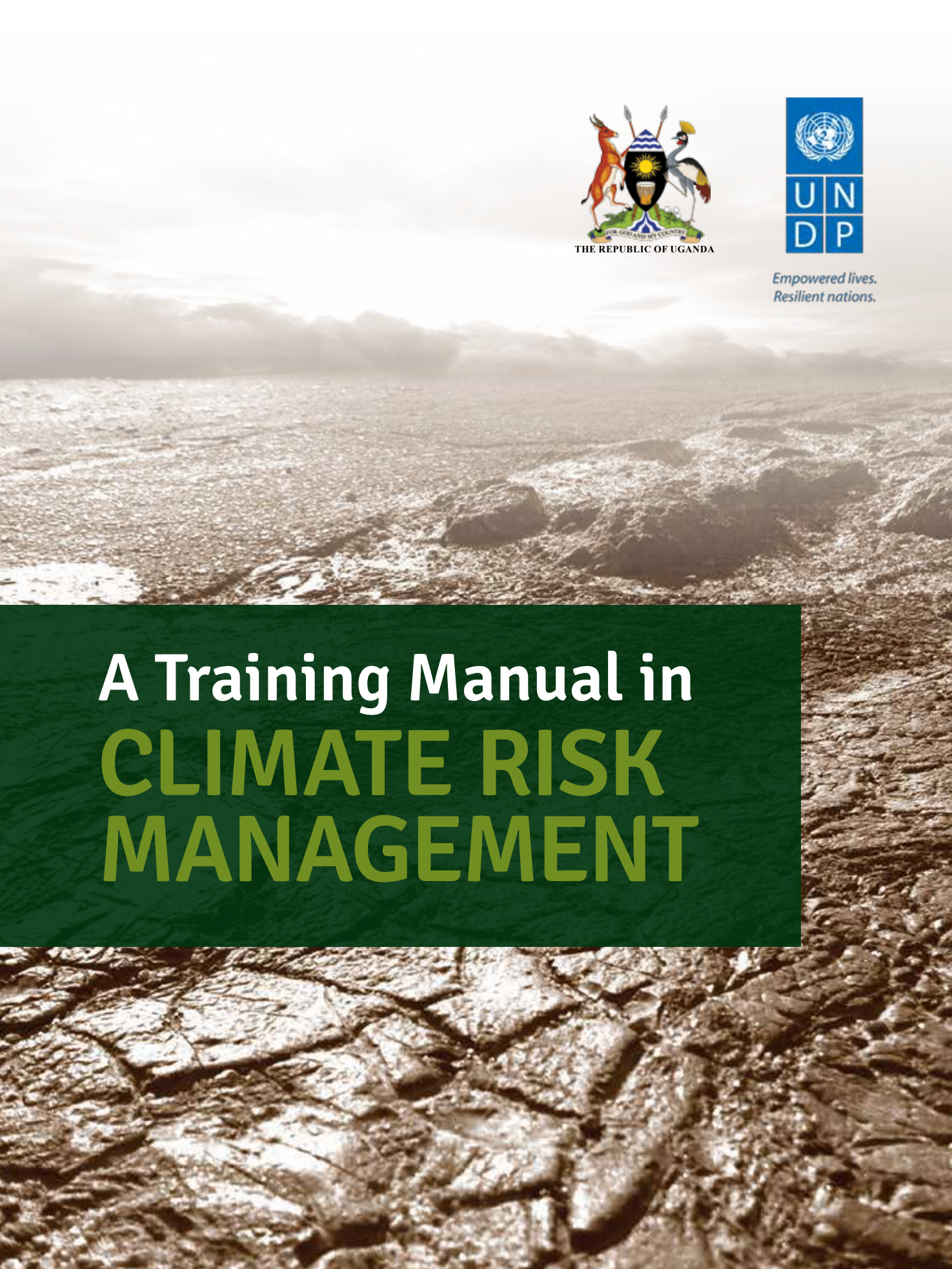

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A Training Manual in CLIMATE RISK MANAGEMENT

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About this Training Manual

This Manual has been developed through a series of case studies undertaken within all the regions of Uganda, with UNDP collaborating with government agencies and institutions including; Ministry of Water and Environment, and the Office of the Prime Minister. Various consultations from international humanitarian organizations, and Civil Society Organizations also supported the effort in varying measures.

The Manual provides a framework for managing increased climate change risks in Uganda which seem to affect national institutions, local governments and all actors in natural resources due to climate change impacts. The prime focus of the manual is on the initial needs assessments and prioritization identified as climate change risks. It aims to help local government departments to:

- specify risks related to climate change impacts;
- prioritize risks that require further attention;
- establish a process for ensuring that these higher priority risks are managed in time and effectively.

Needs assessment of the climate risks has to be undertaken by trained technical personnel who have gained sound professional knowledge of all the environment and natural resource components; and their relevant interactions with institutions, together with a general understanding of the directions and magnitudes of climate change risks.

Please do not use this Manual for:

- Other risks not associated with climate change;
- Measures and actions aimed at mitigating climate change itself, such as reducing greenhouse emissions or introducing emission trading schemes.

How this Training Manual is structured

The Manual overview

The overview gives you a general introduction to the Manual. Prior information contained in the Manual overview will help you determine:

- If the Manual is suitable for you.
- What you will already need to know.
- What you can expect from the training.
- The overview also provides guidance on:
- Activity icons.
- Sections.

We strongly recommend that you read the overview carefully before starting your study.

The Manual content

The Manual is broken down into sections.

Each section comprises:

- An introduction to the section content.
- Section outcomes.
- New terminology.
- Core content of the section.
- A section summary.

The Manual Overview

Welcome to the Climate Risk Management Manual

The purpose of this training Manual is to assist Local Government Institutions and Organizations to adapt to climate change and manage risks.

We observe with concern that global climate is changing, and will continue to change in ways that affect the institutional planning and day to day operational activities of businesses, government institutions, departments and humanitarian organizations.

The manifestations of climate change include higher temperatures, altered seasonal rainfall patterns, and more frequent extreme events such as floods, hail storms, heat waves, drought, and thunder storms. This Training Manual is a road map to Climate Risk Management for technical staff at national and district levels, and the general managers of government institutions.

Is this Manual for you?

This training manual is intended for people, who integrate climate change impacts into risk management and other strategic planning activities in national and local government institutions;

who have to ensure that their departments, units and organizations are aware of existing climatic change events from climate change impacts and suitably employ appropriate management responses;

who must apply risk management in there operational frameworks to ensure their institutions have identified and integrated the risks of climate change impacts into their institutional planning perspectives

Training Manual outcomes

Upon the completion of this training Manual, you will be able to:

Outcomes

- identify risks of climate change in your region.
- integrate climate change impacts into risk management and strategic planning.
- recognize existing climatic change events so you can employ appropriate management response.
- apply risk management in your operational frameworks.

Getting around this Training Manual
Margin icons

While working through this Training Manual you will notice the frequent use of margin icons. These icons serve to "signpost" a particular piece of text, a new task or change in activity; they have been included to help you to find your way around this Manual.

A complete icon set is shown below. We suggest that you familiarize yourself with the icons and their meaning before starting your study.

Activity

Assessment

Assignment

Case study

Discussion

Group activity

Help

Note it!

Outcomes

Reading

Reflection

Study skills

Summary

Terminology

Time

Tip

Section I

Climate Change Risk Management

Introduction

You will note that each year there are climatic change events that translate into climate change risks which affect institutions, livelihoods and organizations; hence, causing loss of lives and property. These climate related risks arise from 'normal' day-to-day, seasonal, and year-to-year variability in climate as well as regional climate differences and weather patterns.

Unfortunately, most institutions in Uganda have not implemented practices and strategies to deal with climate variability and climate risks, for which reason climate risks continue to raise challenges and impediments that have to be managed to reduce losses and damages.

Do you see any reason why we need training on climate change risk management?

In managing climate risks, you as a technical staff ought not to simply rely on assumptions that the prevailing climate will be more or less the same as it was over the past 50 or 100 years. Climate change is likely to invalidate this assumption, with changes in average conditions, frequency and severity of extreme climate events.

Upon completion of this section, you will be able to:

Outcomes

- Understand concepts and issues involving climate change risk management.
- Identify examples of climate risks arising from climate change.
- Identify major characteristics of climate change.
- Project impacts of future climate change in Uganda.
- Understand the nature, basic components, and trend of the climate of Uganda.

Terminology

Climate:	The multiple surface weather conditions such as temperature, rainfall, atmospheric pressure, humidity, sunshine and winds, averaged over a period of time ranging from Months to thousands of years.
Climate Change:	Any change in climate over time, whether due to natural variability or as a result of human activity
Frequency:	A measure of the number of occurrences per unit of time
Climate Variability:	Variation or deviations from the mean state of climate. The climate system has natural,internal variability but variability could be affected by external factors driving climate change such as changes in the atmospheric concentration of conservatory gases.

Training in Climate Risk Management

Many of you are probably aware of the effects Climate change has already had on our way of life. It has become such a serious issue affecting almost all sectors of production in the country including; agriculture, transport, among others. The climate change risks are causing persistent effects to institutional development and seem to deter service delivery within the country.

Many of these institutions are highly vulnerable and are currently experiencing significant losses and damage due to lack of adequate disaster preparedness within the central and local government levels.

These effects will affect every person and public or private institution at all levels; from strategic management to operational activities. These effects will no doubt have impact across environmental issues, economic performance, social behavior, infrastructure, and other aspects of human existence.

There is therefore need to equip technical staff at different management levels with the climate change risk management skills in order that they could respond within their respective capacities.

Figure 1: Floods Hit Different Places in Uganda

Examples of climate risks arising from climate change

Figure 2: Semi-Arid Area

Drought common in semi-arid areas

- The country relies on agriculture; hence, increases in temperature and net reductions in average rainfall across the country affect productivity.
- Drought sequences are common in semi-arid areas of the country, and the impact of increased temperatures makes them more damaging to plant and livestock viability and production. For example, the Uganda cattle corridor exhibits most of the characteristics of low and erratic rainfall regimes leading to frequent and severe droughts, and fragile soils with weak structures which render them easily vulnerable to climate risks.
- For local governments, climate change may affect the economic base of the local region and locally generated revenue from the

existing enterprises. For instance, by reducing the viability of pasture growth in pastoral communities, it could cause livestock loss and diseases.

- Climate change may also create new demands for services due to frequent drought conditions. Thus, some local governments may face reduced ability to raise income to sustain their development plans and increased demands for services; including livelihood supports, emergency, and relief services.
- Urban development planners will face frequent designs to accommodate urban developments which may increase the carrying capacities, and the stress on emergency services and vulnerability of the existing housing and infrastructure.

Characteristics and Climate Change Impact

If you examine the climate trend over time, what features would you identify to ascertain any changes? There is strong consensus that global climate is changing within the region and globally.

In 2001, the Intergovernmental Panel on Climate Change (Houghton et al. 2001) acknowledged as the most authoritative analysis of information on climate change, concluded that:

- the present global climate is significantly warmer than ever at the beginning of the 20th Century, with global temperatures having increased by around 0.6˚C;
- it is likely that 1990-1999 was the warmest decade in the last 1,000 years, at least in the Northern Hemisphere;
- most global warming experienced in the last 50 years is attributable to human activities notably the release of greenhouse gases, such as carbon dioxide, methane and nitrous oxide, into the atmosphere; and
- due to the long atmospheric lifetime of major greenhouse gases and time lags in the ocean-atmosphere system, climate change will continue for decades to come, even if large scale action is in progress to mitigate greenhouse gases.

Impacts of Climate change on the future of Uganda

The changing climate as a result of increasing discharges will affect Uganda's economy through various sectors. Climatic factors such as rising temperature, unreliable rainfall patterns, and increasing extreme events especially floods, landslides, droughts, among others; impact on the water resources, and agriculture (State of Uganda Population Report, 2009, IPCC, 2007).

Natural Resources and Climate Change in Uganda

Figure 3: Forest Fires

Land degradation and deforestation increase as a result of higher forest fire risk in dry periods. These dry conditions and prolonged droughts create conducive conditions for the spread of wild fires thus destroying forests (which play an important role of social, economic and forest services such as habitant for biodiversity, moderating micro climate,

shade, among others) and land with serious consequences. This puts pressure on forests when other livelihood assets such as medicine, timber, firewood which provides 95% of Uganda's energy collapse; increased rainfall leads to salinisation and soil erosion which result into land degradation; hence, limiting livelihood options while increasing vulnerability. Unique species face extinction including the three-horned chameleon due to their places being closed out due to changes in climate regime. An approximation of 20-30% of plant and animal species face the risk of extinction if increases in global average temperature exceeded threshold.

Climate change-related risks and exposures affect the health status of millions of people especially those with low adaptive capacity (IPCC, 2007d). Health may be in terms of human stress and capital. The paths through which climate affects human health are diverse; involving direct - injury, illness, death- and indirect mechanisms such as displacement due to floods, livelihood impacts associated with health risks. Heavy rainfall leads to floods that help to cause outbreaks of waterborne diseases such as diarrhea and cholera, while prolonged dry spells result into outbreaks of respiratory diseases

The Climate of Ugands

Uganda shares with Kenya and Congo the same features of equatorial climate with moderate humid and hot climatic conditions throughout the year. Most of the area is a plateau lying at 1,000-1,400m (3,500-4,500 ft) above sea level. Much of the country lies at an altitude of 900m to 1500m, with an average altitude of 1200m. The lowest altitude is 620m within the Albert Nile and the highest altitude Mt. Ruwenzori Peak is 5,110m above sea level.

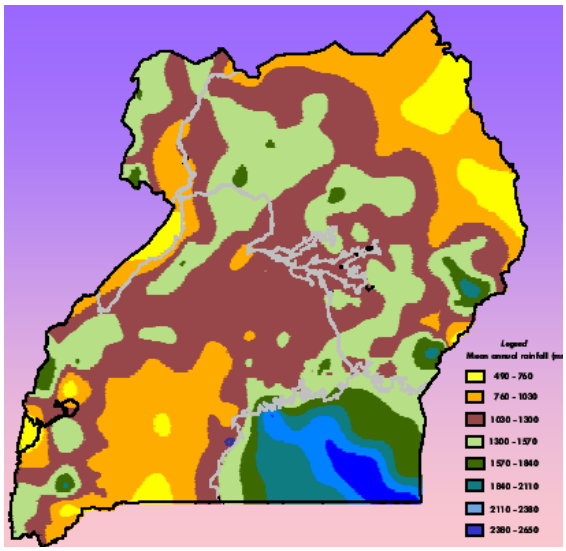
Rainfall

Average annual rainfall and temperature vary from one location to another and ranges from 500mm to 2500mm; and 2°C to 26°C respectively. Uganda receives uni-modal (northern part) and bi-modal (central, western and eastern parts), type of rainfall, most of it (long rains) falling between March and May, while the light/short rains' are experienced between September and November. The rainy seasons have low temperatures. The bimodal patterns are controlled by the passage of air masses associated with the equatorial trough or Inter-tropical Convergence Zone (ITCZ) which varies from year to year profound to variations in Indian Ocean sea-surface temperatures.

The ITCZ oscillates between the northern and southern tropics over the course of a year migrating southwards through Uganda in October to-December, and returning northwards in March to May. This causes Uganda to experience the two distinct wet periods.

The amount of rainfall received in these two seasons is generally 50-200mm per month but varies greatly; exceeding 300mm per month. A dry season is experienced between June and August, December and February when temperatures are highest (see Figure 4)

Figure 4: Map showing Distribution of Mean Annual Rainfall in Uganda



Source: Adapted from World Water Assessment Programme, 2006

Extreme Climatic events

Hepworth and Goulden (2008), summarized a review from previous studies of modeling outputs under a range of plausible IPCC CO2 emission scenarios as follows:

- An increase in mean annual temperature of between 0.7ºC and 1.5ºC by the 2020s and of between 1.3ºC and 4.3ºC by the 2080s. If global greenhouse gas emissions remain high then temperatures may increase in that range.

- A significant increase in mean annual rainfall beyond 2060 with the highest percentage increase in December, January and February. For a medium high emissions scenario and the average of different model results, annual rainfall increases were estimated as up to 7% by 2080s with December to February rainfall increases of 13% by 2080s

- Expected changes in the severity and frequency of extreme events (floods, droughts, heat waves, storms), although little is known about the nature of these changes though some models suggested a 20-30% increase in extreme wet seasons at a medium CO2 emission scenario.

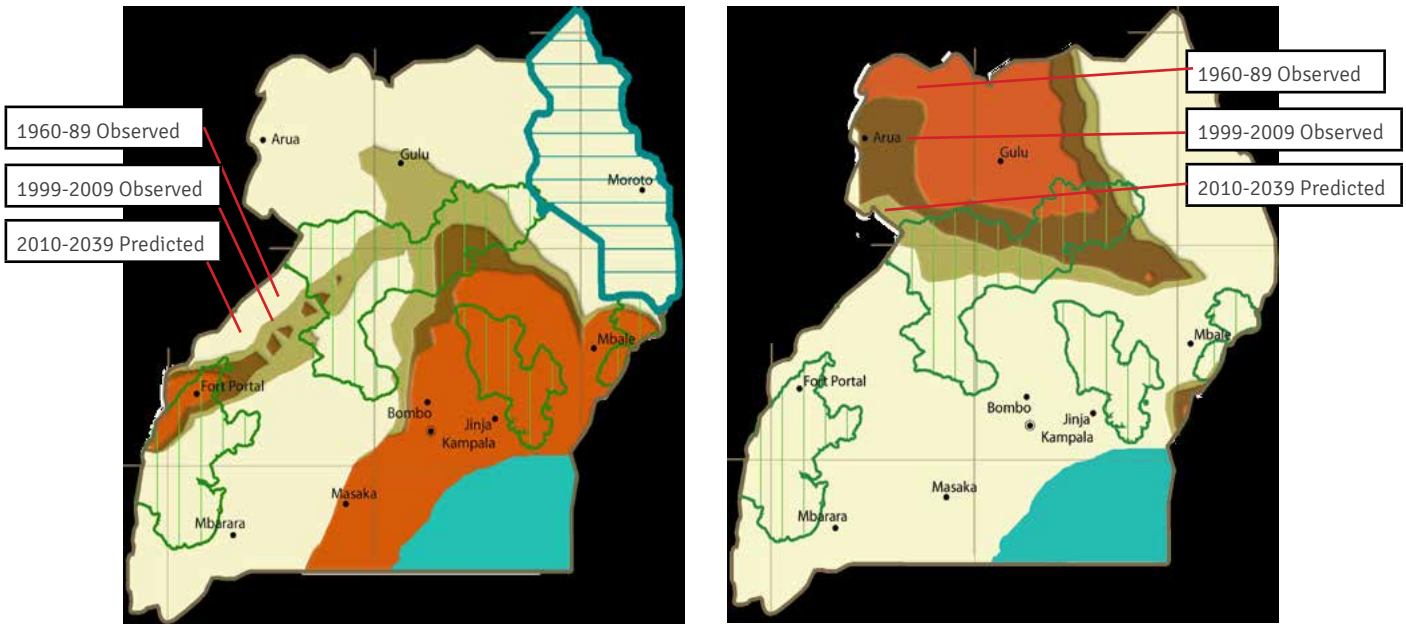
Observed and Predicted Rainfall trends in Uganda

Figure 5 shows some of the changes in rainfall in the different regions of Uganda. Uganda receives most of its rain between March and June, and rainfall totals to more than 500 millimeters (mm) during this season, providing enough water for crops and livestock. Between 1960 and 1989, the region receiving this much rain (on average) during March–June is shown in light brown in the left panel of Figure 4 and should be understood to lie beneath the dark brown and orange areas.

During the past 25 years, this region has contracted (dark brown polygon), exposing populations in the central and western parts of the country to increased rainfall deficits. Cropping areas Northeast of Fort Portal, South of Gulu, and Northwest of Bombo no longer receive, on average, the bountiful rains that were the norm between 1960 and 1989. If present rainfall trends continue, by 2025 the drying impacts will likely lead to a further contraction (orange polygon in Fig. 5).

A similar set of polygons is also shown for the June–September season (right panel, fig. 5). Unimodal rainfall areas across the north of the country are likely to be affected by earlier cessation of summer rains

Figure 5: Climate Change in Uganda



Source: USGS fact sheet 2012-3062

The left map shows the average location of the March–June 500 mm rainfall isohyets for 1960–1989 (light brown), 1990–2009 (dark brown), and 2010–2039 (predicted, orange). The green polygons in the foreground show the main maize surplus regions; these areas produce most of Uganda's maize. The blue polygon in the upper-right shows the Karamoja region. The right map shows analogous changes for the June–September 500 mm rainfall isohyets

Section summary

Summary

In this section you have learned about the need to train on climate change risk management, characteristics, and the impact climate change could have on different sectors of production and service delivery within Uganda. We have been able to explore the nature, basic components, and trends of the climate of Uganda, and hope you can now project the impact the increasing climate change could have on the national, regional, and international political and socio-economic development agenda.

Section II

Climate Change and Risks

Introduction

We have looked at Climate Change risk management in the preceding section. In this second section, we need to explore the link between climate change and the risk. In order to assess the risks of climate change, you need to understand the causal links in all the climate variables and how they affect service delivery in institutions, departments and units.

Upon completion of this section you will be able to:

Outcomes	• appreciate the causal link between climate change and risks, and the effect on planning and service delivery. • enumerate steps involved in climate change risk management. • identify any impacts related with changes to climate variables. • apply risk management frameworks in responding to risks of climate change in your area.

Terminology	**Risk:**	The chance of something happening that will have an impact on objectives 1. A risk is often specified in terms of an event or circumstance and the consequences that may flow from it. 2. Risk is measured in terms of a combination of the consequences of an event and their likelihoods. 3. Risk may have a positive or negative impact.
	Risk Management:	• The Culture, processes and structures that are directed towards realizing potential opportunities whilst managing adverse effects

Understanding the Link

The risks of climate change to an institution affects timely planning and makes unreliable ways of providing goods and services which is a statutory mandate obliged from local government leaders and civil servants .

This results in a chain of consequences, including risks and disasters illustrated in Figure 6. These consequences may directly affect the institution's capacity to serve its people and stakeholders.

Figure 6: Climate Risks Profiles

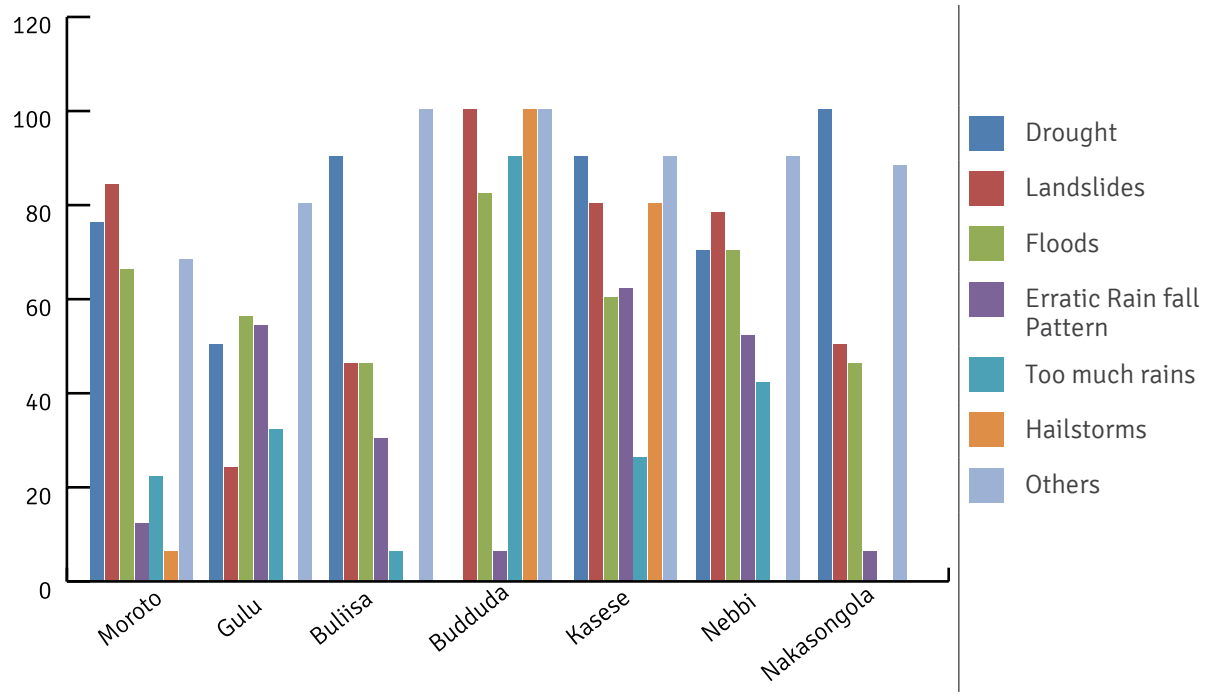


Figure 7 below illustrates the link between changes in specific climate variables likely to occur in many parts of Uganda and resulting into bio-physical and social impacts. Some impacts are linked to changes of more than one climate variable or derived from other impacts. For example, droughts are linked not only to a decrease in rainfall but also to increasing temperatures, which stress natural resources and modify all the components of the environment. Table 1 also shows the different impacts related with changes in climate variables

Figure 7: Links between Climate Change and Risk

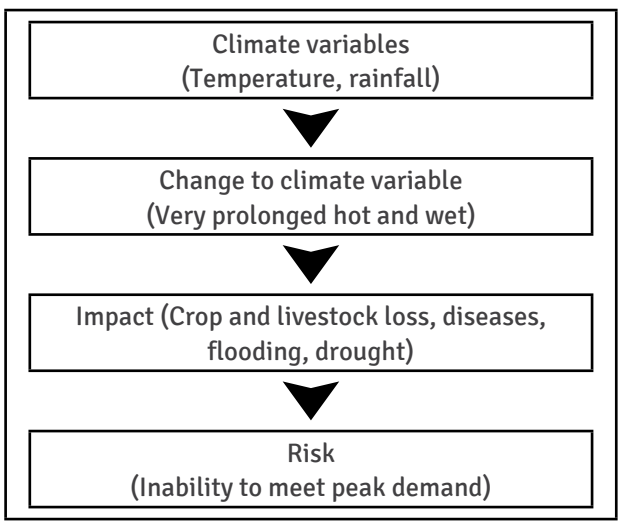


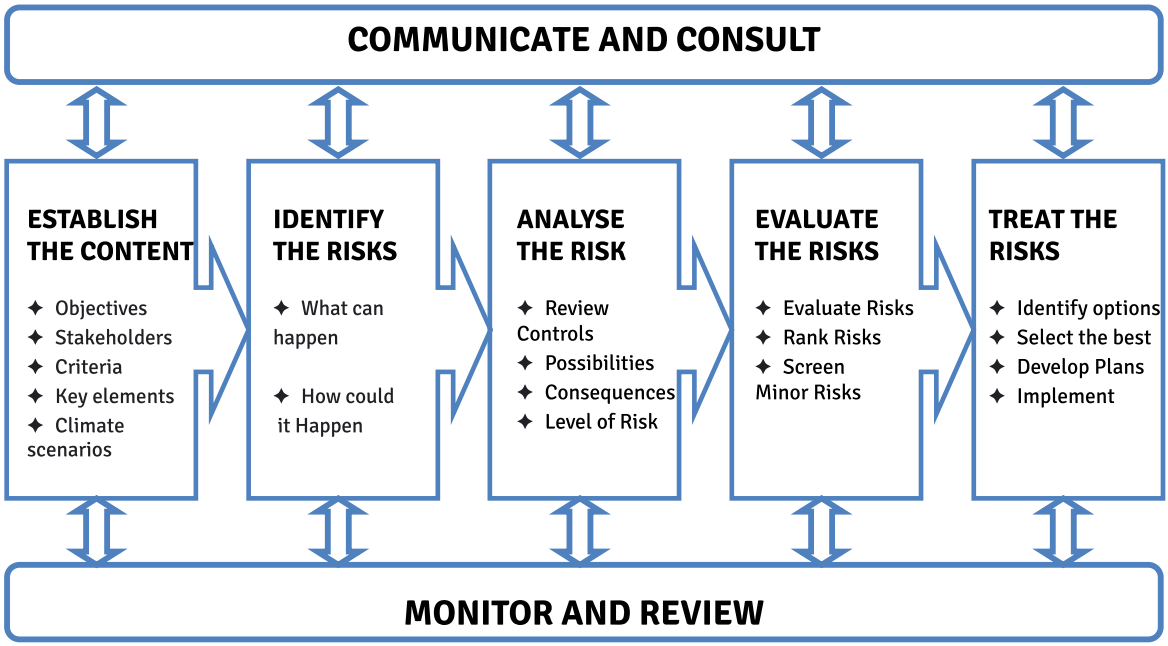
Table 1: Impacts related with Changes to Climate Variables

Change to climate variable	Examples of impacts
Higher mean temperatures	Increased evaporation and decreased water balance. • Increased severity of droughts • Reduced snow caps and melting. • Reduced ranges and alteration of ecosystems and species diversities. • Increased stress and pressure exerted to natural resources
Higher maximum temperatures, increased more hot days and more heat waves	Increased incidence of crop and livestock loss. • Increased heat stress in livestock and wildlife. • Increased risk of damage to crops. • Increased wild fire danger (frequency and intensity).
Higher minimum temperatures	Decreased risk of damage to crops. Livestock and increased risk prevalence. • Extended range and activity of some pest and disease vectors. • Reduced heating energy demand.
Decrease in precipitation	Decreased average runoff, stream flow. • Decreased water quality. • Decreased water resources. • Decrease in hydro-power potential. • Impacts on rivers and wetland ecosystems
Increased severity of drought	Decreased crop yields and rangeland productivity. • Increased damage to foundations caused by ground shrinkage. • Increased forest fire danger
More intense rain	Increased flood, landslide and mudslide damage. • Increased flood runoff. • Increased soil erosion. • Increased pressure on disaster relief systems • Increased risk to human lives and health

Institutional Climate Change Risks

 Activity	Identify activities that you consider to be at risk as a result of a changing climate. Decision whether climate change is a major factor affecting your activities could depend on the objectives and success criteria of any respective local government institution
What is a risk?	A combination of the possibility of an occurrence and its consequences. In practice however, neither possibilities nor consequences are known with certainty. In the context of climate change risk management, uncertainties may arise as a result of large gaps which remain while refining and applying methods for treating uncertainties. For example, uncertainty may arise because institutional decision makers do not know the exact point at which a changing climate impact has a specific level of consequence for their institution. In addition, it may not be clear in some regions the magnitude of the changes or impact associated with climate change i.e. whether temperature or rainfall will decrease or increase in the near future. Therefore improvements are required in ways of expressing the possibility, confidence and range of uncertainty for estimates of outcomes as well as how such estimates fit into broader ranges of uncertainty for specific local government institutional work plan.
 Note it!	Climate Risk management involves quantitative and qualitative techniques defining the nature of the risks. Qualitative techniques are important in situations where there is uncertainty about possibilities or consequences. Sources of uncertainty are constituted by preliminary needs assessment process discussed in the next section of this manual. This assessment will provide a complex and rigorous means of identifying and prioritizing climate change risks. The process requires a general understanding of the impacts of climate change, comprehensive understanding of the institution and outstanding professional decisions. Having undertaken the initial risk assessment, you will find that there are a small number of climate change risks affecting your institutions that need further analysis in order to reduce uncertainties. (See Section VI for a detailed analysis).
Climate Change Risk Management	Risk management is a process that helps an institution to minimize the risks that may keep it from reaching its goals and objectives. Risk management also guides decision making by systematically leading an institution to determine what risks are important and need to be addressed by the district. Risk management is useful in planning for climate change. You will not precisely know the likelihood and timing of future climate changes, neither will you exactly define the types and severity of impacts. This does not mean that institutions/organizations should walk away from an impossible problem; it means they should take practical steps to avoid and minimize risks associated with unwanted outcomes of climate change. Figure 8, indicates the framework used during risk management.

Figure 8: Framework for Risk Management



Source: Australian and New Zealand standards AS/NZS 436

Note it!

See below for a summary of the steps for Climate Risk Management

1.	**Establish the context by:**	• defining the institution to be assessed and the scope of the assessment; • clarifying clearly the objectives of the institution; • identifying the target group and their goals and concerns; • establishing success criteria against which risks to the Institution's objectives can be evaluated; • developing key elements of the institution and its department (its main areas of responsibility) as a means of structuring the process; and • determining significant climate change scenarios for the assessment
2.	**Identify the risks by:**	• describing, listing and prioritizing how climate change impact on each of the key elements of the intuitional departments. All stakeholders should actively participate during this process considering gender lenses.
3.	**Analyse the risks by:**	• reviewing the controls, management systems and responses already in place to deal with each specific risk; • assessing the consequences of each risk against the institution's objectives and success criteria, taking into account the extent and effectiveness of existing controls; • forming an informed decision on the possibility of each identified risk leading to the consequences identified; and • determining the level of risk to the institution and its technical capacity to manage, for each of the climate change scenarios used in the analysis.
4.	**Evaluate the risks by:**	• re-affirming the decisions and estimates; • ranking the risks in terms of their severity and impacts; • selection of minor risks that can be set aside and which would otherwise distract the attention of planning & management; and • Identifying those risks for which more detailed analysis is recommended.
5.	**Treat the risks by:**	• identifying relevant options to manage or adapt to the risks and their consequences; and • selecting the best options, incorporating these into forward plans and implementing them

6.	**Communication and consultation**	This step is intended to communicate why climate risk management is necessary, what the process will be like, and what to expect out of the process for implementation. Involving internal and external stakeholders will ensure that their concerns, interests, perceptions, and views are considered in subsequent risk management steps. Consulting with them helps to build understanding and support for the subsequent steps. This is necessary to engage technical personnel in the process and help them understand the need for climate change risk management to become part of routine management activity. The communication and consultation process will contribute towards the long term development of risk management and help to establish a foundation for its continuing maintenance.
7.	**Monitoring and review**	The outcomes of all steps of climate risk management process should be under review such that as situations change and new information comes in along implementation phases, plans can be maintained and kept up to date under review. Various aspects in monitoring and review process are vital, to include: 1. keeping the analysis and evaluation up to date, including updating climate change scenarios and incorporating new information about climate change impacts; 2. reviewing progress on actions flowing from the process, including implementing actions to reduce climate risks or undertaking further and more detailed analyses; 3. ensuring that the process is implemented in a timely and cost effective manner with documents produced, meetings held, plans reviewed and so on.

Initial Needs Assessment and Detailed Analysis

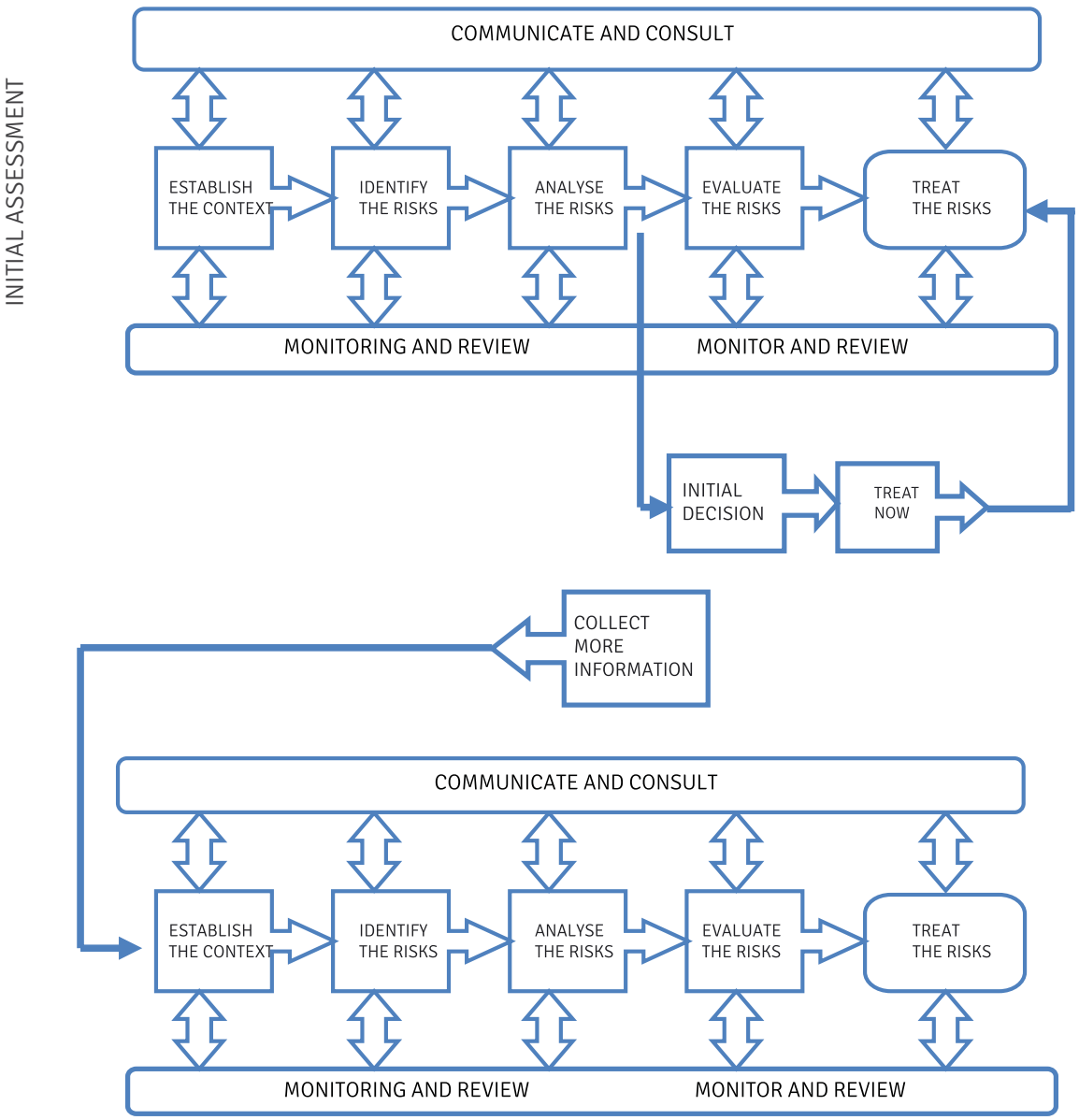


Figure 9: Conceptualization of Steps in the initial needs assessment. Adopted from Australian Department of the Environment and Heritage Australian Greenhouse Office

Note it!

You need to realize that efforts directed towards priority issues follow a two-stage approach to risk assessment:

1. An initial need assessment identifies risks quickly, followed by planning for strategies and implementation for those risks that clearly require it.
2. Detailed analysis is used where additional information is needed to determine whether the strategy is required or what form of strategy to adopt.

Fundamentally, the same process as outlined in figure 9 above should be followed in both the initial assessment and detailed analysis stages of the process.

Overview of initial assessment

This is the stage where most technical staff will make the utmost gain with the least effort. It is where simple, summarized climate change information and a straightforward risk management approach with significant insights may be generated leading to early and effective action. An initial assessment is a cost effective, yet a laborious method of identifying and appraising risks whether new or pre-existing.

The use of an initial assessment stage intends to:

- exploit any immediate insights arising from a simple analysis where, once a risk is documented, it is clear that it needs to be addressed through adaptation or other treatment measures;
- allow for more detailed technical analysis of risks to determine if they require attention or to determine the most effective strategy of handling.

The initial assessment process effectively falls into three stages:

1. Before holding a workshop, it is essential to establish the context of the initial assessment process by determining climate change scenarios that will be used in the assessment; defining the scope of the assessment; considering stakeholders; and establishing the evaluation framework.
2. The risk workshop is a focused activity designed to identify, analyse and evaluate risks so that the highest priority issues can be addressed with a proper level of effort and urgency.
3. After the workshop, the most severe risks can be tackled with strategies to reduce their possibility or deal with the consequences of the risks if they do arise. This section sets out, step by step stages in initial needs assessment process

Section summary

Summary

In this section you learned about the link between climate change and the risk; and how it affects timely planning and provision of goods and services which could result into a chain of consequences, including risks and disasters. We have discussed the frameworks that could be adopted for climate change risk management, and explored steps involved in responding to climate change risks.

Section III

Conducting Initial Needs Assessment

Introduction

Welcome to section III of our Training Manual in which we are going to focus attention on ideas that ought to be considered in conducting initial needs assessment.

The background for risk management sets up a framework for identifying and analyzing risks. It places the assessment of a clear foundation so that everyone works from a common understanding of the scope of the exercise, how risks are to be rated and how the analysis is to be approached.

Upon completion of this section you will be able to:

Outcomes

- Generate ideas that need to be considered in designing the initial needs assessment.
- Create and use climate change scenarios to project climate changes in the future.
- Use risk management frameworks to identify, analyse, and rate risks
- Describe the likelihood of risks under particular climate change scenarios

Terminology

Climate scenario:	A coherent, credible but often simplified description of a possible future state of the climate. A climate scenario should not be viewed as a prediction of the future climate. Rather, it provides a means of understanding the potential impacts of climate change, and identifying the potential risks and opportunities to an organisation created by an uncertain future climate. A 'climate change scenario' can be defined as the difference between a climate scenario and the current climate.
Consequence:	Outcome or impact of an event: 1. There can be more than one consequence from one event. 2. Consequences can range from positive to negative. 3. Consequences can be expressed qualitatively or quantitatively. 4. Consequences are considered in relation to the achievement of objectives
Likelihood:	Used as a general description of probability or frequency can be expressed qualitatively or quantitatively

Monitor	Checking, supervising, observing critically or measuring the progress of an activity, action or system on a regular basis in order to identify change from the performance level required or expected
Risk management process:	The systematic application of management policies, procedures and practices to the tasks of communicating, establishing the context, identifying, analysing, evaluating, treating, monitoring and reviewing risk
Risk identification:	The process of determining what, where, when, why and how something could happen.
Risk analysis	Systematic process to understand the nature of and to deduce the level of risk. 1. Provides the basis for risk evaluation and decisions about risk treatment.
Risk evaluation	Process of comparing the level of risk against risk criteria 1. Risk evaluation assists in decisions about risk treatment
Risk treatment	Process of selection and implementation of measures to modify risk. 1. The term 'risk treatment' is sometimes used for the measures themselves, in addition to the process of generating the measures to deal with a risk. 2. Risk treatment measures can include avoiding, modifying, sharing or retaining risk
Risk assessment	The overall process of risk identification, risk analysis and risk evaluation
Stakeholders	Those people and organizations who may affect, be affected by, or perceive themselves to be affected by a decision, activity or risk. The term 'stakeholder' may also include 'interested parties'

Establishment of the Context

In the process of establishing the context, we mainly consider five parts:

- Climate change scenarios – defining how the climate will be assumed to change in the future.
- Scope – defining the scope of assessment including activities to be covered, geographic boundaries and the time limit.
- Stakeholders – determining whose opinions needed to be taken into account, who can contribute to the analysis and who needs to know its results.
- Evaluation framework – defining how risks will be evaluated by clarifying the objectives and success criteria for the institution and establishing scales for measuring consequences, likelihoods and risk priorities.
- Key elements – creating a framework that will assist in identifying risks by breaking down the institution's concerns into a number of areas of focus and relating them to the climate scenarios.

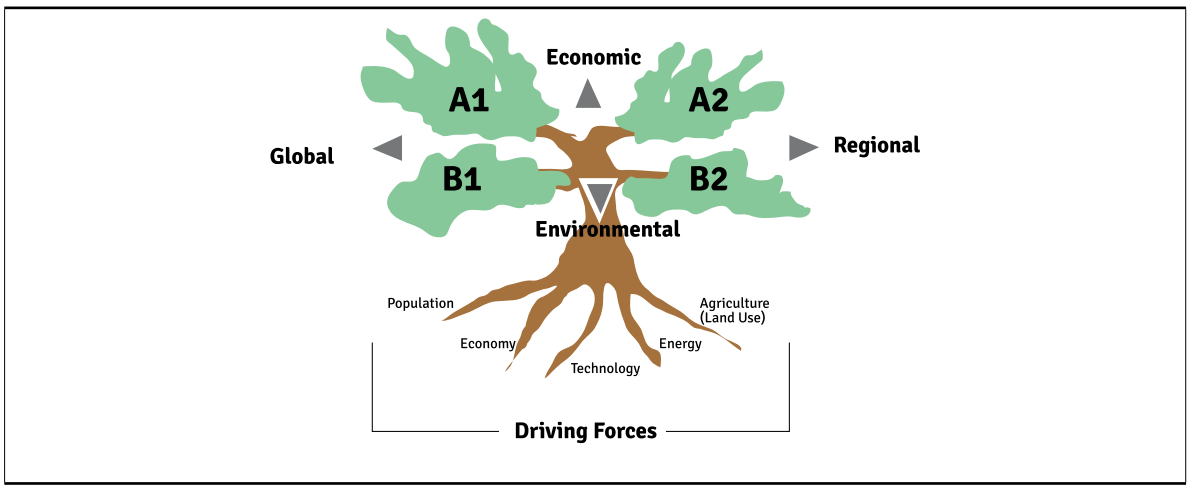
Note it!

Participants in a climate change risk management exercise must have a common view of all the above matters for the exercise to operate proficiently, be repeatable from one review to the next and for the outcomes to be communicated clearly to others.

Climate change scenarios

Managing risks of climate change requires the definition of how climate is projected or assumed to change in the future. This is achieved by using climate change scenarios; for example, A1, A2, B1, and B2 scenarios described in Figure 10 below.

Figure 10: SRES Scenarios



The A1 storyline and scenario family describe a future world of very rapid economic growth, global population that peaks in mid-century and declines thereafter, and the rapid introduction of new and more

efficient technologies. Major underlying themes are convergence among regions, capacity building and increased cultural and social interactions, with a substantial reduction in regional differences in per capita income.

The A1 scenario family develops into three groups that describe alternative directions of technological change in the energy system. The three A1 groups are distinguished by their technological emphasis: fossil intensive (A1FI), non-fossil energy sources (A1T), or a balance across all sources (A1B) (where balanced is defined as not relying too heavily on one particular energy source, on the assumption that similar improvement rates apply to all energy supply and end use technologies). This is a very idealistic future

The A2 storyline and scenario family describe a very heterogeneous world. The underlying theme is self-reliance and preservation of local identities. Fertility patterns across regions converge very slowly, which results in continuously increasing population. Economic development is primarily regionally oriented and per capita economic growth and technological changes are more fragmented and slower than in other storylines. Less idealistic.

The B1 storyline and scenario family describe a convergent world with the same global population, that peaks in mid-century and declines thereafter, as in the A1 storyline, but with rapid change in economic structures toward a service and information economy, with reductions in material intensity and the introduction of clean and resource-efficient technologies. The emphasis is on global solutions to economic, social and environmental sustainability, including improved equity, but without additional climate initiatives.

The B2 storyline and scenario family describe a world in which the emphasis is on local solutions to economic, social and environmental sustainability. It is a world with continuously increasing global population, at a rate lower than A2, intermediate levels of economic development, and less rapid and more diverse technological change than in the B1 and A1 storylines. While the scenario is also oriented towards environmental protection and social equity, it focuses on local and regional levels.

Climate change scenarios provide a credible summary of the changes to climate variables that could apply in your geographical regions, districts and time scale of interest. Scenarios can provide a consistent and efficient basis for assessing climate-related risks across different institutions without affecting the integrity of the analysis.

The scenarios generally provide information on the direction of change in climate variables using a time limit of approximately 20 years. Where feasible, estimates of the magnitude of change to those variables are also provided. In practice, to make a climate change scenario meaningful to your institution, it is useful to supplement the bare 'factual' information of the scenario with a 'word picture' outlining the conditions that would prevail in each scenario. While the majority of you will find the standard scenarios entirely suitable for the identification and assessment of climate-related risks in the initial assessment stage of the process, there is nothing that impedes you from developing tailored scenarios or extending the standard scenarios to include additional climate variables.

Recommended for use in defining climate scenarios:

1. Apply climate change scenarios as the basis for assessing risks in the initial needs assessment stage of the risk assessment process.
2. When applying climate change scenarios to the risk assessment ensure that workshop participants are provided with both quantitative and descriptive information on the scenarios.
3. Limit the number of scenarios used to one or two.
4. More specific and detailed climate change information is provided in the stantdard climate change scenarios may need to be used for detailed anaysis.

The Scope

It is significant to be clear what the initial assessment is to cover and what it is to eliminate.
The scope description should cover the:

- operational activities to be included, which may be everything an institution does or a specific subset of its activities,
- geographical area covered by these activities;
- institutional boundaries of the assessment; and
- time limit to be covered, which has a strong bearing on the definition of climate change scenarios.

Table 2: Examples of scope definitions for different categories of institutions

Scope Definition for Public Value The process will consider all issues associated with maintaining current operations and meeting future requirements within existing service level agreements and regulations, including the management, forecasting and planning functions required to direct efforts to meet future requirements and other institution operations for the next 20-30 years.
Scope Definition for a Government Institution with Policy Concern The process will consider activities of all institutions falling within the Department's responsibility, and the capacity to distribute the outcomes anticipated by Government over the next 20-30 years
Scope Definition for Region Operations The process will consider all current state operations as well as any developments that have been approved for the next 20-30 years, including dependencies on inter-district raw material suppliers and the regional market for our products.

Recommended for use in defining the Scope

- Attempt to address the entire scope of the institution's operations in one assessment exercise if you can.
- If it is necessary to fragment the scope into parts, look carefully for potential gaps between the parts and consider whether you need a separate, high level assessment to deal with issues that are not confined to one area.
- Make sure the geographical area, institutional boundaries, operational boundaries and timeframe are specified clearly.

The Stakeholders

Stakeholders are individuals, groups, and/or institutions which take useful account to achieve a successful outcome for climate risk management within the institution. These will usually include internal groups such as the administrators and executive management, staff and workforce, as well as obvious external groups such as local communities, partners and legal or regulatory authorities. Many people may have or feel that they have a stake in your institution. Some will be able to exercise direct influence while others may make their presence felt through indirect pressure in the public arena, perhaps via the media. Examples of stakeholders may include;

- Individuals or groups living or operating in your region or neighboring regions who may be affected by climate change impacts,
- Visitors and others who make use of natural resources that you rely upon or are required to maintain and protect,
- Institution's personnel working with communities,
- Service providers,
- Collaborative partners,
- regulatory agencies and authorities; and

Political and special interest groups who may share a common interest in the activities for reasons of policy or in pursuit of independent agendas.
Stakeholder analysis is therefore typically concerned with identifying the main stakeholder groups with common interests.

Recommended for use in defining Stakeholders

1. Start with extensive groups of stakeholders rather than small groups or individuals.
2. Split groups if they have two or more distinctly separate sets of interests and concerns.
3. Merge the stakeholders with essentially the same interests and concerns.
4. Think widely about anyone who is not directly involved but could have an effect on the success of your institution.
5. List the stakeholders with a short summary of their motivations and concerns.

An Evaluation Framework

Evaluation of risks in the initial needs assessment involves three components:

- scales to describe the level of consequence of a risk if it should happen,
- a scale to describe the probability of suffering that level of consequence; and
- a means of assigning a priority rating, given this consequence and its probability.

Note it!

Key elements are a set of topics that can be considered one by one during the climate risk identification step of the process.

A set of key elements must be complete enough to cover all significant issues. However, since the number of key elements tends to drive the duration of the climate risk identification activity, it must also be contained to an appropriate scale. Finally, it must balance the need for sufficiently specific language to stimulate the identification of risks against ensuring enough generality to avoid prejudging the identification process. There are many ways to derive a set of key elements, basing on any concept that makes it possible to break down your institution's activities into separate areas. An example:

- Institutional functions or activities,
- Geographical areas or different land uses within the area of interest,
- Service or product types.

A useful set of topics may include items of different types. The main requirement is to be comprehensive, cover everything, leave scope for creative input and achieve an appropriate level of detail on the major climate change impacts.

What Key elements would you consider in a particular institution?

Key elements for any institution includes those particular needs for that sector. For example; the transport sector's key elements may include (Assets like vehicles, maintenance facilities and among others); Infrastructure (current and forecast usage, population demographics, land use and growth), technical staff and funding (development and maintenance facilities).

Key elements for the water sector may include; Water sources, Infrastructure and resources, Customers, Environment & community, and Business environment while those for a public sector include service delivery, related services and service providers, personnel, general public, systems and equipment, Administration and support.

Reflect on the nature and scope of activities involved in your district or region Please, identify the Key elements that you would consider in the process of Climate risk identification.

Objectives, Success Criteria and Consquence Scales

An institution's objectives are connected to climate risk management process via criteria for measuring success. Success criteria are basically a summary of the institution's long term objectives. By conjoining success criteria with a consequence scale it is possible to describe the level of consequence to an institution of a climate risk associated with climate change, if it happens. An institution's long term success generally covers:

- Financial or economic issues,
- Outcomes, service or product delivery,
- Regulatory or ethical compliance; and
- Image, reputation and public relations.

Most institutions will be able to build a set of success criteria around the above mentioned themes. To check if your set of success criteria is adequate, consider two questions:

1. If we are successful against all of these criteria, is there any way we could still fail to achieve overall success for our institution? If so, something may be missing from the set.
2. Do any of these criteria only matter because they affect one of the others?

Illustrations of success criteria for local institutions

Protect and enhance the local institutions in environment and natural resources

- Protect and mainstream existing institutional structures in natural resource management
- Sustain and enhance the physical and natural environment
- Ensure sound public administration and governance

Success criteria for public institutions

Ensure reliable quality service and delivery.

- Manage interaction with other actors in ensuring integrated efforts towards minimizing climate risks and impacts to achieve cost-effective operation.
- Ensure that all regulatory frameworks in all governing structures like political structures are consulted and informed on what needs to be done and how it should be implemented.

- Maintain and strengthen institutional confidence among all partners and collaborators to ensure sustainability
- Maintain required human resource capacity to implement activities related to natural resources with considerations in climate risk management
- Ensure regulatory and legislative compliance to all environment impact assessment

Having presented the success criteria above and its establishment, it is also necessary to describe how badly climate change risks affect any of the mentioned criteria. This is usually achieved by defining a scale that describes levels of consequences for each set criteria as follows;

- Catastrophic - the level that would constitute a complete failure
- Insignificant - level that would attract no attention or resources.

Scales in Table 3 and Table 4 are proven mechanisms for describing the consequences of climate change risks. The risks contain no firm numbers but use simple descriptions that are understood by the participants in the process of learning. There may be occasions where numbers are appropriate, such as in describing levels of damages and losses resulting from climate change, but even descriptions of how the institutions and departments that would react may be adequate: for example, Catastrophic events may equate to closure of institutional activities and service delivery or replacement which cost a lot of resources, Major is equated to having a financial burden for future years, Moderate means having to curtail planned expenditure in the short to medium term and so on for an institution (see Tables 3 & 4).

Table 3: Example of Consequence Scales for Local Institutions

Rating	Service quality	Service delivery	Interaction with other providers	Administration	Community confidence
Catastrophic	Services would fall well below acceptable standards and this would be clear to all institutions.	Services would be incorrectly targeted, delivered late or not at all in a large number of cases	The institutions would be in conflict with other providers and this would directly affect services	Administration of institutions would be seen to have failed and in need of external intervention	There would be widespread concern about our capacity to serve the community
Major	The general public would regard the organisation's services as unsatisfactory	There would be isolated instances of services being incorrectly targeted, delivered late or not delivered at all	The effort of managing relations with other providers would drain resources and badly degrade service delivery	Administration of the organization would be seen to be deficient and in need of external review	There would be serious expressions of concern about our capacity to serve the community

Moderate	Services would be regarded as barely satisfactory by the general public and the Institutional' s personnel	There would be isolated but important instances of services being poorly targeted or delivered late	Unnecessary overheads arising from relations with other providers would be a drain on resources but the public would be unaware of this	Administrative failings might not be widely seen but they would cause concern if they came to light	There would be isolated expressions of concern about our capacity to serve the community
Minor	Services would be regarded as satisfactory by the general public but personnel would be aware of deficiencies	There would be isolated instances of service delivery failing to meet acceptable standards to a limited extent	Unnecessary overheads in dealing with other providers would absorb some effort but the public would be unaware of this and would not be affected	There would be some administrative short comings demanding attention but they would not be regarded as serious failures	There would be some concern about our capacity to serve the community but it would not be considered serious
Insignificant	Minor deficiencies in principle that would pass without comment	Minor technical shortcomings in service delivery would attract no attention	Minor unnecessary overheads arising from relations with other providers but no material effect	There would be minor areas of concern but they would not demand special attention	There would be minor concerns but they would attract no attention

Table 4: Example of Consequence Scales for a Public Utility

Rating	Public safety	Local economy and Growth	Community and lifestyles	Environment and sustainability	Public administration
Catastrophic	Large numbers of serious losses and damages on lives and assets resulting from climate change.	Regional decline leading to widespread Service delivery, losses and damages.	The region would be seen as very unattractive and unable to support its community to adapt and cope with climate change risks and disasters.	Major widespread loss and damage to the Environment.	Public administration would fall into decay and cease to be effective
Major	Isolated instances of serious injuries, loss of lives and property.	Regional stagnation such that production and businesses are unable to thrive and employment does not keep pace with population growth	Severe and widespread decline in services delivery and quality of life within the institution	Severe loss of environmental amenity and a danger of continuing Environmental damage and degradation.	Public administration would struggle to remain effective and be seen in danger of failing completely

Moderate	Small numbers of injuries impacting institutional livelihood	Individually significant but isolated areas of reduction in economic performance relative to current forecasts	Isolated but noticeable examples of decline in services	Minor instances of environmental damage that could be reversed	Isolated instances of public administration being under severe pressure
Insignificant	Appearance of a threat but no actual harm to institutional operations	Minor shortfall relative to current forecasts	There would be minor areas in which the region is unable to maintain its current services	No environmental damage	There would be minor instances of public administration being under more than usual stress but it could be managed

Note it!

Where two or more climate scenarios are employed, consequences must be interpreted as if each scenario has arisen. The consequences of one climate risk may differ depending on which scenario is being considered.

Recommended for use in developing consequence scales for climate risks:

Stay close to an existing risk management framework while satisfying the following recommendations;

- Aim to fulfill all the criteria.
- Test the criteria before developing the scales to make sure they are a complete set and there are not too many to understand.
- Define the extremes of the consequences, Catastrophic and Insignificant, before specifying the Major, Moderate and Minor levels.

Likelihood Scales

It is necessary to describe the likelihood of a risk arising if a particular climate change scenario comes about. This is a conditional likelihood, to be assessed as if the climate change scenario was going to happen.

The likelihood of the scenario actually arising and how to take this into account in the analysis is discussed later.

Likelihood scales for risk analysis are less dependent on the details of the application than consequence scales. A five point scale has proved effective for likelihood ratings just as it has for consequences. The extreme ends of the scale in this case are climate risks that are almost certain to happen and those that are almost, but not quite, certain not to happen. There is one potential source of confusion to be addressed concerning how often the same risk might occur.

Note it!

Some risks are most realistically thought of as events that could happen once, such as the loss of an endangered plant or animal species at the centre of any business or a permanent move of population from increasingly arid areas to town centres and major cities. Other risks make more sense when considered as recurring events such as structural damage to domestic buildings from severe drought, landslides, floods and all death related disasters. A scale that can be used to rate the likelihood of both single and recurrent events. This has been used widely in the world and recommended by IPCC, including in the case studies undertaken in preparing this Manual, and is likely to be relevant to most applications. Where two or more climate scenarios are employed, the likelihood of the risk arising must be interpreted as if the climate change scenario has arisen. The likelihood of a specific risk arising may differ depending on which scenario is being considered.

Risk Priority Level

Use a matrix, similar to that in Table 5, to define the level of priority associated with each combination of consequence and likelihood.

Table 5: Risk Priority Levels

Consequences					
Likelihood	**Insignificant**	**Minor**	**Moderate**	**Major**	**Catastrophic**
Almost certain	Medium	Medium	High	Extreme	Extreme
Likely	Low	Medium	High	High	Extreme
Possible	Low	Medium	Medium	High	High
Unlikely	Low	Low	Medium	Medium	Medium
Rare	Low	Low	Low	Low	Medium

Adopted from the Australian Environment Protection Agency

The interpretation of the Priority Levels follows below:

Extreme: Climate change risks demand urgent attention at the most senior level and cannot be simply accepted as a part of routine operations without executive sanction.

High: Medium: Climate change risks can be expected to form part of routine operations but they will be explicitly assigned to relevant managers for action, maintained under review and reported upon at senior management level.

Low: Climate change risks will be maintained under review but it is expected that existing controls and checks will be sufficient and no further action will be required to treat them unless they become more severe.

Note it!

When setting up the framework for the first time, think about each cell in the priority matrix and consider whether the initial priority rating is appropriate given the meaning of the consequence and likelihood and the interpretation of the priority set out above. Depending on the attitude of the institution towards climate change risks management, the boundaries between the priority regions in the matrix may be moved. There is an opportunity to adjust priorities at the end of the risk identification and analysis but the more initial priorities that are acceptable, the more efficient the overall process will be. The most common pitfall in defining the priority matrix is to make the Extreme region too large and the Low region too small. Careful reflection on a few examples of climate change risks is a good way to test this before putting the matrix to use.

Recommended for use in developing a Priority Matrix

1. In case you have an existing risk management framework, stay as close to it as you can while fulfilling the following recommendations.
2. In case you need to start afresh, use relevant familiar examples as a foundation.
3. Generate a few examples of climate change risks to check the scales.
4. If in hesitation, err on the side of making the Extreme and High regions of the matrix smaller rather than larger, as severe risks that are understated will usually be picked up in the review at the end whereas it is often more difficult to downgrade climate change risks that are overstated and they can deter the process.

Briefing Note

The outcome of the context stage is a briefing document summarizing the context and the process to be used in the training workshop for the initial needs assessment. See Table 6 for a typical content list of a briefing note. Earlier to the training workshop, the briefing note should be distributed to workshop participants, allowing adequate lead time for it to be read carefully. If there are objections or errors to be addressed, it is more efficient to resolve them before the workshop, than in an open meeting. We shall have to discuss this and other institutional matters relevant to planning the workshop later.

Table 6: Briefing Note Content

Section	Contents
Introduction	Purpose of the exercise time, date, content and location of the workshop(s) Identity of the facilitator and, if different, the team leader of the exercise. List of training workshop participants, outline of the process with reference to other guideline standards like AS/NZS 4360.
Context	Climate scenarios to be considered with scope, stakeholders, evaluation framework and key elements relevant for institutional setup
Workshop	Procedural description of training agenda and purpose with intended work plan.

Review Climate Risk Treatment Strategy

An institution should usually review its climate change risk treatment and management strategies as part of the monitoring and review step

Section summary

Summary

In this section you have learned about how to conduct initial needs assessment, and the process of establishing Objectives, Success Criteria, and Consequence Scales. We have also emphasized the importance of context. You have been introduced to concepts and frameworks of climate change risk management which are much relevant to the success of national and local government programmes. The likelihood scales and climate scenarios covered in this section are meant to help you learn how to describe the likelihood of risks under particular climate change scenarios.

Section IV

Risk Management Process - During Training Workshop

Introduction

Welcome to section iv of our Training Manual. We hope you enjoyed and learnt a lot from the previous one. In this section, we are going to focus on the Risk Management Process, during the training workshop.

Upon completion of this section you will be able to:

Outcomes	• Facilitate training/discussions on the risk management process. • Guide participants through the risk management workshop process. • Identify any possible climate change risks and possible plan of action. • Conduct risk analysis to set priorities.

Terminology	Control:	An existing process, policy, device, practice or other action that acts to minimize negative risk or enhance positive opportunities. The word control may also be applied to a process designed to provide reasonable assurance regarding the achievement of objectives
	Probability:	A measure of the chance of occurrence expressed as a number between zero and one. 'Frequency' or 'likelihood' rather than 'probability' may be used in describing risk
	Sensitivity:	The degree to which a system is affected, either adversely or beneficially, by climate related variables including means, extremes and variability

Risk Management Process

During the training workshop, there are three main central sets in risk management process that you ought to consider:

- Identify the risks
- Analyse the risks
- Evaluate the risks

These steps are best undertaken as a single exercise in a training workshop setting. The three steps must generate a list of climate change risks associated with climate change, as comprehensive as possible, and not overseeing any major area of exposure.

At the conclusion of these steps you will have a list of climate change risks and existing controls that tend to mitigate them, with consequence and possibility ratings in each scenario you have decided to consider and an agreed overall priority rating for each risk to your institutional setting.

The training is most effective if it is led by an experienced facilitator, possibly an independent climate risk assessment specialist and a senior natural resource officer acquainted with climate change in the region. Smooth running of the training may also benefit from having an additional person, either independent of the institution or organization personnel working in the same field. Considerable attention will need to be given to ensuring that consensus outcomes from the identification, analysis and evaluation steps are fully and systematically recorded during the course of the training.


Note it!

Training participants should be fully aware of what is being studied and demonstrated. In practice, this probably means recording the information on a whiteboard, a computer spreadsheet projected on to a screen or a similar mechanism that provides visibility of proceedings to the participants.

Risk Workshop Process Overview

During training, the recommended climate risk identification, analysis and evaluation process is to take each key element and each climate change scenario in turn as follows:

i) Brainstorm risks related with the element until the main issues are felt to have been exposed.
ii) Take each risk in turn by:

1. identifying any existing controls (features of the environment, natural and man-made structures and mechanisms, procedures and other factors affecting the environment) that are already in place and tend to mitigate the climate change risks;
2. describing the consequences the climate change risks would have if it was to arise, given the controls, and in each of the climate change scenarios under consideration;
3. describing the likelihood of suffering that different levels of consequences bring under given climate change scenarios;
4. assigning an initial priority in each climate change scenario based on the likelihood and consequence of climate change risk; and
5. Where two or more climate change scenarios are being considered, consider adjusting the priority in recognition that some scenarios are less likely to occur than others.

6. Return to step (1) for the next key element.

Identify Climate Change Risks

A risk is the probability of something happening that will have an impact on the institution's objectives. Climate risk is the probability of harmful consequences or expected losses resulting from the interaction of climate hazards with vulnerable conditions (UNISDR, 2004), and the risks are resulting from climate change and affecting natural and human systems and regions.

A brainstorming approach to climate risk identification inspires all participants to raise issues and provide opportunities for the contributions of how to manage and mitigate these risks. The usual rules of brainstorming, which involves allowing practically any input and suspending decision during the brainstorming activity, should be applied

Tip

All issues raised in the training session should be included, even if they prove later to be insignificant or duplicates of other risks.

The Analysis step screens out the minor issues, and duplicates can be merged in later prioritization of the identified climate risks. There are a few recommendations for your consideration, for a successful risk identification exercise:

- ensure that every risk statement includes a verb, saying “Drought may be severe” rather than just “Severe drought”;
- aim for a cause effect statements (X, the cause, may happen leading to Y, the effect) or equivalent;
- apply common sense tests and local examples to check whether the statement will be understood by anyone who was not present in the training.

It can be difficult to isolate climate risks from separate sources when long timescales and complex issues are concerned. The inclusion of a few non-climate change risks in the process will do no harm apart from absorbing a little time. If a risk is partly related to climate change, it should be included as an example.

Recommended for use in running the risk identification activity

1. Adopt the conventional rules of brainstorming that allow input and various contributions.
2. Maintain the focus of the training to climate risk management.

Analyse Risks

The analysis stage allocates each risk a priority assuming that each of the climate change scenarios being considered arises. It considers any existing factors that will operate to control the risk, and may be features of the environment, or existing practices by which people can adapt as the climate changes or other trends that will happen at the same time and modify the effects of the risk. Table 7 shows a few risk controls.

Table 7: Examples of Risk Controls

Only measures th at are already in place or committed and require no further action to be implemented can be claimed as controls. Measures that might be taken to treat risks in the future cannot be assumed to be in place.
Controls on degradation of infrastructure: • Routine monitoring and repair systems • Inherent robustness in the design and construction • The existence of alternatives that can be used if the main infrastructure system fails
Controls on flooding due to storms and high tides: • The existing elevation of homes and other buildings above sea level • The design and construction of assets that may be affected by flooding
Controls on outbreaks of plant, animal or human diseases: • Early warning monitoring systems • Prophylactic treatments already in place • Naturally occurring mechanisms that compete with or counter the disease and will develop at the same time as the conditions that promote the disease
Controls on movements of population • Economic barriers to relocation Existing distribution of health, transport and other infrastructure • Established government programs that provide incentives to remain in place • Growth of business opportunities associated with climate change that offer fresh employment in existing centres of population

Source: Australian Department of Environment Heritage

Note it!

Priorities are allocated in two stages:

- First, each risk is allocated a qualitative consequence and likelihood rating in each climate scenario being considered; and
- Secondly, a priority is then assigned in each scenario, based on the combination of the consequence and likelihood ratings. Consequences, likelihoods and risk priorities are assessed using the scales developed in the context step as already described above.

If more than one climate change scenario has been used in climate risk identification, then the priority rating of risks may need to be adjusted in recognition of the fact that some scenarios are less likely to occur than others. This can be addressed in two relatively simple ways according to the wishes of the participants.

The simplest approach is to examine the most severe risks and consider whether the relative likelihood of the alternative scenarios mean that some risks should be given more or less priority than has been allocated using 5, based on the initial assessment of consequences and likelihood framework. A risk that only rates a high priority in an unlikely scenario might be downgraded compared to one that rates a high priority in all scenarios or in the most likely scenario. This approach relies on direct examination and expert judgment, which is the basis of the entire process.

A slightly more mechanistic alternative is to reduce the priority rating of risks in the least likely scenarios systematically, while leaving those in the most likely scenario as they are. See Table 8 for illustrations.

Another alternative is not to adjust the priority ratings. This course may be prudent when there is little information about the likelihood of different scenarios. Better information about the likelihood of the alternative scenarios is expected to become available in the next 1-2 years.

Table 8: Adjusting Priority Ratings

More Likely Scenario		Less Likely Scenarios	
Initial	Adjusted	Initial	Adjusted
Extreme	Extreme	Extreme	High
High	High	High	Medium
Medium	Medium	Medium	Low
Low	Low	Low	Low

Source: Australian Department of Environment Heritage

Using this approach, each risk is allocated an overall priority equal to the highest priority it received in any of the climate scenarios being considered. This ensures that any risks that may be noteworthy, in at least one of the possible sets of future climatic conditions, are given appropriate attention in later stages of the analysis.

Evaluate Risks

The objective of the evaluation step is to ensure that priority ratings are consistent with one another and match the participants' general view of the context within which they are operating. When all key elements have been considered, assemble all the risks into a single set in priority order and review them as a whole (please create risk profiles). The output will be a list of risks with all the information recorded in the identification and analysis as well as the agreed priority allocated in the evaluation review.

Review Initial Needs Assessment

The initial needs assessment review is considered an extension of the risk evaluation stage. The purpose of the review is to place risks into the following categories:

- risks that should be treated immediately without further analysis and for which the appropriate strategy is clear;
- risks that can be set aside without further action for the time being; and
- risks that will require more detailed analysis before determining whether to treat them or not or to select the most appropriate form of strategy.

In categorizing risks, it is valuable to consider the following general principles:

1. Extreme priority risks demand urgent attention at the most technical level and cannot be simply accepted as a part of routine operations without in-depth understanding.
2. High priority risks are the most severe that can be accepted as part of routine operations without in-depth analysis to an institution.
3. Medium priority risks can be expected to form part of routine operations but they will be explicitly assigned to relevant technical personnel for action and maintained under review.
4. Low priority risks will be maintained under review but it is expected that existing controls will be sufficient to move an institution.

In general, extreme and high priority risks will need to be treated immediately or subjected to more detailed analysis by the experts. Low priority risks on the other hand, will generally be set aside with no further action required to treat them apart from routine reviews to ensure that there has been no change that would make them more severe.

Starting with the most severe risks and drawing down to lower priority ratings as time and resources permit, you need to determine whether:

- the action required to address a risk is obvious, requires no further explanation, and/or can be implemented immediately,
- further analysis is required to determine the detailed nature of the risk or identify the most appropriate action to take; or it must simply be borne, either because it is insignificant or because there is no cost-effective treatment and this is clear without further analysis with appropriate understanding.

Section summary

Summary

In this section we have focused attention on the risk management process, putting emphasis on what transpires during the training workshop. You learned about risk management process, the workshop process, and the steps of risk management.

Section V

Climate Risk Management Process - After the Workshop

Introduction

Welcome once again to section v of our Training Manual. We still have our focus on the Climate Risk Management Process. In this section, our attention is directed to the process after the workshop.

Upon completion of this section you will be able to:

Outcomes

- Identify the most effective actions to take in response to identified risks and implementation.
- Identify several strategies for climate change risk treatment.

Terminology

Adaptation:	Actions in response to actual or projected climate change and impacts that lead to a reduction in risks or a realisation of benefits. A distinction can be made between a planned or anticipatory approach to adaptation and an approach that relies on unplanned or reactive alterations.
Climate change mitigation:	Response measures that reduce the emission of greenhouse gases into the atmosphere or enhance their sinks, aimed at reducing their atmospheric concentrations and therefore the possibility of reaching a given level of climate change
Risk management process:	The systematic application of management policies, procedures and practices to the tasks of communicating, establishing the context, identifying, analyzing, evaluating, treating, monitoring and reviewing risk
Risk treatment:	Process of selection and implementation of measures to modify risk

Climate Risk Management (CRM) Process

Climate risk management involves a systematic approach to use climate information and practice of considering climate-related trends and events in development decision-making to cope with climate change and minimize potential harm (UNISDR, 2008). This also involves determining the most cost-effective actions to be undertaken in response to the identified risks and implementation of those actions. It usually results in the adjustment of existing strategies and plans, development of new plans, distribution of resources and responsibilities for the plans and their implementation, and the technical personnel. The formulation and implementation of actions is an institutional matter for the routine operating practices within institutional structures. It is often the case that one treatment action has an effect on various risks and one risk can be affected by more than one treatment.

Climate Change Risk Treatment

Risk treatments can simply be referred to as coping and adaptation to reduce and/or minimize disaster occurrences. It is established and implemented by an institution to respond to climate change. Because of the long time scales, climate change risk treatments always involve strategic planning and allocation of new resources. They are thus usually differentiated from short term and reactive adjustments. Climate change risk treatments can include technological and infrastructure measures, planning, research and education or a combination of actions. See Table 9 for an overview of different types of possible measures that could be adopted as risk treatments.

Table 9: Examples of Climate change risk treatments

Treatment type	Description and examples
Spread risk	**Insurance and diversification strategies:** • Use of financial products that off-lay the risk • Geographical diversification
Structural and technological	**Prevent effects through engineering solutions and changed practices:** • Increase reservoir capacity • Implement energy demand management measures • Scale up coastal protection measures • Change design of storm-water systems • Build more resilient housing • Install more efficient irrigation systems • Create wildlife corridors

Regulatory and institutional	**Prevent or mitigate effects through revised regulations and planning:** • Adopt integrated planning approaches • Amend local planning schemes to give greater weight to flood risk • Revise guidance notes for urban planners • Amend building design standards • Increase resources for water resource planning • Factor climate change into criteria for designation of species or ecosystems requiring increased protection • Improved contingency and disaster planning • Lengthen strategic planning periods (5-10 years to 20-30 years)
Avoidance	**Avoid or exploit changes in risk:** • Grow new crops • Migration of people way from high risk areas • Change location of new housing developments • Improve forecasting systems to give advance warning of extreme climate events
Research	**Research to improve understanding of relationship between climate change and risk:** • Improve knowledge of relationship between past and present variations • in climate and performance of economic, social and environmental systems • Improve modeling of regionally-based climate change impacts • Improve knowledge of the probability of frequency and magnitude of changes to extreme climate events and other climate variables under climate change • Improve understanding of the relationship between changes to frequency and magnitude of extreme events and critical thresholds for individual risks
Education, behavioural	**Educate and inform stakeholders about the risks of climate change:** • Increase public awareness about the potential impacts of climate change and about climate change adaptation measures • Educate and inform management and personnel about climate change risks and adaptation measures

Source: Australian Department of Environment Heritage

Section summary

Summary

In this section we have further considered the risk management process with attention focused on the stage after the workshop. We have mainly discussed the climate risk management process with particular focus on the climate risk management process, and the climate change risk treatment.

Section VI

Philosophies for Treating Risks of Climate Change

Introduction

In this section we intend to explore a few philosophies that could be used for treating risks. Many of these, as you will realize, could be drawn from Willows & Connell 2005.

Upon completion of this section you will be able to:

Outcomes

- Use some of the philosophies in treatment of climate change risks within your context.

Philosophies for Treating Climate Change Risks

Achieve balance between climate and non-climate risks	Implementing a climate change risk treatment is itself not risk free. An institution may under-estimate the risks related with climate change relative to other non-climate risks to the institution, leading to inadequate actions taken to treat the climate change risks. Alternatively, the risks of climate change may have been over-estimated relative to other risks, resulting in too much attention and resources being devoted to treating the climate change risks.
Manage priority climate change risks	The initial needs assessment provides institutions with a process for identifying and prioritizing their climate change risks. As discussed in earlier chapters, the risk treatment process of institutions should focus on their high priority risks (i.e. extreme and high risks). This is simply a statement of the general rule that it is necessary to set priorities for the allocation of management attention and resource

Philosophies for Treating Climate Change Risks

Use adaptive management	Adaptive management is an important strategy for dealing with climate change uncertainties. It is the process of putting in place small, flexible, incremental changes based on regular monitoring and revision of plans using information available at the time, rather than relying on large-scale treatments. Adaptive management leaves scope for judgment about treatments to be reviewed in the future as improved information becomes available about the nature of climate change risks.
Look for win-win.	Institutions should look for and give priority to implementing 'win-win 'strategies. Win–win treatments refer to measures that address the targeted climate change risk while also having other environmental, social or economic benefits. See Table 10 for examples of win-win treatments.

Table 10: Examples of win-win and no-regrets treatments

Win-win treatments:

- changed cropping in response to climate change leads to reduced soil erosion
- climate change risk treatment by an electricity distribution company
- increases reliability of customer supply
- strategic response to climate change by a local government helps to build community networks

No-regrets treatments:

- treatment measures that are cost neutral— maybe involving an initial capital investment but reducing overall costs in the longer term
- Improved management practices by an institution (e.g. strategic planning)- How contracts are negotiated in institutions.

Source: Australian Department of Environment Heritage

Avoid adaptation constraining decisions Institutions should avoid taking decisions that will make it more difficult for them or others to manage climate change risks in the future. These decisions are sometimes referred to as 'adaptation constraining decisions'. An example of an adaptation constraining decision is a local council permitting a residential development in a flood-prone area

Section summary

Summary

In this section you have learned about philosophies for treating risks of climate change. You will always find them useful in their provision of guidance towards an appropriate response in the event of any climate change risk.

Section VII

Detailed Analysis for Climate Risk Management

Introduction

Welcome to section vii of this Training Manual. In this section we are going to look at a detailed analysis for climate change risk management and the reason why it is sometimes worth considering.

Upon completion of this section you will be able to:

Outcomes

- Appreciate the need for the detailed analysis in climate risk management.
- Identify major aspects of the detailed analysis in climate risk management
- Assess different options in the event of a climate change risk management.

Terminology

Adaptive capacity:	The capacity of an institution to moderate the risks of climate change through changes in its characteristics. Adaptive capacity can be an inherent property or it could have been developed as a result of previous policy, planning or design decisions of the organisation
Organisation:	Group of people and facilities with an arrangement of responsibilities, authorities and relationships; e.g. company, corporation, firm, enterprise, institution, charity, sole trader, association, or parts or combination thereof
Sensitivity:	The degree to which a system is affected, either adversely or beneficially, by climate related variables including means, extremes and variability
Vulnerability	This refers to the inability to withstand the effects of a hostile environment.

Major Aspects of Detailed Analysis in CRM

Some climate change risks are too complex, with impacts affecting several components of an institution and interactions with other trends and changes during the same time frame. In many cases the initial assessment process will prove sufficient for an institution to identify and prioritise the risks that it faces from climate change to develop and implement treatments of identified climate risks. Some risks may need more detailed analysis before the need for treatment or the nature of appropriate treatment measures can be determined.

Detailed analysis may be needed to:

- address uncertainty in the likelihood, projected level or rate of change to climate variables– i.e. understand the climate change itself by analyzing the previous climatic trends in previous 20-30 years;
- analyse the sensitivity of particular risks to changes in climate variables – i.e. understand the way your activities will be affected by climate change; or
- assess climate risk treatment options. This chapter provides a brief overview of each of these aspects of detailed analysis. The process of implementing the detailed analysis will, in most cases, be particular to institutions and to the different risks faced by your institution as identified. For this reason, it is not feasible or appropriate to offer specific guidance on the detailed analysis. Throughout the remainder of this chapter, while dealing with detailed analytical issues, it is important to consider the purpose of the exercise. It is to provide a sound basis for deciding whether to act on an identified risk or not and, if action is to be taken, to select the most appropriate form of climate risk management option.

Climate Variables	Projected changes
Higher maximum temperatures and more hot days over nearly all land areas	Very likely
Higher minimum temperatures, fewer cold days and hot days over nearly all land areas	Very likely
Reduced diurnal temperature range over most land areas	Very likely
Increase of heat index over land areas	Very likely, over most areas
More intense precipitation events	Very likely, over most areas
Increase summer continental drying and associated risk of drying	Likely, over most mid-latitude continental interiors
Increase in tropical cyclone peak wind intensities	Likely, over some areas
Increase in tropical cyclone mean and peak precipitation intensities	Likely, over some areas

Addressing uncertainty associated with climate change

Uncertainties exist about the magnitude, rate and direction of changes to specific climate variables, especially at the regional and local levels. Some institutions may decide that, in order to assess a risk, more detailed analysis is required on one or more climate variables to reduce the uncertainty in projections.

Reducing uncertainty about the likelihood of changes

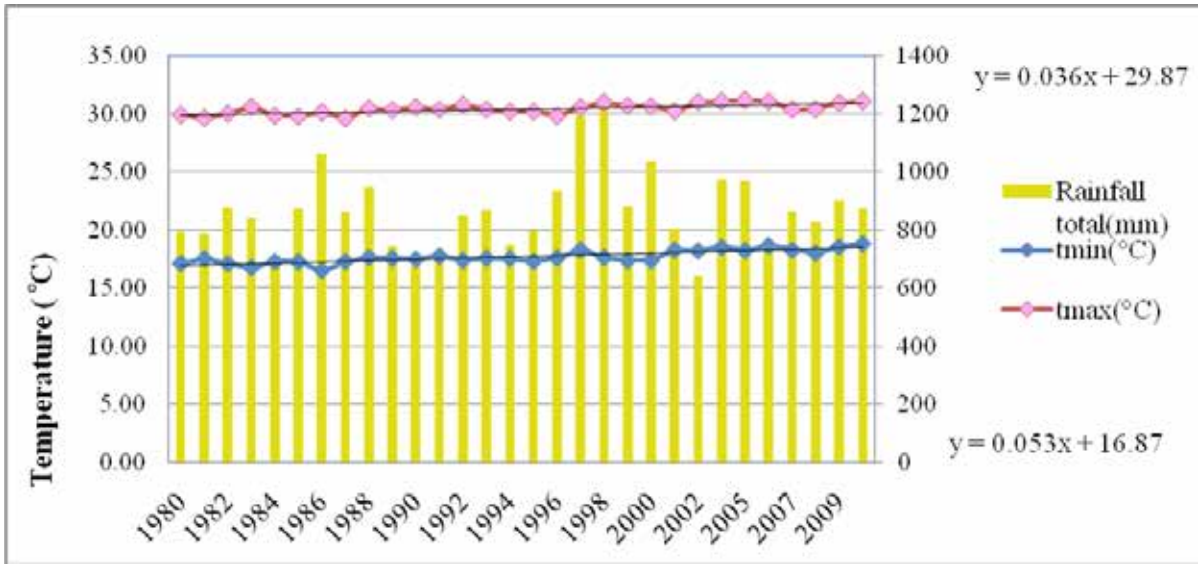
[1]The IPCC (2001) has provided estimates of confidence in projected changes to extreme events and other climate variables (Table 11).

Analysis of Weather trends from Weather data collected from the different regions across the Country

Temperatures in Kasese district have been increasing slowly but steadily over the last thirty years as shown by the positive relationship in the two temperature equations; however rainfall has remained constant over the period with maximum peaks being registered in the period of 1997 to 1998 where Uganda experienced the el'nino rains country wide. The lowlands of the district experienced remarkable flooding (Figure 7)

Table 11: Estimates of confidence in projected changes in extreme events and other climate variables changes to extreme events and other climate variables (Table 11).

Figure 11: Temperature trends for Kasese District



1 The IPCC uses the following definitions of confidence: very likely - 90-99% confidence; likely - 66-90% confidence

Reducing uncertainty about regional and local changes

The climate change scenarios accompanying this Guide provide an indication of the sort of changes in climate that business and communities may have to prepare for in a number of regions in Uganda. The IPCC and other researchers in the region have also undertaken studies which address projections of climate changes at the state and regional levels. A number of state climate change reports provide regional and even site-specific information on projected changes to the frequency of:

- very hot and very cold days and spells;
- droughts;
- extreme rainfall;
- extreme winds; and
- storm surges.

Source: IPCC 2001

Note it!

Many of these studies are available publicly. Some institutions may decide that the level of detail provided in existing reports is insufficient for their needs. For example, they may want to know the implications of projected rainfall changes for stream flow in a specific catchment.

Understanding sensitivity to climate change events

Climate sensitivity is a measure of how responsive the temperature of the climate system is, to a change in the radioactive forcing of the system. This is the degree to which an area or activity of interest will be affected, either adversely or beneficially, by a particular change in climate or a climate-related variable. For activities and assets of some institutions, relatively minor changes in the climate may pass unnoticed up to a certain point, and even significant changes may be manageable without the need for treatment of climate change risks. For example, there may be some activities that would be unaffected by temperature rise.

Once a change to a climate variable (e.g. temperature or rainfall) passes an initial threshold, problems could arise that require treatment of the risk, but it may be unclear where the threshold lies. This may require an analysis in itself, drawing on expertise judgment with in an institution rather than relying on only climate science. Even when the threshold at which change starts to matter is clearly defined, it may still be a challenge to determine whether and how far into the future that point is likely to be reached. This is another matter for climate science.

Expertise in the institution's operations and in climate science will generally both be required for a detailed analysis of climate sensitivity. Such studies may be a significant undertaking and it is important to use the initial assessment to set priorities to ensure that they are not devoted to risks that are insignificant or for which it is clear, without further study, that action is required.

Adaptive Capacity

The range of climate risk management options that are available to an institution will often depend on its capacity to respond to climate change. Much of the literature dealing with climate change response makes reference to the 'vulnerability' of institutions and organisations or systems, defined as 'the extent to which a system or organization can cope with climate change' (McCarthy et al. 2001). It is a function of risk and 'adaptive capacity', defined as 'the ability of a system or an organisation to adjust or respond to climate change or moderate the potential risks of climate change to its assets or activities'.

Adaptive capacity can be an inherent property of the organisation or it could have been developed as a result of previous policy, planning or design decisions. There are a range of factors which can influence adaptive capacity:

- **Information increases adaptive capacity:** Is relevant information available to the institution on climate change and variability?

  Is the information available to the right people within the institution and to relevant stakeholders?

  Are there effective monitoring and other programs in place to detect changes that are occurring?
- **Flexibility and resources increase adaptive capacity**: How flexible is the asset or activity at risk – i.e. can changes be made relatively easily and quickly or are long lead times required?

  Are there appropriate resources for treating a risk– human, financial or other in place already?

  Other risks reduce adaptive capacity: Will other (non-climate) risks to the institution influence its ability to respond to the climate-related risk(s)?

Note it!

Adaptive capacity factors such as these could determine the range of treatment options that are available to an institution or the treatments that are required to deal with a climate-related risk, and ultimately the cost of implementing treatments. Institutions or systems with strong adaptive capacity can generally be expected to have lower costs and a wider range of treatment options to select from than institutions with weak adaptive capacity.

Costs and benefits of treatment options

Where an institution has a number of options for treating risks of climate change, detailed analysis may be required to assess the costs and benefits of the alternatives. A range of tools or techniques are available for assessing the costs and benefits of risk treatment options including those associated with climate change. Some of these involve a full quantitative analysis of the costs and benefits of options; others are semi

quantitative or qualitative. The choice of technique employed will depend on judgments about:

- the significance of the risk to be treated;
- the range of options that are available for treating the risk;
- the range of criteria like economic, social and environmental factors that need to be considered when assessing each option;
- data and information requirements in relation to each of these criteria; and
- the capacity of the decision makers to assimilate the available information and form a judgment without formal modeling.

Reading

See Table 12 for a brief overview of some of the major techniques available for assessing risk treatment options. Further discussion of these techniques is beyond the scope of this Guide. There are numerous guides however, which discuss in depth general application of the techniques. In addition, reports discussing the application of assessment techniques specifically to the impacts of climate change are available through the IPCC website and Australian Greenhouse Office. www.greenhouse.gov.au

Table 12: Tools and techniques for assessing risk treatment options

Tool/technique	Type	Description and purpose	Comments
Cost-Benefit Analysis	Quantitative, economic	Determine whether the total benefits to society of a treatment option outweighs the costs of the option or which option (from a group of options) will produce the greatest net benefit	Focus is on costs and benefits to society: >Relies on pricing major benefit and cost streams. >Pricing of non-market costs and benefits can be resource intensive.
Cost-Effectiveness Analysis	Quantitative, economic	Determine the least-cost way of achieving a predetermined physical or environmental goal.	Only costs of treatment options need to be monetised. > Each option should achieve the same or Similar level of benefit.
Financial Analysis	Quantitative, financial	Determine whether the total benefits to an individual entity of a treatment option out-weighs the costs of the option or which option (from a group of options) will produce the greatest net benefits.	Focus is on costs and benefits to the individual entity
General equilibrium analysis	Quantitative, economic	Determine the flow-on effects throughout the economy of a treatment option or options.	Usually undertaken using computable general equilibrium models. > Data and resource intensive.

Tool/technique	Type	Description and purpose	Comments
Multi-Criteria Decision Analysis	Qualitative/ Semi-quantitative	Determine overall preferences among alternative treatment options, where the options accomplish several objectives. Options assessed against a range of weighted criteria using qualitative or semi-quantitative scoring and then ranked based on scores and weights.	Often relies on expert judgment. > Methods are not yet universally agreed > Can be combined with economic or financial techniques. C7.4

Source: Metroeconomica 2003; MJA 2004.

Section summary

Summary

In this section you have learned about the major aspects that ought to be considered in arranging a detailed Analysis for Climate Risk Management. We have explored instances where it could be very important to organise a detailed analysis. We have also discussed how to go about the assessment of treatment options.

Section VIII

Preparation, Planning and Integration

Introduction

Welcome to section viii of our Training Manual. We are going to briefly discuss the preparation, planning, and/or integration of climate change risk management activities for the appropriate implementation.

Upon completion of this section you will be able to:

 **Outcomes**	▪ Identify major steps for initiating a climate change risk management process. ▪ Integrate climate change risk management activities into existing risk management practices.

 **Terminology**	**Hazard:**	**A source of potential harm**
	Climate projection:	Is a projection of the response of the climate system to scenarios of greenhouse gas discharges or atmospheric concentrations of greenhouse gases. Climate projections are often based upon simulations of the climate system by computer based mathematical models. Climate projections depend on assumptions about emission rates and concentrations and response of the climate system to changes in these variables and can therefore be distinguished from climate predictions

Preparation and Planning

Planning is precarious to the success of any risk management activity. It should;

1. involve people required to sanction, implement and act upon the outputs of the analysis;
2. obtain relevant information;
3. stipulate the timing of activities; and
4. obtain the resources required for the administration, facilitation and data recording components of each task.

The following list sets out the major steps for initiating a climate change risk management process;

1. Review any existing risk management processes or earlier assessment of climate change, if any, within an institution.
2. Determine how climate change risk management will be integrated with other processes (unless it is decided to treat it as a stand-alone exercise, which is not recommended).
3. Identify the sponsor and the audience for the outcome of the process, generally the senior technical staff of the institution.
4. Determine how any actions flowing from this process will be inserted into routine operational activity with appropriate resources and controls.
5. Build around the entire exercise a simple communication plan setting out what will be said by whom and to whom about climate change risk management and the actions flowing from it.
6. Identify the participants in the process, including any external advisers and collaborators you may wish to use
7. Prepare a simple project plan for the process, with dates for the completion of each step.

Key tasks in the project plan for the initial needs assessment

1. Check that you have the latest climate change scenarios relevant to your institution
2. Establish the context of the initial assessment.
3. Identify who will plan and manage the work and, if it is a different person, who will facilitate the workshop(s) and analyse the results.
4. Identify the participants in the workshop(s).
5. Determine whether all participants can be included in a single workshop or if more than one workshop will be required.
6. Estimate how long it will take to prepare and document the context definition.
7. Pick a workshop date or dates allowing sufficient time to prepare a briefing note for all participants and issue it a clear week, or more, before the first workshop.
8. Document the plan for: establishing the context; preparing a briefing note; holding the workshop(s); and conducting the initial assessment review.

Recommendations when planning for the initial risk assessment

- Work on an initial estimate of one to three months elapsed time to complete the stage and adjust it as necessary to suit your situations, but try to avoid extended delays.
- Take account of the timing of significant information inputs that might become available around the time of the analysis and try to plan workshops to take advantage of them.
- Try to ensure the initial assessment output is available in time to be used in budgeting and target setting, towards the end of a planning year rather than just after the start of a year.
- Plan workshops for a half or a full day, erring on the high side if in doubt, with a target of seven to fifteen people in each.
- Engage workshop participants who have understanding and ownership of the issues and responsibility for taking action to treat risks.
- Consider whether you need a specialist facilitator, in-house or external, to help with the rest of the process.

Integration with Existing Risk Management Practices

Institutions have risk management practices in place. These may range from fully integrated enterprise wide risk management systems to disjointed applications of safety and hazard assessments.

This manual therefore, is intended for any institution, no matter how much or how little their risk management activity has been dignified to date. Two extremes, in terms of the current state of risk management, are discussed in the following sub-sections. From these, most institutions will be able to select guidance to suit their circumstances.

Building on a fully integrated risk management system

An institution that has a fully integrated risk management system will have skilled resources that can be applied to climate change risk management and many personnel will be familiar with the general working of the process. The institution is likely to have an agreed strategic context definition, processes for defining the context of separate parts of their operation, and mechanisms for evaluating risks. The institution may also have in-house resources for facilitating the risk management process or access to such expertise elsewhere.

Recommendations if you have no formal risk management processes at the moment

1. Consider whether this will be an isolated risk management exercise or part of a wider risk management development.
2. If there is an intention to develop a general risk management process as well as implement climate change risk management, seek additional advice as this manual does not extend to the establishment of a full institutional risk management process.
3. Even if there is no intention to go beyond climate change risk management, consider using specialist risk management guidance, even though it may not be required by everyone to implement the process laid out here.

Integration with other Activities

The annual planning cycle

Climate change is taking place on a similar timescale and in some cases with similar consequences to other long terms trends and changes.
These include: population growth; ageing of the population; changes in land use; general aspiration towards higher living standards; and pressure to reduce greenhouse gas emissions and adopt sustainable development practices.

Planning and budgeting are usually conducted to a well-defined timetable, but investigations that might feed into a risk analysis may be less predictable. Where possible, arrange for relevant information to be available before risks are identified or reviewed.

Recommendations during the Annual Planning Cycle

1. Consider integrating climate change risk assessment with strategic planning.
2. Use all strategic planning and related information to identify changes that will take place at the same time as climate change.

3. Plan to have the conclusions of the risk management process available in time to be included in the annual objective setting and budget allocation exercises.
4. Use the communication and consultation activity in the risk management process to gather relevant information from other planning and investigation activities and disseminate climate change risk management information to these other activities.
5. As far as possible, try to make the outcome of other investigations and reports available before the risk analysis takes place.

Section summary

Summary

In this section you have learned about the preparation, planning and integration of climate risk management activities for implementation. We have learnt that this could be through integration with existing risk management practices, or otherwise.

Checklist of Recommendations

Using climate change scenarios

1. Apply climate change scenarios as the basis for assessing risks in the initial assessment stage of the risk assessment process. Standard scenarios accompany this Guide, and will be updated periodically as new information about climate projections becomes available.
2. When applying climate change scenarios to the risk assessment ensure that workshop participants are provided with both quantitative and descriptive information on the scenarios.
3. Limit the number of scenarios used to one or two.
4. More specific and detailed climate change information than is provided in the standard climate change scenarios may need to be used for detailed assessments.

When defining the scope

5. Try to address the entire scope of the institution's operations in one assessment exercise if you can.
6. If it is necessary to split the scope into parts, look carefully for potential gaps between the parts and consider whether you need a separate, high level assessment to deal with issues that are not confined to one area.
7. Make sure the geographical area, Institutional/ organizational boundaries, operational boundaries and timeframe are specified explicitly.

When identifying the Stakeholders

8. Start with broad groups of stakeholders rather than small groups or individuals.
9. Break groups down if they contain two or more distinctly separate sets of motivations and concerns.
10. Group together stakeholders with essentially the same motivations and concerns.
11. Think widely about anyone who is not directly involved but could have an effect on the success of your organisation.
12. List the stakeholders with a short summary of their motivations and concerns

When developing consequence scales

13. If you have an existing risk management framework, stay as close to it as you can while satisfying the following recommendations.
14. Aim for four to six criteria.
15. Test the criteria before developing the scales to make sure they are a complete set and there are not too many of them.
16. Define the extremes of the consequences, Catastrophic and Insignificant, before specifying the Major, Moderate and Minor levels.

When developing likelihood scale

17. If you have an existing risk management framework, stay as close to it as you can while satisfying the following recommendation.
18. Use the default scale shown here unless there is a pressing reason not to, such as there being an established scale in use already or the range of likelihoods you face being very low.

When developing a priority matrix

19. If you have an existing risk management framework, stay as close to it as you can while satisfying the following recommendations.
20. If you need to start afresh, use the examples here as a foundation.
21. Create a few examples of risks to test the scales.
22. If in doubt, err on the side of making the Extreme and High regions of the matrix smaller rather than larger, as severe risks that are understated will usually be picked up in the review at the end whereas it is often more difficult to downgrade risks that are overstated and they can clog the process.

When running the risk identification activity

23. Adopt the conventional rules of brainstorming that allow almost any input and suspend judgment.
24. Do not allow the workshop to be diverted into debating whether a risk is a climate change risk or not. If in doubt let it remain in the process and consider the matter later, after the workshop.

When planning the initial risk assessment

25. Work on an initial estimate of one to three months elapsed time to complete the stage and adjust it as necessary to suit your situations, but try to avoid extended delays.
26. Take account of the timing of significant information inputs that might become available around the time of the analysis and try to plan workshops to take advantage of them.
27. Try to ensure the initial assessment output is available in time to be used in budgeting and target setting, towards the end of a planning year rather than just after the start of a year.
28. Plan workshops for a half or a full day, erring on the high side if in doubt with a target of seven to fifteen people in each.
29. Engage workshop participants who have understanding and ownership of the issues and responsibility for taking action to treat risks.
30. Consider whether you need a specialist facilitator, in-house or external, to help with the rest of the process.

If you have existing risk management processes

31. Use the established process as the foundation for climate change risk management
32. If it is necessary to adjust or extend existing processes to meet the needs of climate change risk management, integrate the two processes into a single framework
33. Make climate change risk management an integral part of risk management in the organization, not a separate risk management activity operating on a different basis from that used for other risk management tasks

If you have no formal risk management processes at the moment

34. Consider whether this will be an isolated risk management exercise or part of a wider risk management development.
35. If there is an intention to develop a general risk management process as well as implement climate change risk management, seek additional advice as this Guide does not extend to the establishment of a full organisational risk management process.
36. Even if there is no intention to go beyond climate change risk management, consider using specialist risk management guidance, even though it may not be required by everyone to implement the process laid out here.

The annual planning cycle

37. Consider integrating climate change risk assessment with strategic planning.
38. Use all strategic planning and related information to identify changes that will take place at the same time as climate change.
39. Plan to have the conclusions of the risk management process available in time to be included in the annual objective setting and budget allocation exercises.
40. Use the communication and consultation activity in the risk management process to gather relevant information from other planning and investigation activities and disseminate climate change risk management information to these other activities.
41. As far as possible, try to make the outcome of other investigations and reports available before the risk analysis takes place.

Obtaining information and support

42. Check AGO website for the most up-to-date climate science information and scenarios.
43. Ensure that a member of the facilitation team involved in the initial assessment stage has a basic familiarity with current climate science to the level of, say, the 'summary for policy makers' in the IPCC Synthesis Report (IPCC 2001).
44. Consider using a specialist, whether in-house or externally sourced, to interpret climate science where it is necessary to go beyond the simplified scenarios accompanying this Guide.
45. Take account of the strategic nature of climate change risk management and the desirability of integrating the process with other management systems when selecting advisers for risk management support

References

AIACC. (2007): Climate Change Vulnerability and Adaptation in Developing Country Regions. Draft Final Report of the AIACC Project. A Global Environment Facility Enabling Activity in the Climate Change Focal Area Project No GFL-2328-2724 4330. http://www.aiaccproject.org/Final%20Reports/Final%20Reports/Draft%20Final%20Report_AIACC_April%2007.pdf (accessed by 3rd/8/2011).

Commonwealth of Australia, (2006), A training guide for climate change impacts and risk management for Business and Government. Commonwealth of Australia.

Houghton, J. T., Ding, Y., Griggs, D.J., Noguer, M., van der Linden, P.J., Dai, X., Maskell, K. and Johnson, C.A., (eds.) 2001. Climate Change 2001: The Scientific Basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, Cambridge, UK. 572pp. Available from: http://www.grida.no/climate/ipcc_tar/

Huq, S., Rahman, A., Konate, M., Sokono, Y. and Reid, H. (2003): Mainstreaming adaptation to climate change in least developed countries (LDCs) http://www.un.org/special-rep/ohrlls/ldc/LDCsreport.pdf (accessed by 29th/7/2011).

IPCC (Intergovernmental Panel on Climate Change), 2007. Summary for Policymakers. In: Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report.

Louw, E.J.M. (2007): Climate Change in the Western Cape: A Disaster Risk Assessment of the Impact on Human Health. Dissertation presented for the degree of Doctor of Philosophy at the University of Stellenbosch. http://www.idrc.info/userfiles/image/presentations2008/Louw_Elretha_Climate_Change_in_the_Western_Cape_A_Disaster_Risk_Assessment_of_the_Impact_on_Human_Health.pdf

Lukwiya, P. (2009): Effect of Climate Change on Water Resources in Uganda; article was submitted to the On the Frontlines of Climate Change Forum.

NAPA. (2007): Climate change 2007 Uganda national adaptation programmes of action.

United Nations Development Programme (UNDP) (2012). Crisis Prevention and Recovery. Disaster Reduction Unit. What We Do – Risk Reduction Tools. New York. Retrieved February 2012 from http://www.undp.org/cpr/disred/english/wedo/rrt/dri.htm

United Nations Development Programme (UNDP) (2004). Reducing Disaster Risk: A Challenge for Development. A Global Report. New York: UNDP.

United Nations Development Programme (UNDP) (2011). MDGs in Uganda. Available from http://www.undp.or.ug/mdgs/25

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