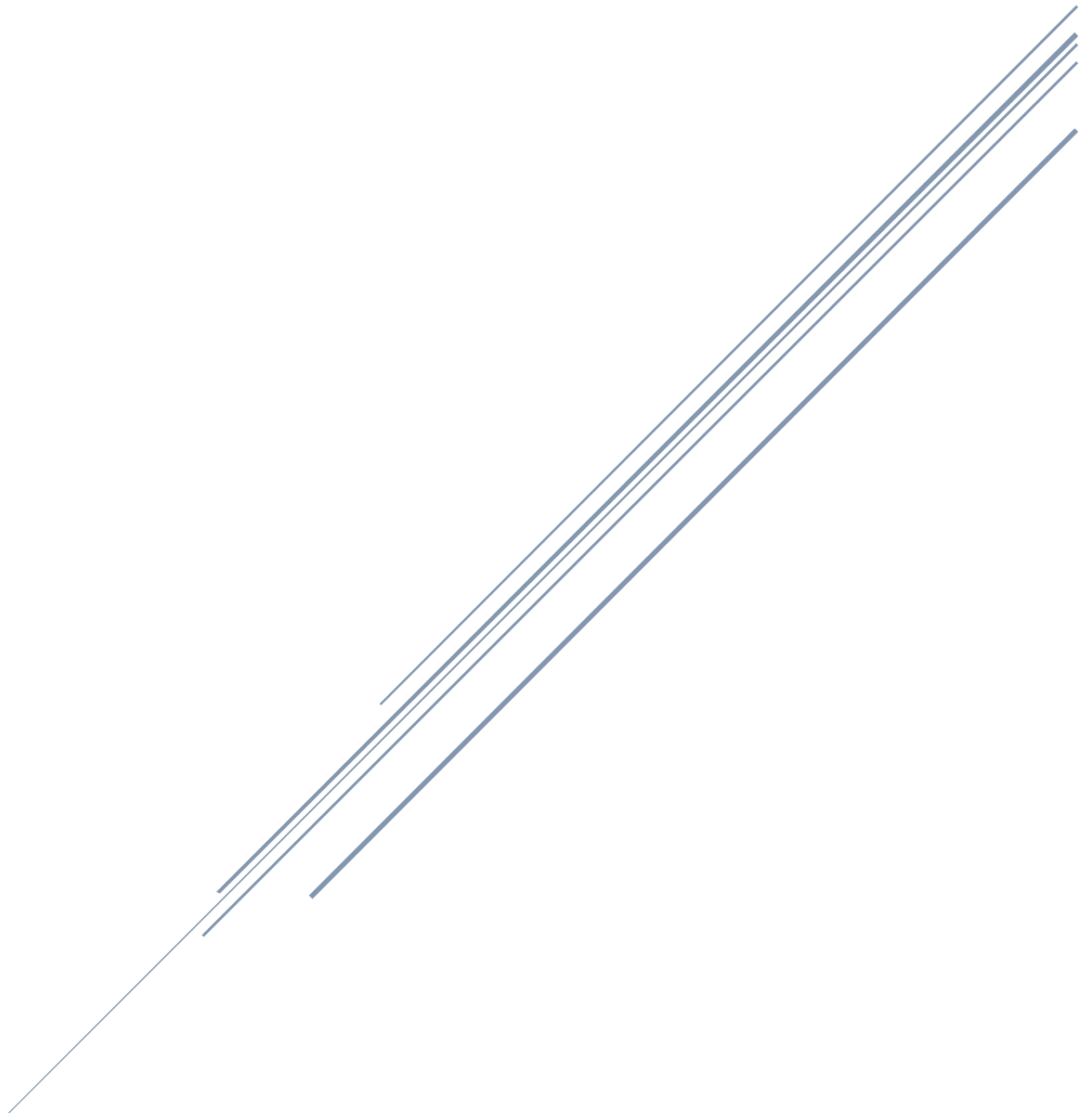


# KEY TERMS AND CONCEPTS

Climate Change, Adaptation, Resilience, Loss & Damage and  
Disaster

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## Preface

Adaptation, resilience, and loss & damage in the face of climate change have emerged as important topics in domestic as well as international discussions. This document attempts to identify and explain the fundamental terms and concepts used by the climate change community and other institutions in relation to climate change, adaptation, resilience, L&D, and disaster. By doing so, it seeks to foster a shared understanding among diverse stakeholders, particularly frontline workers at the grassroots level.

The following concepts and terms have been documented from reports and publications of the IPCC, the UNFCCC, and other UN agencies. Some scientific literature, such as *Science* and *Nature*, as well as other academic articles, have been reviewed.

The definitions are taken without editing from the original sources. The sources of the concepts and terms are stated at the end of the paper.

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# 1 Terminologies Related to Climate and Climate Change

## 1.1 Weather

Weather refers to the short-term conditions of the lower atmosphere, such as precipitation, temperature, humidity, wind direction, wind speed, and atmospheric pressure. It could be sunny, cloudy, rainy, foggy, cold, hot, windy.

## 1.2 Climate

The climate is defined as the average weather or, more rigorously, the statistical description in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands or millions of years.

The classical period for averaging these variables is 30 years, as defined by the World Meteorological Organization (WMO). The relevant quantities are most often surface variables such as temperature, precipitation and wind.

## 1.3 Microclimate

Local climate at or near the Earth's surface.

## 1.4 Climate Change

A change in the state of the climate can be identified by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer.

Climate change may be due to natural internal processes or external forcings such as modulations of the solar cycles, volcanic eruptions and persistent anthropogenic changes in the composition of the atmosphere or in land use.

## 1.5 Climate Variability

Deviations of climate variables from a given mean state (including the occurrence of extremes, etc.) at all spatial and temporal scales beyond that of individual weather events.

Variability may be intrinsic, due to fluctuations of processes internal to the climate system (internal variability), or extrinsic, due to variations in natural or anthropogenic external forcing (forced variability).

## 1.6 Climate Change Scenario

A coherent and internally-consistent description of the change in climate by a certain time in the future, using a specific modelling technique and under specific assumptions about the growth of greenhouse gas and other emissions and about other factors that may influence climate in the future.

## 1.7 Extreme Climate Event

The occurrence of a value of a weather or climate variable above (or below) a threshold value near the upper (or lower) ends of the range of observed values of the variable.

When a pattern of extreme weather persists for some time, such as a season, it may be classified as an extreme climate event, especially if it yields an average or total that is itself extreme (e.g., high temperature, drought or heavy rainfall over a season).

For simplicity, extreme weather events and extreme climate events are referred to collectively as climate extremes.

## 1.8 Impacts

The consequences of realized risks on natural and human systems, where risks result from the interactions of climate-related hazards (including extreme weather/climate events), exposure, and vulnerability.

Impacts generally refer to effects on lives, livelihoods, health and well-being, ecosystems and species, economic, social and cultural assets, services (including ecosystem services) and infrastructure.

Impacts may be considered consequences or outcomes and can be adverse or beneficial.

## 1.9 Climate Impacts

Consequences of climate change on natural and human systems. Depending on the consideration of adaptation, one can distinguish between potential impacts and residual impacts.

- Potential Impacts: All impacts that may occur given a projected change in climate without considering adaptation.
- Residual Impacts: The impacts of climate change that would occur after adaptation.

## 1.10 Global Warming

Global warming refers to the increase in global surface temperature relative to a baseline reference period, averaging over a period sufficient to remove interannual variations (e.g., 20 or 30 years). A common choice for the baseline is 1850–1900 (the earliest period of reliable observations with sufficient geographic coverage), with more modern baselines used depending upon the application.

## 1.11 Greenhouse Gases (GHGs)

Gaseous constituents of the atmosphere, both natural and anthropogenic, absorb and emit radiation at specific wavelengths within the spectrum of radiation emitted by the Earth's surface, the atmosphere itself, and clouds. This property causes the greenhouse effect.

Water Vapor (H<sub>2</sub>O), Carbon Dioxide (CO<sub>2</sub>), Nitrous Oxide (N<sub>2</sub>O), Methane (CH<sub>4</sub>) and Ozone (O<sub>3</sub>) are the primary GHGs in the Earth's atmosphere.

**Human-made GHGs include** Sulphur Hexafluoride (SF<sub>6</sub>), Hydrofluorocarbons (HFCs), Chlorofluorocarbons (CFCs) and Perfluorocarbons (PFCs).

## 1.12 Acclimatization

A change in functional or morphological traits occurring once or repeatedly (e.g., seasonally) during the lifetime of an individual organism in its natural environment. Through acclimatization, the individual maintains performance across a range of environmental conditions.

### 1.13 Climate Justice

Justice that links development and human rights to achieve a human-centred approach to addressing climate change safeguarding the rights of the most vulnerable people, and sharing the burdens and benefits of climate change and its impacts equitably and fairly.

## 2 Terminologies Related to Adaptation

### 2.1 Adaptation

**In human systems**, the process of adjustment to actual or expected climate and its effects in order to moderate harm or exploit beneficial opportunities.

**In natural systems**, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate and its effects.

**According to UNFCCC Secretariat**, adaptation is a practical step to protect countries and communities from the likely disruption and damage that will result from the effects of climate change.

### 2.2 Types of Adaptation

- a. **Anticipatory Adaptation:** Adaptation that takes place before the impacts of climate change are observed, also referred to as proactive adaptation.
- b. **Autonomous Adaptation:** Adaptation that does not constitute a conscious response to climatic stimuli but is triggered by ecological changes in natural systems and by market or welfare changes in human systems and also referred to as spontaneous adaptation.
- c. **Planned Adaptation:** Adaptation is the result of a deliberate policy decision based on an awareness that conditions have changed or are about to change and that action is required to return to, maintain, or achieve a desired state.
- d. **Private Adaptation:** Adaptation that is initiated and implemented by individuals, households or private companies. Private adaptation is usually in the actor's rational self-interest.
- e. **Public Adaptation:** Adaptation that is initiated and implemented by governments at all levels. Public adaptation is usually directed at collective needs.
- f. **Reactive Adaptation:** Adaptation that takes place after impacts of climate change have been observed.

### 2.3 Adaptation Deficit

The gap between the current state of a system and a state that minimizes adverse impacts from existing climate conditions and variability.

### 2.4 Adaptation Gap

The difference between actually implemented adaptation and a societally set goal, determined largely by preferences related to tolerated climate change impacts and reflecting resource limitations and competing priorities

## 2.5 Adaptation Limits

The point at which an actor's objectives (or system needs) cannot be secured from intolerable risks through adaptive actions.

- **Hard adaptation limit** – No adaptive actions are possible to avoid intolerable risks.
- **Soft adaptation limit** – Options may exist but are currently not available to avoid intolerable risks through adaptive action.

## 2.6 Adaptation Needs

The circumstances require action to ensure populations' safety and assets' security in response to climate impacts.

## 2.7 Adaptation Options

The array of strategies and measures that are available and appropriate for addressing adaptation. They include a wide range of actions categorized as structural, institutional, ecological or behavioural.

## 2.8 Adaptation Baseline

Adaptation baseline is a description of adaptations to the current climate that are already in place (e.g., existing risk mitigation policies and programs).

## 2.9 Adaptation Constraint

Factors that make it harder to plan and implement adaptation actions or restrict options.

## 2.10 Adaptation Benefits

The avoided damage costs or the accrued benefits following adopting and implementing adaptation measures.

## 2.11 Adaptation Costs

Costs of planning, preparing for, facilitating, and implementing adaptation measures, including transition costs.

## 2.12 Community-based Adaptation

Local, community-driven adaptation. Community-based adaptation focuses attention on empowering and promoting the adaptive capacity of communities. It is an approach that takes context, culture, knowledge, agency, and preferences of communities as strengths.

## 2.13 Ecosystem-based Adaptation (EbA)

The use of ecosystem management activities to increase resilience and reduce the vulnerability of people and ecosystems to climate change



## **2.14 Incremental Adaptation**

Adaptation that maintains the essence and integrity of a system or process at a given. Incremental adaptations to change in climate are understood as extensions of actions and behaviors that already reduce the losses or enhance the benefits of natural variations in extreme weather/climate events.

## **2.15 Transformational Adaptation**

Adaptation changes the fundamental attributes of a social-ecological system in anticipation of climate change and its impacts.

## **2.16 Climate-smart Agriculture (CSA)**

An approach to agriculture that aims to transform and reorient agricultural systems to effectively support development and ensure food security in a changing climate by sustainably increasing agricultural productivity and incomes, adapting and building resilience to climate change, and reducing and/or removing greenhouse gas emissions, where possible

## **2.17 Nature-based Solution (NBS)**

Actions to protect, sustainably manage and restore natural or modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits.

## **2.18 Maladaptation**

Actions that may lead to increased risk of adverse climate-related outcomes, including via increased greenhouse gas (GHG) emissions, increased or shifted vulnerability to climate change, more inequitable outcomes, or diminished welfare, now or in the future. Most often, maladaptation is an unintended consequence.

## **2.19 Coping**

The use of available skills, resources, and opportunities to address, manage and overcome adverse conditions, with the aim of achieving basic functioning of people, institutions, organizations and systems in the short to medium term.

## **2.20 Coping Capacity**

The ability of people, institutions, organisations and systems, using available skills, values, beliefs, resources, and opportunities, to address, manage and overcome adverse conditions in the short to medium term.

## **2.21 Coping Range**

Coping range is the range of climate where the outcomes are beneficial or negative but tolerable; beyond the coping range, the damages or loss are no longer tolerable, and a society (or a system) is considered vulnerable.

## **3 Terminologies Related to Resilience**

### **3.1 Exposure**

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.

### **3.2 Sensitivity**

The degree to which a system or species is affected, either adversely or beneficially, by climate variability or change. The effect may be direct (e.g., a change in crop yield in response to a change in the mean, range, or variability of temperature) or indirect (e.g., damages caused by an increase in the frequency of coastal flooding due to sea level rise).

### **3.3 Adaptive Capacity**

The ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities or to respond to consequences

### **3.4 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. Vulnerability is a function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity.

### **3.5 Resilience**

Amount of change a system can undergo without changing state.

A tendency to maintain integrity when subject to disturbance.

The ability of a system to recover from the effect of an extreme load that may have caused harm.

Resilience is a positive attribute when it maintains a capacity for adaptation, learning and/or transformation.

The capacity of social, economic, and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity, and structure while maintaining the capacity for adaptation, learning, and transformation.

## **4 Terminologies Related to Loss and Damage**

### **4.1 Loss and Damage**

Loss and damage aim to avert and minimize the residual risks associated with climate change impacts (i.e., when mitigation and adaptation have failed)

- **Losses** are irreversible and cannot be restored; they can be addressed through risk transfer (e.g., insurance) and risk retention (e.g., social safety nets).
- **Damages** are reversible and can be addressed through reparation or restoration.

## 4.2 Economic Loss and Damage

Economic L&D include those related to physical and financial assets that can be assigned a monetary value or be associated with loss of earnings or productivity, i.e., a decrease in rice yield

## 4.3 Non-economic Loss and Damage

NELD represents intangible or tangible impacts that cannot be traded in markets but still hold significant value for people. NELD has been shown to affect people's sense of place, identity, and individual and collective well-being. NELD includes, among other impacts, loss of life, territory, cultural heritage, local and Indigenous knowledge, social cohesion, and biodiversity and ecosystem services

# 5 Terminologies Related to Disaster

## 5.1 Disaster

A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its resources.

## 5.2 Hazard

A dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

## 5.3 Risk

The potential for adverse consequences for human or ecological systems, recognizing the diversity of values and objectives associated with such systems.

**In the context of climate change**, risks can arise from the potential impacts of climate change and human responses to climate change. Relevant adverse consequences include those on lives, livelihoods, health, ecosystems and species, economic, social and cultural assets, services (including environmental services) and infrastructure.

## 5.4 Disaster Risk

The likelihood over a specified time period of severe alterations in the normal functioning of a community or a society due to hazardous physical events interacting with vulnerable social conditions, leading to widespread adverse human, material, economic, or environmental effects that require immediate emergency response to satisfy critical human needs and that may require external support for recovery.

## **5.5 Residual Risk**

The risk related to climate change impacts that remains following adaptation and mitigation efforts. Adaptation actions can redistribute risk and impacts, with increased risk and impacts in some areas or populations and decreased risk and impacts in others.

## **5.6 Risk Assessment**

The qualitative and/or quantitative scientific estimation of risks.

## **5.7 Risk Management**

Plans, actions, strategies or policies to reduce the likelihood and/or magnitude of adverse potential consequences based on assessed or perceived risks.

## **5.8 Risk Retention**

The risk retention approach involves retaining responsibility for the disaster risk through a planned acceptance of losses should the hazard materialize. Typically, this involves sovereign disaster risk financing through the national budget. Governments may use dedicated funds, domestic catastrophe reserves, loans or other off-budget instruments to increase their financial capacity in the immediate aftermath of a disaster while still protecting long-term fiscal sustainability.

## **5.9 Risk Transfer**

The process of formally or informally shifting the financial consequences of particular risks from one party to another whereby a household, community, enterprise or state authority will obtain resources from the other party after a disaster occurs in exchange for ongoing or compensatory social or financial benefits provided to that other party.

## **5.10 Disaster Risk Reduction**

Denotes both a policy goal or objective and the strategic and instrumental measures employed for anticipating future disaster risk; reducing existing exposure, hazard, or vulnerability; and improving resilience.

## **5.11 Disaster Risk Management (DRM)**

Processes for designing, implementing and evaluating strategies, policies and measures to improve the understanding of current and future disaster risk, foster disaster risk reduction and transfer, and promote continuous improvement in disaster preparedness, prevention and protection, response and recovery practices, with the explicit purpose of increasing human security, well-being, quality of life and sustainable development (SD).

## **5.12 Community-based Disaster Risk Management**

It promotes the involvement of potentially affected communities in disaster risk management at the local level. This includes community assessments of hazards, vulnerabilities and capacities and their involvement in planning, implementing, monitoring and evaluating local action for disaster risk reduction.

### **5.13 Response**

The provision of emergency services and public assistance during or immediately after a disaster in order to save lives, reduce health impacts, ensure public safety and meet the basic subsistence needs of the people affected.

### **5.14 Early Warning System**

The set of capacities needed to generate and disseminate timely and meaningful warning information to enable individuals, communities and organizations threatened by a hazard to prepare and act appropriately and in sufficient time to reduce the possibility of harm or loss.

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