Mekong Rive Comission

Climate Change and Adaptation Initiative

Glossary of Terms and Definitions

on

Climate Change and Adaptation

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Introduction

The countries of the Lower Mekong Basin (LMB) are recognised as among the most vulnerable countries to climate change in the world. Their economies, ecosystem sustainability and social harmony are at risk.

There is a high demand for better understanding of the potential impacts from climate change and variability and in particular the options for adaptation to these changes. The Mekong River Commission (MRC) has been identified as the appropriate organisation to lead in the management of the Climate Change and Adaptation Initiative (CCAI), supported through a multi-donor partnership. The LMB countries are committed to this collaborative regional initiative, which supports them in adapting to the new challenges posed by climate change by building a systematic process of planning, implementation and learning.

This glossary is intended to start working toward a common understanding for a core set of terms and concepts of climate change and adaptation relevant to the Mekong region facilitating to build national capacity of climate change knowledge, awareness and information. The glossary is a living document, which will be updated with new terms as need be.

In developing this glossary, the MRC CCAI have identified and reviewed relevant climate change and adaptation terms and concepts in the context of the Mekong basin, based on the glossaries and terms from recognised scientific and official sources such as UNFCCC, IPCC, UN/ISDR. As necessary, additional explanation, examples and clarification are given for each term after the short definition or concept.

Abbreviations and acronyms

AOGCMs	Atmosphere-Ocean General Circulation Models
CDM	Clean Development Mechanism
CCAI	Climate Change and Adaptation Initiative (of the MRC)
COP	Conference of the Parties
DGVM	Dynamic Global Vegetation Model
ENSO	El Niño-Southern Oscillation
GCM	General Circulation Model
GDP	Gross Domestic Product
GHG	Greenhouse gas
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
LDCs	Least Developed Countries

LMB	Lower Mekong Basin
MRC	Mekong River Commission
NAPAs	National Adaptation Programmes of Action
NTP	National Target Programme (of Viet Nam)
OECD	Organisation for Economic Cooperation and Development
SIDS	Small Island Developing States
SRES	Special Report on Emissions Scenarios
UN	United Nations
UNCCD	United Nations Convention to Combat Desertification
UNFCCC	United Nations Framework Convention on Climate Change
UNEP	United Nations Environment Programme
WMO	World Meteorological Organisation

A.

Acclimatisation

The physiological *adaptation* to climatic variations

Adaptability

See *adaptive capacity*.

Adaptation

Adjustment in natural or *human systems* in response to actual or expected climatic *stimuli* or their effects, which moderates harm or exploits beneficial opportunities

The *IPCC* distinguishes several types of adaptation:

- **Anticipatory adaptation**—Adaptation that takes place before impacts of *climate change* are observed. Also referred to as proactive adaptation.
- **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. Also referred to as spontaneous adaptation.
- **Planned adaptation**—Adaptation that 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.
- **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.
- **Public adaptation**—Adaptation that is initiated and implemented by governments at all levels. Public adaptation is usually directed at collective needs.
- **Reactive adaptation**—Adaptation that takes place after impacts of *climate change* have been observed.

Adaptation benefits

The avoided damage costs or the accrued benefits following the adoption and implementation of *adaptation* measures

Adaptation costs

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

Adaptive capacity (in relation to climate change impacts)

The ability of a system to adjust to *climate change* (including *climate variability* and extremes) to moderate potential damages, to take advantage of opportunities, or to cope with the consequences

Aggregate impacts

Total *impacts* integrated across sectors and/or regions. The aggregation of impacts requires knowledge of (or assumptions about) the relative importance of impacts in different sectors

and regions. Measures of aggregate impacts include, for example, the total number of people affected, or the total economic costs

Anthropogenic

Resulting from or produced by human beings

Anthropogenic emissions

Emissions of greenhouse gases, greenhouse-gas precursors, and aerosols associated with human activities. These include the burning of fossil fuels, *deforestation*, land-use changes, livestock, fertilisation, etc. that result in a net increase in emissions.

B.

Baseline/reference

The baseline (or reference) is the state against which change is measured.

It might be a 'current baseline', in which case it represents observable, present-day conditions. It might also be a 'future baseline', which is a projected future set of conditions excluding the driving factor of interest. Alternative interpretations of the reference conditions can give rise to multiple baselines.

Base year

It means setting a base year to allow for emissions to be accurately compared over time.

The year 1990 is the base year used in the *UNFCCC* and also for most quantified emission limitations and reduction commitments established under the *Kyoto Protocol*.

However, countries defined as economies in transition that chose a different base year under decision taken at the second Conference Of Parties (COP2) meeting shall use that base year under the Protocol. Also, all Annex I Parties have the option of choosing 1995 as the base year for their emissions of the three industrial gases covered by the Protocol – hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride. The term is also used for voluntary reporting and generally refers to the first year a *GHG* inventory is prepared.

C.

Capacity building

In the context of *climate change*, capacity building is developing the technical skills and institutional capabilities of countries and economies to enable their participation in all aspects of *adaptation* to, *mitigation* of, and research on *climate change*, and in the implementation of the Kyoto Mechanisms, etc.

Carbon cycle

The term used to describe the flow of carbon (in various forms, e.g., *carbon dioxide*) through the *atmosphere*, ocean, terrestrial *biosphere* and lithosphere.

Carbon dioxide (CO_2)

A naturally occurring gas fixed by *photosynthesis* into organic matter. A by-product of fossil fuel combustion and *biomass* burning. It is also emitted from natural *respiration* and degradation processes and from various industrial processes.

It is the principal *anthropogenic greenhouse gas* that affects the Earth's radiative balance. It is the *reference* gas against which other greenhouse gases are measured, thus having a *Global Warming Potential* of 1.

Carbon Footprint

All *greenhouse gas* emissions associated with an individual's or organisation's activities.

Carbon Sequestration

The removal and storage of carbon from the atmosphere in carbon sinks (such as oceans, forests or soils) through physical or biological processes, such as *photosynthesis*.

In principle, carbon sequestration refers to storage of carbon that would otherwise be released into the atmosphere. There are three main methods in various states of discovery and development: i) Near term storage in the terrestrial biosphere where vegetation would soak up the CO_2 and store it in biomass and soil; ii) Long term storage in the earth's soil by pumping CO_2 into existing or drilled/excavated sub-surface reservoirs; iii) Long term storage in the earth's oceans where CO_2 would be injected thousands of feet deep and trapped by the water.

Carbon stock

The quantity of carbon in a reservoir/pool having the capacity to accumulate or release carbon.

CDM (Clean Development Mechanism)

The CDM allows *greenhouse gas* emission reduction projects to take place in countries that have no emission targets under the *United Nations Framework Convention on Climate Change (UNFCCC) Kyoto Protocol*, yet are signatories. The associated emission reduction is granted to the country, which has an emission target, funding the project.

Climate

Climate in a narrow sense is usually defined as the 'average *weather*', or more rigorously, as 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 of time is 30 years, as defined by the World Meteorological Organisation (WMO). These quantities are most often surface variables such as temperature, precipitation, and wind.

Climate in a wider sense is the state, including a statistical description, of the *climate system*.

Climate change

A change of *climate*, which is attributed directly or indirectly to human activity that alters the composition of the global *atmosphere* and which is in addition to natural *climate variability* observed over comparable time periods. See also *climate variability*.

Climate feedback

The influence of a climate-related process on another that in turn influences the original process.

For example, a positive climate feedback is an increase in temperature leading to a decrease in ice cover, which in turn leads to a decrease of reflected radiation (resulting in an increase

in temperature). An example of a negative climate feedback is an increase in the Earth's surface temperature, which may locally increase cloud cover, which may reduce the temperature of the surface.

Climate model

A numerical representation of the *climate system* based on the physical, chemical, and biological properties of its components, their interactions and *feedback* processes, and accounting for all or some of its known properties.

The *climate system* can be represented by models of varying complexity (differing in such aspects as the number of spatial dimensions, the extent to which physical, chemical, or biological processes are represented etc.). Coupled Atmosphere-Ocean General Circulation Models (*AOGCMs*) provide a comprehensive representation of the *climate system*. More complex models include active chemistry and biology.

Climate models are applied, as a research tool, to study and simulate the *climate*, but also for operational purposes, including monthly, seasonal, and interannual *climate predictions*.

Climate prediction

A climate prediction or climate forecast is the result of an attempt to produce an estimate of the actual evolution of the *climate* in the future, e.g., at seasonal, interannual or long-term time scales. See also *climate projection* and *climate (change) scenario*.

Climate projection

The calculated response of the *climate system* to *emissions* or concentration *scenarios* of *greenhouse gases* and *aerosols*, or *radiative forcing scenarios*, often based on simulations by *climate models*.

Climate projections are distinguished from *climate predictions*, in that the former critically depend on the emissions/concentration/*radiative forcing scenario* used, and therefore on highly uncertain assumptions of future socio-economic and technological development.

Climate scenario

A plausible and often simplified representation of the future *climate*, based on an internally consistent set of climatological relationships and assumptions of *radiative forcing*, typically constructed for explicit use as input to *climate change impact* models.

Climate system

The *climate system* is defined by the dynamics and interactions of five major components: *atmosphere*, hydrosphere, *cryosphere*, land surface, and *biosphere*.

Climate system dynamics are driven by both internal and external forcing, such as volcanic eruptions, solar variations, or human-induced modifications to the planetary radiative balance, for instance via *anthropogenic emissions* of *greenhouse gases* and/or land-use changes.

Climate threshold

The point at which *external forcing* of the *climate system*, such as the increasing atmospheric concentration of *greenhouse gases*, triggers a significant climatic or

environmental event which is considered unalterable, or recoverable only over very long time-scales, such as widespread bleaching of *corals* or a collapse of oceanic circulation systems.

Climate variability

Climate variability refers to variations in the mean state and other statistics (such as standard deviations, statistics of extremes, etc.) of the *climate* on all temporal and spatial scales beyond that of individual *weather* events.

Variability may be due to natural internal processes within the *climate system* (internal variability), or to variations in natural or *anthropogenic external forcing* (external variability). See also *climate change*.

Copenhagen Accord

A document that delegates at the 15th session of the Conference of Parties (COP15) to the United Nations Framework Convention on *Climate Change* agreed to "take note of" at the final plenary on 18 December 2009.

While COP 15 failed to agree on emission reduction targets among Annex I Parties and Non-Annex I Parties, the Accord endorses the continuation of the *Kyoto Protocol*, underlines that *climate change* is one of the greatest challenges of our time and emphasizes a "strong political will to urgently combat *climate change* in accordance with the principle of common but differentiated responsibilities and respective capabilities", and urges states to "enhance action and international cooperation on *adaptation* to reduce *vulnerability* and build *resilience* in developing countries, especially in those that are particularly vulnerable, especially Least Developed Countries (LDCs), Small Island Developing States (SIDS) and Africa" and agrees that "developed countries shall provide adequate, predictable and sustainable financial resources, technology and *capacity building* to support the implementation of *adaptation* action in developing countries".

Coping capacity

The means by which people or organisations use available resources and abilities to face adverse consequences that could lead to a *disaster*. In general, this involves managing resources, both in normal times as well as during crises or adverse conditions. The strengthening of coping capacities usually builds *resilience* to withstand the effects of natural and human-induced *hazards*.

Coping range

The range of *climate* where the outcomes are beneficial or negative but tolerable; beyond the coping range, the damages or losses are no longer tolerable and a society (or a system) is said to be vulnerable.

D.

Detection and attribution

Detection of change in a system (natural or human) is the process of demonstrating that the system has changed in some defined statistical sense, without providing a reason for that change.

Attribution of such an observed change in a system to *anthropogenic climate change* is usually a two-stage process. First, the observed change in the system must be demonstrated to be associated with an observed regional *climate change* with a specified degree of *confidence*. Second, a measurable portion of the observed regional *climate change*, or the associated observed change in the system, must be attributed to *anthropogenic* climate forcing with a similar degree of confidence. Confidence in such *joint attribution* statements must be lower than the confidence in either of the individual *attribution* steps alone due to the combination of two separate statistical assessments.

Development scenario

A range of developments selected to provide a perspective of future development opportunities and their impacts.

Disaster

A serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources.

Disaster risk

The potential disaster losses, in lives, health status, livelihoods, assets and services, which could occur to a particular community or a society over some specified future time period.

Disaster risk management

The systematic process of using administrative directives, organisations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of *hazards* and the possibility of *disaster*.

This term is an extension of the more general term "risk management" to address the specific issue of disaster risks. Disaster risk management aims to avoid, lessen or transfer the adverse effects of *hazards* through activities and measures for prevention, *mitigation* and *preparedness*.

Disaster risk reduction

The concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of *disasters*, including through reduced exposure to *hazards*, lessened *vulnerability* of people and property, wise management of land, water and the environment, and improved *preparedness* for adverse events.

Downscaling

A method that derives local- to regional-scale (10 to 100 km) information from larger-scale models or data analyses.

Drought

The phenomenon that exists when precipitation is significantly below normal recorded levels, causing serious hydrological imbalances that often adversely affect land resources and production systems.

E.

Ecophysiological process

Individual organisms respond to environmental variability, such as *climate change*, through ecophysiological processes which operate continuously, generally at a microscopic or sub-organ scale.

Ecophysiological mechanisms underpin individual organism's tolerance to environmental stress, and comprise a broad range of responses defining the absolute tolerance limits of individuals to environmental conditions. Ecophysiological responses may scale up to control species geographic ranges.

Ecosystem

A system of living organisms interacting with each other and their physical environment. The boundaries of what could be called an ecosystem are somewhat arbitrary, depending on the focus of interest or study. Thus, the extent of an ecosystem may range from very small spatial scales to, ultimately, the entire Earth.

Ecosystem approach

The ecosystem approach is a *strategy* for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way.

An ecosystem approach is based on the application of appropriate scientific methodologies focused on levels of biological organisation, which encompass the essential structure, processes, functions and interactions among organisms and their environment. It recognises that humans, with their cultural diversity, are an integral component of many *ecosystems*. The ecosystem approach requires *adaptive management* to deal with the complex and dynamic nature of ecosystems and the absence of complete knowledge or understanding of their functioning. Priority targets are conservation of *biodiversity* and of the ecosystem structure and functioning, in order to maintain *ecosystem services*.

Ecosystem services

Ecological processes or functions having monetary or non-monetary value to individuals or society at large.

There are (i) supporting services such as productivity or *biodiversity* maintenance, (ii) provisioning services such as food, fibre, or fish, (iii) regulating services such as flood protection, *climate* regulation or *carbon sequestration*, and (iv) cultural services such as tourism or spiritual and aesthetic appreciation.

El Niño-Southern Oscillation (ENSO)

El Niño, in its original sense, is a warm-water current that periodically flows along the coast of Ecuador and Peru, disrupting the local fishery. This oceanic event is associated with a fluctuation of the inter-tropical surface pressure pattern and circulation in the Indian and Pacific Oceans, called the Southern Oscillation. This coupled *atmosphere*-ocean phenomenon is collectively known as El Niño-Southern Oscillation (ENSO).

During an El Niño event, the prevailing trade winds weaken and the equatorial countercurrent strengthens, causing warm surface waters in the Indonesian area to flow

eastward to overlie the cold waters of the Peru Current. This event has great impact on the wind, sea surface temperature, and precipitation patterns in the tropical Pacific. It has climatic effects throughout the Pacific region and in many other parts of the world. The opposite of an El Niño event is called *La Niña*.

Emissions scenario

A plausible representation of the future development of emissions of substances that are potentially radiatively active (e.g., *greenhouse gases*, *aerosols*), based on a coherent and internally consistent set of assumptions about driving forces (such as demographic and socio-economic development, technological change) and their key relationships.

In 1992, the *IPCC* presented a set of emissions scenarios that were used as a basis for the *climate projections* in the Second Assessment Report. These emissions scenarios are referred to as the IS92 *scenarios*. In the *IPCC* Special Report on Emissions Scenarios (*SRES*) (Nakićenović et al., 2000), new emissions scenarios – the so-called SRES scenarios– were published.

Ensemble

A group of parallel model simulations used for *climate projections*.

Variation of the results across the ensemble members gives an estimate of *uncertainty*. Ensembles made with the same model but different initial conditions only characterise the *uncertainty* associated with internal *climate variability*, whereas multi-model ensembles including simulations by several models also take into account the contribution of model differences to *uncertainty*.

Evaporation

The transition process from liquid to gaseous state.

Evapotranspiration

The combined process of water *evaporation* from the Earth's surface and *transpiration* from vegetation.

External forcing

External forcing refers to a forcing agent outside the *climate system* causing a change in the *climate system*. Volcanic eruptions, solar variations and *anthropogenic* changes in the composition of the *atmosphere* and *land use change* are external forcings.

Extreme weather event

An event that is rare within its statistical *reference* distribution at a particular place. Definitions of 'rare' vary, but an extreme weather event would normally be as rare as or rarer than the 10^{th} or 90^{th} percentile. By definition, the characteristics of what is called 'extreme weather'may vary from place to place. Extreme weather events may typically include *floods* and *droughts*.

F.

Flood

The overflowing of the normal confines of a stream or other body of water, or the accumulation of water over areas that are not normally submerged. Floods include river (fluvial) floods, flash floods, urban floods, pluvial floods, sewer floods, coastal floods, and glacial lake outburst floods.[1]

Climate change is projected to increase the rainfall in much of the Mekong Region as well as expected to increase rainfall intensity. Floods would therefore potentially become more frequent and more severe.

Food security

A situation that exists when people have secure access to sufficient amounts of safe and nutritious food for normal growth, development and an active and healthy life. Food insecurity may be caused by the unavailability of food, insufficient purchasing power, inappropriate distribution, or inadequate use of food at the household level.

G.

Glacier

A mass of land ice flowing downhill (by internal deformation and sliding at the base) and constrained by the surrounding topography (e.g., the sides of a valley or surrounding peaks). A glacier is maintained by accumulation of snow at high altitudes, balanced by melting at low altitudes or discharging into the sea.

Global warming

Global warming refers to the gradual increase, observed or projected, in global surface temperature, as one of the consequences of *radiative forcing* caused by *anthropogenic emissions*.

Global Warming Potential (GWP)

An index, based upon *radiative* properties of well mixed *greenhouse gases*, measuring the *radiative forcing* of a unit mass of a given well mixed *greenhouse gas* in today's *atmosphere* integrated over a chosen time horizon, relative to that of *carbon dioxide*.

The GWP represents the combined effect of the differing times these gases remain in the *atmosphere* and their relative effectiveness in absorbing outgoing *thermal infrared radiation*. The *Kyoto Protocol* is based on GWPs from pulse emissions over a 100-year time frame.

Greenhouse effect

The process in which the absorption of *infrared radiation* by the *atmosphere* warms the Earth. In common parlance, the term 'greenhouse effect' may be used to refer either to the

[1] http://www.ipcc.ch/organization/organization.shtml#.UVzmXKLwnw0

natural greenhouse effect, due to naturally occurring *greenhouse gases*, or to the enhanced (*anthropogenic*) greenhouse effect, which results from gases emitted as a result of human activities.

Greenhouse gas (GHG)

A group of gases in the atmosphere, , both natural and *anthropogenic*, that absorb and emit radiation at specific wavelengths within the spectrum of *infrared radiation* emitted by the Earth's surface, the *atmosphere*, and clouds. This property causes the *greenhouse effect*.

Water vapour (H_2O), *carbon dioxide* (CO_2), nitrous oxide (N_2O), methane (CH_4) and *ozone* (O_3) are the primary greenhouse gases in the Earth's *atmosphere*.

H.

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.

I.

Ice cap

A dome-shaped ice mass covering a highland area that is considerably smaller in extent than an *ice sheet*.

Ice sheet

A mass of land ice that is sufficiently deep to cover most of the underlying bedrock topography.

An ice sheet flows outwards from a high central plateau with a small average surface slope. The margins slope steeply, and the ice is discharged through fast flowing ice streams or outlet *glaciers*, in some cases into the sea or into ice shelves floating on the sea. There are only two large ice sheets in the modern world – on Greenland and Antarctica, the Antarctic ice sheet being divided into east and west by the Transantarctic Mountains. During ice age periods there were others.

(climate change) Impact assessment

The practice of identifying and evaluating, in monetary and/or non-monetary terms, the effects of *climate change* on natural and human systems.

(climate change) 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*. See also *aggregate impacts*, market impacts, and non-market impacts.

- **Aggregate Impacts** - Total impacts summed up across sectors and/or regions. The aggregation of impacts requires knowledge of (or assumptions about) the relative importance of impacts in different sectors and regions. Measures of aggregate impacts include, for example, the total number of people affected, change in net primary productivity, number of systems undergoing change, or total economic costs.
- **Market Impacts** - Impacts that are linked to market transactions and directly affect *gross domestic product (GDP)*--for example, changes in the supply and price of agricultural goods.
- **Non-Market Impacts** - Impacts that affect ecosystems or human *welfare*, but that are not directly linked to market transactions--for example, an increased risk of premature death.

Industrial revolution

A period of rapid industrial growth with far-reaching social and economic consequences, beginning in England during the second half of the 18th century and spreading to Europe and later to other countries including the USA.

The industrial revolution marks the beginning of a strong increase in combustion of fossil fuels and related emissions of *carbon dioxide*. In the *IPCC* fourth assessment report from 2007, the term 'pre-industrial' refers, somewhat arbitrarily, to the period before 1750.

Infrared radiation

The heat energy that is emitted from all solids, liquids, and gases.

In the context of the greenhouse issue, the term refers to the heat energy emitted by the Earth's surface and its *atmosphere*. Greenhouse gases strongly absorb this radiation in the Earth's *atmosphere*, and re-radiate some of it back towards the surface, creating the *greenhouse effect*.

Integrated assessment

An interdisciplinary process of combining, analysing, interpreting and communicating knowledge from diverse scientific disciplines so that all relevant aspects of a complex societal issue can be evaluated and considered for the benefit of decision-making.

Intergovernmental Panel on Climate Change (IPCC)

The Intergovernmental Panel on Climate Change (IPCC) is the leading international body for the assessment of *climate change*. It was established by the United Nations Environment Programme (UNEP) and the World Meteorological Organisation (WMO) to provide the world with a clear scientific view on the current state of knowledge in *climate change* and its potential environmental and socio-economic impacts.[2]

J.

[2] http://www.ipcc.ch/organization/organization.shtml#.UV0NEqLwnw0

K.

Kyoto Protocol

The Kyoto Protocol is an international agreement linked to the United Nations Framework Convention on Climate Change, which **commits** its Parties by setting internationally binding emission reduction targets. [3]

L.

La Niña

See *El Niño-Southern Oscillation (ENSO)*.

M.

(climate change) Mainstreaming

The potential impacts of *climate change* are considered and appropriate *adaptation* measures are integrated as normal practice within ongoing programme activities.

Maladaptation

Any changes in natural or human systems that inadvertently increase *vulnerability* to climatic *stimuli*; an *adaptation* that does not succeed in reducing *vulnerability* but increases it instead.

Microclimate

Local climate at or near the Earth's surface. See also *climate*.

(climate change) Mitigation

An *anthropogenic* intervention to reduce the *anthropogenic* forcing of the *climate system*; it includes strategies to reduce *greenhouse gas* sources and emissions and enhancing *greenhouse gas* sinks. See also *sink.*

Mitigation Potential

In the context of *climate change mitigation*, the mitigation potential is the amount of *mitigation* that could be – but is not yet – realised over time.

Monsoon

A monsoon is a tropical and sub-tropical seasonal reversal in both the surface winds and associated precipitation.

N.

National Action Plan

A national document outlining plan of action to address problems and issues faced by a particular human, economic development and environment system.

[3] http://unfccc.int/kyoto_protocol/items/2830.php

National Adaptation Programmes of Action (NAPAs)

Documents prepared by least developed countries (LDCs) identifying urgent and immediate activities useful for coping with *climate change*. The NAPAs are then presented to the international donor community for support.

National Target Programme (NTP)

The national document in Viet Nam outlining the key *climate change impacts*/risks and the priority action to *respond to climate change*.

No regrets policy

A policy that would generate net social and/or economic benefits irrespective of whether or not *anthropogenic climate change* occurs.

Non-linearity

A process is called 'non-linear' when there is no simple proportional relation between cause and effect.

O.

Opportunity costs

The cost of an economic activity forgone through the choice of another activity.

Ozone

The triatomic form of oxygen (O_3), a gaseous atmospheric constituent.

In the *troposphere*, it is created both naturally and by photochemical reactions involving gases resulting from human activities (*photochemical smog*). In high concentrations, tropospheric ozone can be harmful to many living organisms. Tropospheric ozone acts as a *greenhouse gas*. In the *stratosphere*, ozone is created by the interaction between solar ultraviolet radiation and molecular oxygen (O_2).

Ozone depletion

Depletion of stratospheric ozone, due to chemical reactions that may be enhanced by *climate change*, results in an increased ground-level flux of ultraviolet (UV) B radiation.

P.

Permafrost

Ground (soil or rock and included ice and organic material) that remains at or below 0°C for at least two consecutive years

Phenology

The study of natural phenomena that recur periodically (e.g., development stages, migration) and their relation to *climate* and seasonal changes.

Phenotypic Plasticity

The ability of an organism to adapt to a changing environment through the manipulation of its phenotype, without the alteration of its genotype.

Potential production

Estimated crop productivity under non-limiting soil, nutrient and water conditions.

(Disaster) Preparedness

The knowledge and capacities developed by governments, professional response and recovery organisations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current *hazard* events or conditions.

Projection

The potential evolution of a quality or set of quantities, often computed with the aid of a model.

Projections are distinguished from predictions in order to emphasise that projections involve assumptions – concerning, for example, future socio-economic and technological developments, that may or may not be realized – and are therefore subject to substantial *uncertainty*. See also *climate projection* and *climate prediction*.

R.

Radiative forcing

Radiative forcing is the change in the net vertical irradiance (expressed in Watts per square metre; W/m^2) at the tropopause due to an internal or external change in the forcing of the *climate system*, such as a change in the concentration of CO_2 or the output of the Sun.

Relative sea level

Sea level measured by a *tide gauge* with respect to the land upon which it is situated. Mean sea level is normally defined as the average relative sea level over a period, such as a month or a year, long enough to average out transients such as waves and tides.

Resilience

The ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organisation, and the capacity to adapt to stress and change.

Respiration

The process whereby living organisms convert organic matter to *carbon dioxide*, releasing energy and consuming oxygen.

Respond to climate change

Human activities aiming at *climate change adaptation* and *climate change mitigation*.

Risk (climate-related)

The result of interaction of physically defined *hazards* with the properties of the exposed systems – i.e., their *sensitivity* or (social) *vulnerability*. Risk can also be considered as the combination of an event, its likelihood, and its consequences – i.e., risk equals the probability of climate *hazard* multiplied by a given system's *vulnerability*.

Risk management

The implementation of strategies to avoid unacceptable consequences. In the context of *climate change adaptation* and *mitigation* are the two broad categories of action that might be taken to avoid unacceptable consequences.

S.

Salinisation

The accumulation of salts in soils.

Salt-water intrusion

Displacement of fresh surface water or groundwater by the advance of salt water due to its greater density. This usually occurs in coastal and estuarine areas due to reducing land-based influence (e.g., either from reduced *runoff* and associated groundwater recharge, or from excessive water withdrawals from aquifers) or increasing marine influence (e.g. *sea level rise*).

Scenario

A plausible and often simplified description of how the future may develop, based on a coherent and internally consistent set of assumptions about driving forces and key relationships.

Scenarios may be derived from *projections*, but are often based on additional information from other sources, sometimes combined with a 'narrative *storyline*'. See also *climate scenario*, *emissions scenario* and *SRES.*

Sea level rise

Sea level can change, both globally and locally, due to (i) changes in the shape of the ocean basins, (ii) changes in the total mass of water and (iii) changes in water density.

Factors leading to sea level rise under *global warming* include both increases in the total mass of water from the melting of land-based snow and ice, and changes in water density from an increase in ocean water temperatures and salinity changes. Relative sea-level rise occurs where there is a local increase in the level of the ocean relative to the land, which might be due to ocean rise and/or land level subsidence.

Sea wall

A human-made wall or embankment along a shore to prevent sea water flooding.

Sensitivity

Sensitivity is the degree to which a system 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*).

Sequestration

See *carbon sequestration.*

Sink

Any process, activity, or mechanism that removes a *greenhouse gas*, an *aerosol*, or a precursor of a *greenhouse gas* or aerosol from the *atmosphere*.

Snow water equivalent

The equivalent volume/mass of water that would be produced if a particular body of snow or ice was melted.

Socio-economic scenarios

Scenarios concerning future conditions in terms of population, *Gross Domestic Product* and other socio-economic factors relevant to understanding the implications of *climate change*. See *SRES*.

Solar radiation

Electromagnetic radiation emitted by the Sun. It is also referred to as shortwave radiation. Solar radiation has a distinctive range of wavelengths (spectrum) determined by the temperature of the Sun, peaking in visible wavelengths.

SRES

The *storyline*s and associated population, *GDP* and *emissions scenarios* associated with the Special Report on Emissions Scenarios (SRES) (Nakićenović et al., 2000), and the resulting *climate change* and *sea-level rise scenarios*. Four families of *socio-economic scenario* (A1, A2, B1 and B2) represent different world futures in two distinct dimensions: a focus on economic versus environmental concerns, and global versus regional development patterns.

Stakeholder

A person or an organisation that has a legitimate interest in a project or entity, or would be affected by a particular action or policy.

Stimuli

All the elements of *climate change*, including mean climate characteristics, *climate variability*, and the frequency and magnitude of extremes.

Storyline

A narrative description of a *scenario* (or a family of *scenarios*) that highlights the *scenario*'s main characteristics, relationships between key driving forces, and the dynamics of the *scenarios*.

Strategy

A broad plan of action that is implemented through policies and measures. A **climate change adaptation strategy** for a country refers to a general plan of action for addressing the *impacts* of *climate change*, including *climate variability* and extremes. It may include a mix of policies and measures, selected to meet the overarching objective of reducing the country's *vulnerability*.

Stratosphere

Highly stratified region of *atmosphere* above the *troposphere* extending from about 10 km (ranging from 9 km in high latitudes to 16 km in the tropics) to about 50 km.

T.

Thermal expansion

In connection with *sea level rise*, this refers to the increase in volume (and decrease in density) that results from warming water. A warming of the ocean leads to an expansion of the ocean volume and hence an increase in sea level.

Thermal infrared radiation

Radiation emitted by the Earth's surface, the *atmosphere* and the clouds. It is also known as *terrestrial* or *long wave radiation*, and is to be distinguished from the near-infrared radiation that is part of the solar spectrum.

Infrared radiation, in general, has a distinctive range of wavelengths (*spectrum*) longer than the wavelength of the red colour in the visible part of the spectrum. The spectrum of thermal infrared radiation is practically distinct from that of shortwave or *solar radiation* because of the difference in temperature between the Sun and the Earth-*Atmosphere* system.

Threshold

The level of magnitude of a system process at which sudden or rapid change occurs. A point or level at which new properties emerge in an ecological, economic or other system, invalidating predictions based on mathematical relationships that apply at lower levels.

Tide gauge

A device at a coastal location (and some deep sea locations) that continuously measures the level of the sea with respect to the adjacent land. Time averaging of the sea level so recorded gives the observed secular changes of the relative sea level. See *Sea level change/sea level rise*.

Troposphere

The lowest part of the *atmosphere* from the surface to about 10 km in altitude in mid-latitudes (ranging from 9 km in high latitudes to 16 km in the tropics on average) where clouds and '*weather*' phenomena occur. In the troposphere, temperatures generally decrease with height.

U.

Uncertainty

An expression of the degree to which a value (e.g., the future state of the *climate system*) is unknown.

Uncertainty can result from lack of information or from disagreement about what is known or even knowable. It may have many types of sources, from quantifiable errors in the data to ambiguously defined concepts or terminology, or uncertain *projections* of human behaviour. Uncertainty can therefore be represented by quantitative measures (e.g., a range of values calculated by various models) or by qualitative statements (e.g., reflecting the judgement of a team of experts).

United Nations Framework Convention on Climate Change (UNFCCC)

The Convention on Climate Change sets an overall framework for intergovernmental efforts to tackle the challenge posed by *climate change*. It recognizes that the *climate system* is a

shared resource whose stability can be affected by industrial and other emissions of *carbon dioxide* and other greenhouse gases.

V.

Vulnerability

Vulnerability is the degree to which a system is susceptible to, and 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 change* and variation to which a system is exposed, its *sensitivity*, and its adaptive capacity.

Vulnerability assessment

Vulnerability assessment identifies who and what is exposed and sensitive to change.

A vulnerability assessment starts by considering the factors that make people or the environment susceptible to harm, i.e. access to natural and financial resources; ability to self-protect; support networks and so on.

W.

Weather

Atmospheric condition at any given time or place.

Weather is measured in terms of such things as wind, temperature, humidity, atmospheric pressure, cloudiness, and precipitation. In most places, weather can change from hour-to-hour, day-to-day, and season-to-season. Weather should be clearly distinct from *climate*, which is usually defined as the "average weather", or in wider sense is the state of the *climate system*. A simple way of remembering the difference is that *climate* is what you expect (e.g. cold winters) and 'weather' is what you get (e.g. a blizzard). See also *Climate.*

Weather prediction/forecast

The application of science and technology to predict the state of the *atmosphere* for a future time and a given location.

Human beings have attempted to predict the *weather* informally for millennia, and formally since at least the nineteenth century. Weather forecasts are made by collecting quantitative data about the current state of the *atmosphere* and using scientific understanding of atmospheric process to project how the *atmosphere* will evolve.

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