

TECHNICAL
SPECIFICATION

ISO/TS
14092

First edition
2020-05

**Adaptation to climate change —
Requirements and guidance on
adaptation planning for local
governments and communities**

*Adaptation au changement climatique — Exigences et
recommandations relatives à la planification de l'adaptation pour les
autorités locales et les communautés*



Reference number
ISO/TS 14092:2020(E)

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Published in Switzerland

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 207, *Environmental management*, Subcommittee SC 7, *Greenhouse gas management and related activities*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

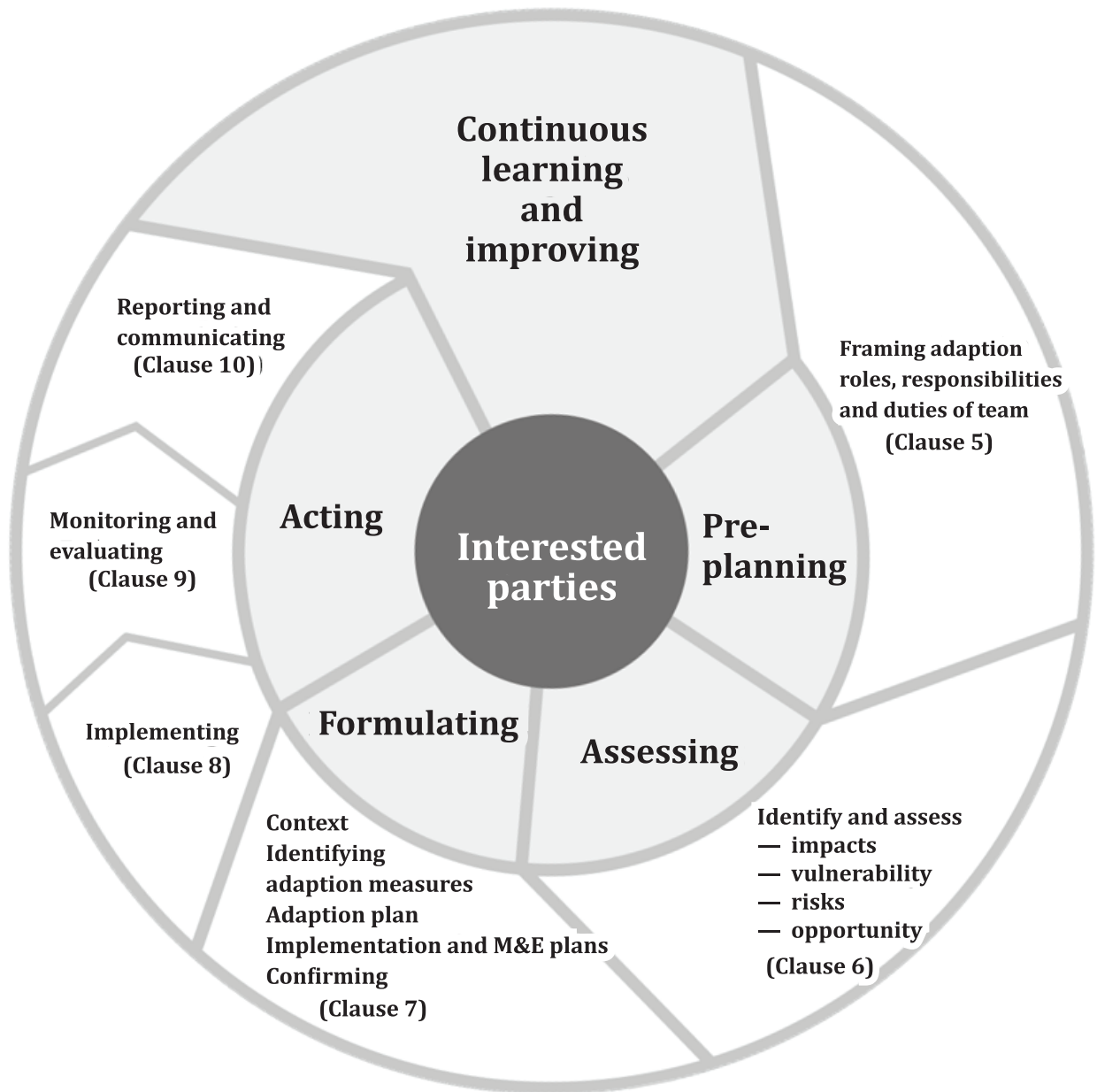
Introduction

Preparing for risks posed by climate change and planning for adaptation at local government and community levels is essential for the safety and security of society, as well as for its economic, environmental and social well-being. Changes in the climate are often reflected by floods, heatwaves, droughts, coastal erosion and other impacts that have been identified across the globe, which pose threats to life, property, economic well-being and to ecosystems. The UN Intergovernmental Panel on Climate Change (IPCC) has projected that global warming from past anthropogenic emissions will persist for centuries to millennia and will continue to cause further long-term changes in the climate system such as sea level rise, with associated impacts.

This document presents guidance for local governments and communities on how to prepare for such threats and the associated risks. The document recognizes that the impacts posed by climate change vary widely from region to region, and directly affect communities' well-being and local governments including the public services they offer, as well as the safety and security of individuals within their jurisdiction. It is the responsibility of local governments and communities to provide leadership in planning and preparing to manage these risks.

This document also describes how to develop an adaptation plan at the local government and community levels. The planning process details why and how to establish an appropriate (well-structured and collaborative) governance structure and the elements of the adaptation planning and implementation processes. These details include establishing a facilitation team, assessing risks and developing an effective plan, monitoring the progress of adaptation implementation and evaluating its achievement with the aim of improving the plan. The step-by-step process presented enables tailoring of the local adaptation plan to suit the climate, environmental and societal conditions in each case. Following this document will lead to developing a robust, effective adaptation plan that can be implemented, promoting appropriate climate action today and in the future.

It is important to note that the climate is changing, and planning and implementing adaptation is a continual learning and improvement process that requires sustained attention and action. This document will help local governments and communities in taking initial action to create a safe, socially and economically secure and sustainable society that is resilient to current and future impacts of climate change.



NOTE The graph is designed to be interpreted clockwise.

Figure 1 — Logical framework of this document

Adaptation to climate change — Requirements and guidance on adaptation planning for local governments and communities

1 Scope

This document specifies requirements and guidance on adaptation planning for local governments and communities.

This document supports local governments and communities in adapting to climate change based on vulnerability, impacts and risk assessments. In working with relevant interested parties, it also supports the setting of priorities, and the development and subsequent updating of an adaptation plan.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

adaptation to climate change **climate change adaptation**

process of adjustment to actual or expected *climate* (3.3) and its effects

Note 1 to entry: In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities.

Note 2 to entry: In some natural systems, human intervention can facilitate adjustment to expected climate and its effects.

[SOURCE: ISO 14090:2019, 3.1]

3.2

adaptive capacity

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

Note 1 to entry: Coping capacity is defined as the ability of people, *organizations* (3.17), and systems, using available skills, resources, and opportunities, to address, manage, and overcome adverse conditions.

[SOURCE: ISO 14090:2019, 3.2, modified — Note 1 to entry has been added.]

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3.3

climate

statistical description of weather in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands or millions of years

Note 1 to entry: The classical period for averaging these variables is 30 years, as defined by the World Meteorological Organization.

Note 2 to entry: The relevant quantities are most often near-surface variables such as temperature, precipitation, and wind.

[SOURCE: ISO 14090:2019, 3.4]

3.4

climate change

change in *climate* (3.3) that persists for an extended period, typically decades or longer

Note 1 to entry: Climate change can be identified by such means as statistical tests (e.g. on changes in the mean, variability).

Note 2 to entry: Climate change might be due to natural processes, internal to the climate system, 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.

[SOURCE: ISO 14090:2019, 3.5]

3.5

climate projection

simulated response of the *climate* (3.3) system to a scenario of future emission or concentration of greenhouse gases and aerosols, generally derived using climate models

Note 1 to entry: Climate projections are distinguished from climate predictions in order to emphasize that climate projections depend upon the emission/concentration/radiative forcing scenario used, which are based on assumptions concerning, for example, future socioeconomic and technological developments that may or may not be realized.

[SOURCE: Adapted from IPCC, 2014]

3.6

climate scenario

plausible and often simplified representation of the future *climate* (3.3), based on an internally consistent set of climatological relationships that has been constructed for explicit use in investigating the potential consequences of anthropogenic *climate change* (3.4)

Note 1 to entry: Climate scenario often serves as input to *impact* (3.10) models.

[SOURCE: Adapted from IPCC, 2014]

3.7

community

group of people with an arrangement of responsibilities, activities, relationships and with common interests in *impacts* (3.10) of *climate change* (3.4)

Note 1 to entry: A community can also be an *organization* (3.17) or institute (i.e. hospital, school, volunteer group, etc.) comprised of a group of people living or working in the same place or having a particular characteristic in common.

3.8

exposure

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 affected

Note 1 to entry: Exposure can change over time, for example as a result of urban development and land use change.

[SOURCE: ISO 14090:2019, 3.6, modified — Note 1 to entry has been modified.]

3.9

hazard

potential source of harm

Note 1 to entry: The potential for harm can be in terms of loss of life, injury or other health *impacts* (3.10), as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems and environmental resources.

Note 2 to entry: In this document, the term usually refers to climate-related physical events or trends or their physical impacts.

Note 3 to entry: Hazard comprises slow-onset developments (e.g. rising temperatures over the long term) as well as rapidly developing climatic extremes (e.g. a heatwave or a landslide) or increased variability.

[SOURCE: ISO 14090:2019, 3.7]

3.10

impact

effect on natural and human systems

Note 1 to entry: In the context of *climate change* (3.4), the term “impact” is used primarily to refer to the effects on natural and human systems of extreme weather and climate events and of climate change. Impacts generally refer to effects on lives, livelihoods, health, ecosystems, economies, societies, cultures, services and infrastructure due to the interaction of climate change or *hazardous* (3.9) climate events occurring within a specific time period and the *vulnerability* (3.21) of an exposed society or system. Impacts are also referred to as consequences and outcomes. The impacts of climate change on geophysical systems, including floods, droughts and sea level rise, are a subset of impacts called “physical impacts”.

[SOURCE: ISO 14090:2019, 3.8]

3.11

incremental change

small adjustments made towards a targeted result

3.12

indicator

quantitative, qualitative or binary variable that can be measured or described, in response to a defined criterion

[SOURCE: ISO 13065:2015, 3.27]

3.13

interested party

person or *organization* (3.17) that can affect, be affected by, or perceive itself to be affected by a decision or activity

EXAMPLE *Communities* (3.7), citizens, suppliers, customers, regulators, non-governmental organizations, investors, employees and academia.

Note 1 to entry: To “perceive itself to be affected” means the perception has been made known to the organization.

[SOURCE: ISO 14001:2015, 3.1.6, modified — Example has been modified.]

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3.14

local adaptation plan

action plan identifying and addressing the *impacts* (3.10) of *climate change* (3.4) in the area of responsibility of a *local government* (3.15) or *community* (3.7)

Note 1 to entry: Such plan of action may contain priorities and planned activities for identifying and addressing the impacts of climate change, including those associated with climate variability and extremes. It may include a mix of policies, projects, programmes and measures, which are updated periodically.

3.15

local government

administration of a specific local area constituting a subdivision of a major political unit (such as a nation or state), and the services they provide (i.e. state, prefecture, province, county, district, city, town, etc.)

3.16

national adaptation plan

national document containing adaptation priorities and planned activities (policies, projects and programmes) including an implementation strategy for a given period (e.g. 3 to 5 years)

Note 1 to entry: The main output of the process to formulate and implement national adaptation plans (NAPs) established under the UNFCCC in 2010 as a means to enable Parties to identify medium- and long-term adaptation needs and develop and implement strategies and programmes to address those needs.

[SOURCE: United Nations Framework Convention on Climate Change, 2017]

3.17

organization

person or group of people that has its own functions with responsibilities, authorities and relationships to achieve its objectives

Note 1 to entry: The concept of organization includes, but is not limited to sole-trader, company, corporation, firm, enterprise, authority, partnership, charity or institution, or part or combination thereof, whether incorporated or not, public or private.

[SOURCE: ISO 14001:2015, 3.1.4]

3.18

risk

effect of uncertainty

Note 1 to entry: An effect is a deviation from the expected. It can be positive, negative or both. An effect can arise as a result of a response, or failure to respond, to an opportunity or to a threat related to achieving defined objectives.

Note 2 to entry: Uncertainty is the state, even partial, of deficiency of information related to, understanding or knowledge of an event, its consequence, or likelihood.

Note 3 to entry: Risk is often characterized by reference to potential “events” (as defined in ISO Guide 73:2009, 3.5.1.3) and “consequences” (as defined in ISO Guide 73:2009, 3.6.1.3), or a combination of these.

Note 4 to entry: Risk is often expressed in terms of a combination of the consequences of an event (including changes in circumstances) and the associated “likelihood” (as defined in ISO Guide 73:2009, 3.6.1.1) of occurrence.

[SOURCE: ISO 14001:2015, 3.2.10, modified — Note 1 to entry has been modified.]

3.19 sensitivity

degree to which a system or species is affected, either adversely or beneficially, by *climate* (3.3) variability or *climate change* (3.4)

Note 1 to entry: The effect may be direct (e.g. a change in the health and functioning of green infrastructure 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).

[SOURCE: Adapted from IPCC, 2014]

3.20 transformation

change in the fundamental attributes of natural and human systems

[SOURCE: ISO 14090:2019, 3.14]

3.21 vulnerability

propensity or predisposition to be adversely affected

Note 1 to entry: Vulnerability encompasses a variety of concepts and elements including *sensitivity* (3.19) or susceptibility to harm and lack of capacity to cope and adapt.

Note 2 to entry: Vulnerability is the degree to which an ecological, social and economic system is susceptible to, or unable to cope with, adverse *climate change* (3.4) *impacts* (3.10), including *climate* (3.3) variability and extremes.

[SOURCE: ISO 14090:2019, 3.15, modified — Note 2 to entry has been added.]

4 Principles

4.1 Accountability

The local government and community acknowledge and assume responsibility for their climate change adaptation. They accept appropriate scrutiny, and also accept a duty to respond to this scrutiny.

NOTE 1 This principal refers to ISO 14090.

NOTE 2 The community acknowledges its role in collaborating with local government in adaptation activity.

4.2 Continual learning and improvement

Continual learning and improvement are fundamental for climate change adaptation where there are uncertainties in knowledge, but also continual changes in the drivers of change, the knowledge and evidence available, and the context within which the responses are to be identified and implemented.

4.3 Flexibility

Allow various measures to meet goals and objectives by taking technical, social, administrative, political, legal, environmental and economic circumstances into account to accommodate a wide range of data availabilities and technical and institutional capacities.

4.4 Mainstreaming and embedding

Climate change adaptation is most effective when it is integrated into the local government's and community's operations (such as policies, plans, procedures, risk management and implementation).

NOTE 1 This principal refers to ISO 14090.

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NOTE 2 A community's understanding and endorsement of this integration is essential to success.

4.5 Practicality

Set goals and objectives to be practical and achievable. Impractical goals might prevent climate change adaptation from achieving or effectively achieving the desired benefits. Focus on indicators/metrics that are relatively easy to measure and where the underlying data are available. Aggregate and compare them across scales so as not to put in place additional burdens.

4.6 Prioritization

At the time of identifying the content of adaptation plans including the adaptation measures to implement, it is not necessary or always possible to cover all areas. The local government and community should prioritize the climate change impacts in order to determine where adaptation needs are higher by assessing the relative characteristics of the impacts (magnitude, likelihood and urgency). This should also take into account the capacities of interested parties and the capacities and opportunities of the local government and community to act.

4.7 Proportionality

Undertake actions that are the most effective under the current circumstances [contexts within which the local government and community are operating (economic, social, cultural and political), capabilities, knowledge and evidence base] when identifying and assessing adaptation measures, while also aspiring to continual improvement.

4.8 Relevance

Facilitate assessments leading to information for adaptation planning that is meaningful to decision-makers and practitioners, including at appropriate spatial scales and for relevant time durations.

4.9 Transparency

Reports and communications on the climate change adaptation are based on an open, comprehensive and understandable presentation of information for interested parties.

NOTE This principal refers to ISO 14090.

5 Pre-planning

5.1 General

The local government and community shall agree and decide on the process and means for formulating an adaptation plan prior to undertaking the planning. It should be recognized that there are benefits to having a collaborative relationship between plans formulated at the local government and community levels. It is the responsibility of the local government and the community to formulate an adaptation plan that aims to avoid or minimize damage and loss, etc. that could be caused by the impacts of current and future climate change within their jurisdiction or area of responsibility.

The local government and community shall prepare:

- for the adaptation planning to be formulated according to [Clauses 6 to 10](#);
- so that the planning process is not limited, interrupted or halted due to insufficient preparation.

The local government and community should consider their level of preparation and the nature and scope of the preparation to deliver the process, and reconsider these when they reassess or revise the adaptation plan.

5.2 Framing adaptation

The local government and community should establish, implement and maintain an adaptation policy.

The adaptation policy shall:

- a) be appropriate for the purpose and context of the jurisdiction, giving consideration to relevant legislation and any policies or plans (e.g. spatial, economic or municipal plans), and to climate change impacts and associated vulnerabilities of the activities, services, etc.;
- b) provide a framework for setting adaptation objectives, boundaries and timescales;
- c) include a commitment to facilitate the development and implementation of the adaptation policy;
- d) include a commitment to continual improvement of the local adaptation plan, as well within the associated implementation, and a commitment to monitoring and evaluation plans to enhance the adaptation plan's effectiveness and performance;
- e) be long term and sustainable while being timely and effective;
- f) be recorded, revisited and amended according to changing priorities;
- g) be communicated within the entity and to interested parties as appropriate.

5.3 Roles, responsibilities and duties of the teams

5.3.1 Core decision-making team

The local government and community shall identify and appoint members of a core decision-making team. This team should involve the governor, mayor or equivalent position, and leaders of departments or sections who have decision-making authority in the local government and community.

This core decision-making team shall:

- have the power for taking those decisions made in the process of the preparation and planning;
- take accountability for the formulation of the local adaptation plan and the effectiveness of the actions specified in the plan;
- communicate the importance of effective adaptation and its management, and of conforming to the adaptation framework requirements within their jurisdiction and area of responsibility;
- approve and support the actions of the facilitation team and relevant persons to contribute to the effectiveness of the adaptation action;
- support other relevant management roles to demonstrate their leadership as it applies to their areas of responsibility;
- mobilize financial resources;
- seek cooperation and assistance from appropriate parties, such as the state, higher governance/administrative entities, neighbouring local governments and communities, if and where necessary.

5.3.2 Facilitation team

The local government and community should establish a facilitation team to lead the adaptation planning process. In establishing a facilitation team, the core decision-making team shall endorse its constitution, including agreeing and approving its membership and the scope of the actions to be undertaken by it.

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A facilitation team should include:

- members from relevant departments whose areas of responsibility cover sectors and areas in which climate change impacts are recognized;
- one or more experts whose speciality is in climate science, disaster management, ecosystems, economic and social science, and other areas that are relevant to impact, vulnerability, exposure and adaptation assessments.

In the preparation process, the facilitation team should:

- establish its roles and responsibilities;
- establish a network with relevant organizations such as higher administration levels, research institutes, universities, local meteorological agencies and other institutes that provide necessary and credible information or evidence that are needed to support the planning process;
- review the national adaptation plan and other relevant policies and programmes (see [7.2](#)) to identify and bring for consideration relevant aspects, including strategies and plans that should be considered within the adaptation planning process.

The facilitation team working with the engaged interested parties should establish a work programme for the adaptation planning process including:

- the different steps and tasks comprising the adaptation planning process;
- proposed timing and resources associated with each step and task;
- expectations as to roles and responsibilities of members of the team and engaged interested parties;
- risks and risk management measures associated with undertaking the adaptation planning process;
- expected decision points and outcomes for each step and task.

The facilitation team should seek confirmation from the core decision-making team regarding elements of the work programme.

Missions of a facilitation team should include:

- confirming the progress of planning and sharing with the core decision-making team, relevant departments, and experts and interested parties;
- identifying challenges and difficulties found in the planning process and seeking solutions;
- promoting collaboration among relevant departments, experts and interested parties;
- promoting continual improvement;
- sharing information on adaptation measures and their implementation, particularly in the context of monitoring and evaluation, and cross-sector/functional implications;
- engaging with interested parties to foster their involvement in the adaptation planning process and implementation, including through the use of informational mechanisms and forums for public participation.

The facilitation team should assess the adaptive capacity and capabilities of the local government and community and determine the scope of the adaptation actions by:

- identifying the required levels of expertise, knowledge, information and data sources, and their availability and gaps;
- ensuring that the adaptation policy and objectives are established and are compatible with the strategic direction and the context of the local government and community;

- ensuring that the resources needed for the adaptation actions are available;
- assessing its capability to undertake climate change adaptation, and identifying any gaps and means of addressing these;
- assessing the identified potential adaptation measures in terms of their contributions to achieving the intended outcomes.

The facilitation team shall document the results of their assessments, including the basis for those results, as well as identify and describe capacity gaps so as to inform the need for further action.

5.3.3 Interested parties

The local government and community shall identify and engage interested parties to enhance the legitimacy and breadth of knowledge and expertise considered within the adaptation planning process and to engender broader commitment to the outcomes of the process. The facilitation team should develop a plan to engage with interested parties early and throughout the adaptation planning process. There should be an analysis to support the identification of interested parties, including identifying who will be affected by climate change or adaptation measures and who can influence and inform the adaptation planning process. This analysis should lead to a strategy and plan as to whom, how and when they should be engaged. When engaging them, it is also important to understand their perspectives on risks, potential solutions and implementation, as well as monitoring and evaluating adaptation measures. Consultation with and engaging interested parties can also facilitate knowledge sharing about climate change adaptation as well as participation in the climate change adaptation process.

Interested parties can include:

- citizens and people who live, work, commute to or visit the area within the jurisdiction of the local government and community;
- entities under the authority of the local government and community, e.g. public service suppliers such as gas, water and transport;
- private sector (business and industry) within the jurisdiction or area of responsibility of the local government and community;
- regulatory authorities;
- neighbouring local, regional governments or communities, and national government authorities;
- non-governmental organizations.

5.3.4 Agreement and approval

The local government and community shall agree on and approve the formulation of the local adaptation plan. The agreement should involve relevant departments of the sectors where current and future impacts of climate change are identified or recognized. The approval should involve all the leaders of the said departments and the core decision-making team of the local government and community.

6 Assessing climate change impacts including opportunities

6.1 General

The local government and community shall identify property (including open space), infrastructure, services, and social and economic activities under their control or that they influence that are currently vulnerable and exposed to climate variability and change. This knowledge will provide an initial focus for gathering information and data, as well as for the adaptation planning process including engagement efforts. The facilitation team and interested parties engaged should prioritize the climate change impacts in order to determine where adaptation needs are higher by assessing the

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relative characteristics of the impacts (magnitude, likelihood and urgency). Assessing such impacts and associated vulnerability is crucial for the local government and community to support efforts related to identifying potential adaptation measures and when formulating the local adaptation plan. It is important to identify these potential adaptation measures in the context of their contributions to achieving the desired objectives and outcomes.

The local government and community should consider including:

- target sectors and areas to be assessed;
- boundaries (for further details, see ISO 14090:2019, Annex A);
- the particular social groups (e.g. rural communities, elderly people, indigenous people, women/men, certain parts of the workforce) to be considered;
- the range of hazards to be included (e.g. flooding, rising temperatures, sea level rise, heatwaves);
- the scenarios to be used (e.g. climate scenario, socio-economic or demographic scenario);
- the time horizon of the assessment (e.g. 30, 50 or 100 years from now);
- resolution of the assessment (decision on spatial scale might be influenced by the availability of data and evidence relevant to the assessment).

6.2 Identifying climate change

The local government and community, with the assistance of relevant experts if needed, shall identify past and future trends in average and extreme conditions and changing variability and seasonality of relevant parameters in the area, sectors or systems of concern.

Parameters of climate change can include:

- surface temperature (sea and atmospheric);
- precipitation;
- humidity;
- sea level rise;
- wind speed and direction;
- freeze–thaw cycles.

For that purpose, the local government and community should collect information relating to those parameters and other climate information for which past experience has shown would be reasons for concern or for which there are known sensitivities for areas, sectors or systems of concern.

The local government and community, with the assistance of relevant experts if needed, should collect information on observation and projection data of local climate parameters, which may be obtained from organizations working on climate change, e.g. the United Nations and related organizations, national regulatory authorities, state and local agencies, universities, national weather service providers and other research institutes.

The local government and community, with the assistance of relevant experts if needed, should also seek other sources including scientific reports, relevant climate change impact assessments, governmental and intergovernmental publications, and databases.

The local government and community shall document the data and information sources used, the criteria used for their selection, and how the data and information were used, including the consideration of limitations and uncertainties.

6.3 Assessing climate change impacts

The local government and community shall assess current and future impacts of climate change in the area. The assessment should include a consideration of slow onset impacts as well as sudden impacts due to extreme events.

NOTE Slow onset impacts can put increasing pressure on infrastructure and services as a result of incrementally increasing maintenance costs and shortening of asset lifespans (e.g. drainage system).

When the local government and community assess climate change impacts, they should assess climate change impacts that could be significant in the area, sector or systems of concern based on their divisional structure, which may include the following:

- agriculture, livestock, fishery and food security;
- water resources and flood protection;
- forests, urban forestry and parks;
- terrestrial and marine ecosystems; coastal and riverine;
- energy;
- business and industry including tourism;
- transportation;
- ICT and telecommunications;
- social infrastructure;
- human health, including health and social care systems;
- urban environment;
- government and community services;
- financial sector, including banking and insurance.

Climate change impacts should be assessed comprehensively, covering cross-cutting (systemic) issues including impacts directly and indirectly on the local government and community, their well-being, and the livelihood, safety and well-being of their citizens.

Examples of direct impacts include:

- flooding and storm surges;
- water scarcity;
- changes in human health, safety and security;
- heatwave mortality.

Examples of indirect impacts include:

- changing productivity of crops and livestock, and what these mean for food security;
- changes in land use and cover;
- changes in the provision of ecosystem services;
- loss or damage of infrastructure and disruption of the services they provide;
- increases in financial risk as a result of financial institutions placing a risk premium on investment;

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- loss or damage of the built environment;
- disruption to supply chains and distribution networks;
- impacts on services and operations;
- impacts on health and care systems, safety and productivity;
- impacts of regulation or other government interventions;
- resulting business opportunities;
- changes in the levels of contamination;
- changes in the risk of landslide;
- changes in air quality.

Impact assessments can involve analysing the following influencing factors:

- relevant internal and external policies, including national policy;
- strategies, including associated organizations' strategies and programmes;
- life cycle of policies, plans and assets (e.g. maintenance and replacement time frames);
- existing climate adaptation actions by the local government and community themselves, as well as those being taken by relevant organizations;
- climate adaptation actions taken by third parties.

The local government and community should collect information on the observation and projection data of climate change impacts, which may be obtained from organizations working on climate change, e.g. the United Nations and related organizations, national regulatory authorities, state and local agencies, universities, national weather service providers and other research institutes.

The local government and community should also seek other sources for this data and information, including scientific reports, relevant climate change impact assessments, governmental and intergovernmental publications, and databases.

There could be some areas where data on projections of climate change impacts are not available, or where local specific climate data are not be sufficiently resolved for smaller areas.

If data on projections of climate change impacts are not available for the jurisdiction or area of responsibility, the local government and community should identify whether the data at the national level are available and relevant.

When the local government and community finds that the existing information on projections of climate change and its impacts is insufficient for the intended purpose, they may need to develop their own projections of climate change and associated impacts by using more appropriate and local climate models as well as local knowledge and expert judgement to enhance the results from existing sources. When the local government and community do not have appropriate human resources capable of developing such projections, they may outsource the development to relevant government authorities, universities, research institutes or private organizations, etc.

The local government and community shall document the data and information sources used, the criteria used for their selection and how the data and information were used, including the consideration of limitations and uncertainties.

The local government and community should share the sources of the information used for impact assessments with interested parties.

The assessment shall be made by competent persons or organizations, either internal or external. When the local government and community do not have appropriate human resources capable of performing such an assessment, they may outsource the assessment to relevant authorities, universities, research institutes or private organizations, etc.

The local government and community should identify whether the impacts of climate change provide opportunities and the nature and scope of those opportunities, including factors that could limit realizing them.

The local government and community should document the findings of their impact assessment to share internally and externally.

The climate change impact assessment should be reassessed and updated as necessary to reflect changes in local strategy, external environment and influences, and knowledge about climate change. The means and basis for reassessing and updating the assessment should be clearly laid out within a monitoring and evaluation plan (see [7.6.6](#)).

6.4 Impact assessment methods

6.4.1 General

There is a range of methods that may be used by the local government and community to undertake their climate change impact assessment.

Methods to assess impacts can include:

- risk assessment;
- vulnerability assessment;
- threshold analysis.

The local government and community shall adopt the method that best suits their needs and situation (e.g. capacities, knowledge, data availability).

Impact assessment methods may need to utilize information and data on non-climate factors including their projected changes:

- demographics;
- trade patterns;
- land use;
- policies and programmes;
- socio-economic and environmental factors;
- technological developments.

Data (climate and non-climate) availability and uncertainty are significant challenges within all aspects of the adaptation planning process. The local government and community should determine practical and feasible assessment methods according to available data or other conditions. For example, observed climate data and model-based climate projections are not always available at the desired spatial and/or temporal resolutions for many parts of the world. Additionally, observed climate data, as well as model-based climate scenarios and other climate and non-climate projections, including climate change impacts, have inherent uncertainties that should be considered when using them within the assessment process.

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6.4.2 Risk assessment

If a risk assessment approach is adopted, the risk assessment may include:

- the hazard and the likelihood of occurrence;
- the associated consequences or impacts;
- the identification of the nature of associated vulnerabilities and exposure to the hazards.

NOTE The identification of the exposure of activities and services considers those related to changes in climate and changes in climate hazards.

It is valuable to first perform a risk assessment based upon the current climate, including historical climate and trends, variability and climate events. The focus can then move on to understanding the risks under future climate and non-climate trends, climate events and climate change impacts over the full lifespan of a decision.

The local government and community should identify areas and sectors of high risks (e.g. relative magnitude, likelihood, urgency) as high-priority areas and sectors and take actions to address them.

The local government and community should understand that there are multiple methodologies to assess risks relating to climate change impacts.

6.4.3 Vulnerability assessment

If a vulnerability assessment approach is adopted, the vulnerability assessment for the local government and community may include:

- determination of the sensitivity of activities, assets and services to changes in climate and changes in climate hazards;
- consideration of the ability of the local government and community to adjust, take advantage or to respond to these changes and consequences, i.e. adaptive capacity (see [6.5](#)).

The local government and community may also include:

- identification of the exposure of activities, assets and services to changes in climate and changes in climate hazards;
- identification of the potential impacts of climate change on activities, assets and services as a result of changes in climate and changes in climate hazards.

It is valuable first to perform an assessment of exposure, sensitivity and adaptive capacity under the current climate, including historical climate and trends, variability and climate events. The focus can then move on to understanding exposure, sensitivity and adaptive capacity under future climate and non-climate trends, climate events and climate change impacts over the full lifespan of a decision.

The local government and community should understand local vulnerability and exposure to impacts of climate change consistent with the reasons for concern (see [6.2](#)), e.g. torrential rain and high temperatures, particularly for vulnerable populations, to inform prioritizing for action areas and sectors highly vulnerable or exposed to climate change impacts.

6.4.4 Thresholds analysis

Thresholds analysis is an approach to prioritize where and when action will be needed by understanding the points at which a system is deemed to be no longer effective (economically, socially, technologically or environmentally) as a result of changes in the average or extreme climate conditions.

If a threshold analysis approach is adopted, the threshold analysis may include:

- identification of the system's constituent components, their dependencies and interdependencies;

- identification of systemic thresholds beyond which system performance will be unacceptably altered;
- climate thresholds at which operations and activities reach intolerable levels of performance.

It is valuable to first perform an analysis of the system under current climate conditions, including historical climate trends, variability and climate events. The focus can then move on to understanding factors influenced by future climate and non-climate trends, climate events and climate change impacts over the full lifespan of a decision.

The local government and community should recognize the fact that appropriate adaptation measures differ depending on a number of factors, including the extent of the climate change impacts. For example, some kinds of plants and trees used in urban areas and communities may not be sustainable under projected changes in climate. It is desirable to develop adaptation measures (e.g. through using an adaptation pathway methodology) that reflect on and address such thresholds.

NOTE See [6.4.4](#) and ISO 14090:2019, Annex B.

6.4.5 Defining areas and sectors where adaptation is needed

The local government and community shall define areas or sectors where effective and efficient adaptation measures and priorities for action are needed.

The local government and community shall assess the information on climate change impacts collected by the procedure mentioned above, particularly noting their respective magnitude, probability, irreversibility, persistent vulnerability or exposure, timing, and limited potential to reduce risks through climate change adaptation provided by existing coping or adaptation measures, and then prioritize it based on this assessment.

For this purpose, the local government and community may establish a technical council with competent experts who have knowledge of climate change impacts and of potential adaptation measures in each sector/issue as necessary.

The local government and community may conduct questionnaire surveys or participatory workshops with interested parties to identify and explore issues such as the perception of the climate change impact assessment in various areas and sectors, and the needs for adaptation measures from the perspectives of the interested parties.

The interested parties may, in this case, also include local residents, private organizations and local communities in their jurisdictions.

6.5 Assessing adaptive capacity

The local government and community shall assess their existing adaptive capacity to address the impacts of climate change identified in [6.4](#), including the available:

- human resources;
- technical resources;
- financial resources;
- informational resources;
- other institutional capabilities.

For the local government and community, major challenges include a lack of:

- knowledge of climate change adaptation;
- knowledge of the impacts, risks, uncertainties coming from climate and non-climate projections and scenarios;

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- knowledge and evidence related to interdependencies across risks and response measures;
- knowledge related to prioritizing risks and actions.

In assessing their adaptive capacity, the local government and community should analyse the extent to which they:

- have leadership and commitment to the adaptation process;
- have the competence (the ability) to identify the risks that are relevant to their capability levels, to know what to do about them, and to act on that understanding effectively;
- are able to ensure key decision-makers, including the governor or the mayor, city council and other political parties, are made aware of the need to address climate change;
- have expertise internally on climate change adaptation;
- can access expertise to seek advice externally on climate change adaptation;
- can formalize institutional and other structures that define roles and responsibilities clearly and permits the effective delivery of actions, and can remain flexible to new adaptation opportunities for improved actions;
- can engage in meaningful and timely dialogue with interested parties;
- can develop collaborative approaches to design intervention strategies that work across key decision-making interested parties;
- can construct partnerships with external organizations (e.g. neighbouring local governments, private organizations);
- are able to learn from experience to improve decisions over time, embedding knowledge and learning in decisions, including continual changes in the drivers of change, the knowledge and the context within which the responses are to be implemented;
- can assess the adaptive capacity of those expected to implement the identified adaptation measures.

The local government and community shall document the identified gaps in their adaptive capacity. Based on this documentation, the local government and community should consider adaptive capacities that need to be reinforced during the adaptation planning.

The local government and community may consider utilizing funding mechanisms or subsidies to fill identified financial gaps. Those mechanisms to consider may include financial support programmes such as those under the United Nations and other international bodies, national or subnational and private subsidiary schemes, or relevant climate bonds and green bonds.

The local government and community may also consider the use of these financial support options while preparing the adaptation plan.

The local government and community shall develop capabilities where gaps exist. Collaborative approaches, particularly with the state, neighbouring communities and local private sectors, to co-design and co-develop the required capacities shall be used where appropriate.

6.6 Identifying opportunities

The local government and community shall identify those opportunities that can arise from climate change, including those that result from a changing climate and those as a result of taking action.

Climate change impacts can also have positive effects. The local government and community can take advantage of the potential benefits brought by climate change to vitalize or revive the community and industry in the region while enhancing society security and safety.

Where opportunities requiring action have been identified, the local government and community should document any trade-offs between these and their other policies or strategies.

The local government or the community should recognize when assessing potential opportunities what or how much change is projected to occur for their activities and services as a result of projected future climate change and its impacts.

The local government and community should consider the possibilities for improving its activities and services or creating new ones that are limited or not possible under current climate conditions. For instance, the local government and community may introduce new urban greening options or introduce new business opportunities relating to an improved climate or build on their climate risk management processes.

6.7 Identifying uncertainties

There are inherent uncertainties in climate and other scenarios, climate projections and other forms of data used in adaptation decision-making, including those derived from observation and monitoring systems, and the results of models and of impact assessments. The local government and community shall understand sources of uncertainty and how these propagate through the forms of analysis undertaken.

NOTE 1 Climate and other projections and scenarios often provide broad ranges or distributions of values and these ranges reflect the associated uncertainties.

Levels of analysis on uncertainty should be appropriate to the needs and the situation of the local government and community. The local government and community may not have enough knowledge and information on uncertainties. In such cases, they may seek advice or assistance from relevant authorities, universities, research institutes or private organizations, etc.

NOTE 2 ISO 14033 provides guidelines on systematic and methodical acquisition and review of quantitative environmental information and data with regards to uncertainty.

NOTE 3 Different climate variables have a different level of uncertainty, e.g. the level of confidence in projected temperature trends is high, the level of confidence in projected trends in precipitation is medium, the level of confidence in projected trends in wind is low.

The local government and community shall document the methods used and assumptions made when dealing with uncertainty, along with the sources of data and information and their limitations.

If the local government and community have used assistance outside of the entity, they should record the relevant information, including information and expertise sources such as the names of the institutions engaged.

7 Formulating the adaptation plan

7.1 General

The local government and community shall aim to undertake an adaptation planning process to secure people's life and property from the adverse impacts, both current and in the future, while taking advantage of opportunities as a result of climate change and those arising from adaptation measures introduced. This planning process shall lead to the local government and community preparing an adaptation plan.

The local government and community shall incorporate and embed climate change adaptation into their policies, strategies and plans that are directly or indirectly related to the scope of the adaptation plan.

The local government and community shall develop the plan working with interested parties so that:

- the planning will be harmonized with other relevant policies, strategies and plans;

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- adaptation measures adopted in the plan will minimize or eliminate potential conflicts with other policy and programme issues both within and outside their jurisdiction or area of responsibility.

Adaptation planning is the action of assembling an adaptation plan from varied sources of knowledge, information and data, in the context of existing policies, strategies, planning and decision-making processes. The local government and community should seek advice from research institutes, universities, local meteorology agencies, etc. The local government and community shall ensure that the institutes stated above are credible and legitimate suppliers of expertise, data and information related to climate change and its impacts.

The facilitation team shall:

- lead the planning process;
- encourage, enable and empower relevant departments to take part in the planning;
- share the progress of the planning within the jurisdiction;
- document information and findings, and report to the core decision-making team, relevant departments and the interested parties;
- obtain confirmation and approval of the planning from the core decision-making team and the leaders of sectors that take part in the planning as necessary.

7.2 Planning considering the policy context

The local government and community shall review the national adaptation plan and the adaptation plans of organizations, as well as other bodies within or affecting their jurisdiction or area of responsibility, while identifying potential synergies, complementarities and conflicts with their adaptation planning. The local government and community should determine the following:

- scope;
- objectives and priorities;
- climate change impacts;
- adaptation actions to be implemented;
- timing of actions.

The local government and community shall identify relevant internal and external policies, strategies and plans that affect or will be affected by their adaptation planning.

The local government and community shall:

- recognize the dependencies and interdependencies between such policies, strategies, plans and the adaptation plan;
- ensure that the adaptation planning is consistent and harmonized with the policies, strategies and plans identified above.

The local government and community shall identify the items relevant to local adaptation planning as specified in:

- national policies and adaptation activities of organizations and other bodies within or impacting their jurisdiction or area of responsibility;
- legal and other requirements;
- internal policies and strategies other than the adaptation plan (e.g. city/infrastructure development plan, sustainability policy);

- sector specific standards, guidelines and codes of practice;
- national, regional and neighbouring communities' adaptation plans and strategies.

When establishing a local adaptation plan, the local government and community may state the relationships with:

- the UNFCCC Paris Agreement;
- the United Nations Sustainable Development Goals: Goal 13 Climate Action and other related goals;
- the Sendai Framework for Disaster Risk Reduction;
- the New Urban Agenda (Habitat III).

7.3 Identification of potential adaptation measures

Potential adaptation measures are those that can address the previously identified vulnerabilities and risks. The local government and community shall identify a range of possible climate change adaptation measures, including green (ecosystem-based adaptation), soft (building adaptive capacity, e.g. knowledge generation) and grey (infrastructure and technology) measures, as well as measures that are incremental or transformative.

The local government and community should:

- identify and collect, in a portfolio, a range of potential climate change adaptation measures that address the previously identified objectives;
- identify and consider examples of good adaptation practices.

7.4 Assessment of adaptation measures

The local government and community should assess which potential climate change adaptation measures are best suited to their needs and capability, using decision-making methods suitable for their context and climate change.

When establishing a local adaptation plan, the local government and community should identify an appropriate approach for assessing the adaptation measures including:

- cost benefit analysis (CBA), which is a form of economic analysis that assigns a monetary value to the measure of effect;
- cost effectiveness analysis (CEA), which is a form of economic analysis that compares the relative costs and outcomes (effects) of different courses of action;
- multi-criteria decision analysis (MCDA), which evaluates multiple conflicting criteria in decision-making;
- real options analysis, which accounts for uncertainty and flexibility rather than assuming a deterministic future required for traditional CBA, and most commonly uses Monte Carlo analysis and decision trees to calculate the value of real options;
- adaptation pathway, based on threshold analysis, which presents different flexible adaptation scenarios that can be explored and implemented dependent on how the climate and its impacts evolve;
- SWOT analysis, which identifies the inherent strengths and weaknesses, as well as the external opportunities and threats.

In the process of assessment and selection of adaptation measures, the local government and community should:

- appropriately engage key decision-makers and other interested parties;

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- specify, as a part of their adaptation plan, the resources required to ensure implementation.

The local government and community shall:

- identify criteria that can be used to assess if the adaptation measures selected are fit-for-purpose, applicable or acceptable across their jurisdiction and area of responsibility by taking into account characteristics such as culture, tradition, capabilities, etc.;
- use those criteria to select the appropriate adaptation measures from the list of potential measures.

The local government and community should consider the following items when assessing adaptation measures:

- additional benefits from enhancing capacity and addressing other challenges;
- the timing of adaptation actions;
- prioritized actions, including considering feasibility and the need for urgent early actions;
- identifying barriers for the implementation of adaptation measures;
- trends of climate change impacts over the full expected lifespan of decisions and actions;
- how the required actions will be updated (e.g. every five years) based on ensuring that they reflect strategic and policy directions and learning from the experience of those delivering the actions (see [Clause 9](#)).

The local government and community shall document the assumptions and rationale behind the decisions made and the resulting policies, plans and strategies. This is critical to the continual learning and improvement processes of those delivering the plan, and to new knowledge, available data and information.

7.5 Decision-making**7.5.1 General**

In the process of decision-making in the local government and community, the involvement of:

- all the leaders of sectors that have taken part in the adaptation planning process shall be required;
- experts who participated in the adaptation planning process should be engaged;
- interested parties should be encouraged.

Non-climate information, such as demographic, socio-economic and environmental conditions in the jurisdiction of the local government and community, shall be reviewed as part of the decision-making. Such information can be obtained from:

- a census;
- policy papers and reports;
- statistical reports.

Potential barriers to decision-making and adaptation action should be identified and considered during the decision-making process. For the local government and community, major barriers include a lack of:

- knowledge of climate change adaptation;
- knowledge of the impacts and risks;
- knowledge and evidence related to interdependencies across risks and adaptation measures;

- knowledge of related priorities, as well as implications of prioritizing short-term actions.

Decision-making may:

- adopt an adaptive management approach that enables the capture of new knowledge and learning from the experiences of decision-making to inform future decisions;
- support flexibility and take adaptive management approaches so as to leave room for consideration of future measures that become available.

To make better decisions, the local government and community shall:

- assess which potential climate change adaptation actions are best suited to their needs and capability, using decision-making methods suitable for the context of the organization and climate change;
- identify and seek support from research institutes, universities or experts in impacts and response measures within and across sectors;
- identify and use reliable and appropriate sources of information, including science-based evidence, expert opinion and views of interested parties;
- clearly describe the sources of information;
- provide mechanisms that permit feedback from all the relevant interested parties, including the experts involved in the planning, and learning from decision-making throughout the planning process and related policy making.

7.5.2 Interested parties' engagement

The engagement of relevant interested parties, both within and outside of the local government and community, are key to the delivery of the climate change adaptation actions. The local adaptation plan should describe:

- the way in which the relevant interested parties were identified;
- who the interested parties are;
- the resources that were mobilized and activities undertaken to engage interested parties in the climate change adaptation planning process.

The information above can be used internally and need not be publicly available.

7.5.3 Selection of climate change adaptation measures

The local government and community should make decisions that:

- are consistent with the established objectives and associated success criteria;
- address high risk impacts, in particular those which are likely to threaten or damage people's lives or properties;
- consider appropriate action in the short, medium and long term.

Based on the criteria and resulting decisions, the local government and community should identify indicators that can be used for monitoring and evaluation (see [Clause 9](#) and [Annex C](#)).

The local government and community shall pay close attention to determine:

- if the adaptation actions selected are compatible with the existing systems, measures, etc.;
- if they can take advantage of the climate change and utilize the opportunities identified in [6.6](#).

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The local government and community shall not select adaptation measures that are considered as over- or incorrect adaptation. If selecting an adaptation action that is “under-adaptation”, the local government and community shall rationalize such in a manner that is consistent with the proportionality and continual learning and improvement principles.

A system may be a geographic, economic or political region, a business or industrial area, or a neighbourhood comprised of households and businesses or farms with supportive infrastructure and public services, etc. that is exposed to climate change or specific climate hazards.

7.5.4 Short, medium and long lifespan decisions

The local government and community shall assess adaptation measures over the expected lifespan of the decision's consequences. Such measures shall be considered and decided in accordance with the review cycles of other plans or strategies in the local government and community that are dependent on or where there is an interdependent relationship with the proposed adaptation activities.

Decisions often have consequences that go beyond the planning horizon. For long lifespan decisions requiring high levels of capability, the local government and community should:

- report their intention of taking such adaptation measures to higher levels of governance;
- take into account the interests of internal and external interested parties, including neighbouring local governments and communities, who influence or are influenced by long-term climate-relevant decisions, and communicate with these parties regarding the proposed adaptation actions;
- determine what level of capability is required by themselves and by their relevant interested parties in order to consider climate change appropriately and over the correct timescales;
- design improvement strategies to address any gaps between required capacity and existing capacity;
- review decisions in context with other interdependent decisions.

Collaborative approaches to the design and delivery of adaptation measures should be used where appropriate, particularly where there are dependent or interdependent relationships with the state, neighbouring communities and local private sectors.

7.5.5 Documenting the decision

The local government and community shall document the adaptation actions that are to be implemented to address [Clause 5](#), [Clause 6](#) and [7.4](#), along with explanations of why some actions were adopted and others were not. The document should include a description of the risks associated with the decision and their implementation, and potential ancillary benefits if appropriate.

Each documented climate change adaptation action shall include:

- objectives;
- descriptions;
- indicators;
- timescales;
- persons who are responsible for its implementation and for monitoring and evaluation of its effectiveness.

Each documented climate change adaptation action should also include:

- its estimated costs and expected benefits;
- an assessment of the risks (barriers/ constraints) to its effective implementation;

- a clear articulation of the current and required capability of the local government and community that is required to implement it;
- the need, where appropriate, for supportive instruments (e.g. regulatory/economic instruments).

The information above can be used internally and need not be publicly available.

NOTE For further details, see ISO 14090:2019, 7.3.

7.6 Local adaptation plan

7.6.1 General

This subclause sets out the format and content of a local adaptation plan.

NOTE A local adaptation plan is encouraged to meet the requirements stated in this subclause.

The following points are applicable, but not limited, to municipalities with a relatively large population such as cities.

A local adaptation plan shall:

- be publicly available;
- be accurate, verifiable, relevant and not misleading;
- use clear language that is easy to understand and be presented in an easy-to-read manner;
- provide a true picture of the significance of the impacts of climate change assessed in [Clause 6](#) and of the adaptation that the local adaptation plan adopts.

It shall not, either directly or by implication, underestimate the need for and scope of action.

The local adaptation plan can comprise more than one document.

Example tables of contents of local adaptation plans are given in [Annex A](#).

Tools for local adaptation planning are given in [Annex B](#).

7.6.2 Scope of the plan

A local adaptation plan shall specify the scope of the plan. By taking into account their jurisdiction and area of responsibility, the local government and community shall specify:

- the spatial scope;
- the operational scope;
- the temporal scope.

The local government and community should specify the scope by considering:

- their geographical, political, economic and other social characteristics;
- their cultural, historical, traditional and other indigenous characteristics.

The local government and community shall confirm that the scopes specified in the planning will not conflict with policies, strategies or planning identified in [7.2](#).

7.6.3 Boundaries of the system

The local government and community shall recognize their administrative and legislative boundaries, ensuring that the adaptation activities to be taken should not cause conflicts with neighbouring local

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governments and communities. The local government and community shall recognize if impacts outside of their scope may have influence in their area of responsibility or on systems within their jurisdiction and indicate where external cooperation is needed. This recognizes that adaptation plans can inform the identification of common goals with neighbouring local governments and communities, which, by working together, will more effectively tackle common impacts of climate change, e.g. fluvial flooding.

Findings and recommendations from the local adaptation plan shall address both the resilience of the local government and community and that of associated systems or networks.

A system may be a geographic, economic or political region, a business or industrial area, or a neighbourhood comprised of households and businesses or farms with supportive infrastructure and public services, etc. that is exposed to climate change or specific climate hazards.

7.6.4 Formulation and presentation

The local government and community shall formulate and present a local adaptation plan. In the process of formulating the plan, the local government and community shall identify which aspects of the plan shall be open to the public. A local adaptation plan shall:

- state the objectives and the scope of the local adaptation plan;
- state the ways and means the local government and community intend to achieve the objectives;
- state the actions that are to be implemented (it may also state actions to be considered for future implementation);
- state justifications for the actions to be implemented;
- document any assumptions made;
- document the information and data on which decisions are based;
- state its period of validity;
- identify who is responsible for each of the identified actions.

The local adaptation plan should:

- state the rationale behind its formulation;
- state the promotion of sustainable development;
- describe the climate change, in the past, present and the future, thereby providing the basis for concern;
- identify the climate data and information considered, including their source and identification of projections, scenarios and models used;
- state the greenhouse gas emission scenarios considered;
- state any other scenarios or projections used (e.g. socio-economic, demographic);
- state and clearly define baselines when applicable;
- describe the potential impacts, both positive and negative, and direct, indirect and cross-cutting (systematic) impacts that climate change poses to services and activities, etc. of the local government and community;
- document how the most critical climate impacts identified in [Clause 6](#) are addressed;
- document how the adaptation opportunities identified in [Clause 6](#) are to be realized.

The local adaptation plan should consider risks and measures by:

- documenting prioritized areas and sectors in reducing climate change risks and building capacity;
- describing any prioritization process used and its outcomes;
- documenting the reduction of the level of impacts from climate change and related hazards;
- describing and rationalizing the level of acceptable (residual) risks, as well as strategies for addressing these if they are realized;
- describing feasible approaches to reducing climate change risks, including a combination of green (ecosystem-based adaptation), soft (building adaptive capacity) and grey (infrastructure and technology) options, as well as actions that are incremental or transformative;
- describing appropriate and cost-effective practices for the local government and community.

The local adaptation plan should consider the adaptive capacity by:

- stating the current adaptive capacity of the local government and community, of the affected systems and of those expected to implement adaptation actions;
- stating the adaptive capacity that is required to effectively manage impacts identified by the impact assessment;
- stating the way in which the climate change adaptation process is to be embedded in the policies, strategies and plans of the local government and community;
- using the initial findings of capacity assessments as benchmarks and assessing progress against these at regular intervals.

The local adaptation plan may:

- state national policies, rules, codes, guidelines, etc. that are relevant to or influence the adaptation process;
- describe how and when the community will be informed about the local adaptation plan;
- describe its relationship with existing policies and strategies;
- state how and when the local adaptation plan is to be made publicly available.

The local government and community may use the logical framework approach (LFA) for the design of its local adaptation plan. It should be noted that the LFA can also facilitate the monitoring and evaluation process (see [B.5](#)).

7.6.5 Implementation

The local government and community should develop an action plan to implement activities according to [Clause 8](#) and should describe it in the local adaptation plan.

The implementation plan can be used internally and need not be publicly available.

7.6.6 Monitoring and evaluation

The local government and community should develop a plan for monitoring and evaluation actions and decisions relevant to their climate change adaptation process according to [Clause 9](#) and should describe it in the local adaptation plan.

The monitoring and evaluation plan can be used internally and need not be publicly available.

ISO/TS 14092:2020(E)**7.6.7 Consultation on the draft adaptation plan**

Consultations on the draft adaptation plan should be sought from relevant interested parties both within and outside of the local government and community. These consultations are critical to ensure the legitimacy, and therefore the delivery, of the adaptation plan and its component adaptation measures. The local government and community should:

- confirm the relevant interested parties with whom they will consult;
- confirm the elements of the adaptation plan on which they will be consulting;
- provide sufficient time for the consultation process, including identifying an appropriate deadline;
- provide a user-friendly process for those interested parties to submit their comments.

The local government and community shall address the comments received and should take them into account when finalizing the adaptation plan. The responses to the submitted comments and any actions taken (response log) should be documented (see [7.6.9](#)).

7.6.8 Confirmation and authorization

The local adaptation plan shall be confirmed and authorized by the leadership of the local government or community (e.g. mayor, governor). This confirmation and authorization normally follow the usual decision-making procedures of the local government and community.

Prior to going forward for authorization, the local adaptation plan should be confirmed by all interested parties, including the sector leaders involved in the planning process. This confirmation is normally not a significant challenge when interested parties have been engaged throughout the adaptation planning process. Confirmation may require formal signed agreements that are adapted to the specific needs of the interested parties.

7.6.9 Publication and archive

The local government or community is encouraged to make their adaptation plan publicly available. This is essential to garner the support that is necessary for the implementation of the plan, including the development of supportive adaptation plans and actions by business, industry, voluntary organizations and members of the public. The means of publication of the plan should allow for and promote access to it. Considering that adaptation planning is a continual learning and improvement process that will require subsequent iterations of the plan, the local government or community should establish a publicly available archive in which all versions of the plan and supporting documents, including the log of comments received and responses, are available for future reference. Providing an abridged version of the adaptation plan that is easy to read may also be considered.

8 Implementation**8.1 Leadership and commitment**

Implementation means transforming the climate change adaptation plan into ongoing actions. Implementation also means appropriately mainstreaming the actions comprising the climate change adaptation plan into other policy fields, such as land use planning, water management and resource management. The core decision-making team of the local government and community shall legitimize climate change adaptation actions across the relevant parts of the entity.

The core decision-making team shall:

- develop a network engaging, at the appropriate level, interested parties with which the local government and community operates to administer their responsibilities and regularly exchanges information relevant to the adaptation plan and related actions;

- develop a network engaging with neighbouring local governments and communities and exchanging information regarding their respective adaptation plans and actions so as to promote synergistic adaptation, as well as to prevent conflicts.

The core decision-making team shall ensure the integration of the adaptation action requirements into the operation and/or administration processes of the local government and community.

Regarding sectors or areas beyond their jurisdiction or area of responsibility, the local government and community shall review the adaptation plans and their implementation to confirm that the responsible governments or administrations have taken the necessary actions.

8.2 Preparation for implementation

The local government and community should prepare for implementation by:

- embedding the local adaptation plan into their policies, strategies, processes, and operational and administrative activities;
- referring to relevant laws, regulations and codes set by government or ministries;
- referring to the latest scientific findings;
- taking into account adaptation actions implemented or not being implemented in the neighbouring local governments and communities, and any influences on their own jurisdiction and area of responsibility;
- involving all the local government and community departments or sections that took part in the adaptation planning process;
- obtaining sound public understanding through the promotion of the local adaptation plan and the activities specified in the plan.

The local government and community should encourage local private sectors in their jurisdiction or area of responsibility to consider the adaptation plan within their risk management and adaptation planning and to participate in and support the implementation process.

8.3 Implementation plan

The local government and community should formulate and prepare an implementation plan by:

- documenting the process, including inputs and outputs, that will be used to ensure the actions identified in the local adaptation plan are delivered;
- establishing processes to reflect upon experiences gained during the implementation process and update the implementation plan as required;
- creating an enabling environment that allows for and accepts adapting actions being implemented based on identified new adaptation opportunities that will provide improved outputs including synergies and scalability of interventions;
- engaging in timely dialogue with interested parties;
- having specified improvement objectives (incremental or transformative);
- assessing risks and opportunities associated with the implementation of the identified measures and identifying a means of addressing those identified so as to enable effective implementation.

The implementation plan may include actions that are primarily for internal use and that may not need to be publicly available.

NOTE For further details, see ISO 14090:2019, Clause 8.

ISO/TS 14092:2020(E)

9 Monitoring and evaluation

Monitoring and evaluation are used to assess, inform and review a local adaptation plan so that satisfactory progress is confirmed and indications of unsatisfactory progress are highlighted early enough, allowing corrective action to be taken (compare developments with or without the implemented climate change adaptation).

When the local government and community establish a process for the monitoring and evaluation, the process should consider:

- the adaptation plan's sectoral and geographic scope;
- the population, its distribution, and economic and development status in the region;
- wider strategic and policy matters;
- the level of actions (i.e. community, national, international);
- the need to build and embed, within the adaptation planning process, new knowledge and learning.

Indicators and scenarios should be determined to measure the evolution of the impacts through time. Indicators should also be identified for those measures introduced to address implementation risks and enablers. The same indicators and scenarios should be used for monitoring and evaluation. However, the indicators should also be re-evaluated reflecting the evidence developed during the implementation planning process (a continual learning and improvement process). This could lead to an updated set of indicators. For sectors or areas beyond their jurisdiction or area of responsibility, the local government and community shall confirm to what extent the other government/administrative levels have taken the necessary measures by reviewing relevant reports and dialogues in relevant networks.

The local government and community shall prepare a monitoring and evaluation plan. ISO 14090:2019, Clause 9, provides details. The monitoring and evaluation plan may include actions that are primarily for internal use and that may not need to be publicly available.

For more information on indicators, see [Annex C](#).

10 Reporting and communication

The local government and community shall communicate their climate change adaptation within, across and beyond their jurisdiction and area of responsibility. The purpose of the communication is to inform others within and outside the jurisdiction and area of responsibility of the actions being taken so that interested parties can take the necessary actions and be aware of any effects, impacts or the influence of the actions within the plan with respect to their activities.

The local government and community shall formally communicate the formulated plan to their sub-governance and administrative levels.

Climate change adaptation communications shall:

- be accurate, verifiable, relevant and not misleading;
- be unlikely to result in misinterpretation;
- clearly state the scope of the reasons for concern and the related climate change adaptation.

Climate change adaptation communications shall not:

- imply that the climate change adaptation is endorsed or verified by an independent third-party organization when it is not;
- either directly or by implication, exaggerate the significance of the climate change adaptation to which the communication relates.

Climate change adaptation communications should:

- be reassessed and updated as necessary to reflect changes in climate change risks and adaptation opportunities, or the results of monitoring and evaluation;
- include qualitative or quantitative information about uncertainties;
- explain the monitoring and evaluation plan as well as any relevant monitoring and evaluation results.

Annex A (informative)

Example tables of contents of local adaptation plans

A.1 General

Local governments and communities may refer to the examples given in [A.2](#) to [A.6](#). These examples are illustrative only and chosen at random.

A.2 Example 1

From: “Climate Change Adaptation Strategy”, City of Vancouver, Canada (population of 603 502 as of 2011).

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Source:

<https://vancouver.ca/files/cov/Vancouver-Climate-Change-Adaptation-Strategy-2012-11-07.pdf>

<https://vancouver.ca/news-calendar/population.aspx>

A.3 Example 2

From: “Climate Change Adaptation Plan”, Hume City Council, Metropolitan Melbourne, Australia (population of 224 394 as of 2018).

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Appendix One: Summary of Learnings and Outcomes from the Climate Change Development Plan (Stage 1 of Hume's Climate Change Adaptation Process)	

Source:

https://www.hume.vic.gov.au/files/sharedassets/hume_website/environment/energy/climate_change_adaptation_plan.pdf

<https://profile.id.com.au/hume>

ISO/TS 14092:2020(E)

A.4 Example 3

From: “Climate Change Adaptation Plan”, San Juan Bay Estuary, Puerto Rico (population of 320 967 as of 2018).

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Source:

https://www.researchgate.net/publication/326187973_San_Juan_Bay_Estuary_Climate_Change_AdaptaAdap_Plan

<https://www.census.gov/quickfacts/sanjuanmunicipiopuertorico>

A.5 Example 4

From: “Climate Change Adaptation Action Plan”, Clyde River, Nunavut, Canada (population of 1 000 as of 2018).

Clyde River Climate Change Adaption Action Plan
<p>The community of Clyde River has prepared this plan to better prepare for changes that have started or might happen as a result of climate change. It is understood that this is a first step in a long journey to help the community adjust to climate change. Future steps will be based on new research, knowledge and experience obtained by the community.</p> <p>The plan includes three parts; the desired results (goals), the methods that will be used to achieve the desired results (strategies) and the specific steps that will be taken (an action plan).</p> <p>What are our desired results (goals)</p> <ul style="list-style-type: none"> ✓ Clyde River shows the ability to effectively prepare and adapt to climate change. ✓ Effective partnerships between the community and decision-makers and scientists in the territorial and federal government. ✓ Our knowledge is shared with other communities and organizations. ✓ Clyde River is seen as a model learning centre in preparing for climate change. ✓ Scientific research that contributes to the community. ✓ The people of Clyde River are informed of the local issues regarding climate change. <p>How will we achieve our desired results (strategies)</p> <ul style="list-style-type: none"> — Develop and use better information to guide the future physical development of Clyde River. — Review our community land use plan with new information on climate change issues. — Equip and train our residents in methods to increase their safety while out on the land. — Develop and implement a tourism plan to enhance the community as an attractive destination for visitors and tourists including cruise ship passengers. — Record our knowledge and experiences with changing travel and hunting conditions. — Attend meetings and conferences to share our knowledge, promote our community and learn from others. — Continue to support the research being done by Natural Resources Canada in a way that benefits both parties <p>What-specific actions are we taking (action plan)</p> <p>We will review progress on our action plan on a regular basis and update our action plan every fall. Ittaq will assume the responsibility to monitor progress made in carrying out the actions and to start the annual review of the action plan.</p>

Source:

<http://www.cip-icu.ca/Files/Resources/Climate-Change-Adaptation-Action-Plan-Clyde-River>

<https://clyderiver.ca/>

ISO/TS 14092:2020(E)

A.6 Example 5

From: “Climate Change Adaptation Plan”, City of Donostia-San Sebastian, Spain (population of 180 989 as of 2017). Translated from Spanish to English.

Diagnosis

1. Introduction
2. Objectives
3. Historical climate trends and future climate projections of Donostia/San Sebastian
4. Evaluation of the climate change impact evidence in the cost of Donostia/San Sebastian
5. Vulnerability and Risk assessment at submunicipal scale
6. Complementary activities to the Strategy
7. Bibliography

Annexes

Adaptation plan

1. Introduction
2. Summary and key conclusions of the process
3. List of Adaptation Measures

Source:

<https://www.donostia.eus/ataria/documents/8023875/8050879/DIAGNOSTICO.pdf>

<https://www.donostia.eus/ataria/documents/8023875/8050879/PLAN+DE+ADAPTACION.pdf>

Annex B (informative)

Tools for local adaptation planning

B.1 General

Local governments and communities may refer to the tools given in [B.2](#) to [B.5](#) to develop a local adaptation plan.

B.2 Climate-ADAPT, Adaptation Support Tool

The aim of the Adaptation Support Tool^[7] is to assist users in developing climate change adaptation strategies and plans by providing guidance, links to relevant sources and dedicated tools.

The tool is based on the policy cycle, see [Figure B.1](#), which highlights that climate change adaptation is an iterative process that will help ensuring decisions are based on up-to-date data and knowledge. This iterative process will be supported by monitoring and timely assessment of measures. In its design, the Adaptation Support Tool borrows from the UKCIP Adaptation Wizard and various risk assessment frameworks.

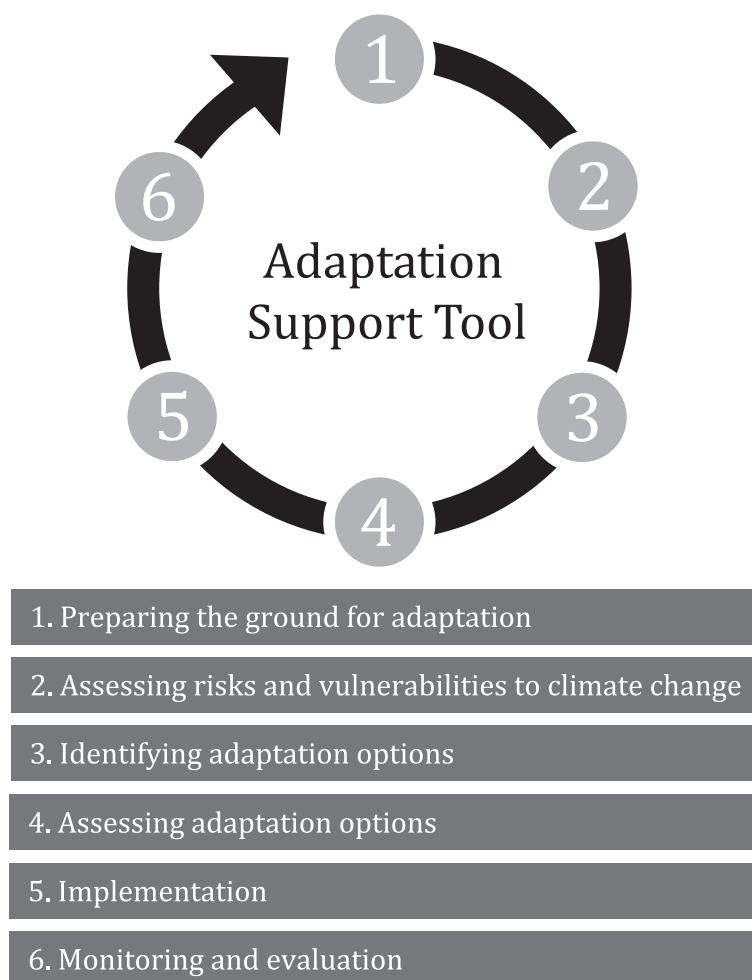


Figure B.1 — Adaptation Support Tool

B.3 RESIN project, RESIN decision framework

The purpose of this group of steps^[15], see [Figure B.2](#), is to define the challenges and the city system in order to frame the further planning process (“what are we looking at”).

The underlying steps are:

- define the problem, making clear the reasons that drive the climate adaptation goals;
- survey areas of climate threat, determine relevant climate hazards/stressors and gather information on climate conditions, past extreme events and climate change projections;
- survey the non-climate trends that can have a major influence on climate stressors and their effects;
- determine interested parties to involve in the adaptation process as well as their interests;
- determine the right time horizon to find the right balance between the vision and attainability of immediate plans;
- analyse the context in order to find additional constraints for the adaptation process.

RESIN decision framework

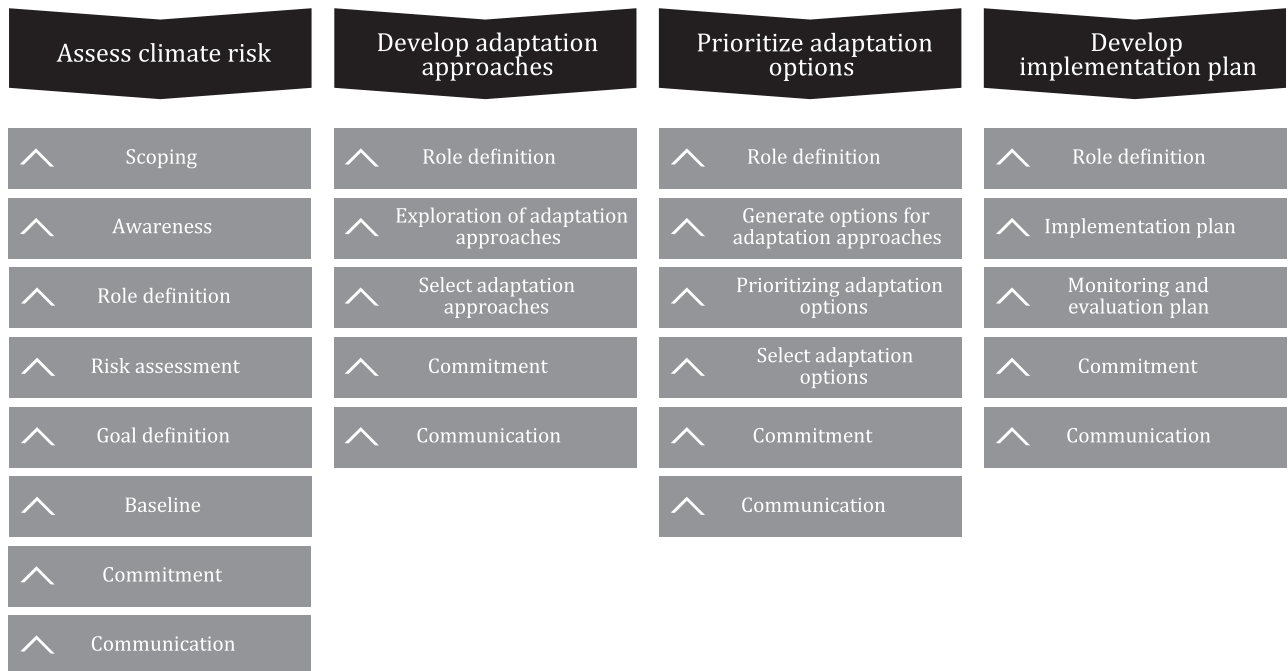


Figure B.2 — RESIN decision framework

B.4 UK CIP, Adaptation Wizard

The Wizard^[16] is a five-step process, see [Figure B.3](#), to help to assess an organization's vulnerability to current and future climate change, identify options to address the organization's key climate risks, and develop and implement a climate change adaptation strategy.

The Wizard can help to:

- raise awareness of climate change and adaptation;
- access information, tools and resources;
- assess vulnerability to climate change;
- make the case for adaptation in an organization;
- develop a climate-resilient project, programme, policy or strategy;
- develop and implement a climate change adaptation strategy.

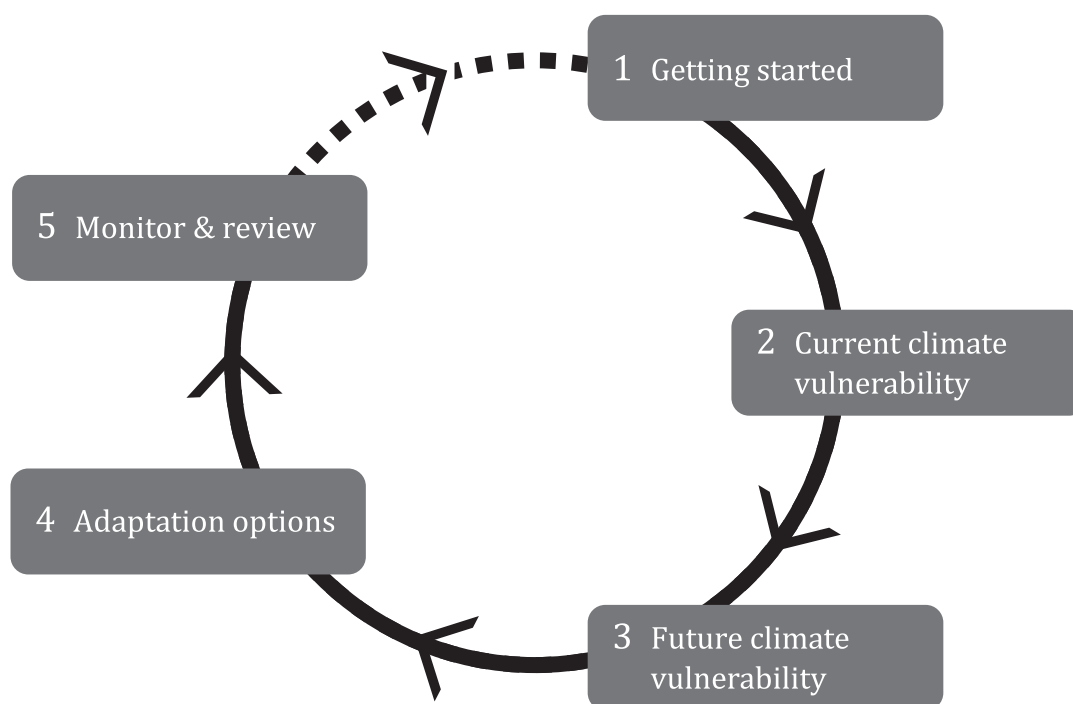


Figure B.3 — Adaptation Wizard

B.5 Logical Framework Approach

The Logical Framework^{[18][19]}, or “LogFrame”, is one of the principal tools used by the international development community to help design projects to achieve measurable results. It was pioneered for USAID in the 1970s and has since been widely adopted by multilateral and bilateral agencies, NGOs, governments and implementers. The LogFrame is useful to both managers and evaluators at every stage of the project cycle. It is a vehicle for organizing a large amount of information in a coherent and concise manner, assisting with the design, implementation and evaluation of projects. The process used to develop the LogFrame supports the USAID principles of selectivity and focus, evaluation and learning, and adaptation and flexibility. In addition, the LogFrame:

- fosters a clearly stated, explicit and measurable description of what will happen if a project is successful, along with the project hypotheses underlying the design;
- clarifies what the mission and project team should be responsible for accomplishing and why, in unambiguous terms;
- displays the key elements of a project, and their relationship to each other, in a way that facilitates analysis, decision-making and measurable impact.

Annex C

(informative)

Indicators for monitoring and evaluation in local adaptation planning

Local governments and communities may refer to the following information on indicators that can be used for monitoring and evaluation.

Local governments and communities should use indicators to monitor and evaluate. Indicators may be either quantitative or qualitative. For example, when monitoring the impacts on heat-related mortality and illness, they may be monitored quantitatively by the annual number of people to get heatstroke, or monitored qualitatively by the use of questionnaire survey asking people how they feel as a result of the heat conditions.

Indicators require data and information. As such, the selection of indicators depends on the quantity and quality of the data available. When considering the impact of forest and grass fires, if less or poor data are available, it can be monitored by counting the annual number of fires that have occurred. On the other hand, with sufficient data and technique, it can be monitored with annual associated economic loss.

For further information, References [\[8\]](#) and [\[14\]](#) related to indicators could be useful.

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