

# Toolkit for Youth on Adaptation & Leadership



## MODULE 2

### THE BASICS OF VULNERABILITY AND CLIMATE CHANGE ADAPTATION



GLOBAL  
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## Acronyms

<b>ASAP</b>	The Adaptation for Smallholder Agriculture Programme
<b>CBA</b>	Community based adaptation
<b>CCA</b>	Climate change adaptation
<b>CIS</b>	Climate Information Services
<b>COP</b>	Conference of the Parties
<b>COY</b>	Conference of Youth
<b>CRA</b>	Community Risk Assessment
<b>DRM</b>	Disaster Risk Management
<b>DRR</b>	Disaster Risk Reduction
<b>EAC</b>	East Africa community
<b>ECOWAS</b>	Economic Community of West African States
<b>GCF</b>	Green Climate Fund
<b>GHGs</b>	Greenhouse gases
<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>JPA</b>	Joint Principles for Adaptation
<b>LAP</b>	Local Adaptation Plans
<b>LDCF</b>	Least Developed Countries Fund
<b>LLA</b>	Locally Led Adaptation
<b>MDGs</b>	Millennium Development Goals
<b>NAP</b>	National Adaptation Plan
<b>NAPA</b>	National Adaptation Programs of Action
<b>NDC</b>	Nationally determined contribution
<b>NGOs</b>	Non-Governmental Organizations
<b>PPCR</b>	Pilot Program for Climate Resilience
<b>PSP</b>	Participatory Scenario Planning
<b>SCCF</b>	The Special Climate Change Fund
<b>SDG</b>	Sustainable Development Goal
<b>SIDS</b>	Small Islands Developing States
<b>SMART</b>	Specific, Measurable, Achievable, Relevant and Time-bound
<b>UNEP</b>	United Nations Environment Programme
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change

# WELCOME TO THE TOOLKIT FOR YOUTH ON ADAPTATION & LEADERSHIP!

## Who is this toolkit for?

Climate change is reshaping the world young people have inherited and they will bear the costs in the coming decades. However, young people are often excluded from taking on leadership roles and engaging in decision-making activities related to climate change adaptation. This Toolkit for Youth on Adaptation & Leadership equips young people with the knowledge and skills to engage in climate adaptation policy, advocacy and action. This toolkit uses the terms “youth” and “young people” to refer to people between 15 and 35 years old.

## What you will learn

The toolkit covers essential materials and offers practical guidance for how you, as a young person, can take part in adaptation policy processes, lead advocacy campaigns, and approach adaptation with an entrepreneurial mindset. It provides tools for designing and implementing your own climate change adaptation actions so that you can be part of the solution to the climate crisis.



The “Toolkit for Youth on Adaptation & Leadership” is a project under the Global Center on Adaptation Youth Leadership Program, developed by the CARE Climate Justice Center with the financial support of Norad. It came together with input from young people who, like you, are concerned about the impacts of climate change and have faced challenges when advocating and taking adaptation action.



## How to use the toolkit

The toolkit includes eight modules:



### 1 Understanding climate change



### 2 The basics of vulnerability and climate change adaptation



### 3 Vulnerable groups and climate adaptation planning



### 4 Learning from youth-led climate adaptation solutions: African case studies



### 5 Developing soft skills for youth leadership in adaptation



### 6 Engaging in climate adaptation policies: local, national, and international



### 7 Designing and implementing your adaptation advocacy strategy



### 8 Designing your adaptation action

## Each module contains four sections:



**Warm Up** is the place to start. This provides an overview of the module's key concepts, based on the latest research and best practices. It highlights tools you can use to apply what you have learned, and develop your leadership skills.



**Heat Wave** will deepen your understanding. Find links to supporting scientific research, important publications, and tools for exploring and applying key concepts.



**Bright spark** is the place to get inspired. Read case studies, watch videos, and listen to podcasts about young climate leaders to get fired up for your own climate change actions!



**Cool Down** is your last stop. Here, you have space to test your knowledge (with a short quiz) and consider how you can apply what you have learned to your own climate action.

## MODULE 2

# THE BASICS OF VULNERABILITY AND CLIMATE CHANGE ADAPTATION



This module explains vulnerability and highlights the impacts of climate change in Africa. It defines climate change adaptation and details available adaptation options. It also provides information about how to respond to the climate crisis through good practices in Community-Based and Locally Led Adaptation.

## What will I learn?

### By the end of the module, you will:

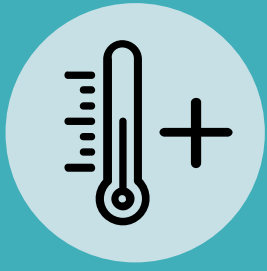
- Be able to explain what causes vulnerability.
- Understand the meaning of climate change adaptation and the various options for adaptation.
- Have gained a better understanding of Community-Based and Locally Led Adaptation approaches and the principles that underpin them.
- Understand the value and role of nature-based solutions in climate change adaptation action.

## Glossary

Term	Definition	Source
<b>Community-based adaptation</b>	Community-based adaptation is a set of climate change adaptation activities developed in partnership with at-risk communities to promote local awareness of, and appropriate and sustainable solutions to, current and future climatic conditions.	<a href="#">CARE (2019). Climate Vulnerability and Capacity Analysis Handbook.</a>
<b>Climate change adaptation</b>	<p>In human systems, climate change adaptation refers to the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities. In natural systems, it refers to the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate and its effects.</p> <p>In practical terms, adaptation refers to the changes people and institutions make to adjust to observed or projected changes in climate. It is an ongoing process that aims to reduce vulnerability to climate change. Retrieved from: CARE (2019). Climate Vulnerability and Capacity Analysis Handbook: <a href="http://careclimatechange.org/cvca/">careclimatechange.org/cvca/</a></p>	<p><a href="#">IPCC(2021). Glossary of terms.</a></p> <p><a href="#">CARE (2019). Climate Vulnerability and Capacity Analysis Handbook.</a></p>
<b>Climate information</b>	Climate information refers to the collection and interpretation of observations of the actual weather and climate as well as simulations of climate in both past and future periods. Climate information is the collection and interpretation of weather and climate data that is credible, relevant and usable.	<a href="#">CARE (2022) (based on World Meteorological Organization &amp; IPCC)</a>
<b>Climate Information Services (CIS)</b>	CIS involve the provision of climate information in a way that assists decision making by individuals and organizations. They are tools and processes that enable decision makers and user communities to assess, and prevent or prepare for, potential impactful weather and climate events.	<a href="#">CARE (2022) (based on World Meteorological Organization &amp; IPCC)</a>
<b>Ecosystem based adaptation</b>	Ecosystem-based adaptation is a nature-based solution that harnesses biodiversity and ecosystem services to reduce vulnerability and build resilience to climate change.	<a href="#">IUCN (2022). Ecosystem-based Adaptation</a>
<b>Exposure</b>	Exposure is "the presence of people, livelihoods, species or ecosystems, environmental functions, services, and resources, infrastructure, or economic, social, or cultural assets in places and settings that could be adversely affected".	<a href="#">IPCC</a>
<b>Gender</b>	Gender refers to socially constructed characteristics of women and men – such as norms, roles and relations of and between groups of women and men	<a href="#">World Health Organization</a>
<b>Gender inequality</b>	Gender inequality is discrimination on the basis of sex or gender causing one sex or gender to be routinely privileged or prioritized over another.	<a href="#">Save the children</a>

Term	Definition	Source
<b>Locally Led Adaptation (LLA)</b>	<p>LLA allows an approach of empowerment of the different local stakeholders through the implementation of different tools for participatory planning, consensual decision making, accountability and integration of local and scientific knowledge, as well as capacity building by prioritizing local stakeholders. Thus, it is important to understand that local stakeholders better understand their problems and the actions to prioritize in order to solve them. In this sense, locally-led adaptation allows power to be shifted to local stakeholders while they are accompanied by external actors to alleviate the burden of responsibility for adaptation, in order to catalyze effective, equitable and transparent adaptation. Locally-led adaptation, unlike other more common participatory approaches, goes beyond the involvement of local stakeholders and only occurs when they have control over the development and adaptation processes. For CARE, this approach is equivalent to the CBA.</p>	<p><a href="#">GCA (2021). Principles of locally led adaptation.</a></p>
<b>Nature-based Solutions</b>	<p>Nature-based solutions are actions to protect, sustainably manage and restore natural and modified ecosystems in ways that address societal challenges effectively and adaptively, to provide both human well-being and biodiversity benefits</p>	<p><a href="#">IUCN, 2016</a></p>
<b>Resilience</b>	<p>Resilience is the ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management.</p> <p>Resilience is the capacity to deal with shocks and stresses, manage risks and transform lives and systems in response to new hazards.</p>	<p><a href="#">United Nations Office for Disaster Risk Reduction</a></p> <p><a href="#">CARE (2019), Online Course - Increasing Resilience Approach and Marker</a></p>
<b>Risk</b>	<p>Risk is “the potential for adverse consequences where something of value is at stake and where the occurrence and degree of an outcome is uncertain.” Risk is a function of vulnerability, exposure and the likelihood of a hazard occurring</p>	<p><a href="#">CARE (2019). Climate Vulnerability and Capacity Analysis Handbook. (based on IPCC)</a></p>
<b>Stress</b>	<p>Stresses are continuous, long-term trends or pressures that negatively impact people's lives and the systems they live in.</p>	<p><a href="#">CARE (2019). Climate Vulnerability and Capacity Analysis Handbook.</a></p>
<b>Sustainability</b>	<p>Sustainability is the practice of using natural resources responsibly, that meets the needs of the present without compromising the ability of future generations to meet their own needs</p>	<p><a href="#">United Nations Brundtland Commission (1987)</a></p>

Term	Definition	Source
<p><b>Vulnerability</b></p>	<p>Vulnerability is defined as “the propensity or predisposition to be adversely affected”. Vulnerability encompasses a variety of concepts and elements including sensitivity or susceptibility to harm and lack of capacity to cope and adapt.</p> <p>In the context of climate change, vulnerability refers to the potential for negative effects resulting from the impacts of climate change. Vulnerability to the same risks may differ based on gender, wealth, mobility and other factors. It is influenced by adaptive capacity; the higher the adaptive capacity, the lower the vulnerability.</p>	<p>IPCC Glossary, 2014</p> <p><a href="#">CARE (2019). Climate Vulnerability and Capacity Analysis Handbook.</a></p>



# Warm Up

## Climate change hits poor people hardest

Climate change is one of the greatest threats to achieving a world of hope, tolerance and social justice, where poverty has been overcome and all people live with dignity and security.

Climate change is already making the lives of the poor more challenging. In 2022, the world witnessed record-breaking extreme weather globally, with mighty floods, vast wildfires, enduring heatwaves, and drought on every continent. But Africa is extremely vulnerable. Between 2020 and 2022, more than 52 million people—some 4 percent of the continent's population—were directly affected by drought and floods.<sup>1</sup> Temperatures are increasing across all regions of Africa and the continent is warming faster than the global average over both land and sea.

By 2030, climate change is expected to have a significant impact on poverty, mainly by pushing up food prices and reducing agricultural production in Africa and South Asia. The World Bank estimates that even with rapid, inclusive, and climate-informed development, climate change will increase poverty for between 3 million and 16 million people in 2030. Worse, if there are delays in inclusive, climate-smart development, poverty could increase for between 32 million and 132 million people.<sup>2</sup>

Climate change is also expected to negatively impact people's health in all regions.<sup>3</sup> The magnitude of these impacts will depend on the development choices governments make.

## Understanding vulnerability to climate change

### Vulnerability

**Vulnerability** refers to “the conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impact of hazards.”<sup>4</sup> Such factors include things like people’s income, levels of education, where they live, and access to housing and health care. Vulnerability affects the degree to which people and ecosystems can cope with climate change.

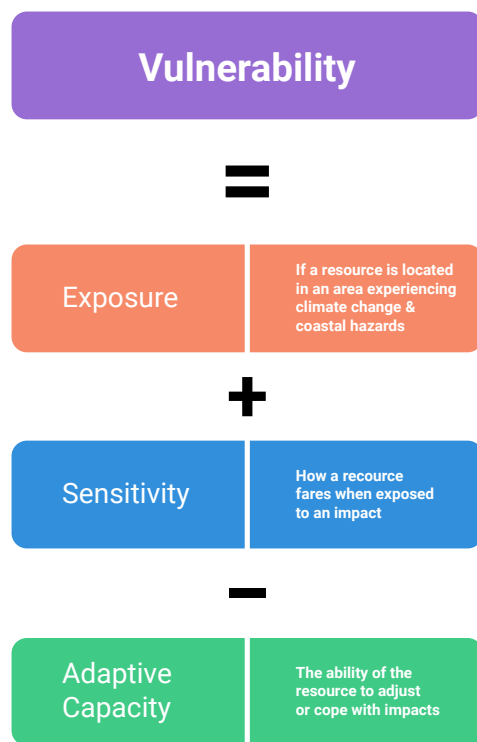
Vulnerability is a function of exposure, sensitivity and adaptive capacity (see Figure 1).

The three components of vulnerability are explained below.

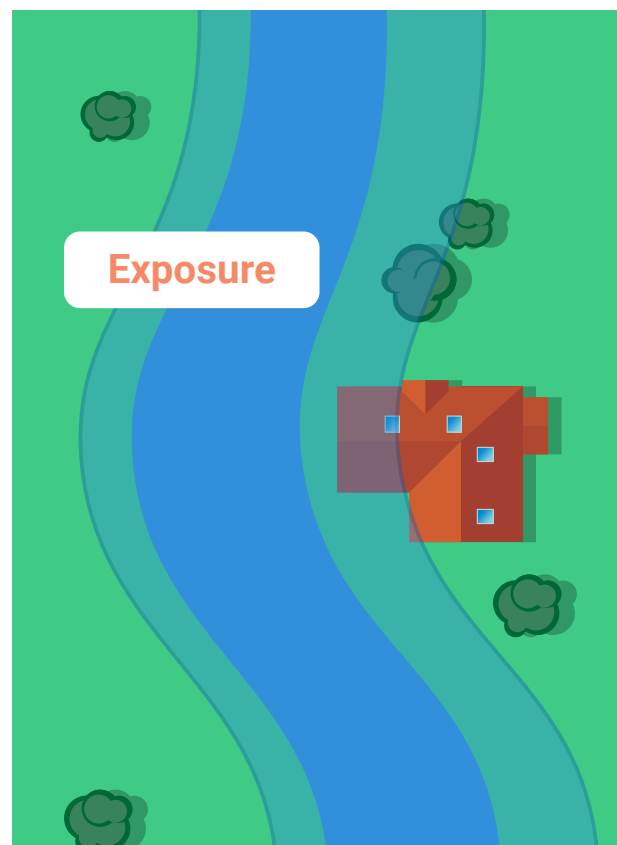
### Exposure

**Exposure**, according to the IPCC, is the “presence of people, livelihoods, species or ecosystems, environmental functions, services, and resources, infrastructure, or economic, social, or cultural assets in places and settings that could be adversely affected.”<sup>6</sup> In short, it involves the degree to which people or systems experience, or are expected to experience, climate change impacts.

To conceptualize this, think of a house on a riverbank that often floods in heavy rains. The house has a high level of *exposure* to flooding



**Figure 1:** How vulnerability relates to exposure, sensitivity and adaptive capacity. Source: National Park Service, 2022.<sup>5</sup>



**Figure 2:** The meaning of exposure: the house is in a place where it is exposed to flooding. Source: EAUFRANCE, no date.<sup>7</sup>

## Sensitivity

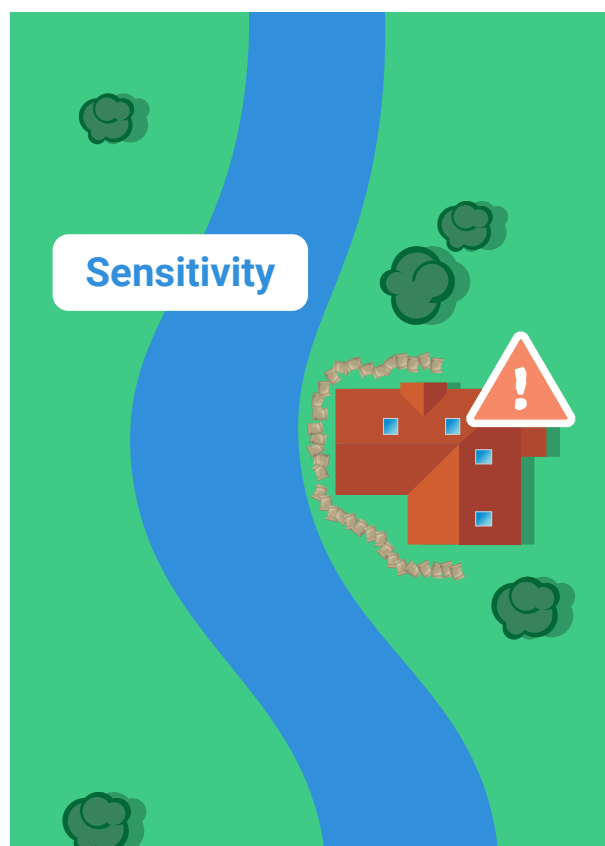
**Sensitivity**, is the “degree to which a system or species is affected, either adversely or beneficially, by climate variability or change.”<sup>8</sup>

To conceptualize this, think of the same house on the riverbank. If it was built of poor-quality materials, it would be more likely to be damaged in the floods and have a *higher sensitivity*.

## Adaptive capacity

**Adaptive capacity**, is the “ability of systems, institutions, humans, and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences.”<sup>10</sup> This refers to the ability of social systems to: (a) adjust to better respond to the risks associated with climate change, and (b) learn lessons and adjust after a disaster or shock.

Continuing with our example: if the owners decided to move their house to higher ground, away from the riverbank, they would be *increasing their adaptive capacity*.



**Figure 3:** The sensitivity of the house depends on the types of materials used to construct it.  
Source: EAUFRACTURE, no date.<sup>9</sup>

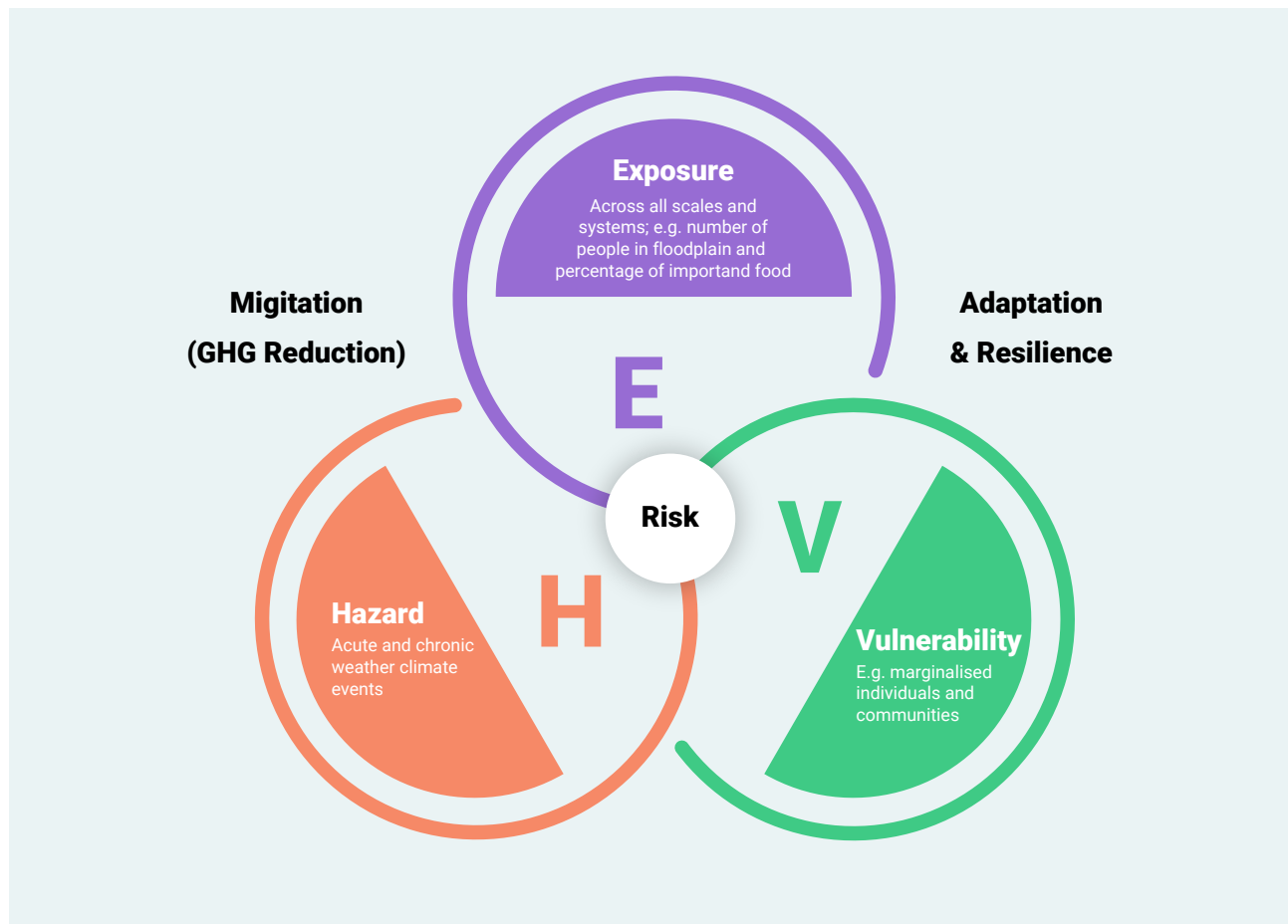


**Figure 4:** The house is no more susceptible to flooding because it is away from the riverbank and built strong on a higher ground.



## How climate change risk is determined

Vulnerability affects the level of **climate change risk** experienced by communities and countries. Figure 5 highlights the interaction between a climate hazard (such as a flood), vulnerability and exposure, to generate climate change risks.



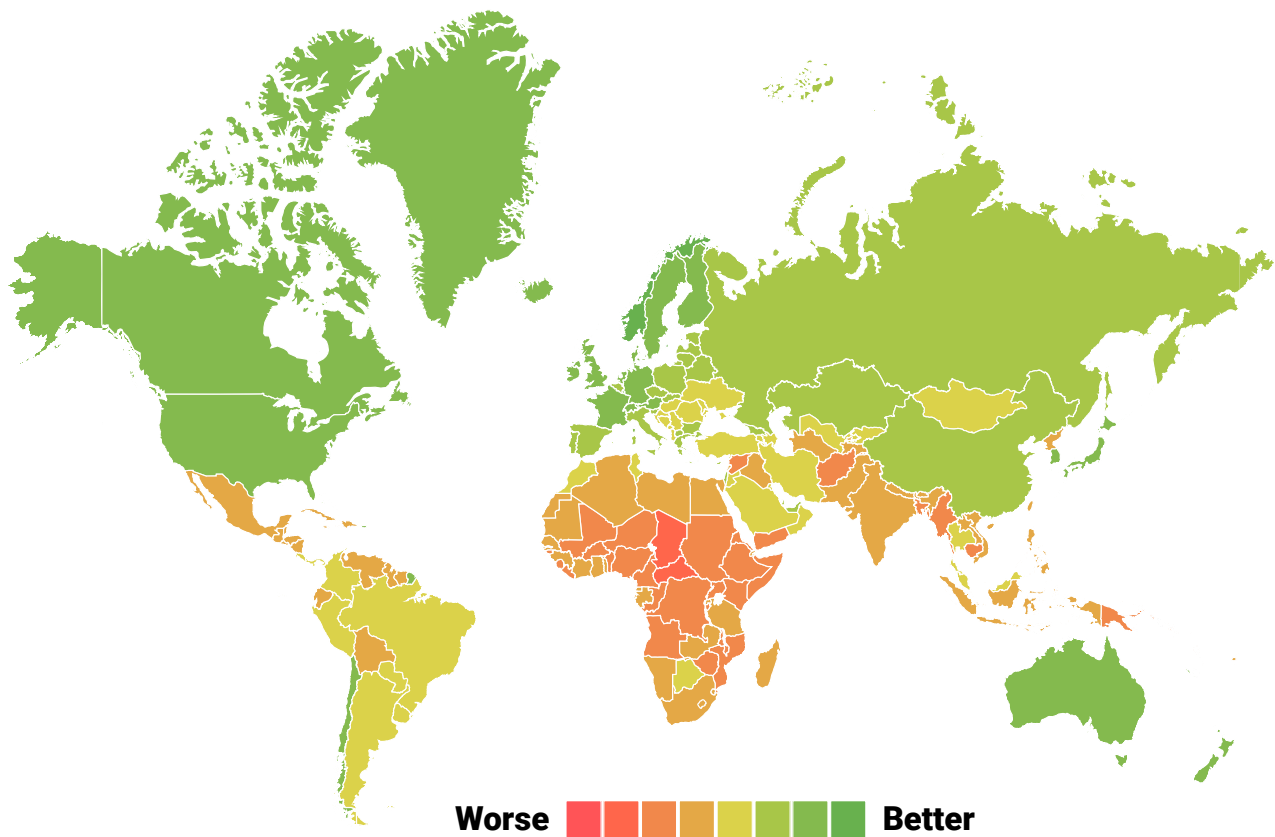
**Figure 5:** Representation of climate risk as a function of hazard, exposure and vulnerability, based upon the IPCC SREX definition of risk. Source: Viner et al., 2020.<sup>11</sup>

## The injustices of climate change

The countries with historically low greenhouse gas (GHG) emissions, and the poorest people, have contributed the least to the climate crisis but are most vulnerable to its impacts. This is at the heart of calls for climate justice.

Climate change is already having negative impacts around the world. As you learned in Module 1, climate change is expected to lead to drops in agricultural productivity, reduced access to water and increased weather extremes. However, these impacts will not be evenly felt around the globe.

How climate change impacts different countries depends on each country's **vulnerability**. Figure 6 shows the countries that are most vulnerable to climate change. You will see that Africa is highly vulnerable.

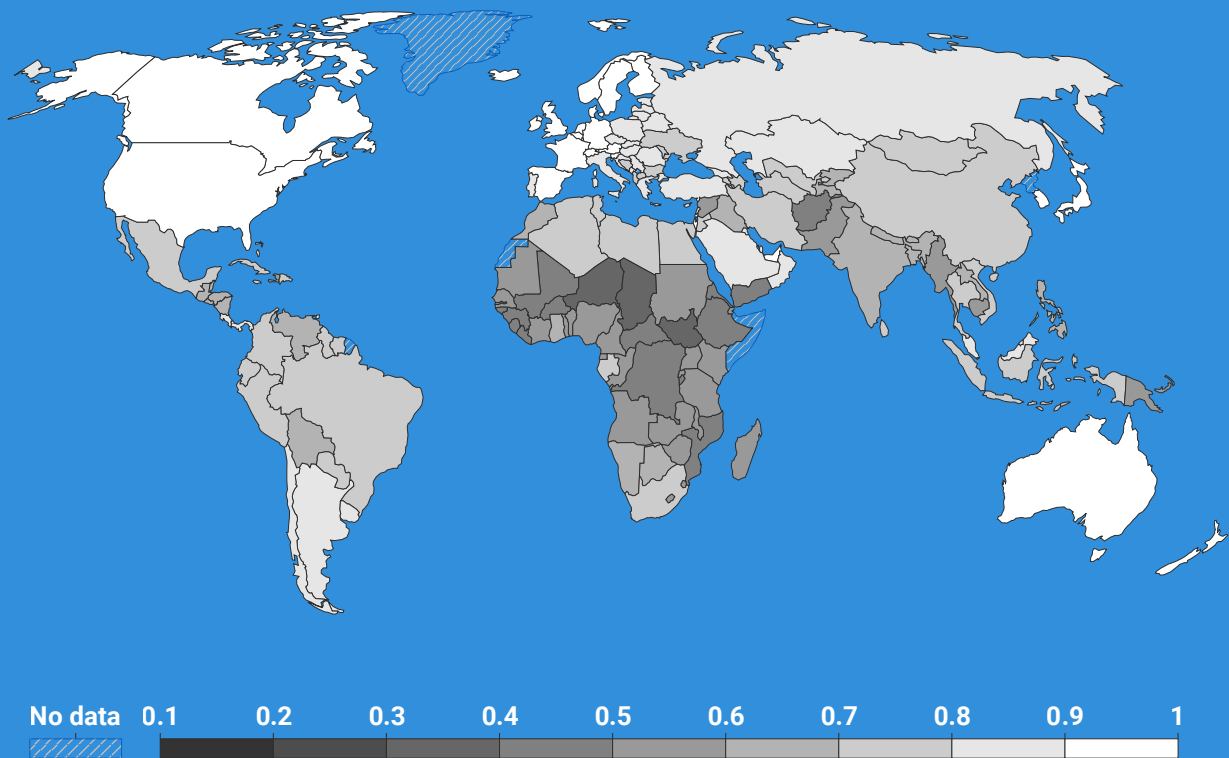


**Figure 6:** Map showing the most vulnerable countries to climate change. Source: University of Notre Dame, 2022.<sup>12</sup>

Figure 7 shows how different countries rank on the Human Development Index, a tool that shows levels of development based on life expectancy, education and standard of living. The higher a country's ranking, the higher its level of human development. As you can see, many of the countries that have low levels of development (in dark blue) are more vulnerable to climate change.

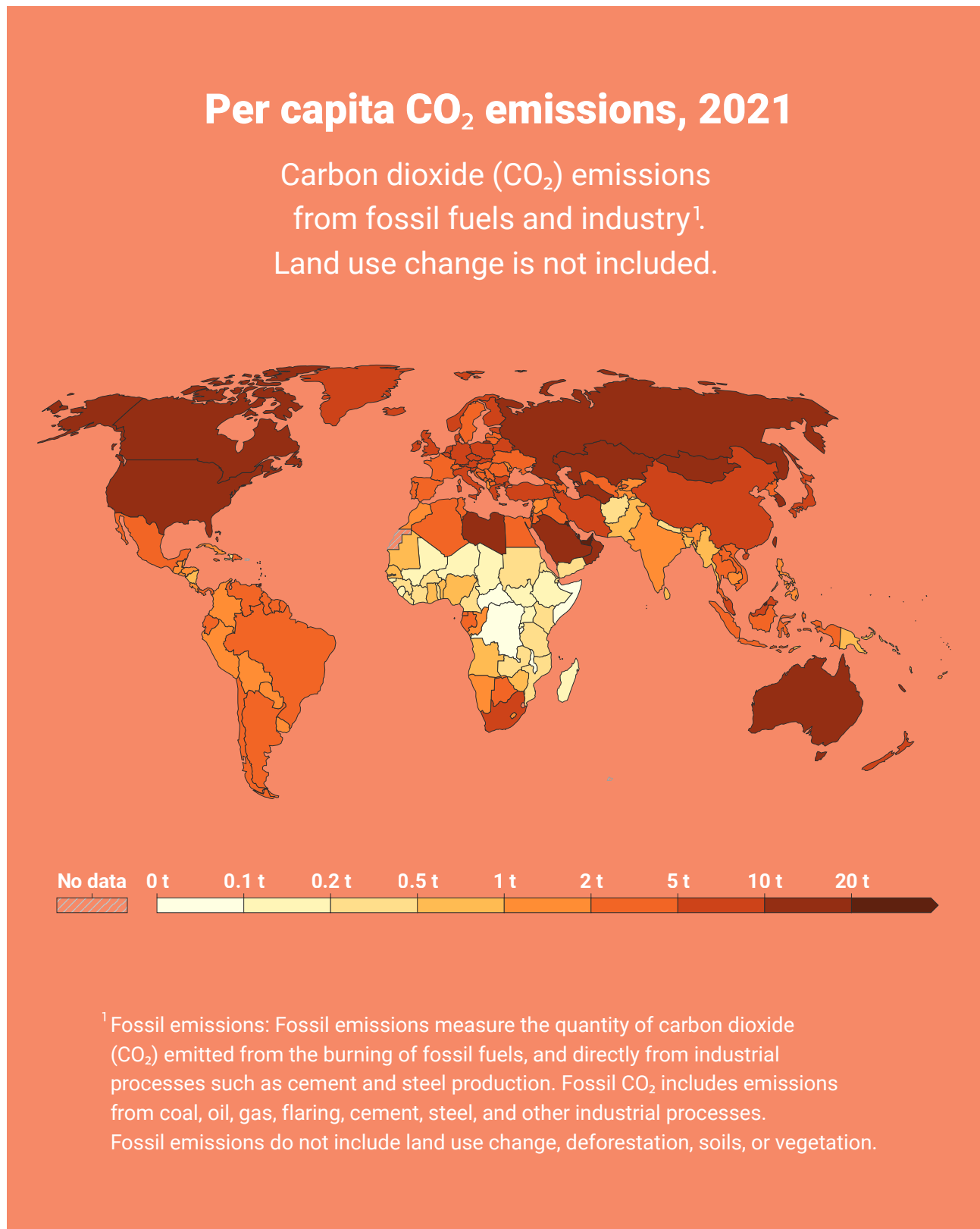
## Human Development Index, 2021

The Human Development Index (HDI) is a summary measure of key dimensions of human development: a long and healthy life, a good education, and having a decent standard of living.



**Figure 7:** Human Development Index (HDI) map showing countries according to their rank on the Human Development Index. Source: Our World in Data, 2021.<sup>13</sup>

In Figure 8, you can see that the least developed countries, which are most vulnerable to climate change, are typically responsible for the lowest emissions.



**Figure 8:** Per capita carbon dioxide emissions in 2021. Source: Our World in Data, 2022.<sup>14</sup>



## Africa is vulnerable and prone to extreme climate risks

Africa is one of the most vulnerable continents to climate change and climate variability, a situation aggravated by the interaction of multiple factors such as underdevelopment, conflict and scarcity of resources.

Climate change is already causing systemic risks to Africa's economies, infrastructure investments, water and food systems, public health, agriculture and livelihoods. The risks posed by climate change threaten to undo the continent's hard-fought development and reverse decades of economic progress.

## Factors combine to make Africa highly vulnerable

What makes Africa vulnerable? There are numerous factors. For example, rates of poverty are high among the millions of smallholder farmers and the large numbers of people who live in informal settlements in cities, with low access to basic services. At the same time, large portions of Africa – in particular, the dryland areas that cover three-fifths of the continent – are warming twice as fast as the global average, putting half a billion people at risk.



With much of the river system dried up in Kenya's Isiolo County during the drought in 2017, pastoralists living in the Ewaso Ngiro river basin in central Kenya had to dig for water in the riverbed. Credit: Denis Onyodi/KRCS.

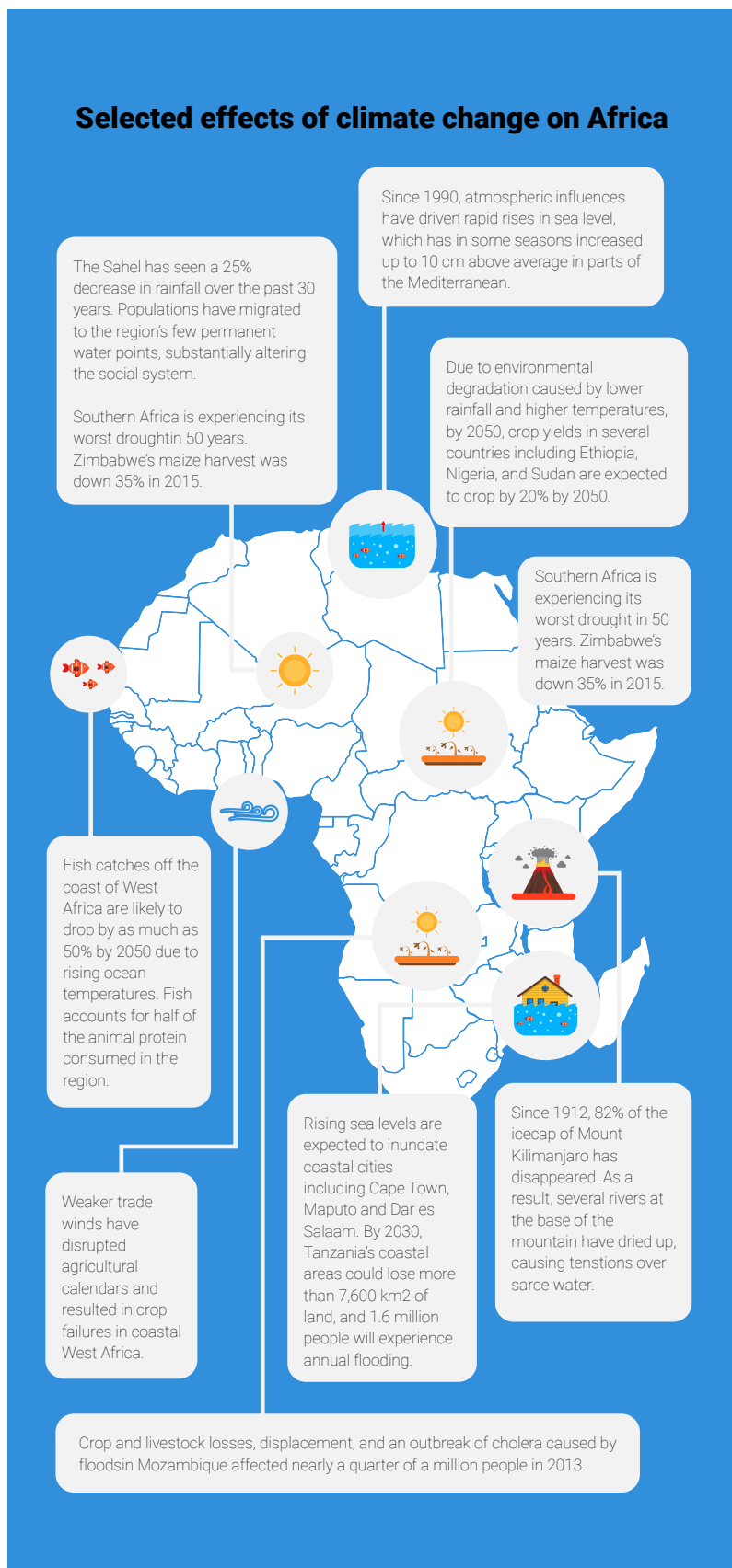
Projections estimate that climate change will cause a 2–4% annual loss in gross domestic product (which is a measure of national income) in Africa by 2040. The poor, women, and marginalized or excluded populations will bear the brunt of the impact.

Even if international mitigation efforts keep global warming below 2 °C, the continent is expected to face climate change adaptation costs of USD 50 billion per year by 2050.<sup>15</sup>

**On top of these challenges, climate change poses additional threats, including:**

- Extinction of species and reduction or irreversible loss of ecosystems and their services, including freshwater, land and ocean ecosystems.
- Risk to food security, risk of malnutrition, and loss of livelihoods due to reduced food production from crops, livestock and fisheries.
- Risks to marine ecosystem health and to livelihoods in coastal communities.
- Increased human mortality and morbidity due to increased heat and infectious diseases.
- Reduced economic output and growth, and increased inequality and poverty rates.
- Increased risk to water and energy security due to drought and heat.

Figure 9 shows a few of the ways climate change is already affecting Africa's social and economic systems.



**Figure 9:** Current and possible future impacts and vulnerabilities for Africa. Source: Africa Center for Strategic Studies, 2016.<sup>15</sup>

## Different parts of Africa are affected differently

Although the entire continent is expected to be affected by the climate crisis, some regions will be more seriously affected than others, due to their level of vulnerability and adaptive capacity. The countries likely to be hardest hit are generally located in western, southern and eastern Africa.<sup>18</sup>

Table 1 shows how Africa will experience extreme climate change risks in different ways.

**Table 1:** Summary of effects of climate change in Africa.<sup>19</sup>

<b>Temperature</b>	Mean annual temperatures are increasing at 0.2 °C to 0.5 °C per decade.
	Under each of the major emissions scenarios, a global temperature increase of 1.5 °C above pre-industrial levels is likely to be exceeded in the next decade or so. By mid-century, all but the lowest emissions scenarios suggest temperature increases of 2 °C or more.
	High-emissions scenarios suggest it is very likely that warming will exceed 3 °C by 2100, except in Central Africa where the estimate is 2.5 °C.
	Modeling suggests the number of days above 35 °C will increase by 20 to 160 days annually, depending on the scenario and region.
	Life-threatening temperatures above 40 °C are projected to increase by 10 to 140 days annually, depending on the scenario and region.
<b>Summary:</b> Heat waves and heat stress will increase drastically in the worst scenarios.	
<b>Precipitation</b>	The frequency and intensity of heavy precipitation events are projected to increase almost everywhere in Africa, leading to more flooding.
	Observations are variable, but in many areas, there is evidence of a drying trend, especially in parts of North Africa, west southern Africa and central Africa. Models project that this trend will continue.
	River flood observations suggest there has been some increase in recent decades. Model results vary with scenario and region. These suggest that what are currently once-in-100-year floods could happen as frequently as once in 40 years under low-warming scenarios, and once in 20 years under higher-warming scenarios.
<b>Drought</b>	Droughts are expected to increase in all regions of Africa except the northern parts of East Africa and the Horn of Africa.
<b>Aridity</b>	Observation and modelling suggest increasing aridity (dryness) in North Africa, west and east southern Africa, and Madagascar.
<b>Summary:</b> Changes in total precipitation are small, but more rain is likely to fall in heavy rainfall events in most regions. The effect of increased precipitation must also be considered alongside the prospect of increasing temperatures. The overall picture is one of drier conditions over most of the continent with more droughts but also more flooding.	



<b>Ocean impacts</b>	African sea levels are currently rising slightly faster than the global average, although a little slower in parts of the Indian Ocean coast. They are virtually certain to continue rising by 0.4 m to 0.5 m by 2100 under low-warming scenarios, and 0.8 m to 0.9 m under high-warming scenarios.
<b>Ocean temperatures</b>	Marine heat waves are expected to continue to increase in frequency and intensity, especially around the Horn of Africa.
<b>Cyclones</b>	Cyclones are possibly decreasing in frequency, but high-intensity events will become more common, often associated with very heavy rainfall.
<b>Coastal flooding</b>	Projections suggest that what is currently a once-in-100-year flooding event will recur every 10 or 20 years by 2050, and every 5 years to annually by 2100, even under moderate warming.
<b>Fire weather</b>	Likely to increase throughout extratropical Africa.
<b>Summary:</b> <i>Sea levels and marine heat waves are to continue rising. Cyclones are possibly decreasing in frequency, but high-intensity events will become more common with frequent flooding.</i>	

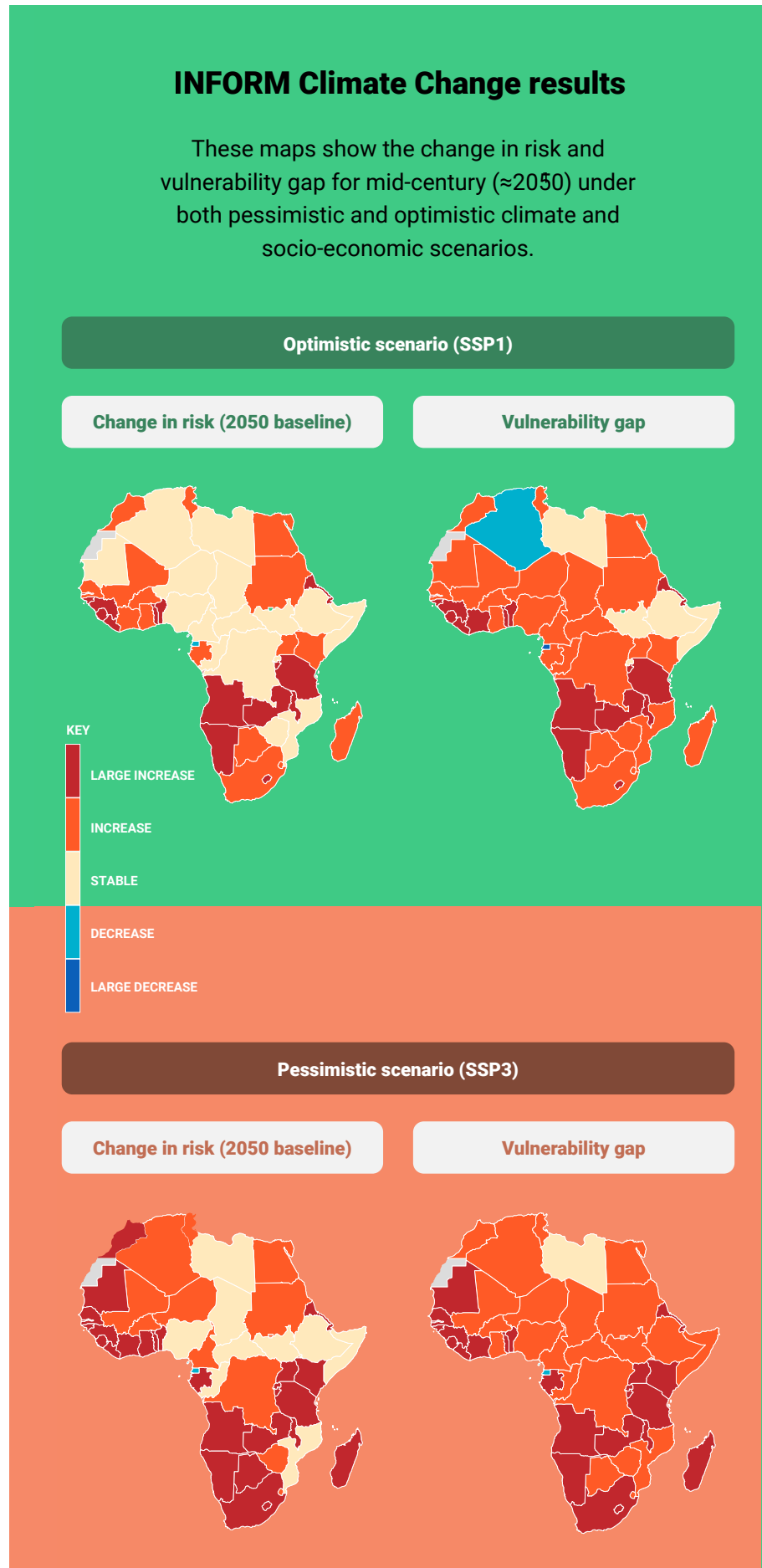


Category 4 Cyclone Idai wreaked havoc in Central Mozambique in 2019. Photo Credit: Josh Estey/CARE.



As you can see in Figure 10, in an “optimistic” warming scenario, risk and vulnerability to climate change increases in many African countries by 2050. In a “pessimistic” scenario, this extends to almost all African countries.

**Figure 10:** Changes in risk and vulnerability gap across Africa in an optimistic and pessimistic warming scenario. Source: adapted from Throw et al., 2022.<sup>20</sup>



## How can Africa adapt to climate change?

To deal with the impacts of climate change, Africa needs to adapt. Adaptation involves actions that support households, communities, and countries to respond to the effects of climate change. Such actions support livelihoods, increase income and ensure that wellbeing is protected even when climate change risks arise. An example is the use of drought-tolerant seed varieties for maize production in many countries in East Africa, which has enabled farmers to generate good agricultural produce even when faced with droughts.



*The impact of climate change will fall disproportionately on the world's poorest countries, many of them in Africa. Poor people already live on the front lines of pollution, disaster, and degradation of resources and land. For them, adaptation is a matter of sheer survival.*

Former UN Secretary-General Kofi Annan



Former UN Secretary-General Kofi Annan, addressing the Twelfth Conference of the Parties to the UNFCCC, Nairobi, Kenya, 15 November 2006.



## Adaptation involves adjusting to climate change

As you learned in Module 1, adaptation involves actions that help manage the current and future impacts of climate change. It is a “process of adjustment to actual or expected climate and its effects,” according to the IPCC.<sup>21</sup>

Adaptation involves deciding how to cope with climate change. It includes policy decisions that governments and organizations make to predict how best to adjust to climate impacts. For example, coastal communities at risk of sea level rise can build embankments to hold back the ocean and stop erosion.



Men working on the construction of a levee with sandbags for protection against erosion, on a sandy beach in Ihuru, an atoll in the Maldives islands. Credit: Alain Schroeder/Climate Visuals.



In the Fulani village of Hore Mondji, located in southern Mauritania on the banks of the Senegal River, a women's cooperative uses solar energy to operate the borehole that supplies water to the market garden. Credit: Raphael Pouget/Climate Visuals Countdown.

**Table 2:** Climate impacts and adaptation strategies with potential unintended consequences.

CLIMATE IMPACT	ADAPTATION STRATEGY	POTENTIAL UNINTENDED CONSEQUENCES
Rising sea levels cause more frequent flooding in cities	Build seawalls and pumping systems and change building codes	Seawalls could lead to more intense flooding in other parts of the coastal regions
More frequent droughts cause crop loss	Shift planting patterns to new seasons or introduce new crops that can adjust to the new climate	New crops can lead to loss of biodiversity if not adapted to the ecosystem
Changes in precipitation	Improve stormwater management	Stormwater management cannot tackle all issues raised by changes in precipitation
More frequent heat waves	Ensure adequate cooling in houses, especially for vulnerable populations	Cooling by air conditioning can lead to an increase in the level of GHG emissions
Intrusion of saltwater in freshwater areas	Introduce salt-tolerant crop varieties and agricultural practices	New crop varieties can damage the environment (for example, if these crops are invasive species that overuse available resources)

Adaptation strategies are not necessarily easy to implement, or low cost. Some of the main challenges of adaptation are complexity and cost. Adaptation requires trade-offs due to the scarcity of resources.

In some cases, adaptation can have negative effects as well. For example, seawalls do not stop sea level rise. They just block it. Building sea walls in one area can push the problem of sea level rise to a different part of the coast.

Although adaptation is one of the most effective ways of responding to climate change risks, there are times when the climate change risks are too severe. When adaptation actions are no longer effective in protecting communities and societies, then an **adaptation limit** has been reached.

## Maladaptation happens when adaptation backfires

Sometimes, actions that are intended to support communities or societies to adapt may be ineffective. Instead, they can backfire and make communities more vulnerable to climate change risks, by increasing their vulnerability or reducing their adaptive capacity. This is called **maladaptation**.

Adaptation activities can have a high or low risk of maladaptation. Table 3 highlights examples of low and high-risk adaptation activities.

**Table 3:** Examples of actions with high and low risk of maladaptation (adapted from Barnett and O'Neill, 2013<sup>22</sup>).

	INCREASING ADAPTIVE CAPACITY	DECREASING SENSITIVITY	DECREASING EXPOSURE
<b>Example used: Sea-level rise</b>	<ul style="list-style-type: none"> <li>- Strengthening coastal planning institutions</li> <li>- Raising awareness of best practices of coastal management</li> </ul>	<ul style="list-style-type: none"> <li>- Improving building design (elevating houses)</li> <li>- Siting new developments inland</li> <li>- Building seawalls</li> </ul>	<ul style="list-style-type: none"> <li>- Resettlement of entire communities</li> </ul>
<b>Risk of maladaptation</b>	Low risk	Medium risk	High risk
<b>Why this risk</b>	<ul style="list-style-type: none"> <li>- Not emission-intensive</li> <li>- Not inequitable if targeted at all groups</li> <li>- Relatively inexpensive</li> </ul>	<ul style="list-style-type: none"> <li>- Can be (temporarily) carbon and cost expensive intensive</li> <li>- Things like seawalls can encourage development in high-risk areas</li> </ul>	<ul style="list-style-type: none"> <li>- Large emissions of greenhouse gases</li> <li>- High opportunity costs</li> <li>- Inequitable to those displaced</li> </ul>



## Three key types of adaptation actions

There are three main categories for adaptation options, according to the IPCC: **social**, **institutional**, and **physical**.<sup>23</sup> These should be considered overlapping rather than discrete. They are often implemented simultaneously. Examples given here can be relevant to more than one category.

### 1. Social adaptation options include behavioral, educational and informational options such as:

- hazard and vulnerability mapping
- land and water conservation techniques
- agricultural practices
- livelihoods diversification
- communication campaigns on climate change.





**2. Institutional adaptation options** include economic and policy changes such as:

- local development plans that include adaptation
- laws for defining no-building zones in flood-prone areas
- defining forest-protected areas to preserve water sources in areas exposed to water scarcity
- national or regional climate change strategies
- integration of adaptation into sectoral policies
- financial incentives, including taxes and subsidies.





**3. Physical adaptation** options include making changes to the built environment using technology and ecosystem-based services. Examples include:

- climate resilient infrastructure, such as quality road surfaces to withstand hotter temperatures, and storm-resistant buildings or shelters
- traditional technologies, such as floating gardens.
- floating houses
- ecological corridors
- food banks and distribution of food surplus.



Clare Mukankusi is a bean breeder in Kawanda, Uganda. She leads efforts for breeding drought-resistant beans, an example of a physical adaptation action. Credit: CIAT/Georgina Smith.



## Putting communities at the heart of adaptation

People and communities on the frontlines of climate change are often the most active and innovative in developing adaptation solutions. Yet, too often, they lack access to the resources and agency needed to implement these actions effectively. Adaptation efforts must put communities at the forefront.<sup>24</sup>

## Community-Based Adaptation

Community-Based Adaptation (CBA) interventions aim to improve the capacity of local communities and individuals to adapt to climate change. This approach places emphasis on building the **adaptive capacity** of the poorest and most marginalized people.

In CBA initiatives, organizations, governments and others support communities to act and bring about positive changes in their lives. For example, communities might be supported in changing the time of year they plant crops to better align with changing rainfall patterns or build homes that can better withstand high-intensity cyclones.

CBA can also focus on preserving natural systems. For example, many communities might work together to protect and conserve a river basin.<sup>25</sup>

### CBA aims to:

- Generate adaptation strategies with communities and other local stakeholders to improve the uptake and sustainability of the adaptation process and develop a strong sense of ownership within a community.
- Enhance communities' awareness and understanding of climate change and uncertainty to create responsive plans and facilitate more flexible and context-appropriate decisions.
- Embed new knowledge and understanding into existing community structures to expand and strengthen those structures as well as institutional mechanisms.

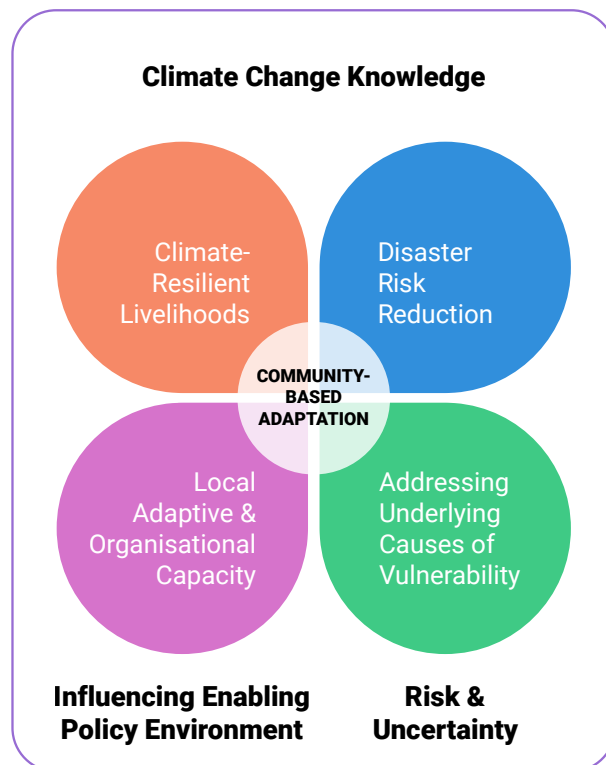
CBA initiatives can be integrated into sectoral projects or implemented as stand-alone projects. While CBA focuses on communities, CBA approaches do not work exclusively at the community level. CBA is rather a "community-led" or "community-driven" process that supports a rights-based approach. This approach builds on communities' economic, ecological and administrative interconnectivity, supporting them to work at higher levels as appropriate.

## Four interlinked strategies for Community-Based Adaptation

To build adaptive capacity, the CBA process should incorporate four interlinked strategies, shown in Figure 11.

### 1. Promote climate-resilient livelihoods

Climate-resilient livelihoods refer to livelihoods that are less sensitive to climate change. To support the development of climate-resilient livelihoods CBA can, for example, promote new agricultural techniques to improve soil moisture or drought-resistant seeds in areas that are becoming drier.



**Figure 11:** CARE's Community-Based Adaptation Framework includes four interlinked strategies. Source: CARE, 2014.<sup>26</sup>





## 2. Promote disaster risk reduction

Disaster risk reduction (DRR) includes all activities that can help reduce the impacts of disasters, particularly on vulnerable households and individuals. It includes prevention, preparedness, response and rehabilitation measures such as contingency planning, building storage for food, informing communities about safe locations in case of emergency, and developing early warning systems.

Climate change adaptation and DRR are strongly linked: they both look at climate-related hazards. Climate change adaptation addresses additional gradual effects of climate change, such as sea level rise or temperature rise, while DRR can include non-climate-related hazards, such as earthquakes.



Mariamo Humberto, 16, at her family home, in Beira, Mozambique, that was all but destroyed by Cyclone Idai in 2019.  
Credit: Josh Estey/CARE.



### 3. Build local adaptive and organizational capacity

**Local adaptive and organizational capacity** includes capacity development for local civil society organizations (CSOs) and governmental institutions and local authorities so that they can provide better support to communities in their adaptation efforts. It can include development of local adaptation and contingency plans, and training on climate change for local authorities and CSOs.



Facilitated dialogue about climate-resistant agricultural techniques in Muchava Community, Homoine District, Maxixe, Mozambique, as part of The Southern African Nutrition Initiative. Credit: Tanja Kisslinger/CARE.

### 4. Address the underlying causes of vulnerability

The **underlying causes of vulnerability** can refer to poverty, poor governance, environmental degradation, unequal access to and control over resources, limited access to basic services, or gender inequality, depending on the context. These can be addressed through advocacy, social mobilization, and other methods.

## Locally Led Adaptation

While CBA provides support to communities, Locally Led Adaptation (LLA) aims to put local institutions and communities in control of the actions that affect them.

It follows eight principles, launched in 2021 (see Figure 12). These were developed by the Global Commission on Adaptation, the International Institute for Environment and Development (IIED), World Resources Institute (WRI), and the International Centre for Climate Change and Development (ICCCAD).

### 1. Devolving decision making to the lowest appropriate level

Giving local institutions and communities more direct access to finance and decision-making power over how adaptation actions are defined, prioritised, designed and implemented; how progress is monitored; and how success is evaluated.



### 2. Addressing structural inequalities faced by women, youth, children, people with disabilities and displaced people, Indigenous Peoples and marginalised ethnic groups

Integrating gender-based, economic and political inequalities that are root causes of vulnerability into the core of adaptation action and encouraging vulnerable and marginalised individuals to meaningfully participate in and lead adaptation decisions.



### 3. Providing patient and predictable funding that can be accessed more easily

Supporting long-term development of local governance processes, capacity, and institutions through simpler access modalities and longer term and more predictable funding horizons, to ensure that communities can effectively implement adaptation actions.



### 4. Investing in local capabilities to leave an institutional legacy

Improving the capabilities of local institutions to ensure they can understand climate risks and uncertainties, generate solutions and facilitate and manage adaptation initiatives over the long term without being dependent on project-based donor funding.



### 5. Building a robust understanding of climate risk and uncertainty

Informing adaptation decisions through a combination of local, Indigenous and scientific knowledge that can enable resilience under a range of future climate scenarios.



### 6. Flexible programming and learning

Enabling adaptive management to address the inherent uncertainty in adaptation, especially through robust monitoring and learning systems, flexible finance and flexible programming.



### 7. Ensuring transparency and accountability

Making processes of financing, designing and delivering programmes more transparent and accountable downward to local stakeholders.



### 8. Collaborative action and investment

Collaboration across sectors, initiatives and levels to ensure that different initiatives and different sources of funding (humanitarian assistance, development, disaster risk reduction, green recovery funds and so on) support one another, and their activities avoid duplication, to enhance efficiencies and good practice.



Figure 12: The principles of Locally Led Adaption. Source: IIED, 2021.<sup>27</sup>

## Box 1: The difference between Community-Based Adaptation and Locally Led Adaptation

**Community-Based Adaptation** is a set of climate change adaptation activities developed in partnership with at-risk communities to promote local awareness of, and appropriate and sustainable solutions to, current and future climatic conditions.<sup>28</sup>

**Locally Led Adaptation** refers to climate adaptation in which local communities, community-based organizations, citizen groups, local government, and local private sector entities at the lowest administrative structure are included as decision makers in the interventions that affect them (World Resources Institute).<sup>29</sup>

## Nature-based solutions for adaptation

Combining nature-based solutions with community-oriented adaptation approaches is critical for building the resilience of ecosystems on which poor communities rely for their livelihoods.

### What are nature-based solutions?

**Nature-based solutions** support climate change adaptation and mitigation by using natural systems and processes to restore ecosystems, conserve biodiversity, and enable sustainable livelihoods. They are actions that prioritize ecosystems and biodiversity. They are designed and implemented with the full engagement and consent of local communities and Indigenous Peoples.<sup>30</sup>

Examples include planting trees, restoring wetlands, conserving mangrove forests, or switching to regenerative farming practices.

Figure 13 illustrates the concept of nature-based solutions.

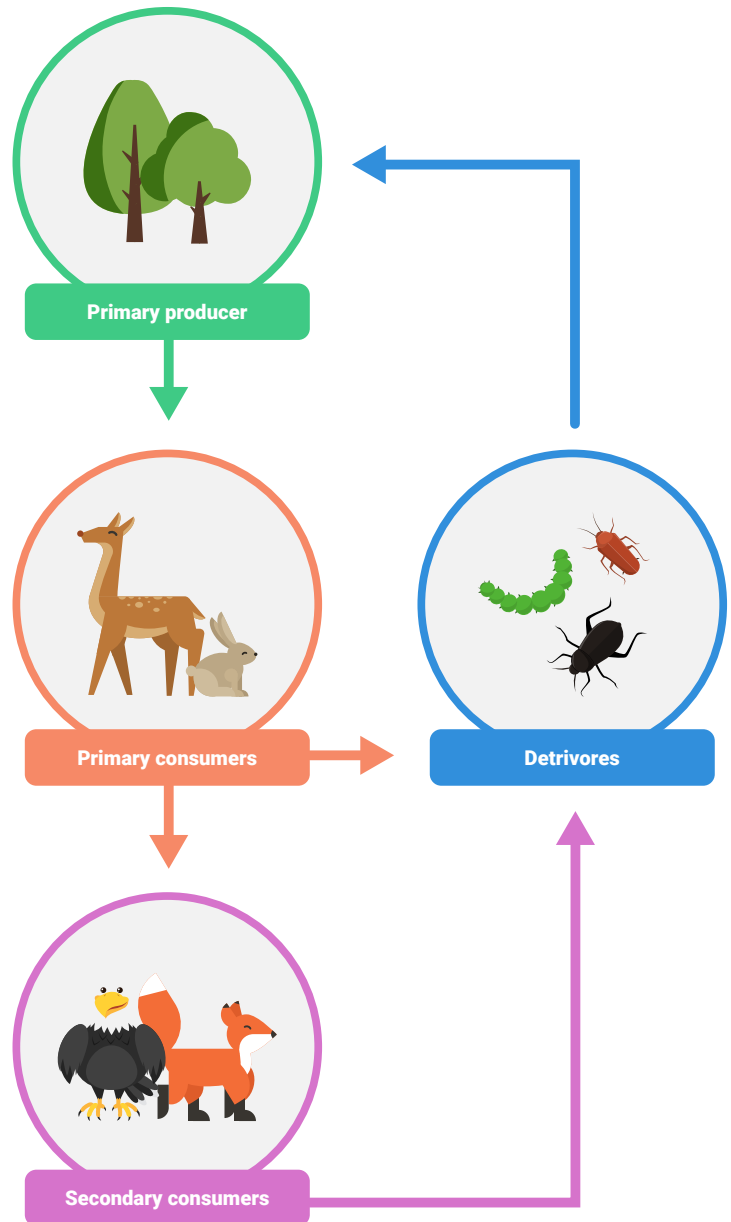


**Figure 13:** The concept of nature-based adaptation. IUCN, 2020.<sup>31</sup>

### What is an ecosystem?

An ecosystem is a dynamic complex of plant, animal and microorganism communities and the non-living environment interacting as a functional unit. Humans are an integral part of ecosystems.<sup>32</sup>

**Figure 14:** A 'rich' ecosystem.  
Source: Project Pangolin





## What do nature-based solutions for adaptation look like?

Nature-based solutions may include protecting and restoring forests, rivers, coastal wetlands, mangroves and marshes. Figure 14 shows examples and their associated benefits.



**Figure 15:** How different nature-based solutions can work together across landscapes to build resilience. Source: Global Commission on Adaptation, 2019.<sup>33</sup>

Nature-based solutions should be an integral part of all climate adaptation strategies. However, these will, unfortunately, become less effective as warming increases, and ecosystems reach their soft and hard adaptation limits.

## The role of climate information services

When communities have access to accurate information about weather and climate, it builds their adaptive capacity. For example, when armed with accurate, high-quality data and analyses, tailored to their needs, farmers can plan what to plant and when. Policymakers, such as government ministries and local government representatives, can also use this information to make properly informed decisions. For example, on where to provide food assistance, or on how to design climate change policies. Likewise, if people know about impending extreme events they can prepare in advance.

Broadly speaking, Climate Information Services involve processes for collating, analyzing, packaging and distributing climate data on variables such as temperature, rainfall, wind, soil moisture, ocean conditions and extreme weather indicators to different groups of people so that they can use it to inform decision making.





# Heat Wave

## Understanding climate hazards, vulnerabilities and impacts in Africa

**EXPLORE** the tools provided by the [IPCC Interactive Atlas](#), the [ThinkHazard tool](#) and the [INFORM Climate Change Products](#) to help you identify four or five climate hazards and vulnerabilities. Here, you will learn about the different types of hazards, and the types of vulnerabilities that are determining risk posed by these hazards. You will also be able to explore how these hazards and vulnerabilities differ across different geographies.

**READ** about the latest climate change adaptation trends in the [State and Trends in Adaptation 2022 Report: Africa](#), from the Global Center on Adaptation.

**READ** about the effects of climate change in different parts of Africa from the [Climate Action Tracker](#). This will highlight how different parts of the continent are affected by global warming and how this is manifested through different climate change risks.

**READ** an [article](#) on the differentiated vulnerabilities to climate change in Uganda. Here, you will learn about how climate change generates different types of vulnerabilities for different groups of people, and how this affects their daily lives.

**READ** the IPCC's *4th Assessment Report* [chapter](#) on the impacts of climate change and adaptation pathways in Africa. Here, you will learn about the options available to African countries and communities.

**READ** a highlight of [regional initiatives](#) responding to climate change in Africa.

**READ** an explanation of the [difference between adaptation and mitigation](#), where you will learn about the different characteristics of mitigation and adaptation in different contexts.

## Maladaptation

**READ** more about maladaptation [here](#). You will learn about the different definitions and causes of maladaptation. There are also different examples of how maladaptation has occurred in different contexts across the world.

**READ** about some [guiding principles for avoiding maladaptation](#).

## Community-Based Adaptation

**READ** about the [CBA framework](#) here, where you will learn:

- What Climate Change Adaptation (CCA) is and why we need to accelerate adaptation action
- The importance of locally led approaches to adaptation including CBA, which considers gender and ecosystems
- What CBA looks like in practice.

## Locally Led Adaptation

**READ** about the [principles for Locally Led Adaptation](#). These emphasize the importance of (for example): devolving decision making to the lowest appropriate level; addressing structural inequalities faced by women, youth, children, the disabled and elderly; the importance of funding; and building a better understanding of climate risks.

**WATCH** the following videos to understand LLA principles.

- (a) [Youth Adaptation Dialogue: Role of universities and students in Locally Led Adaptation \(1:06:19\)](#). This video is a recording of a webinar that had some young people as panelists talking about locally led adaptation. It will introduce you to the principles of locally led adaptation, and also highlight the role of young people in advancing it.
- (b) [Anchoring Event: Locally Led Adaptation \(1:59:16\)](#). In this video, which is also a recording of a webinar, you will learn about the importance of international collaborations and financing in enabling locally led adaptation. You will hear from people working on adaptation speaking about their experiences on locally led adaptation and how the principles can be operationalized.

## Nature-based solutions

**READ** the [Waterways to Resilience](#) report by WWF. With interest in nature-based solutions increasing, the report focuses on the evidence, both from Africa and globally, on their ability to effectively address five key water challenges – water scarcity, degradation of water quality, flood risk, stormwater and urban floods, and coastal erosion and floods.  
Adaptation Good Practice Checklist

**READ** the [Adaptation Good Practice Checklist \(AGP\)](#), which provides guidance on actions and criteria that help to ensure adaptation results in quality, impactful and long-term climate resilience for the most vulnerable people. The nine practices in the AGP checklist define the range of activity areas that are needed for adaptation to climate change.

## Climate Information Services

**READ** the [CARE CIS report](#), which presents a synthesis of CARE's engagement in and learning from CIS work in Africa and Asia, supporting agriculture decision making and early warning early action systems towards climate resilience among climate-vulnerable communities.

**LEARN** about Climate Information Services and how they contribute to increasing climate resilience and how to implement CIS programs in this online course on the [Basics of Climate Information Services](#).



# Bright Spark

## Case studies

### Participatory Scenario Planning in Ethiopia

In 2020 and 2021, Participatory Scenario Planning (PSP) enabled people to prepare for floods, and to pre-position resources. CARE Ethiopia continues to mainstream PSP through many of its projects, as the approach works as an effective bridge between the technical Ethiopia National Meteorology Agency data and national/regional forecasting and brings it down to the local level, using and blending with indigenous forecasting and information systems.



Participatory Scenario Planning in Ethiopia. Credit: CARE/World Vision.

## Where the Rain Falls

In this [CARE project](#), 1300 households were surveyed in eight different countries (Guatemala, Peru, Ghana, Tanzania, Bangladesh, India, Thailand and Vietnam), where people overwhelmingly perceived climatic changes happening today in the form of rainfall variability. In seven of the eight countries, more than 80% (sometimes as many as 90%) already perceived at least one change relating to the timing, quality, quantity and overall predictability of rainfall. These include delayed onset and shorter rainy seasons; reduced number of rainy days per year; increased frequency of heavy rainfall events; and more frequent prolonged dry spells during rainy seasons. In eight research sites, the households whose livelihoods were mainly dependent on agriculture reported that rainfall variability negatively affected food production and food consumption.

## Without water there is no life: a case study from Zimbabwe

This [case study](#) highlights communities' experiences of climate change, and the effects of climate change on availability of water. It also describes the work done by a project to help communities adapt to climate change.

## Podcasts

**LISTEN** to these podcasts by [Future Climate For Africa](#) to hear stories about climate change and how it is impacting Africa.

## Videos

**WATCH** this [video](#) (6:46) about Participatory Scenario Planning (PSP) in an Info-Act project in Vietnam. You will learn about the use of a PSP exercise. You will also learn about how it is conducted and what participants and other stakeholders think about its benefits.

**WATCH** this [video](#) (1:49) about a campaign to encourage people to invest in nature. This campaign is titled Time *#fornature*





# Cool Down

## Test your understanding *answers on page 44*

- 1 Vulnerability is a function of which three elements?**
  - (a) Exposure
  - (b) Sensitivity
  - (c) Risk
  - (d) Adaptive capacity
  
- 2 Using drought-tolerant seed varieties for maize production is an example of which type of climate action?**
  - (a) Mitigation
  - (b) Adaptation
  
- 3 The IPCC classifies adaptation options into three main categories. Write down the missing one in the list below.**
  - (a) Social
  - (b) Institutional
  - (c) .....
  
- 4 .....is a set of climate change adaptation activities developed in partnership with at-risk communities to promote local awareness of, and appropriate and sustainable solutions to, current and future climatic conditions. Select the missing term.**
  - (a) Locally Led Adaptation
  - (b) Community-Based Adaptation
  
- 5 Which of the following is not an example of a nature-based solution?**
  - (a) Planting trees
  - (b) Restoring wetlands
  - (c) Resurfacing roads
  - (d) Switching to regenerative farming practices

**BONUS QUIZ:** To further test your knowledge of climate change, do [this online quiz](#) developed by UNDP. It covers three topics:

- [The problem of climate change](#)
- [The impacts of climate change](#)
- [Mitigating the impacts of climate change](#)

## Reflect and prepare for your climate adaptation action

**Consider the following questions about gender and climate change.**

- What are some of the norms and beliefs that have contributed towards causing gender inequalities in your community or country? Which groups have been impacted by these inequalities? How have they been impacted?
- What do the gender inequalities mean for how people with different gender identities can engage in climate adaptation action?
- How can you, as a young person, contribute to ensure that people of any gender can equally engage in climate adaptation action?

## Answers

**1. Correct answer:** (a), (b) and (d).

**EXPLANATION:** Vulnerability is a function of exposure, sensitivity and adaptive capacity. It refers to “the conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impact of hazards.”

**2. Correct answer:** (b) Adaptation.

**EXPLANATION:** Adaptation efforts in Africa involve actions that support households, communities, and countries to respond to the effects of climate change. Such actions support livelihoods, increase income and ensure that wellbeing is protected even when climate change risks arise.

**3. Correct answer:** (c) Physical.

**EXPLANATION:** There are three main categories for adaptation options, according to the IPCC: social, institutional, and physical. These should be considered overlapping rather than discrete. They are often implemented simultaneously.

**4. Correct answer:** (b) Community-Based adaptation.

**EXPLANATION:** Community-Based Adaptation is a set of climate change adaptation activities developed in partnership with at-risk communities to promote local awareness of, and appropriate and sustainable solutions to, current and future climatic conditions. Locally led adaptation refers to climate adaptation in which local communities, community-based organizations, citizen groups, local government, and local private sector entities at the lowest administrative structure are included as decision makers in the interventions that affect them.

**5. Correct answer:** (c) Resurfacing roads.

**EXPLANATION:** Nature-based solutions support climate change adaptation and mitigation by using natural systems and processes to restore ecosystems, conserve biodiversity, and enable sustainable livelihoods. They are actions that prioritize ecosystems and biodiversity and are designed and implemented with the full engagement and consent of local communities and Indigenous Peoples.



## Endnotes

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