water points. More than 90 such multi-village water schemes have been formed to date, bringing piped water to approximately 300,000 people.

This UNICEF programme is helping lay the foundations for a national water utility system in terms of both infrastructure and management. The local government owns the assets and employs trained staff from the community to manage operations and maintenance of the system. Water tariffs are set in consideration of both the cost of system maintenance and community ability to pay. Communities covered by the rural piped water scheme have reported significant benefits: reliable access to clean water year-round; improved hygiene and decreased morbidity; better quality healthcare; significant reduction in time spent collecting water; and reduced need for large-scale migration during the dry season.

In addition, UNICEF mainstreamed its vision and strategies for climate-resilient WASH services in Ethiopia into the Government's One WASH National Programme (OWNP). Following a thorough review, and thanks to successful UNICEF advocacy, the second phase of OWP (2019– 2024) earmarks US\$2.5 billion of its planned budget of US\$6.5 billion for climate-resilient WASH programming. This includes groundwater mapping inspired by UNICEF-pioneered satellite remote sensing technology; groundwater monitoring; and prioritizing water infrastructure for communities in chronically water-scarce areas. Climate-resilient WASH approaches – aiming to provide Ethiopians with dependable water of adequate quantity and quality throughout the year with no interruption – is being scaled up by the Government and development partners through a pooled WASH sector fund.

Case Study 6: Building resilience in the Sahel through Multi sectoral programming

Climate change context

The Sahel is one the most water scarce regions in the world. Increasing water scarcity across the region lowers the water levels in traditional wells, forcing people to travel long distances to collect limited quantities of water, UNICEF as part of the implementation of the United Nations Integrated Strategy for the Sahel (UNISS), is supporting wash and nutrition programmes in priority areas in Mauritania.



UNICEF Mauritania / Raphaël Pouget / 2019

Water scarcity is not a recent phenomenon in the Sahel, it is being compounded by many factors including climate change, increased water demand and population growth. The impact of climate change in recent decades has been evident in the form of increased variability of rainfall, temperatures and wind speeds contributing to water scarcity, droughts, floods, sandstorms and heavy rain events.

Increasing water scarcity also has wider implications on the livelihood options of families, and increases the risk of migration, urbanization and conflict. Water scarcity and poor water quality increases also the risk of diarrhea amongst young children. When young children have repeated bouts of diarrhea, this impedes their ability to absorb nutrients, and irreversibly impairs physical and mental development of young children, increasing the risks of stunting and malnutrition. The burden for water collection falls mainly on women and girls, who have to spend long time to collect and queue for water, in addition to the physical burden of carrying water long distances and the increased safety risks they are exposed to. More time collecting water also reduces the time and energy available to go to school, affecting children's enrollment, attendance and participation, and consequently their future opportunities.

The UNICEF response

Sustainable source of water

To address this situation in Mauritania, UNICEF is working to support WASH and Nutrition programmes, with joint programming undertaken in priority areas. One of the key interventions in the WASH programme, has been to support the Government of Mauritania through an innovative programme to reach the most vulnerable villages with a sustainable source of water.

In Mauritania, approximately 80 per cent of the country's villages have populations of less than 500 people, and most of these are in remote locations. Owing to the remoteness of these villages, UNICEF has coupled manual drilling with solar powered water systems. The manual drilling approach enables boreholes to be drilled in very remote areas, at low cost. The low level of technology involved allows water sources to be drilled in areas that would otherwise be inaccessible.

The conditions in Mauritania make it an ideal location for solar powered systems, due to the high levels of solar irradiation levels in the country (2099-2284 kWh/m²) and an average of 8 hours of sunshine per day). The solar systems offer a very efficient, cost effective, low maintenance and sustainable alternative to diesel powered systems, particularly for rural areas.

To support to the Ministry of Water Resources to increase the access to safe water in very remote areas, UNICEF and the project partner PRACTICA Foundation, developed a manual drilling toolkit to give technical guidance to the water sector in Mauritania on the application of the technology in the country. In response to this, five local construction firms are now operating to drill boreholes using solar technology, and to install solar panels. It has been estimated that the manual drilling approach is four times cheaper than drilling with conventional drilling rigs, and the local production of the tools has reduced cost by an additional 10%. Once installed, the solar powered water system cost an estimated 30 per cent less than diesel-powered systems.

As UNICEF strives to leave no one behind, and in support to the government of Mauritania, the intervention has focused on providing water to those small villages with less than 150 inhabitants whilst the Government has focused on larger sized villages. Typical UNICEF systems in these villages comprise solar panels, water storage tanks (7 to 10 m³) with a chlorination system installed a water standpipe with two or three taps. Importantly, the systems have been designed to ensure that the maximum distance of any household to the water point is less than 500m, dramatically reducing the time required to collect water.

To ensure the sustainability of these water systems, user-fees are collected to fund the operation and maintenance of the systems. For larger villages, privately run start-up companies are responsible for maintaining the solar powered water systems.

To further support the water sector in Mauritania, UNICEF collaborated with PRACTICA to build the capacity on solar in the country through the publication of a technical guide for solar pumping in Mauritania.

Safe water

As a result of the supported interventions between 2015 and 2017, 23,000 people have gained access to safe water, within 500m of their homes. Over this period, 19 mini solar drinking water networks and 40 solar powered water stations have been constructed.

The solar programme is being scaled-up at a national level. From 2019, all new rural water supply projects in Mauritania which target individual villages or groups of two to three villages with boreholes will only be powered by solar systems. For UNICEF, this has already increased the number of solar systems installed per year from 20 in 2017 to 53 in 2019, with further support anticipated under a forthcoming UNICEF-WFP (World Food Programme) partnership for resilience. Meanwhile, old diesel-powered systems are being progressively replaced by solar systems, either by the Ministry itself or the private operators managing large-scale rural water supply systems (70 in total).

Contribution to improve health and nutrition outcomes

The availability of safe water supply thanks to solar power directly contributed to improved health and nutrition outcomes for children in the Guidimakha region of Mauritania. In support of the Government, UNICEF first identified 20 villages with high rates of Severe Acute Malnutrition among children, secondly it constructed solar powered water supply systems and sanitation facilities at health center level, connecting them to the newly constructed water system, thirdly it promoted community-led total sanitation and hygiene across the region providing Hygiene Kits and training health personnel and community workers on Hygiene promotion, water treatment and safe storage. Mothers and children were provided with WASH Kits (Soap, hand washing utensils, water transport and storage container), and sensitized on essential family practices. As a result of these interventions:

- 6000 persons obtained sustainable access to safe drinking water,
- 15,000 persons ended open defecation
- 20 Health/Nutrition centers obtained access to adequate water and sanitation facilities.
- As a result, the initiative contributed to reduce diarrhea prevalence in the target area from 20.6% in 2017 to 9.1% in 2019 and that of stunting from 26.3% to 25.2%.

The above-mentioned initiative provides one example on how UN agencies, as part of their UNISS engagement took up the challenge of responding to the ever increasingly harsh climate conditions in the Sahel.

To continue to support the solar sector for the region, UNICEF is in the process of establishing a Regional Solar Hub to strengthen West and Central African countries through the provision of technical advice on solar systems, developing solar materials (courses and resources in French and English, building on what has already been done) and visiting countries to offer in situ technical advice and to assess the bottlenecks for scaling up solar in the respective countries, while sharing knowledge on good practices and innovations from the region with the broader sector.

5.8 Climate change, social inclusion and protection

Social protection covers the range of policies and programmes needed to reduce the lifelong consequences of poverty and exclusion. Programmes like cash transfers – including child grants, school feeding, skills development and more – help connect families with health care, nutritious food and quality education to give all children, no matter what circumstances they are born into, a fair chance in life.

Climate change drives inequality and creates and prolongs poverty traps, with children, adolescents and women particularly exposed. The main climate change impacts in relation to social inclusion are:

- Climate change impacts are projected to slow down economic growth and will put considerable additional strain on public social security systems. Even though several countries may be increasing their spending on social services and social protection, progress made is likely to be counteracted by climate change impacts. Therefore, social policies need to take into account climate change impacts, including the particular vulnerability of women and children and how they relate to non-climate stressors.
- Climate change impacts affect women disproportionately, magnifying patterns of gender inequality: Women are more dependent on local natural resources for their livelihoods while barriers to decision-making, financial, natural and knowledge resources increase their vulnerability.
- Climate change is increasing the need for public services such as health care, social welfare and disaster response by increasing the prevalence of diseases, malnutrition, natural disasters and extreme weather events, for example.
- Deforestation and degraded environments lower the availability of natural resources such as firewood, food production, and clean water and air, resulting in more deprivation and lower standards of living.
- The most exposed and vulnerable to the adverse impacts of climate change are people living in more degraded and hazard prone areas. These are mostly low-income areas and areas with informal settlements.

Case Study 7: Social protection to strengthen resilience of mothers and children in Kenya

Climate change context

Kenya ranked 150th of 181 countries and territories in the 2017 ND-GAIN Index which measures vulnerability to climate change; it is considered the 32nd most vulnerable country and the 40th least ready country. Three quarters of its 46 million people rely on agricultural

livelihoods and the country is subject to a range of natural hazards, including droughts, floods and landslides.

Pockets of significant vulnerability can be found all across Kenya, not just in the arid or semi-arid lands, widely viewed as the most deprived part of the country. Examples include Nairobi County and Kakamega County, which owe their vulnerability to increasing population density, intense competition for scarce resources, and a repeated cycle of intergenerational poverty.

With a population of 1.7 million, Kakamega County in Western Province is the second most populous county in Kenya. A 2014 survey indicated that half of its population lives under the poverty line, and the county accounted for 4.8 per cent of national poverty – the highest share in the country. At 880 per 100,000 live births in 2013, maternal mortality in Kakamega County is more than double the national average of 400 per 100,000 live births. Under-five mortality rates are also higher; only 34 per cent of deliveries take place in the presence of a skilled birth attendant.

Despite efforts to increase resilience to climate change, agricultural yields have continued to decrease due to less predictable weather patterns and low adaptive capacity. Women and youth are among the most vulnerable groups to climate hazards in the county. While putting in place strategies to support alternative livelihoods is of foremost priority, effective safety nets are also needed to reduce economic and social vulnerabilities to poverty and deprivation.

The UNICEF response

Recognizing the vital role of social protection in strengthening the resilience of children, families and communities, UNICEF has supported the Government-run National Safety Net Programme established in 2013 and several cash-plus initiatives, as well as governance coordination mechanisms and systems for the social protection of vulnerable children and adolescents.

Imarisha Afya Ya Mama na Mtoto is a cash-plus social protection programme which supports women to access maternal and child health and nutrition services in Kakamega County. The programme, which has been implemented since 2014, aims to support healthy pregnancies and child development during the first 1,000 days of life by: increasing coverage of skilled attendants during childbirth; reducing maternal and under-five mortality; reducing mother-to-child transmission of HIV; and improving the nutrition status of children under 2 years of age. The programme is targeted at pregnant women who are living in poverty, are under 18 years of age, or are living with HIV.

Women receive a payment of KSh 2,000 (US\$20) for each of six key points of contact with the health facility: the ANC appointment; delivery in the presence of a skilled attendant; postpartum care four weeks after birth; and child health appointments supporting the continuum of care at 4 months, 9 months, and 18 months of age. By offsetting the costs associated with healthcare access, the *Imarisha* programme has successfully facilitated access to health and nutrition services for women and children and eliminated the need to choose between paying for health services and other necessities. In addition to providing a safer environment for both mother and child, delivering a child in a health facility also simplifies the process of getting a birth certificate – a critical step that helps secure the rights of the child.

Commendable results have been achieved in the first four years of the programme. The proportion of women in Kakamega County delivering babies in health facilities increased from 34 per cent in 2013 to 69 per cent in 2016; 54 per cent of mothers attended at least four ANC appointments, up from 35 per cent in 2013; and the number of fully immunized children increased from 63 per cent in 2014 to 83 per cent in 2017.

The Imarisha programme has been developed, managed and funded by the Kakamega County Government. UNICEF supported the county government in programme development; elaboration of a social protection policy; establishment of a communication framework and a monitoring and evaluation system; capacity development; and procurement of the e-platform for programme administration. A multisectoral technical working group, which includes representatives from Imarisha programme management, UNICEF (nutrition and health), and the Ministry of Health, supports management to adjust the programme as it develops.

Community mobilization is an integral part of the Imarisha programme. Recognizing that it is often the most vulnerable women – those with limited education, isolated, or living in remote communities – who are least likely to benefit from available healthcare services, community health workers, village chiefs, and others working on the ground spread messages to encourage women to seek care in health facilities and to check if they are eligible for the programme.

Cash-plus programmes based on an analysis of local patterns of vulnerability like Imarisha can help protect children and mothers by removing economic barriers to services; helping reduce spikes in consumption during a period of stress and increased need; and addressing some of the root causes of social and economic exclusion. They can also help vulnerable populations better withstand shocks and stresses related to climate fluctuations.

5.9 Climate change and education

UNICEF investments in preparedness and early response in the education sector helps protect education continuity for hundreds of thousands of children living in vulnerable areas. In emergency and humanitarian situations, children and their right to education, are among the most affected as developmental gains in education are offset due to damage or destruction of school facilities, extended disruption of education, and limited access to schooling.

The Eastern and Southern Africa region has on average 28 per cent of children out of school, with higher levels of out-of-school children observed in the Horn of Africa countries of Somalia (44 per cent), Eritrea (47 per cent) and South Sudan (62 per cent) where the IPC levels are 2 to 4; showing how the climate crisis continues to exacerbate the situation. While in southern Africa, numbers of out-of-school children are largely influenced by the rate of urbanization, the current climate change induced floods and droughts threaten to undo the inroads made in giving out-of-school children an education.

Climate change impacts disrupt learning, hinder access to education (particularly for girls) and weaken the school system. At the same time, children will need problem solving skills and knowledge about environmental change and sustainability to thrive despite environmental problems. The main climate change impacts in relation to children's education are:

- Increasingly frequent and intense extreme weather events such as storms, storm surges,

hurricanes, (flash) floods, heat waves and droughts can disrupt education services and/or children's ability to access them.

- Increasingly irregular or lack of rainfall can lead to the degradation of livelihoods, and children, mainly girls, often must supplement the family income by sacrificing their education and taking over more domestic duties or may face an increased risk of child marriage. In addition, families may no longer be able to cover school-related costs.
- Increasing water stress increases time women and girls spend fetching water leading to less time for learning and attending school.
- Rehabilitation costs after natural disasters drain national budgets and may divert resources from the education sector.
- In order to effectively adapt to the impacts of climate change, children and adults need to be informed about the risks associated with climate change and will need adequate science, and problem-solving skills as well as knowledge of environmental sustainability.

Case study 8: Building resilience through inclusion of DRR in the education system in Madagascar

Climate change context

As discussed in Case Study 1 above, Madagascar is one of the poorest countries in the world. The country ranked 162nd out of 189 countries and territories in the 2019 Human Development Index. Adverse climatic events, which repeatedly erode development gains, contribute to the low levels of progress in development indicators. A large island state, Madagascar is prone to tropical cyclones causing heavy rainfall, strong winds and prolonged flooding, as well as periods of low rainfall causing droughts, especially in the country's south. A recent drought in 2015–2017 resulted in crop losses of 90–95 per cent, leaving many families destitute. The country is highly vulnerable to the impacts of natural hazards and adverse effects of climate change due to a high risk of exposure coupled with very high susceptibility of existing infrastructure, and low coping and adaptive capacity.

Frequent exposure to natural hazards has contributed to a strong focus on DRR in Madagascar since the early 2000s. In addition to coordinating disaster response efforts, the national disaster management body, the National Disaster Risk Management Agency, manages the development of annual multi-sector contingency plans and runs simulation exercises to test preparedness.

Adverse weather events and natural hazards can seriously affect education system infrastructure, supplies and ability to maintain services. For example, two cyclones in 2015 caused damage to 969 classrooms, disrupting the education of 48,000 children. In 2017, Cyclone Enawo disrupted the education of around 120,000 students. Disaster preparedness was first integrated into the education sector in 2013. The main purpose of a DRR-informed approach within the education sector is to support system resilience, so that the education system is better able to prepare for and effectively respond to crises; maintain core functions when a crisis hits; and reorganize if conditions require it.

The UNICEF response

Initiatives to strengthen resilience go beyond traditional humanitarian and development programming by focusing on the essential conditions for populations to be better prepared

for crises, and better able to withstand and recover from them. UNICEF investments in preparedness and early response in the education sector help protect education continuity for hundreds of thousands of children living in vulnerable areas. Pre-hazard preparedness actions include developing a Disaster Risk Reduction (DRR) curriculum with the Ministry of Education; support for teacher training; prepositioning of critical supplies – temporary classroom tents and learning materials – and forms to quickly receive data on damage and needs; construction of cyclone-resistant classrooms; and development of an education contingency plan and national flag alert system for cyclones.

The DRR curriculum considers the most common hazards in Madagascar – floods, cyclones, droughts, earthquakes, landslides, tsunamis, wildfires, and volcano eruptions – and teaches children preparedness and coping strategies to minimize the loss of lives and assets. The universal presence of the education sector across the country makes schools excellent entry points to spread DRR messages to the community at large.

Education also helps strengthen self-efficacy and resilience of individuals and communities. It empowers students to be agents of change who transfer knowledge to family and community members, allowing them to learn about the local specificities of their environmental resources around them and the services these provide. Lessons and school clubs where children learn about caring for the environment and plant trees on school grounds help promote desirable behaviours, given environmental degradation, deforestation and water pollution are factors which aggravate the impacts of climate change, especially in deprived areas.

When a hazard is identified, UNICEF supports coordination by co-chairing the Education Cluster together with the Ministry of Education and activates a communication chain to all school headteachers so that they make preparations to protect their schools and communities. Once the immediate threat has passed, UNICEF works with schools to collect information on destruction of school assets and immediate needs.

The Education Cluster then oversees allocation of supplies for temporary learning spaces to minimize disruption in schooling. UNICEF follows a ‘build back better’ philosophy when advocating for the rebuilding of infrastructure, with cyclone-proof classroom design, schools with improved water and sanitation facilities, and using building materials with a small environmental footprint. In some regions, the use of solar panels and lamps is being piloted.

In drought-affected areas, the programme helps offset the financial burden of school attendance by distributing teaching and learning materials, which proves to be a significant incentive for parents – who normally bear a large proportion of the cost – to continue children’s education.

Thanks in part to UNICEF support for the national Strategic Plan and its secretariat role for the Global Partnership for Education and the Technical and Financial Partners Platform for Education in Madagascar, education is now seen as a critical part of the emergency response in appeals and response plans, on par with areas such as health or nutrition. The experience of managing education in emergency situations has been applied in the context of a 2017 plague outbreak in the country, when the school system played a key role in the response; a similar approach is being taken in the context of the coronavirus threat in 2020 and can also be envisaged in the longer term as a resilience building curriculum.

5.10 Climate change and health

Climate change is a key driver of disease outbreaks. The relationship between increased intensity of rainfall, flooding and disease outbreaks, as well as increased prevalence, has been observed over time. Ghani et al (2017) state that rainfall and temperature determine the spatial and seasonal distributions of diseases, influencing the year-to-year variability, including epidemics.

The long-term trends of observed warming, particularly in the East African highlands, are associated with global climate processes and observed malaria transmission dynamics. The transmission of human parasitic, viral, and bacterial diseases (such as malaria, dengue, and cholera, respectively) are expected to be affected by climate change. There will potentially be indirect effects on mental health, allergies, and health effects from reduced water and food supply (Table 7). Site-specific information will be required to establish the local direct and indirect effects on health.

Table 7: Key effects of climate change on health

Climate change expression	Health impact
Direct Impacts	
Heat	Heat stress, cardiovascular disease.
Extreme events / severe weather	Immediate effects (injuries, fatalities) and indirect effects (e.g. cholera).
Indirect Impacts	
Air pollution	Asthma, cardiovascular disease.
Reduced water and food supply	Malnutrition, diarrhoea, harmful algal blooms.
Mental health	Anxiety, despair, depression, post-traumatic stress.
Water-borne diseases	Cholera, cryptosporidiosis, campylobacter, leptospirosis.
Allergies	Respiratory allergies, poison ivy.
Vector-borne diseases	Malaria, dengue, Zika virus, encephalitis, hantavirus, Rift Valley fever.
Extreme events/severe weather	Immediate effects (injuries, fatalities) and indirect effects (e.g. cholera).

Source: CSIR, Climate Risk and Vulnerability: A Handbook for Southern Africa 2017

Case study 9: Impact of the 2015–2016 El Niño on child health in southern Africa

Climate change context

The El Niño phenomenon occurs as a product of fluctuating equatorial Pacific Ocean temperatures and large-scale air pressure changes, known as the El Niño Southern Oscillation (ENSO), and has an impact on climate patterns globally. El Niño phases typically last 9–12 months and can bring floods, drought, heat waves, and other extreme events. El Niño in southern Africa is generally associated with higher than usual temperatures and lower rainfall patterns, and is sometimes followed by La Niña, which brings higher rainfall to this region. The changes in temperature and precipitation patterns favour the spread of vector-borne and water-borne diseases.

The 2015–2016 El Niño event was associated with severe drought in southern Africa, adversely affecting health, agriculture, water resources, and food security for 30 million people. UNICEF estimates that the incidence of disease in children has increased fourfold for diarrhoea, threefold for cholera, twofold for malaria and measles, and 1.5-fold for pneumonia. The number of children affected in Angola, Eswatini, Lesotho, Madagascar, Malawi, Mozambique and Zimbabwe – the seven countries most affected in southern Africa – rose from an estimated 4.27 million to 11.75 million (Table 8).

Table 8: Estimated number of children affected by diarrhoea, cholera, malaria, pneumonia and measles in 7 countries in southern Africa, and additional resource needs for preventative and curative health services after the 2015–2016 El Niño/La Niña events

Country	ND-GAIN Index (of 181)	Number of children affected by diarrhoea, cholera, malaria, pneumonia and measles			Resource needs for the increase of cases (in US\$)		
		Before 2015–2016 El Niño	Additional children affected	Total	Prevention	Treatment	Total
Angola	159	1,507,050	1,507,050	3,014,099	25,342	1,137,842	1,163,184
Malawi	156	1,146,370	1,784,269	2,930,639	182,425	1,279,572	1,461,997
Mozambique	159	640,381	1,591,393	2,231,774	74,507	852,994	927,501
Madagascar	169	543,772	1,335,787	1,879,559	409,165	733,637	1,142,802
Zimbabwe	168	360,855	1,082,566	1,443,421	82,398	473,358	555,756
Lesotho	130	40,611	95,842	136,453	12,819	53,169	65,988
Eswatini	129	28,527	85,580	114,106	22,493	34,096	56,589
Total	–	4,267,566	7,482,487	11,750,053	809,149	4,564,668	5,373,817

Source: UNICEF 2019 Cyclone Idai Integration of HIV into humanitarian response in Malawi, Mozambique and Zimbabwe IDAI

Integration of HIV into humanitarian response in Malawi, Mozambique and Zimbabwe

Impact for people living with HIV

In addition, the effects of El Niño in southern Africa – including water shortages, drought, hunger and disease – are impacting the same countries that form the global epicentre of the AIDS pandemic. Income shocks and increased hunger associated with the drought have a profound impact on HIV treatment. Mortality is 2–6 times higher for children living with HIV who begin treatment when they are severely malnourished than for those who are not. In addition, patients find it hard to take anti-retroviral therapy (ART) drugs on an empty stomach and are likely to use the limited resources they have to purchase food rather than pay for travel to a health facility. Poor feeding practices further compromise the immune system, while water scarcity and higher incidence of vector-borne diseases increase the risk of additional infections. There have been reports of health facilities shutting due to a lack of water supply. All these factors affect enrolment, adherence and retention on treatment, threatening to reverse the gains made.

There is evidence that events like El Niño can lead to increased transmission of HIV: a 2014 study of 18 countries in sub-Saharan Africa found that infection rates in HIV-endemic rural areas increased by 11 per cent for every recent drought. Emergency situations can

increase vulnerability to HIV as they give rise to high-risk behaviours and negative coping strategies, including transactional sex, child marriage, and dropping out of school, especially among adolescents. Gender-based violence, particularly sexual violence, exploitation and abuse, often increase in crisis, and access to support services and contraceptives may be disrupted.

The UNICEF response

Working in coordination with national governments and partners, UNICEF scaled up its health response to provide essential prevention and treatment services for children and women in affected countries through provision of SMART Health centers. This included distribution of water treatment kits, oral rehydration solution and zinc and setting up cholera treatment centres for diarrhoea and cholera; distribution of insecticide-treated bed nets, rapid diagnostic tests and antimalarial drugs for malaria; antibiotics and respiratory timers for pneumonia, and immunization and supportive care for measles as well as provision of solar power supply.

UNICEF is committed to continuing HIV prevention, care and treatment for children, young people and women during crises. UNICEF works with national governments and partners to ensure that HIV is part of national emergency preparedness plans and is a key partner in multi-sector response efforts. This includes integration of the food security, nutrition, health, and HIV response, including HIV testing of children admitted for malnutrition treatment, and provision of food supplementation for vulnerable children and mothers living with HIV; work with partners to ensure health facilities are functional or to establish alternative health and ART delivery strategies, e.g. in mobile or temporary health facilities; and enhancing strategies to prevent HIV transmission and support those living with HIV to stay in treatment.

5.11 Climate change, youth engagement and advocacy

UNICEF calls for a paradigm shift in the economic development model to provide opportunities for future generations without destroying the natural environment. This will require drastic changes in individual behaviours, regulations, and business practices.

The participation of young people is a necessity and part of their fundamental rights (Article 12, CRC). Rather than passive victims, children should be recognized as the clients and co-creators of solutions – their concerns and ideas need to be heard, political space for them created, and economic opportunities linked to environmental sustainability made the new normal.

Children and young people can play a key role in addressing climate-related risks by exercising their views, opinions and concerns, identifying and working on solutions, and promoting environmentally sustainable lifestyles – setting an example for their communities.

UNICEF will elevate the voices of children and young people in the global climate discourse, encourage their environmental activism and promote their involvement in activities that combine environmental sustainability and economic development. UNICEF will continue to ensure that children are included in climate negotiations and platforms, to provide platforms for them to press for the reduction of pollution, and push governments and businesses to create more opportunities in the green economy.

Case study 10: UNICEF–Scout Movement partnership for youth engagement on climate change in Eastern and Southern Africa

About the UNICEF–Scout Movement partnership

Recognizing the important role of adolescents and young people as agents of change, and united by a shared commitment to enhance the development and meaningful participation of children and young people, UNICEF and the World Organization of the Scout Movement have worked as global partners since 2005. As part of this, in 2020, the UNICEF Eastern and Southern Africa Regional Office (ESARO) signed an agreement with the Africa Regional Office of the World Organization of the Scout Movement to work together to engage and support adolescents and young people on issues related to climate change, among other UNICEF priorities.

UNICEF works with the Scout movement both at the global and regional level and in individual countries. There is considerable overlap between the reach of both organizations: The Scouts are present in 19 of the 21 countries where UNICEF works in Eastern and Southern Africa.



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Adolescent and youth engagement for climate change mitigation and awareness

The partnership recognizes the important role of adolescents and young people in societies, and empowers them to play a role in raising awareness about climate change and doing their part to contribute to a greener future.

Specifically, the partnership focuses on harnessing innovative UNICEF platforms to teach, gather and share information, and involve young people on specific priority topics; as well as working to strengthen adolescent nutrition and to promote preventive measures in the context of the COVID-19 emergency.

One component of this partnership encourages young people to come up with local solutions to decrease environmental pollution, with a focus on reducing plastic waste, in line with Sustainable Development Goal 12, Ensure sustainable consumption and production patterns. This builds on a climate change awareness curriculum already developed by the Scouts Africa Support Centre in partnership with UNEP and used by the Scouts to conduct activities at the community level.

Under the new partnership, UNICEF, UNEP and the Scouts Movement are using the Cartedo digital platform to co-design and launch a regional challenge for young people to actively develop solutions to reduce plastic waste at the local level. The best three ideas will receive seed funding for a 3-month pilot in their respective communities, which will then be reviewed for potential scale-up.

Expanding young people's access to information

The partnership also focuses on expanding young people's access to relatable climate change information. UNICEF is working with the Scouts Movement and adolescents to develop relevant content for UNICEF's informative Internet of Good Things digital platform, which can be accessed even on low-end mobile devices.

The two organizations are also building on their global partnership around the UNICEF U-Report real-time information sharing and opinion polling platform, which uses SMS-based technology to connect with young people, giving them a chance to voice their opinions on issues that matter to them.

U-Report was first piloted in Uganda, and now engages youth in 66 countries around the world, of which 26 are in Africa. In the Eastern and Southern Africa region this includes Botswana, Burundi, Eswatini, Malawi, Mozambique, South Africa, Uganda, the United Republic of Tanzania, Zambia and Zimbabwe; 7 of these 10 are classified as countries with a high level of vulnerability to climate change but a low level of readiness – part of the lowest quartile of the ND-GAIN Index. These countries are characterized by both a strong need for investment to improve readiness and a great urgency for adaptation actions.

As part of the new regional partnership, the Scouts Movement, which has 2.5 million members in Eastern and Southern Africa, is working with UNICEF to expand the reach of U-Report so that young people can take part in relevant polls on climate change and other climate-related initiatives. More than 31,000 Scouts were trained on how to use U-Report between 2014 and 2017. The feedback from thousands of such 'social monitors' is then used in decision-making about local development programmes, to help identify priority issues, and to hold national and local authorities accountable.

6 Conclusion

UNICEF continues to build resilience and disaster preparedness directly into our programmes. Climate-smart health and education systems are more resilient not just to climate change, but to all sorts of crisis – including pandemics. For example, renewable energy can improve self-reliance of schools and health clinics, minimizing the effects of disruptions in traditional systems and infrastructure. Resilient social protection systems are better able to manage the impacts of the variety of shocks, from climate change and natural disasters, to epidemics and economic shocks

Climate change is posing enormous and unbalanced risks to safer, more resilient and sustainable development in Africa. UNICEF remains a strategic partner for powerful multisectoral responses to climate change. This is an essential catalyst addressing climate change driven challenges, allowing for the provision of efficient, coordinated, sustainable and climate-resilient services to communities. UNICEF therefore continues to advocate with different partners and also create and join partnerships in order to scale solutions that address the climate crisis and have intersections with UNICEF programming (focused on resilience and adaptation), including climate smart schools, health centres, WASH services and the circular economy providing a win-win approach to building resilience – all of this together with the support, creativity and positive engagement of children and young people which safeguard and achieve results for children.

UNICEF believes children and young people can play a key role in addressing climate-related risks by exercising their views, opinions and concerns, identifying and working on solutions, and promoting environmentally sustainable lifestyles. UNICEF will work with young people to elevate their voices on climate change through creative platforms, advocacy and participation in policy processes, and to call for a new economic development model which supports future generations as well as the natural environment.

UNICEF will continue to advocate for child friendly mitigation, adaptation plans and programmes in countries, and climate change will not be an exception. UNICEF Country Offices should commit to ensuring that climate change responses are anchored in the country programme documents (CPDs) that are an essential part of their contracts with governments. They should ensure follow through by supporting governments to access climate financing and assist with building the necessary capacity for this. In addition, the perspectives of the children and the youth as well as their needs must be fully integrated into CPD content as well as in the development of mitigation and adaptation plans as well as programmes.

The role of government in the fight against the negative impacts of climate change cannot be minimized. Governments are essential for country-level policy formulation to develop response mechanisms for climate change adaptation and mitigation. This includes development of instruments at country level such as NAPs and NAPAs. These instruments are critical for developing and monitoring programmes. Governments need to take child-specific vulnerabilities into account and ensure that their response plans are child informed, child-centred and child friendly.

Without concerted efforts for joint and at scale financing, much of the climate response activities cannot be achieved. With the suggested suggest adaptation costs for Africa in the region of US\$ 20-30 billion per annum over the next 10 to 20 years, International financing institutions (IFIs) play a major role in the leveraging of finance for social and economic development programmes of nations with developing or transitional economies. This role goes beyond the funding to include development projects and assisting with their implementation and supporting the monitoring of their impacts. In the case of projects related to climate change, IFIs are required to ensure that projects financed also include child friendly response mechanisms to climate change as an essential part of their social safeguarding mechanisms. Support is also required for capacity building for climate financing, in order to build sufficient capacity for accessing finance.

The private sector has shown to have enormous potential in leveraging the necessary resources and taking our advocacy messages and demonstration work to scale. Working with the private sector can ensure that businesses are child-sensitive and engage in practices that are protective of the natural environment upon which children depend. The right to a safe and clean environment is intrinsic in the CRC and the Children's Rights and Business Principles, and this needs to be upheld. The private sector is also a centre for innovation, development of technology and financing for climate-related interventions to scale. It is therefore a complementary partner for UNICEF in seeking a better environment for children.

As all stakeholders work together, donors have a large contribution to make in ensuring accountability and equity. Donor support helps to achieve accountability from governments, UNICEF and other stakeholders to ensure that programmes, environmental policies and business practices are child friendly. With the donors' ability to shape good practice, quality programmes and development strategies, a global movement can be built to reduce the impact of climate change impacts and uphold child friendly policy and practices and create the necessary synergies for the most resource efficient and effective initiatives and avoiding duplications.

There is a growing need to foster and further strengthen existing collaboration and partnerships engaging with all key stakeholders at regional, national and local level, including government, civil society, United Nations Agencies, and other partners in order to develop, implement and monitor comprehensive multisectoral, at scale projects and programmes that comprehensively address the complex effects of climate change at country level while utilising the comparative advantage of each organisation. This multisectoral collaborative approach will not only build on the mandates and expertise of such institutions, but also increase the efficiency of accessing finance and reduce the administrative burden, allowing for the agility required to achieve the required scale of responses in a timely manner.

In conclusion, as part of our systems approach, UNICEF will continue to work in the area of climate and environment by providing platforms, operational networks and increasingly experience on children at the center of community resilience and improved sustainability and resources efficiency to deliver integrated multisectoral programmes, whose aim is to ensure that ***Every child survives and thrives; Every child learns; Every child is protected from violence and exploitation; Every child lives in a safe and clean environment; Every child has an equitable chance in life and that we have an environment fit for children and future generations.***

Annex 1: Examples of gender dimensions, adaptive strategies and possible interventions

Impact of climate change	Gender dimensions (examples)	Gender-sensitive adaptive strategies (examples)	Possible interventions beneficial to both women and men (examples)
Increase in infectious diseases	<p>Women make up the majority of those who take care of the sick (both as household caregivers and as front-line health care workers)</p> <p>Women often lack, or have less access to, health services</p>	<p>A gender perspective must be incorporated into infectious disease analysis and research to target policies and programmes</p> <p>The data collected must be disaggregated by sex, age, socioeconomic status, education, ethnicity and geographical location, where appropriate</p> <p>An understanding of gender and its implications for health and health-seeking behaviour should be incorporated into the training of health care professionals and development of health-sector responses</p>	<p>Ensure better availability of, access to and support by health systems for both women and men, but especially for women, given their caregiving roles</p> <p>Support outreach activities, using gender-sensitive information, education, and communication strategies and materials for advocacy and training</p> <p>Promote childcare facilities and other approaches to support women's caregiving role, while trying to transform related gendered roles and norms</p>
<p>Scarcity of water</p> <p>Salination of water</p> <p>Increase in arsenic</p> <p>Flooding</p>	<p>Health problems, especially for women and girls who must walk long distances to fetch water</p> <p>Increase in work burden, which implies less time to access health-related resources such as education and economic resources</p>	<p>Promote water-saving practices that consider the different uses and roles related to water for women, girls and men</p> <p>Address salination and arsenic contamination of water, proposing specific actions that consider the different patterns of exposure and impacts on women and men</p> <p>Counter social stigma attached to the effects of arsenic poisoning on women and men</p>	<p>Ensure affordable drinking water, taking into account the different roles and needs of women and men</p> <p>Empower women and facilitate their equal participation in management of water resources at national, regional and grassroots levels</p> <p>Use appropriate technologies to assure potable water closer to where families live</p> <p>Strengthen forestation and water-harvesting mechanisms, taking into account the different roles, needs and impacts on women and men</p> <p>Promote women's rights to own land and own land use certificates</p> <p>Effectively implement water policies that take into account women's and men's different needs and roles for water use, provision and consumption</p> <p>Ensure equitable access to resources also in relation to payments for environmental services</p>

Impact of climate change	Gender dimensions (examples)	Gender-sensitive adaptive strategies (examples)	Possible interventions beneficial to both women and men (examples)
Mortality through extreme weather events	<p>Socioeconomic status, age and social gendered norms influence the risk of injury and death</p> <p>Women are vulnerable due to gender norms that dictate acceptable proper behaviours (e.g. not learning how to swim, not going out alone)</p> <p>Men's vulnerability because of gender norms that promote risk-taking</p>	<p>Provide safe shelters and homes for both women and men</p> <p>Training on gender-sensitive disaster risk reduction and early warning systems</p> <p>Promote programmes that facilitate men to seek help for psychosocial problems</p> <p>Empowerment of women to strengthen their capacity to question and change harmful behavioural norms that put them at risk if extreme events occur</p>	<p>Gender-sensitive disaster preparedness</p> <p>Gender-sensitive early warning systems</p> <p>Ensure women's participation on an equal basis in all policy and programme cycles</p> <p>Target women and men differently in communication campaigns and health-promotion strategies, taking into account their gender norms and roles</p> <p>Adopt strategies at all levels of programming to change norms and practices that prevent women or men from appropriate responses and coping mechanisms in situations of natural disasters</p>
Disruption of human security force migration	<p>Increase of violence at household level</p> <p>Harassment and loss of privacy in shelters</p> <p>Harassment in relief queues</p>	<p>Build strong and supportive networks for both women and men</p> <p>Promote gender-sensitive training to eliminate violence against women, girls and boys</p> <p>Capacity building within the health system to ensure early detection of domestic or sexual violence</p> <p>Involve women in management of shelters and distribution activities</p>	<p>Conceive policy initiatives in the health, education, finance and labour sectors as a part of a cohesive national / international violence prevention effort that includes women, girls, men and boys</p> <p>Implement appropriate health services that respond to the specific needs of women and men based on their respective needs, roles and capacities</p> <p>Design effective referral systems for cases of domestic violence</p> <p>Design referral system for cases of sexual harassment</p>
Decreased income-generating and credit opportunities after extreme weather events	<p>Women working in informal sector are also affected</p> <p>Increase in household expenses</p> <p>Out-migration of males</p> <p>Feminization of poverty, especially in urban/peri-urban areas</p> <p>Risk of malnutrition related to loss of income</p>	<p>Save on expenses or money for lean periods for both women and men</p> <p>Promote alternative income-generating activities</p>	<p>Ensure proper and accessible credit facilities, both formal and informal, for women</p> <p>Establish market linkages that consider the different patterns of consumption of women and men</p> <p>Vocational training for women and men</p> <p>Promote social security and other safety nets among people working in the informal sector, both women and men</p>

Impact of climate change	Gender dimensions (examples)	Gender-sensitive adaptive strategies (examples)	Possible interventions beneficial to both women and men (examples)
<p>Change in agricultural production</p> <p>Decrease in fishery stocks</p>	<p>Increase of work burden</p> <p>Calorie/micronutrient deficiencies</p>	<p>Involve women and men in conservation of biodiversity</p>	<p>Conduct training on agricultural extension for both women and men</p> <p>Provide better nutrition supplements for needy families</p> <p>Provide marketing facilities</p> <p>Ensure land rights for women</p>
<p>Other indirect health impacts following extreme weather events:</p> <p>Increased burden of work and responsibility, especially on women and girls</p> <p>Increased anxiety, fears and intra-household tension</p> <p>Increased rates of suicide among men in cases of drought</p>	<p>Suicide rates are higher, due to weaker or non-existent and ineffective social networks, among men</p> <p>Greater social responsibility on women to cater for family needs such as water and food</p>	<p>Promote programmes that enable men to seek help for psychosocial problems</p> <p>Empower women to enhance their capacities to look after themselves and their families and specifically to use available social and other networks to cope with increased burdens and tensions</p>	<p>Target women and men differently in post-disaster relief, taking into account gender norms, roles and relations</p>

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