Annexes

Annex I
Glossary

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This concise Synthesis Report (SYR) Glossary defines selected key terms used in this report, drawn from the glossaries of the three Working Group contributions to the AR6. A more comprehensive, harmonised set of definitions for terms used in this SYR and the three AR6 Working Group reports is available from the IPCC Online Glossary: https://apps.ipcc.ch/glossary/

Readers are requested to refer to this comprehensive online glossary for definitions of terms of a more technical nature, and for scientific references relevant to individual terms. Italicized words indicate that the term is defined in this or/and the online glossary. Subterms appear in italics beneath main terms.

2030 Agenda for Sustainable Development
A UN resolution in September 2015 aadopting a plan of action for people, planet and prosperity in a new global development framework anchored in 17 *Sustainable Development Goals*.

Abrupt climate change
A large-scale *abrupt change* in the *climate system* that takes place over a few decades or less, persists (or is anticipated to persist) for at least a few decades and causes substantial *impacts* in *human and/or natural systems*. **See also:** *Abrupt change, Tipping point*.

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. **See also:** *Adaptation options, Adaptive capacity, Maladaptive actions (Maladaptation)*.

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.

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.

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

Aerosol
A suspension of airborne solid or liquid particles, with typical particle size in the range of a few nanometres to several tens of micrometres and atmospheric lifetimes of up to several days in the *troposphere* and up to years in the *stratosphere*. The term aerosol, which includes both the particles and the suspending gas, is often used in this report in its plural form to mean 'aerosol particles'. Aerosols may be of either natural or anthropogenic origin in the troposphere; stratospheric aerosols mostly stem from volcanic eruptions. Aerosols can cause an *effective radiative forcing* directly through scattering and absorbing radiation *(aerosol–radiation interaction)*, and indirectly by acting as *cloud condensation nuclei* or ice nucleating particles that affect the properties of clouds *(aerosol–cloud interaction)*, and upon deposition on snow- or ice-covered surfaces. Atmospheric aerosols may be either emitted as primary particulate matter or formed within the *atmosphere* from gaseous *precursors* (secondary production). Aerosols may be composed of sea salt, organic carbon, *black carbon* (BC), mineral species (mainly desert dust), sulphate, nitrate and ammonium or their mixtures. **See also:** *Particulate matter (PM), Aerosol–radiation interaction, Short-lived climate forcers (SLCFs)*.

Afforestation
Conversion to forest of land that historically has not contained forests. **See also:** *Anthropogenic removals, Carbon dioxide removal (CDR), Deforestation, Reducing Emissions from Deforestation and Forest Degradation (REDD+), Reforestation*.

[Note: For a discussion of the term forest and related terms such as *afforestation*, *reforestation* and *deforestation*, see the 2006 IPCC Guidelines for National Greenhouse Gas Inventories and their 2019 Refinement, and information provided by the United Nations Framework Convention on Climate Change]

Agricultural drought
See: *Drought*.

Agriculture, Forestry and Other Land Use (AFOLU)
In the context of national *greenhouse gas (GHG)* inventories under the *United Nations Convention on Climate Change (UNFCCC)*, AFOLU is the sum of the GHG inventory sectors Agriculture and *Land Use*, *Land-Use Change and Forestry (LULUCF)*; see the 2006 IPCC Guidelines for National GHG Inventories for details. Given the difference in estimating the *'anthropogenic' carbon dioxide (CO_2)* removals between countries and the global modelling community, the land-related net GHG emissions from global models included in this report are not necessarily directly comparable with LULUCF estimates in national GHG Inventories. **See also:** *Land use, land-use change and forestry (LULUCF), Land-use change (LUC)*.

Agroforestry
Collective name for *land-use* systems and technologies where woody perennials (trees, shrubs, palms, bamboos, etc.) are deliberately used on the same *land-management* units as agricultural crops and/or animals, in some form of spatial arrangement or temporal sequence. In agroforestry systems there are both ecological and economical interactions between the different components. Agroforestry can also be defined as a dynamic, ecologically based, natural resource management system that, through the integration of trees on farms

and in the agricultural landscape, diversifies and sustains production for increased social, economic and environmental benefits for land users at all levels.

Anthropogenic
Resulting from or produced by human activities.

Behavioural change
In this report, behavioural change refers to alteration of human decisions and actions in ways that mitigate *climate change* and/or reduce negative consequences of climate change impacts.

Biodiversity
Biodiversity or biological diversity means the variability among living organisms from all sources including, among other things, terrestrial, marine and other aquatic *ecosystems*, and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems. **See also:** *Ecosystem*, *Ecosystem services*.

Bioenergy
Energy derived from any form of biomass or its metabolic by-products. **See also:** *Biofuel*.

Bioenergy with carbon dioxide capture and storage (BECCS)
Carbon dioxide capture and storage (CCS) technology applied to a *bioenergy* facility. Note that, depending on the total emissions of the BECCS supply chain, *carbon dioxide (CO_2)* can be removed from the atmosphere. **See also:** *Anthropogenic removals*, *Carbon dioxide capture and storage (CCS)*, *Carbon dioxide removal (CDR)*.

Blue carbon
Biologically-driven carbon fluxes and storage in marine systems that are amenable to management. Coastal blue carbon focuses on rooted vegetation in the coastal zone, such as tidal marshes, mangroves and seagrasses. These *ecosystems* have high carbon burial rates on a per unit area basis and accumulate carbon in their soils and sediments. They provide many non-climatic benefits and can contribute to *ecosystem-based adaptation*. If degraded or lost, coastal blue carbon ecosystems are likely to release most of their carbon back to the *atmosphere*. There is current debate regarding the application of the blue carbon concept to other coastal and non-coastal processes and ecosystems, including the open *ocean.* **See also:** *Ecosystem services*, *Sequestration*.

Blue infrastructure
See: *Infrastructure*.

Carbon budget
Refers to two concepts in the literature:
(1) an assessment of carbon cycle *sources* and *sinks* on a global level, through the synthesis of evidence for *fossil fuel* and cement emissions, emissions and removals associated with *land use* and *land-use change*, ocean and natural land sources and sinks of *carbon dioxide (CO_2)*, and the resulting change in atmospheric CO_2 concentration. This is referred to as the Global Carbon Budget; (2) the maximum amount of cumulative net global *anthropogenic* CO_2 emissions that would result in limiting *global warming* to a given level with a given probability, taking into account the effect of other *anthropogenic* climate *forcers*. This is referred to as the Total Carbon Budget when expressed starting from the *pre-industrial* period, and as the Remaining Carbon Budget when expressed from a recent specified date.

[Note 1: Net anthropogenic CO_2 emissions are *anthropogenic* CO_2 emissions minus *anthropogenic* CO_2 removals. **See also:** *Carbon Dioxide Removal (CDR)*.
Note 2: The maximum amount of cumulative net global *anthropogenic* CO_2 emissions is reached at the time that annual net *anthropogenic* CO_2 emissions reach zero.
Note 3: The degree to which *anthropogenic* climate forcers other than CO_2 affect the total carbon budget and remaining carbon budget depends on human choices about the extent to which these forcers are mitigated and their resulting climate effects.
Note 4: The notions of a total carbon budget and remaining carbon budget are also being applied in parts of the scientific literature and by some entities at regional, national, or sub-national level. The distribution of global budgets across individual different entities and emitters depends strongly on considerations of *equity* and other value judgements.]

Carbon dioxide capture and storage (CCS)
A process in which a relatively pure stream of *carbon dioxide (CO_2)* from industrial and energy-related sources is separated (captured), conditioned, compressed and transported to a storage location for long-term isolation from the *atmosphere*. Sometimes referred to as Carbon Capture and Storage. **See also:** *Anthropogenic removals*, *Bioenergy with carbon dioxide capture and storage (BECCS)*, *Carbon dioxide capture and utilisation (CCU)*, *Carbon dioxide removal (CDR)*, *Sequestration*.

Carbon dioxide removal (CDR)
Anthropogenic activities removing *carbon dioxide (CO_2)* from the atmosphere and durably storing it in geological, terrestrial, or *ocean* reservoirs, or in products. It includes existing and potential *anthropogenic* enhancement of biological or geochemical CO_2 *sinks* and direct air carbon dioxide capture and storage (DACCS) but excludes natural CO_2 *uptake* not directly caused by human activities. **See also:** *Afforestation, Anthropogenic removals*, *Biochar, Bioenergy with carbon dioxide capture and storage (BECCS)*, *Carbon dioxide capture and storage (CCS)*, *Enhanced weathering*, *Ocean alkalinization/ Ocean alkalinity enhancement*, *Reforestation*, *Soil carbon sequestration (SCS)*.

Cascading impacts
Cascading impacts from *extreme weather/climate events occur* when an extreme *hazard* generates a sequence of secondary events in natural and *human systems* that result in physical, natural, social or economic disruption, whereby the resulting impact is significantly larger than the initial impact. Cascading impacts are complex and multi-dimensional, and are associated more with the magnitude of *vulnerability* than with that of the *hazard*.

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

Climate change
A change in the state of the climate that can be identified (e.g., by using statistical tests) 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. **See also:** *Climate variability*, *Detection and attribution*, *Global warming, Natural (climate) variability*, *Ocean acidification (OA)*.

[Note that the United Nations Framework Convention on Climate Change (UNFCCC), in its Article 1, defines climate change as: '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'. The UNFCCC thus makes a distinction between climate change attributable to human activities altering the atmospheric composition and climate variability attributable to natural causes.]

Climate extreme (extreme weather or 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. By definition, the characteristics of what is called extreme weather may vary from place to place in an absolute sense. 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, both extreme weather events and extreme climate events are referred to collectively as 'climate extremes'.

Climate finance
There is no agreed definition of climate finance. The term 'climate finance' is applied to the financial resources devoted to addressing *climate change* by all public and private actors from global to local scales, including international financial flows to *developing countries* to assist them in addressing climate change. Climate finance aims to reduce net greenhouse gas emissions and/or to enhance *adaptation* and increase *resilience* to the impacts of current and projected climate change. Finance can come from private and public sources, channelled by various intermediaries, and is delivered by a range of instruments, including grants, concessional and non-concessional debt, and internal budget reallocations.

Climate governance
The structures, processes, and actions through which private and public actors seek to mitigate and adapt to *climate change*.

Climate justice
See: *Justice*.

Climate literacy
Climate literacy encompasses being aware of climate change, its *anthropogenic* causes, and implications.

Climate resilient development (CRD)
Climate-resilient development refers to the process of implementing *greenhouse gas mitigation* and *adaptation* measures to support *sustainable development* for all.

Climate sensitivity
The change in the surface temperature in response to a change in the atmospheric *carbon dioxide (CO_2)* concentration or other radiative forcing. **See also:** *Climate feedback parameter*.

Equilibrium climate sensitivity (ECS)
The equilibrium (steady state) change in the surface temperature following a doubling of the atmospheric *carbon dioxide (CO_2)* concentration from *pre-industrial* conditions.

Climate services
Climate services involve the provision of climate information in such a way as to assist decision-making. The service includes appropriate engagement from users and providers, is based on scientifically credible information and expertise, has an effective access mechanism, and responds to user needs.

Climate system
The global system consisting of five major components: the *atmosphere*, the *hydrosphere*, the *cryosphere*, the *lithosphere* and the *biosphere*, and the interactions between them. The climate system changes in time under the influence of its own internal dynamics and because of *external forcings* such as volcanic eruptions, solar variations, orbital forcing, and *anthropogenic* forcings such as the changing composition of the *atmosphere* and *land-use change*.

Climatic impact-driver (CID)
Physical *climate system* conditions (e.g., means, events, extremes) that affect an element of society or *ecosystems*. Depending on system tolerance, CIDs and their changes can be detrimental, beneficial, neutral or a mixture of each across interacting system elements and *regions*. **See also:** *Hazard*, *Impacts*, *Risk*.

CO_2-equivalent emission (CO_2-eq)
The amount of *carbon dioxide (CO_2)* emission that would have an equivalent effect on a specified key measure of *climate change*, over a specified time horizon, as an emitted amount of another *greenhouse gas (GHG)* or a mixture of other GHGs. For a mix of GHGs it is obtained by summing the CO_2-equivalent emissions of each gas. There are various ways and time horizons to compute such equivalent emissions (*see greenhouse gas emission metric*). CO_2-equivalent emissions are commonly used to compare emissions of different GHGs but should not be taken to imply that these emissions have an equivalent effect across all key measures of *climate change*.

[Note: Under the Paris Rulebook [Decision 18/CMA.1, annex, paragraph 37], parties have agreed to use GWP100 values from the IPCC AR5 or GWP100 values from a subsequent IPCC Assessment Report to report

aggregate emissions and removals of GHGs. In addition, parties may use other metrics to report supplemental information on aggregate emissions and removals of GHGs.]

Compound weather/climate events
The terms 'compound events', 'compound extremes' and 'compound extreme events' are used interchangeably in the literature and this report, and refer to the combination of multiple *drivers* and/or *hazards* that contribute to societal and/or environmental *risk*.

Deforestation
Conversion of forest to non-forest. **See also:** *Afforestation*, *Reforestation*, *Reducing Emissions from Deforestation and Forest Degradation (REDD+)*.

[Note: For a discussion of the term forest and related terms such as *afforestation, reforestation* and *deforestation*, see the 2006 IPCC Guidelines for National Greenhouse Gas Inventories and their 2019 Refinement, and information provided by the United Nations Framework Convention on Climate Change]

Demand-side measures
Policies and programmes for influencing the *demand* for goods and/ or services. In the energy sector, demand-side *mitigation* measures aim at reducing the amount of *greenhouse gas* emissions emitted per unit of energy service used.

Developed / developing countries (Industrialissed / developed / developing countries)
There is a diversity of approaches for categorizing countries on the basis of their level of development, and for defining terms such as industrialised, developed, or developing. Several categorisations are used in this report. (1) In the United Nations (UN) system, there is no established convention for the designation of developed and developing countries or areas. (2) The UN Statistics Division specifies developed and developing regions based on common practice. In addition, specific countries are designated as least developed countries, landlocked developing countries, *Small Island Developing States (SIDS)*, and *transition* economies. Many countries appear in more than one of these categories. (3) The World Bank uses *income* as the main criterion for classifying countries as low, lower middle, upper middle, and high income. (4) The UN Development Programme (UNDP) aggregates indicators for life expectancy, educational attainment, and *income* into a single composite Human Development Index (HDI) to classify countries as low, medium, high, or very high human development.

Development pathways
See: *Pathways*.

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)*.

Displacement (of humans)
The involuntary movement, individually or collectively, of persons from their country or community, notably for reasons of armed conflict, civil unrest, or natural or human-made disasters.

Drought
An exceptional period of water shortage for existing *ecosystems* and the human population (due to low rainfall, high temperature and/or wind). **See also:** *Plant evaporative stress*.

Agricultural and ecological drought
Depending on the affected *biome*: a period with abnormal *soil moisture* deficit, which results from combined shortage of precipitation and excess *evapotranspiration*, and during the growing season impinges on crop production or ecosystem function in general.

Early warning systems (EWS)
The set of technical and institutional capacities to forecast, predict, and communicate timely and meaningful warning information to enable individuals, communities, managed *ecosystems*, and organisations threatened by a *hazard* to prepare to act promptly and appropriately to reduce the possibility of harm or loss. Depending upon context, EWS may draw upon scientific and/or *Indigenous knowledge*, and other knowledge types. EWS are also considered for ecological applications, e.g., conservation, where the organisation itself is not threatened by *hazard* but the *ecosystem* under conservation is (e.g., *coral bleaching* alerts), in agriculture (e.g., warnings of heavy rainfall, *drought*, ground frost, and hailstorms) and in fisheries (e.g., warnings of storm, *storm surge*, and tsunamis).

Ecological drought
See: *Drought*.

Ecosystem
An ecosystem is a functional unit consisting of living organisms, their nonliving environment and the interactions within and between them. The components included in a given ecosystem and its spatial boundaries depend on the purpose for which the ecosystem is defined: in some cases, they are relatively sharp, while in others they are diffuse. Ecosystem boundaries can change over time. Ecosystems are nested within other ecosystems and their scale can range from very small to the entire *biosphere*. In the current era, most ecosystems either contain people as key organisms, or are influenced by the effects of human activities in their environment. **See also:** *Ecosystem health*, *Ecosystem services*.

Ecosystem-based adaptation (EbA)
The use of *ecosystem* management activities to increase the *resilience* and reduce the *vulnerability* of people and *ecosystems* to *climate change*. **See also:** *Adaptation*, *Nature-based solution (NbS)*.

Ecosystem services
Ecological processes or functions having monetary or non-monetary value to individuals or society at large. These are frequently classified as (1) supporting services such as productivity or *biodiversity* maintenance, (2) provisioning services such as food or fibre, (3) regulating services such as climate regulation or *carbon sequestration*, and (4) cultural

services such as tourism or spiritual and aesthetic appreciation. **See also:** *Ecosystem*, *Ecosystem health*, *Nature's contributions to people (NCP)*.

Emission scenario
See: *Scenario*.

Emission pathways
See: *Pathways*.

Enabling conditions (for adaptation and mitigation options)
Conditions that enhance the *feasibility* of *adaptation* and *mitigation* options. *Enabling conditions* include finance, technological innovation, strengthening policy instruments, *institutional capacity*, *multi-level governance*, and *changes in human behaviour* and lifestyles.

Equality
A principle that ascribes equal worth to all human beings, including equal opportunities, rights and obligations, irrespective of origins. **See also:** *Equity*, *Fairness*.

Inequality
Uneven opportunities and social positions, and processes of discrimination within a group or society, based on gender, class, ethnicity, age, and (dis)ability, often produced by uneven development. Income inequality refers to gaps between highest and lowest income earners within a country and between countries.

Equilibrium climate sensitivity (ECS)
See: *Climate sensitivity*.

Equity
The principle of being fair and impartial, and a basis for understanding how the *impacts* and responses to climate change, including costs and benefits, are distributed in and by society in more or less equal ways. Often aligned with ideas of *equality*, fairness and *justice* and applied with respect to equity in the responsibility for, and distribution of, climate *impacts* and policies across society, generations, and gender, and in the sense of who participates and controls the processes of decision-making.

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. **See also:** *Hazard, Exposure*, *Vulnerability*, *Impacts*, *Risk*.

Feasibility
In this report, feasibility refers to the potential for a *mitigation* or *adaptation option* to be implemented. Factors influencing feasibility are context-dependent, temporally dynamic, and may vary between different groups and actors. Feasibility depends on geophysical, environmental-ecological, technological, economic, socio-cultural and institutional factors that enable or constrain the implementation of an option. The feasibility of options may change when different options are combined and increase when *enabling conditions* are strengthened. **See also:** *Enabling conditions (for adaptation and mitigation options)*.

Fire weather
Weather conditions conducive to triggering and sustaining wildfires, usually based on a set of indicators and combinations of indicators including temperature, *soil moisture*, humidity, and wind. Fire weather does not include the presence or absence of fuel load.

Food loss and waste
The decrease in quantity or quality of food. Food waste is part of food loss and refers to discarding or alternative (non-food) use of food that is safe and nutritious for human consumption along the entire food supply chain, from primary production to end household consumer level. Food waste is recognized as a distinct part of food loss because the drivers that generate it and the solutions to it are different from those of food losses.

Food security
A situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. The four pillars of food security are availability, access, utilization and stability. The nutritional dimension is integral to the concept of food security.

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. **See also:** *Climate change*, *Climate variability*, *Natural (climate) variability*.

Global warming potential (GWP)
An index measuring the *radiative forcing* following an emission of a unit mass of a given substance, accumulated over a chosen time horizon, relative to that of the reference substance, carbon dioxide (CO_2). The GWP thus represents the combined effect of the differing times these substances remain in the *atmosphere* and their effectiveness in causing radiative forcing. **See also:** *Lifetime*, *Greenhouse gas emission metric*.

Green infrastructure
See: *Infrastructure*.

Greenhouse gases (GHGs)
Gaseous constituents of the *atmosphere*, both natural and *anthropogenic*, that absorb and emit radiation at specific wavelengths within the spectrum of radiation emitted by the Earth's surface, by the atmosphere itself, and by 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 *GHGs* in the Earth's atmosphere. Human-made GHGs include *sulphur hexafluoride* (SF6), *hydrofluorocarbons* (HFCs), *chlorofluorocarbons* (CFCs) and perfluorocarbons (PFCs); several of these are also O3-depleting (and are regulated under the *Montreal Protocol*). **See also:** *Well-mixed greenhouse gas*.

Grey infrastructure
See: *Infrastructure*.

Hazard
The potential occurrence of a natural or human-induced physical event or trend that may cause loss of life, injury or other *health* impacts, as well as damage and loss to property, *infrastructure*, *livelihoods*, service provision, *ecosystems* and environmental resources. **See also:** *Exposure*, *Vulnerability*, *Impacts*, *Risk*.

Impacts
The consequences of realised *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 referred to as consequences or outcomes and can be adverse or beneficial. **See also:** *Adaptation*, *Hazard, Exposure*, *Vulnerability*, *Risk*.

Inequality
See: *Equality*.

Indigenous knowledge (IK)
The understandings, skills and philosophies developed by societies with long histories of interaction with their natural surroundings. For many *Indigenous Peoples*, IK informs decision-making about fundamental aspects of life, from day-to-day activities to longer term actions. This knowledge is integral to cultural complexes, which also encompass language, systems of classification, resource use practices, social interactions, values, ritual and spirituality. These distinctive ways of knowing are important facets of the world's cultural diversity. **See also:** *Local knowledge (LK)*.

Indigenous Peoples
Indigenous Peoples and nations are those that, having a historical continuity with pre-invasion and pre-colonial societies that developed on their territories, consider themselves distinct from other sectors of the societies now prevailing on those territories, or parts of them. They form at present principally non-dominant sectors of society and are often determined to preserve, develop, and transmit to future generations their ancestral territories, and their ethnic identity, as the basis of their continued existence as peoples, in accordance with their own cultural patterns, social institutions, and common law system.

Informal settlement
A term given to *settlements* or residential areas that by at least one criterion fall outside official rules and regulations. Most informal settlements have poor housing (with widespread use of temporary materials) and are developed on land that is occupied illegally with high levels of overcrowding. In most such settlements, provision for safe water, sanitation, drainage, paved roads, and basic services is inadequate or lacking. The term 'slum' is often used for informal settlements, although it is misleading as many informal settlements develop into good quality residential areas, especially where governments support such development.

Infrastructure
The designed and built set of physical systems and corresponding institutional arrangements that mediate between people, their communities, and the broader environment to provide services that support economic growth, *health*, quality of life, and safety.

Blue infrastructure
Blue infrastructure includes bodies of water, watercourses, ponds, lakes and storm drainage, that provide ecological and hydrological functions including *evaporation*, transpiration, *drainage*, infiltration, and temporary storage of *runoff* and discharge.

Green infrastructure
The strategically planned interconnected set of natural and constructed ecological systems, green spaces and other landscape features that can provide functions and services including air and water purification, temperature management, floodwater management and coastal defence often with *co-benefits* for people and *biodiversity*. Green infrastructure includes planted and remnant native vegetation, soils, *wetlands*, parks and green open spaces, as well as building and street level design interventions that incorporate vegetation.

Grey infrastructure
Engineered physical components and networks of pipes, wires, tracks and roads that underpin energy, transport, communications (including digital), built form, water and sanitation, and solid-waste management systems.

Irreversibility
A perturbed state of a *dynamical system* is defined as irreversible on a given time scale if the recovery from this state due to natural processes takes substantially longer than the time scale of interest. **See also:** *Tipping point*.

Just transition
See: *Transition*.

Justice
Justice is concerned with ensuring that people get what is due to them, setting out the moral or legal principles of *fairness* and *equity* in the way people are treated, often based on the ethics and values of society.

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.

Social justice
Just or fair relations within society that seek to address the distribution of wealth, access to resources, opportunity, and support according to principles of *justice* and *fairness*.

Key risk
See: *Risk*.

Land use, land-use change and forestry (LULUCF)
In the context of national *greenhouse gas* (GHG) inventories under the United Nations Framework Convention on Climate Change, LULUCF is a GHG inventory sector that covers *anthropogenic emissions* and *removals* of GHG in managed lands, excluding non-CO_2 agricultural emissions. Following the 2006 IPCC Guidelines for National GHG Inventories and

their 2019 Refinement, '*anthropogenic*' land-related GHG fluxes are defined as all those occurring on '*managed land*', i.e., 'where human interventions and practices have been applied to perform production, ecological or social functions'. Since managed land may include *carbon dioxide* (CO_2) removals not considered as '*anthropogenic*' in some of the scientific literature assessed in this report (e.g., removals associated with CO_2 fertilisation and N deposition), the land-related net *GHG emission* estimates from global models included in this report are not necessarily directly comparable with LULUCF estimates in National GHG Inventories *(IPCC 2006, 2019)*.

Least Developed Countries (LDCs)
A list of countries designated by the Economic and Social Council of the United Nations (ECOSOC) as meeting three criteria: (1) a low *income* criterion below a certain threshold of gross national income per capita of between USD 750 and USD 900, (2) a human resource weakness based on indicators of *health*, education, adult literacy, and (3) an economic vulnerability weakness based on indicators on instability of agricultural production, instability of export of goods and services, economic importance of non-traditional activities, merchandise export concentration, and the handicap of economic smallness. Countries in this category are eligible for a number of programmes focused on assisting countries most in need. These privileges include certain benefits under the articles of the United Nations Framework Convention on Climate Change (UNFCCC).

Livelihood
The resources used and the activities undertaken in order for people to live. *Livelihoods* are usually determined by the entitlements and assets to which people have access. Such assets can be categorised as human, social, natural, physical or financial.

Local knowledge (LK)
The understandings and skills developed by individuals and populations, specific to the places where they live. Local knowledge informs decision-making about fundamental aspects of life, from day-to-day activities to longer term actions. This knowledge is a key element of the social and cultural systems which influence observations of and responses to *climate change*; it also informs *governance* decisions. **See also:** *Indigenous knowledge (IK)*.

Lock-in
A situation in which the future development of a system, including *infrastructure*, technologies, investments, institutions, and behavioural norms, is determined or constrained ('locked in') by historic developments. **See also:** *Path dependence*.

Loss and Damage, and losses and damages
Research has taken *Loss and Damage* (capitalised letters) to refer to political debate under the United Nations Framework Convention on Climate Change (UNFCCC) following the establishment of the Warsaw Mechanism on Loss and Damage in 2013, which is to 'address loss and damage associated with impacts of *climate change*, including *extreme events* and slow onset events, in *developing countries* that are particularly vulnerable to the adverse effects of climate change.' Lowercase letters (*losses and damages*) have been taken to refer broadly to harm from (observed) *impacts* and (projected) risks and can be economic or non-economic.

Low-likelihood, high-impact outcomes
Outcomes/events whose probability of occurrence is low or not well known (as in the context of *deep uncertainty*) but whose potential *impacts* on society and *ecosystems* could be high. To better inform *risk assessment* and decision-making, such low-*likelihood* outcomes are considered if they are associated with very large consequences and may therefore constitute material risks, even though those consequences do not necessarily represent the most likely outcome. **See also:** *Impacts*.

Maladaptive actions (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.

Migration (of humans)
Movement of a person or a group of persons, either across an international border, or within a State. It is a population movement, encompassing any kind of movement of people, whatever its length, composition and causes; it includes migration of refugees, displaced persons, economic migrants, and persons moving for other purposes, including family reunification.

Mitigation (of climate change)
A human intervention to reduce emissions or enhance the *sinks of greenhouse gases*.

Mitigation potential
The quantity of net *greenhouse gas* emission reductions that can be achieved by a given *mitigation option* relative to specified emission baselines. **See also:** *Sequestration potential*.

[Note: Net greenhouse gas emission reductions is the sum of reduced emissions and/or enhanced *sinks*]

Natural (climate) variability
Natural variability refers to climatic fluctuations that occur without any human influence, that is *internal variability* combined with the response to external natural factors such as volcanic eruptions, changes in *solar activity* and, on longer time-scales, orbital effects and plate tectonics. **See also:** *Orbital forcing*.

Net zero CO_2 emissions
Condition in which *anthropogenic carbon dioxide (CO_2)* emissions are balanced by *anthropogenic CO_2 removals* over a specified period. **See also:** *Carbon neutrality*, *Land use*, *land-use change and forestry (LULUCF)*, *Net zero greenhouse gas emissions*.

[Note: *Carbon neutrality* and net zero CO_2 emissions are overlapping concepts. The concepts can be applied at global or sub-global scales (e.g., regional, national and sub-national). At a global scale, the terms carbon neutrality and net zero CO_2 emissions are equivalent. At sub-global scales, net zero CO_2 emissions is generally applied to emissions and removals under direct control or territorial responsibility of the reporting entity, while carbon neutrality generally includes emissions and removals within and beyond the direct control

or territorial responsibility of the reporting entity. Accounting rules specified by GHG programmes or schemes can have a significant influence on the quantification of relevant CO_2 emissions and removals.]

Net zero GHG emissions
Condition in which metric-weighted *anthropogenic greenhouse gas (GHG) emissions* are balanced by metric-weighted *anthropogenic GHG removals* over a specified period. The quantification of net zero GHG emissions depends on the *GHG emission metric* chosen to compare emissions and removals of different gases, as well as the time horizon chosen for that metric. **See also:** *Greenhouse gas neutrality*, *Land use*, *land-use change and forestry (LULUCF)*, *Net zero CO_2 emissions*.

[Note 1: *Greenhouse gas neutrality* and net zero GHG emissions are overlapping concepts. The concept of net zero GHG emissions can be applied at global or sub-global scales (e.g., regional, national and sub-national). At a global scale, the terms GHG neutrality and net zero GHG emissions are equivalent. At sub-global scales, net zero GHG emissions is generally applied to emissions and removals under direct control or territorial responsibility of the reporting entity, while GHG neutrality generally includes anthropogenic emissions and anthropogenic removals within and beyond the direct control or territorial responsibility of the reporting entity. Accounting rules specified by GHG programmes or schemes can have a significant influence on the quantification of relevant emissions and removals.
Note 2: Under the Paris Rulebook (Decision 18/CMA.1, annex, paragraph 37), parties have agreed to use GWP100 values from the IPCC AR5 or GWP100 values from a subsequent IPCC Assessment Report to report aggregate emissions and removals of GHGs. In addition, parties may use other metrics to report supplemental information on aggregate emissions and removals of GHGs.]

New Urban Agenda
The *New Urban Agenda* was adopted at the United Nations Conference on Housing and Sustainable Urban Development (Habitat III) in Quito, Ecuador, on 20 October 2016. It was endorsed by the United Nations General Assembly at its sixty-eighth plenary meeting of the seventy-first session on 23 December 2016.

Overshoot pathways
See: *Pathways*.

Pathways
The temporal evolution of *natural* and/or *human systems* towards a future state. Pathway concepts range from sets of quantitative and qualitative *scenarios* or *narratives* of potential futures to solution-oriented decision-making processes to achieve desirable societal goals. Pathway approaches typically focus on biophysical, techno-economic and/or socio-behavioural trajectories and involve various dynamics, goals and actors across different scales. **See also:** *Scenario*, *Storyline*.

Development pathways
Development pathways evolve as the result of the countless decisions being made and actions being taken at all levels of societal structure, as well due to the emergent dynamics within and between institutions, cultural norms, technological systems and other drivers of *behavioural change*. **See also:** *Shifting development pathways (SDPs)*, *Shifting development pathways to sustainability (SDPS)*.

Emission pathways
Modelled *trajectories* of global *anthropogenic emissions* over the 21st century are termed emission pathways.

Overshoot pathways
Pathways that first exceed a specified concentration, forcing or *global warming* level, and then return to or below that level again before the end of a specified period of time (e.g., before 2100). Sometimes the magnitude and *likelihood* of the *overshoot* are also characterised. The overshoot duration can vary from one *pathway* to the next, but in most overshoot pathways in the literature and referred to as overshoot pathways in the AR6, the overshoot occurs over a period of at least one decade and up to several decades. **See also:** *Temperature overshoot*.

Shared socio-economic pathways (SSPs)
Shared socio-economic pathways (SSPs) have been developed to complement the *Representative Concentration Pathways (RCPs)*. By design, the RCP emission and concentration *pathways* were stripped of their association with a certain socio-economic development. Different levels of emissions and *climate change* along the dimension of the RCPs can hence be explored against the backdrop of different socio-economic development pathways (SSPs) on the other dimension in a matrix. This integrative SSP-RCP framework is now widely used in the climate impact and policy analysis literature (see, e.g., http://iconics-ssp.org), where *climate projections* obtained under the RCP *scenarios* are analysed against the backdrop of various SSPs. As several emission updates were due, a new set of *emission scenarios* was developed in conjunction with the SSPs. Hence, the abbreviation SSP is now used for two things: On the one hand SSP1, SSP2, …, SSP5 is used to denote the five socio-economic *scenario* families. On the other hand, the abbreviations SSP1-1.9, SSP1-2.6, …, SSP5-8.5 are used to denote the newly developed *emission scenarios* that are the result of an SSP implementation within an *integrated assessment model*. Those SSP *scenarios* are bare of climate policy assumption, but in combination with so-called shared policy assumptions (SPAs), various approximate *radiative forcing* levels of 1.9, 2.6, …, or 8.5 W m–2 are reached by the end of the century, respectively. denote trajectories that address social, environmental and economic dimensions of *sustainable development*, *adaptation* and *mitigation*, and *transformation*, in a generic sense or from a particular methodological perspective such as *integrated assessment models* and *scenario* simulations.

Planetary health
A concept based on the understanding that human health and human civilisation depend on *ecosystem* health and the wise stewardship of *ecosystems*.

Reasons for concern (RFCs)
Elements of a classification framework, first developed in the IPCC Third Assessment Report, which aims to facilitate judgements about what level of *climate change* may be dangerous (in the language of Article 2 of the UNFCCC; UNFCCC, 1992) by aggregating *risks* from various sectors, considering *hazards*, *exposures*, *vulnerabilities*, capacities to adapt, and the resulting *impacts*.

Reforestation
Conversion to forest of land that has previously contained forests but that has been converted to some other use. **See also:** *Afforestation*, *Anthropogenic removals*, *Carbon dioxide removal (CDR)*, *Deforestation*, *Reducing Emissions from Deforestation and Forest Degradation (REDD+)*.

[Note: For a discussion of the term forest and related terms such as *afforestation*, *reforestation* and *deforestation*, see the 2006 IPCC Guidelines for National Greenhouse Gas Inventories and their 2019 Refinement, and information provided by the United Nations Framework Convention on Climate Change]

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. **See also:** *Loss and Damage*, *losses and damages*.

Resilience
The capacity of interconnected social, economic and ecological systems to cope with a hazardous event, trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity and structure. Resilience is a positive attribute when it maintains capacity for *adaptation*, learning and/or *transformation*. **See also:** *Hazard*, *Risk*, *Vulnerability*.

Restoration
In the environmental context, *restoration* involves human interventions to assist the recovery of an *ecosystem* that has been previously degraded, damaged or destroyed.

Risk
The potential for adverse consequences for human or ecological systems, recognising the diversity of values and objectives associated with such systems. In the context of *climate change*, *risks* can arise from potential *impacts* of *climate change* as well as human responses to *climate change*. Relevant adverse consequences include those on lives, *livelihoods*, *health* and *well-being*, economic, social and cultural assets and investments, *infrastructure*, services (including *ecosystem services*), *ecosystems* and species.
In the context of *climate change impacts*, *risks* result from dynamic interactions between climate-related *hazards* with the *exposure* and *vulnerability* of the affected human or ecological system to the *hazards*. *Hazards*, *exposure* and *vulnerability* may each be subject to *uncertainty* in terms of magnitude and *likelihood* of occurrence, and each may change over time and space due to socio-economic changes and human decision-making.
In the context of climate *change responses*, *risks* result from the potential for such responses not achieving the intended objective(s), or from potential *trade-offs* with, or negative side-effects on, other societal objectives, such as the *Sustainable Development Goals (SDGs)*. *Risks* can arise for example from *uncertainty* in the implementation, effectiveness or outcomes of *climate policy*, climate-related investments, technology development or adoption, and system *transitions*.
See also: *Hazard*, *Exposure*, *Vulnerability*, *Impacts*, *Risk management*, *Adaptation*, *Mitigation*.

Key risk
Key risks have potentially severe adverse consequences for humans and social-ecological systems resulting from the interaction of climate related *hazards* with *vulnerabilities* of societies and systems exposed.

Scenario
A plausible description of how the future may develop based on a coherent and internally consistent set of assumptions about key driving forces (e.g., rate of technological change, prices) and relationships. Note that scenarios are neither *predictions* nor *forecasts* but are used to provide a view of the implications of developments and actions. **See also:** *Scenario*, *Scenario storyline*.

Emission scenario
A plausible representation of the future development of emissions of substances that are radiatively active (e.g., *greenhouse gases* (GHGs) or *aerosols*) based on a coherent and internally consistent set of assumptions about driving forces (such as demographic and socio-economic development, technological change, energy and *land use*) and their key relationships. Concentration scenarios, derived from *emission scenarios*, are often used as input to a *climate model* to compute climate *projections*.

Sendai Framework for Disaster Risk Reduction
The *Sendai Framework for Disaster Risk Reduction 2015-2030* outlines seven clear targets and four priorities for action to prevent new, and to reduce existing *disaster risks*. The voluntary, non-binding agreement recognises that the State has the primary role to reduce disaster risk, but that responsibility should be shared with other stakeholders including local government, the private sector and other stakeholders, with the aim for the substantial reduction of disaster risk and losses in lives, *livelihoods* and *health* and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries.

Settlements
Places of concentrated human habitation. *Settlements* can range from isolated rural villages to *urban* regions with significant global influence. They can include formally planned and informal or illegal habitation and related *infrastructure*. **See also:** *Cities*, *Urban*, *Urbanisation*.

Shared socio-economic pathways (SSPs)
See: *Pathways*

Shifting development pathways (SDPs)
In this report, shifting development pathways describes *transitions* aimed at redirecting existing developmental trends. Societies may put in place *enabling conditions* to influence their future *development pathways*, when they endeavour to achieve certain outcomes. Some outcomes may be common, while others may be context-specific, given different starting points. **See also:** *Development pathways*, *Shifting development pathways to sustainability*.

Sink
Any process, activity or mechanism which removes a greenhouse gas, an aerosol or a precursor of a greenhouse gas from the *atmosphere*. **See also:** *Pool - Carbon and nitrogen*, *Reservoir*, *Sequestration*, *Sequestration potential*, *Source*, *Uptake*.

Small Island Developing States (SIDS)
Small Island Developing States (SIDS), as recognised by the United Nations OHRLLS (UN Office of the High Representative for the *Least Developed Countries*, Landlocked Developing Countries and Small Island Developing States), are a distinct group of developing countries facing specific social, economic and environmental vulnerabilities. They were recognised as a special case both for their environment and development at the Rio Earth Summit in Brazil in 1992. Fifty-eight countries and territories are presently classified as SIDS by the UN OHRLLS, with 38 being UN member states and 20 being Non-UN Members or Associate Members of the Regional Commissions.

Social justice
See: *Justice*.

Social protection
In the context of development aid and climate policy, social protection usually describes public and private initiatives that provide *income* or consumption transfers to the poor, protect the vulnerable against *livelihood risks*, and enhance the social status and rights of the marginalized, with the overall objective of reducing the economic and social *vulnerability* of poor, vulnerable, and marginalized groups. In other contexts, social protection may be used synonymously with social policy and can be described as all public and private initiatives that provide access to services, such as *health*, education, or housing, or income and consumption transfers to people. Social protection policies protect the poor and *vulnerable* against livelihood *risks* and enhance the social status and rights of the marginalized, as well as prevent *vulnerable* people from falling into poverty.

Solar radiation modification (SRM)
Refers to a range of radiation modification measures not related to *greenhouse gas (GHG) mitigation* that seek to limit *global warming*. Most methods involve reducing the amount of incoming *solar radiation* reaching the surface, but others also act on the longwave radiation budget by reducing optical thickness and cloud lifetime.

Source
Any process or activity which releases a *greenhouse gas*, an *aerosol* or a precursor of a greenhouse gas into the *atmosphere*. **See also:** *Pool - carbon and nitrogen*, *Reservoir*, *Sequestration*, *Sequestration potential*, *Sink*, *Uptake*.

Stranded assets
Assets exposed to devaluations or conversion to 'liabilities' because of unanticipated changes in their initially expected revenues due to innovations and/or evolutions of the business context, including changes in public regulations at the domestic and international levels.

Sustainable development (SD)
Development that meets the needs of the present without compromising the ability of future generations to meet their own needs and balances social, economic and environmental concerns. **See also:** *Development pathways*, *Sustainable Development Goals (SDGs)*.

Sustainable Development Goals (SDGs)
The 17 Global Goals for development for all countries established by the United Nations through a participatory process and elaborated in the *2030 Agenda for Sustainable Development*, including ending poverty and hunger; ensuring health and *well-being*, education, gender equality, clean water and energy, and decent work; building and ensuring resilient and sustainable *infrastructure*, cities and consumption; reducing *inequalities*; protecting land and water *ecosystems*; promoting peace, *justice* and partnerships; and taking urgent action on *climate change*. **See also:** *Development pathways*, *Sustainable development (SD)*.

Sustainable land management
The stewardship and use of *land* resources, including soils, water, animals and plants, to meet changing human needs, while simultaneously ensuring the long-term productive potential of these resources and the maintenance of their environmental functions.

Temperature overshoot
Exceedance of a specified *global warming* level, followed by a decline to or below that level during a specified period of time (e.g., before 2100). Sometimes the magnitude and likelihood of the overshoot is also characterized. The overshoot duration can vary from one *pathway* to the next but in most *overshoot pathways* in the literature and referred to as overshoot pathways in the AR6, the overshoot occurs over a period of at least one and up to several decades. **See also:** *Overshoot Pathways*.

Tipping point
A critical threshold beyond which a system reorganises, often abruptly and/or irreversibly. **See also:** *Abrupt climate change*, *Irreversibility*, *Tipping element*.

Transformation
A change in the fundamental attributes of *natural* and *human systems*.

Transformational adaptation
See: *Adaptation*.

Transition
The process of changing from one state or condition to another in a given period of time. Transition can be in individuals, firms, *cities*, *regions* and nations, and can be based on incremental or *transformative* change.

Just transitions
A set of principles, processes and practices that aim to ensure that no people, workers, places, sectors, countries or regions are left behind in the *transition* from a high-carbon to a low-carbon economy. It stresses the need for targeted and proactive measures from governments, agencies, and authorities to ensure that any negative social, environmental or economic impacts of economy-wide transitions are minimized, whilst benefits are maximized for those disproportionately affected. Key principles of just transitions include: respect and dignity for vulnerable groups; *fairness* in energy access and use, social dialogue and democratic consultation with relevant stakeholders; the creation of decent jobs; *social protection*; and rights at work. Just transitions could include fairness in energy, *land use* and climate planning and decision-making processes;

economic diversification based on low-carbon investments; realistic training/retraining programs that lead to decent work; gender specific policies that promote equitable outcomes; the fostering of international cooperation and coordinated multilateral actions; and the eradication of poverty. Lastly, just transitions may embody the redressing of past harms and perceived injustices.

Urban
The categorisation of areas as "urban" by government statistical departments is generally based either on population size, population density, economic base, provision of services, or some combination of the above. Urban systems are networks and nodes of intensive interaction and exchange including capital, culture, and material objects. Urban areas exist on a continuum with rural areas and tend to exhibit higher levels of complexity, higher populations and population density, intensity of capital investment, and a preponderance of secondary (processing) and tertiary (service) sector industries. The extent and intensity of these features varies significantly within and between urban areas. Urban places and systems are open, with much movement and exchange between more rural areas as well as other urban regions. Urban areas can be globally interconnected, facilitating rapid flows between them, of capital investment, of ideas and culture, human *migration*, and disease. **See also:** *Cities*, *City region*, *Peri-urban areas*, *Urban Systems*, *Urbanisation*.

Urbanisation
Urbanisation is a multi-dimensional process that involves at least three simultaneous changes: 1) *land use change*: transformation of formerly rural *settlements* or natural land into *urban settlements*; 2) demographic change: a shift in the spatial distribution of a population from rural to *urban* areas; and 3) *infrastructure* change: an increase in provision of *infrastructure* services including electricity, sanitation, etc. *Urbanisation* often includes changes in lifestyle, culture, and behaviour, and thus alters the demographic, economic, and social structure of both urban and rural areas. **See also:** *Settlement*, *Urban*, *Urban Systems*.

Vector-borne disease
Illnesses caused by parasites, viruses and bacteria that are transmitted by various vectors (e.g. mosquitoes, sandflies, triatomine bugs, blackflies, ticks, tsetse flies, mites, snails and lice).

Vulnerability
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. **See also:** *Hazard*, *Exposure*, *Impacts*, *Risk*.

Water security
The capacity of a population to safeguard sustainable access to adequate quantities of acceptable-quality water for sustaining *livelihoods*, human *well-being* and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters and for preserving *ecosystems* in a climate of peace and political stability.

Well-being
A state of existence that fulfills various human needs, including material living conditions and quality of life, as well as the ability to pursue one's goals, to thrive and to feel satisfied with one's life. Ecosystem well-being refers to the ability of *ecosystems* to maintain their diversity and quality.

Annex II
Acronyms, Chemical Symbols and Scientific Units

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AFOLU	Agriculture, Forestry and Other Land Use *
AR5	Fifth Assessment Report
AR6	Sixth Assessment Report
BECCS	Bioenergy with Carbon Dioxide Capture and Storage *
CCS	Carbon Capture and Storage *
CCU	Carbon Capture and Utilization
CDR	Carbon Dioxide Removal *
CH_4	Methane
CID	Climatic impact-driver *
CMIP5	Coupled Model Intercomparison Project Phase 5
CMIP6	Coupled Model Intercomparison Project Phase 6
CO_2	Carbon Dioxide
CO_2-eq	Carbon Dioxide Equivalent *
CRD	Climate Resilient Development *
CO_2-FFI	CO_2 from Fossil Fuel combustion and Industrial processes
CO_2-LULUCF	CO_2 from Land Use, Land-Use Change and Forestry
CSB	Cross-Section Box
DACCS	Direct Air Carbon Capture and Storage
DRM	Disaster Risk Management *
EbA	Ecosystem-based Adaptation *
ECS	Equilibrium climate sensitivity *
ES	Executive Summary
EV	Electric Vehicle
EWS	Early Warning System *
FaIR	Finite Amplitude Impulse Response simple climate model
FAO	Food and Agriculture Organization of the United Nations
FFI	Fossil-Fuel combustion and Industrial processes
F-gases	Fluorinated gases
GDP	Gross Domestic Product
GHG	Greenhouse Gas *
Gt	Gigatonnes
GW	Gigawatt
GWL	Global Warming Level
GWP100	Global Warming Potential over a 100 year time horizon *
HFCs	Hydrofluorocarbons
IEA	International Energy Agency
IEA-STEPS	International Energy Agency Stated Policies Scenario
IMP	Illustrative Mitigation Pathway
IMP-LD	Illustrative Mitigation Pathway - Low Demand
IMP-NEG	Illustrative Mitigation Pathway - NEGative emissions deployment
IMP-SP	Illustrative Mitigation Pathway - Shifting development Pathways
IMP-REN	Illustrative Mitigation Pathway - Heavy reliance on RENewables
IP-ModAct	Illustrative Pathway Moderate Action
IPCC	Intergovernmental Panel on Climate Change
kWh	Kilowatt hour
LCOE	Levelized Cost of Energy
LDC	Least Developed Countries *
Li-on	Lithium-ion
LK	Local Knowledge *
LULUCF	Land Use, Land-Use Change and Forestry *
MAGICC	Model for the Assessment of Greenhouse Gas Induced Climate Change
MWh	Megawatt hour
N_2O	Nitrous oxide
NDC	Nationally Determined Contribution
NF_3	Nitrogen trifluoride
O_3	Ozone
PFCs	Perfluorocarbons
ppb	parts per billion
PPP	Purchasing Power Parity

ppm	parts per million
PV	Photovoltaic
R&D	Research and Development
RCB	Remaining Carbon Budget
RCPs	Representative Concentration Pathways (e.g. RCP2.6, pathway for which radiative forcing by 2100 is limited to 2.6 Wm^{-2})
RFCs	Reasons for Concern *
SDG	Sustainable Development Goal *
SDPs	Shifting Development Pathways *
SF_6	Sulphur Hexafluoride
SIDS	Small Island Developing States *
SLCF	Short-Lived Climate Forcer
SPM	Summary For Policymakers
SR1.5	Special Report on Global Warming of 1.5°C
SRCCL	Special Report on Climate Change and Land
SRM	Solar Radiation Modification *
SROCC	Special Report on the Ocean and Cryosphere in a Changing Climate
SSP	Shared Socioeconomic Pathway *
SYR	Synthesis Report
tCO_2-eq	Tonne of carbon dioxide equivalent
tCO_2-FFI	Tonne of carbon dioxide from Fossil Fuel combustion and Industrial processes
TS	Technical Summary
UNFCCC	United Framework Convention on Climate Change
USD	United States Dollar
WG	Working Group
WGI	IPCC Working Group I
WGII	IPCC Working Group II
WGIII	IPCC Working Group III
WHO	World Health Organization
WIM	Warsaw International Mechanism on Loss and Damage under UNFCCC *
Wm^{-2}	Watts per square meter

* For a full definition see also Annex I: Glossary

Definitions of additional terms are available in the IPCC Online Glossary: https://apps.ipcc.ch/glossary/

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Annex V
List of Publications of the Intergovernmental Panel on Climate Change

Assessment Reports

Sixth Assessment Report

Climate Change 2021: The Physical Science Basis
Contribution of Working Group I to the Sixth Assessment Report

Climate Change 2022: Impacts, Adaptation, and Vulnerability
Contribution of Working Group II to the Sixth Assessment Report

Climate Change 2022: Mitigation of Climate Change
Contribution of Working Group III to the Sixth Assessment Report

Climate Change 2023: Synthesis Report
A Report of the Intergovernmental Panel on Climate Change

Fifth Assessment Report

Climate Change 2013: The Physical Science Basis
Contribution of Working Group I to the Fifth Assessment Report

Climate Change 2014: Impacts, Adaptation, and Vulnerability
Contribution of Working Group II to the Fifth Assessment Report

Climate Change 2014: Mitigation of Climate Change
Contribution of Working Group III to the Fifth Assessment Report

Climate Change 2014: Synthesis Report
A Report of the Intergovernmental Panel on Climate Change

Fourth Assessment Report

Climate Change 2007: The Physical Science Basis
Contribution of Working Group I to the Fourth Assessment Report

Climate Change 2007: Impacts, Adaptation and Vulnerability
Contribution of Working Group II to the Fourth Assessment Report

Climate Change 2007: Mitigation of Climate Change
Contribution of Working Group III to the Fourth Assessment Report

Climate Change 2007: Synthesis Report
A Report of the Intergovernmental Panel on Climate Change

Third Assessment Report

Climate Change 2001: The Scientific Basis
Contribution of Working Group I to the Third Assessment Report

Climate Change 2001: Impacts, Adaptation, and Vulnerability
Contribution of Working Group II to the Third Assessment Report

Climate Change 2001: Mitigation
Contribution of Working Group III to the Third Assessment Report

Climate Change 2001: Synthesis Report
Contribution of Working Groups I, II and III to the Third Assessment Report

Second Assessment Report

Climate Change 1995: Science of Climate Change
Contribution of Working Group I to the Second Assessment Report

Climate Change 1995: Scientific-Technical Analyses of Impacts, Adaptations and Mitigation of Climate Change
Contribution of Working Group II to the Second Assessment Report

Climate Change 1995: Economic and Social Dimensions of Climate Change
Contribution of Working Group III to the Second Assessment Report

Climate Change 1995: Synthesis of Scientific-Technical Information Relevant to Interpreting Article 2 of the UN Framework Convention on Climate Change
A Report of the Intergovernmental Panel on Climate Change

Supplementary Reports to the First Assessment Report

Climate Change 1992: The Supplementary Report to the IPCC Scientific Assessment
Supplementary report of the IPCC Scientific Assessment Working Group I

Climate Change 1992: The Supplementary Report to the IPCC Impacts Assessment
Supplementary report of the IPCC Impacts Assessment Working Group II

Climate Change: The IPCC 1990 and 1992 Assessments
IPCC First Assessment Report Overview and Policymaker Summaries and 1992 IPCC Supplement

First Assessment Report

Climate Change: The Scientific Assessment
Report of the IPCC Scientific Assessment Working Group I, 1990

Climate Change: The IPCC Impacts Assessment
Report of the IPCC Impacts Assessment Working Group II, 1990

Climate Change: The IPCC Response Strategies
Report of the IPCC Response Strategies Working Group III, 1990

Special Reports

The Ocean and Cryosphere in a Changing Climate 2019

Climate Change and Land
An IPCC Special Report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems 2019

Global Warming of 1.5 °C
An IPCC special report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. 2018

Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation 2012

Renewable Energy Sources and Climate Change Mitigation 2011

Carbon Dioxide Capture and Storage 2005

Safeguarding the Ozone Layer and the Global Climate System: Issues Related to Hydrofluorocarbons and Perfluorocarbons (IPCC/TEAP joint report) 2005

Land Use, Land-Use Change, and Forestry 2000

Emissions Scenarios 2000

Methodological and Technological Issues in Technology Transfer 2000

Aviation and the Global Atmosphere 1999

The Regional Impacts of Climate Change: An Assessment of Vulnerability 1997

Climate Change 1994: Radiative Forcing of Climate Change and an Evaluation of the IPCC IS92 Emission Scenarios 1994

Methodology Reports and Technical Guidelines

2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories 2019

2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol (KP Supplement) 2014

2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands (Wetlands Supplement) 2014

2006 IPCC Guidelines for National Greenhouse Gas Inventories (5 Volumes) 2006

Definitions and Methodological Options to Inventory Emissions from Direct Human-induced Degradation of Forests and Devegetation of Other Vegetation Types 2003

Good Practice Guidance for Land Use, Land-use Change and Forestry 2003

Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories 2000

Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories (3 volumes) 1996

IPCC Technical Guidelines for Assessing Climate Change Impacts and Adaptations 1994

IPCC Guidelines for National Greenhouse Gas Inventories (3 volumes) 1994

Preliminary Guidelines for Assessing Impacts of Climate Change 1992

Technical Papers

Climate Change and Water
IPCC Technical Paper VI, 2008

Climate Change and Biodiversity
IPCC Technical Paper V, 2002

Implications of Proposed CO2 Emissions Limitations
IPCC Technical Paper IV, 1997

Stabilization of Atmospheric Greenhouse Gases: Physical, Biological and Socio-Economic Implications

IPCC Technical Paper III, 1997

An Introduction to Simple Climate Models Used in the IPCC Second Assessment Report

IPCC Technical Paper II, 1997

Technologies, Policies and Measures for Mitigating Climate Change

IPCC Technical Paper I, 1996

For a list of Supporting Material published by the IPCC (workshop and meeting reports), please see www.ipcc.ch or contact the IPCC Secretariat, c/o World Meteorological Organization, 7 bis Avenue de la Paix, Case Postale 2300, Ch-1211 Geneva 2, Switzerland

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