

LET'S ACT TO ADAPT

Dealing with Climate Change

A community information toolkit on adaptation

A resource package developed for farmers and natural resource users in the
Kunene Region, Namibia

September 2011

A project implemented by the Ministry of Environment & Tourism



Africa Adaptation Programme – Namibia Project (AAP-NAM) implemented by the Ministry of Environment and Tourism

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Printed by: John Meinert Printing (Pty) Ltd

ISBN 978-99945-0-025-3

Funded by the Government of Japan through UNDP

Acknowledgements:

The development of this toolkit draws heavily from a large number of consultations and reviews. Farmers and Regional Council representatives of selected constituencies in the Kunene Region of Namibia are thanked for their participation and vigorous inputs. For Kunene Region consultations took place in Opuwo and Kamanjab constituencies.

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Why is climate change an important issue for farmers and natural resource users in the Kunene Region?

Many people living in the Kunene Region depend on livestock farming, conservancy related tourism and the use of biodiversity products for their daily livelihoods. All these natural resource-based livelihoods are vulnerable to climate change to some extent. People have already observed the ongoing natural variability and that there are changes in rainfall patterns, and the last few years have been marked by extreme weather conditions. Although it is sometimes difficult to distinguish between naturally variable climatic conditions and climate change, it is clear that climate change will have profound impacts on our lives in the near future. Although it is not possible to predict what effect future climate will have, it is clear that farmers and resource users need the tools to be able to manage associated extreme situations and risks.

Although our climate in Namibia, including Kunene Region, is variable with dry periods and droughts commonly experienced (see more information in Section 1), conditions for agriculture are expected to become more difficult because of climate change. Impacts may be severe, leading to less water availability, higher temperatures and generally less predictable patterns. As a result, there is a great need to be more flexible and strategic about practising more adaptive livestock management because of fluctuations in grazing availability. It is also important to manage wildlife and tourism carefully in line with less predictable resource availability. Alternative resource uses and livelihoods may need to be explored and promoted to build resilience.

Frequent flooding of the Kunene River and ephemeral rivers that cross the Kunene Region in a westwards direction can have impacts on people, cutting them off from specific areas, destroying infrastructure and even leading to a loss of life. However, these challenges are less extreme compared to other more flood-prone areas in Namibia. More pertinent to Kunene Region, droughts could increase or become more severe in some climate change scenarios. This requires careful planning and preparedness among farmers and resource users.

Even if it is not possible to predict with great certainty what the weather in a particular year is going to be like, it is better to be prepared for any change in climate than to ignore potential threats. This is called '**adaptation**' – adapting to climate change – and every person in Namibia and elsewhere in the world will have to do their bit to ensure that they can react to and cope with the various challenges that could occur. It is clear that taking no action will come at a much greater cost than investing in being prepared.

About this information toolkit

This information toolkit is based on the initial *Natse Otweya!* prototype that was developed with farmers in the Omusati Region in 2008, and that has been tested and applied since then throughout Namibia, including in the Kunene Region. As part of the Africa Adaptation Programme (AAP-NAM), a project coordinated by the Ministry of Environment and Tourism (MET), the *Natse Otweya!* experience is now being scaled up to a regional approach, with five toolkits for the whole of Namibia.

Based on prevailing biomes, environmental and cultural backgrounds and of course the expected climate change risks, the following five initial toolkits are available in this series:

1. Oshana, Ohangwena, Oshikoto regions
2. Caprivi & Kavango regions
3. Kunene Region
4. Omaheke & Otjozondjupa regions
5. Erongo, Hardap, Karas & Khomas regions

The initial toolkit focused very strongly on farming issues but has now been extended to acknowledge that our livelihoods are more broadly affected by climate change. While the focus on farming remains, rural livelihoods are more comprehensively covered.

Gender considerations are essential for successful adaptation – and it is very important that adaptation strategies and approaches do not perpetuate or increase discrimination against vulnerable groups such as women, youth or the elderly.

This is the first comprehensive and dedicated resource for farmers, natural resource users and their service providers in the Kunene Region to learn about what climate change is, what the expected impacts are for Namibia and this regions in particular, and more importantly, it provides some preliminary ideas on options for adaptations that people can apply to start dealing with the threats.

The toolkit is available directly to local farmers and to extension personnel, especially from the Ministry of Environment and Tourism (MET) ,Ministry of Agriculture, Water and Forestry (MAWF), the Ministry of Health and Social Services (MoHSS), regional councils, teachers, church leaders, conservancies, NGOs and CBOs and many different individuals and organisations.

The material is designed to be used in working sessions to start discussions and explore the issues of climate change and to guide resource users in taking the first steps to collaboratively deal with specific regional climate change issues. Inputs from farmers in the Kunene Region have formed the basis of this toolkit, which includes art work that illustrates climate change topics of most concern to the resource users in the regions.

How to use this toolkit

This toolkit comprises two integral and related key parts:

1. The toolkit book:
 - a. Information on climate change in general, risks that Namibia and the region could be exposed to potential impacts on daily livelihoods and potential strategies to adapt – building resilience to the potential risks.
 - b. A series of eight tools that will assist farmers working with their service providers to understand the effects of climate change in their regions and strategically plan actions that will lead to appropriate adaptation. Optimally, the tools should be used in sequence to obtain the best results.
2. The toolkit poster:

Pictures from the book form a composite illustration of ‘life without adaptation’ and ‘life with adaptation’ options in the poster, which is designed as a discussion tool. Many other specific issues will emerge during discussions that will require flexible, sometimes specific and often novel climate risk management actions.

The expected key outcome of the application of the full toolkit would be the development of regionally specific climate change adaptation plans of action. These could apply to an individual farmer, a community e.g. a conservancy, or a community group working with a specific organisation such as such as MAWF, MET or MoHSS.

The plans should address practical adaptation interventions such as the installation of water harvesting technologies and domestic solar power, planting of fruit trees and the development of small home gardens where appropriate. Financing options for the interventions identified should also be discussed.

At the end of the booklet some important contacts are given. There are opportunities to seek technical and financial support and various organisations are well positioned and willing to assist resource users.

1. Introduction to climate change

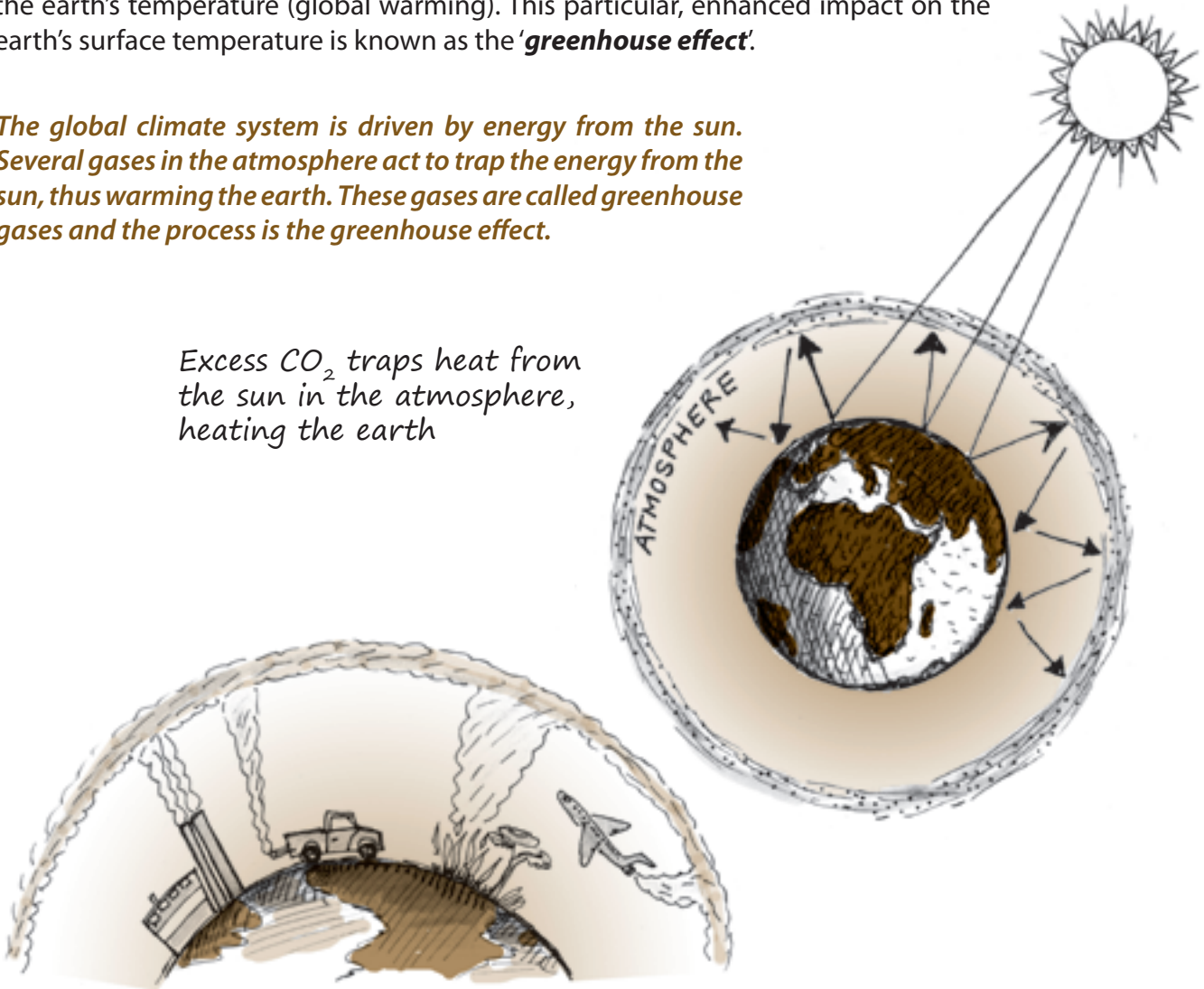
1.1 What is climate change?

Climate change refers to any changes of the 'average weather' in an area over time. It is a natural process that takes place over a very slow timescale and natural changes in climate have been observed over thousands of years i.e. long periods of cooling and subsequent periods of warming.

However, over the past 200 years, the climate has been changing faster than expected, mainly due to the fact that a sharp rise in the human population and subsequent industrialisation has led to an increase in carbon dioxide emissions into the atmosphere. This has led to an increase in the earth's temperature (global warming). This particular, enhanced impact on the earth's surface temperature is known as the '**greenhouse effect**'.

The global climate system is driven by energy from the sun. Several gases in the atmosphere act to trap the energy from the sun, thus warming the earth. These gases are called greenhouse gases and the process is the greenhouse effect.

Excess CO_2 traps heat from the sun in the atmosphere, heating the earth

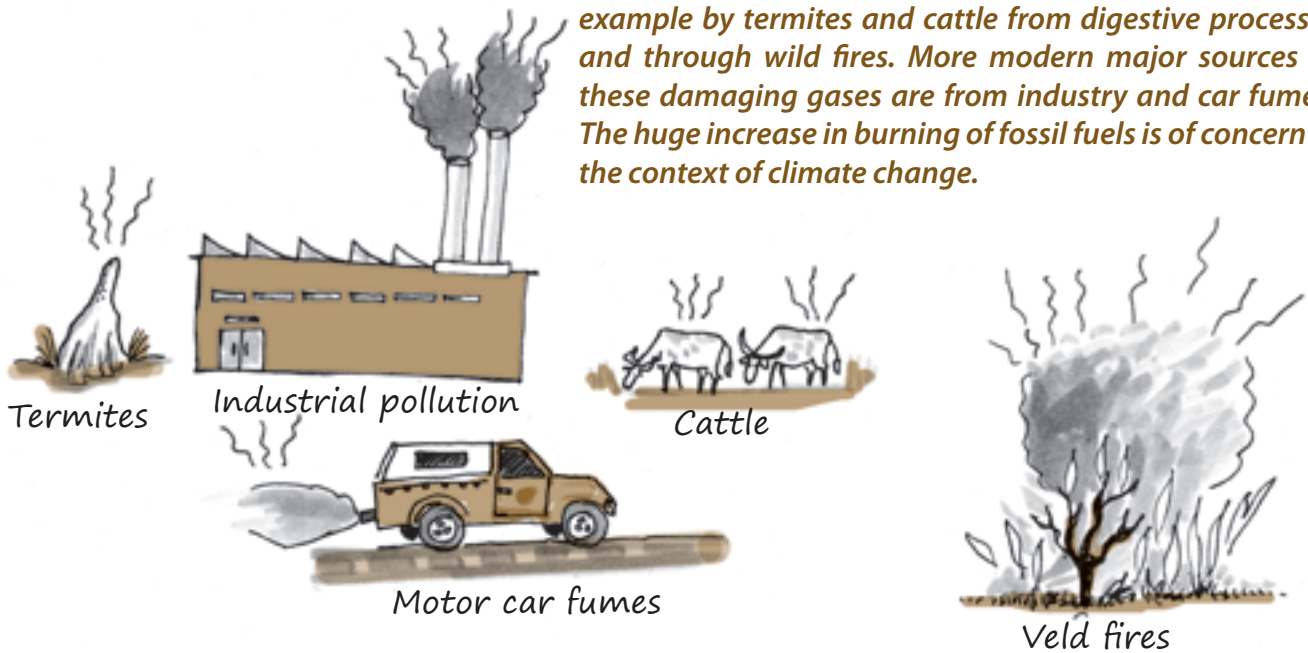


Weather refers to the day to day state of the atmosphere at a given time and place. Weather is described in terms of variable conditions such as temperature, humidity, wind velocity and precipitation.

Climate describes the total of all weather occurring over a period of years in a given place. This includes average weather conditions and regular weather patterns (such as winter, spring, summer, and autumn).

Climate change refers to any changes of average weather in an area over time. Climate change may be due to natural changes or human induced changes.

Greenhouse gases are naturally released into nature, for example by termites and cattle from digestive processes and through wild fires. More modern major sources of these damaging gases are from industry and car fumes. The huge increase in burning of fossil fuels is of concern in the context of climate change.



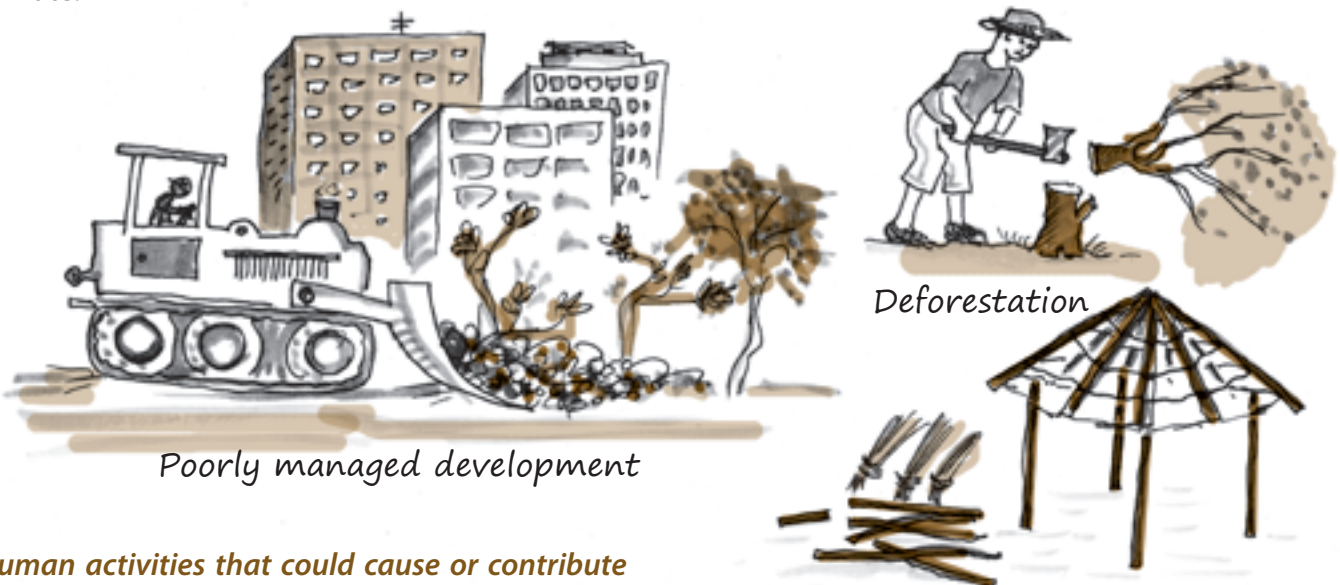
1.2 What causes climate change?

Climate change can be caused either by natural events or because of human activities.

Natural causes of climate change can be activities such as the movement of continents, large eruptions of volcanoes and differences in ocean currents.

Human-induced activities include the burning of fossil fuels (e.g. coal and oil) for energy generation, which is in turn used for cooking, heating and lighting. Over the years people have moved to cities, which has led to the loss of vegetated land and large-scale land use changes for residential, agricultural and industrial purposes.

The decline in natural resources as a result of consumption and over-utilisation has contributed to the increase of **greenhouse gases** in the atmosphere. While development is an important and natural progress of humankind, some of these developments are harmful to the environment and affect the climate.



Human activities that could cause or contribute to climate change are, amongst others, related to the unsustainable use of biomass, deforestation, habitat conversion and uncontrolled use of wood resources.

Greenhouse effect is the rise in temperature of the Earth because certain gases in the atmosphere trap energy from the sun.

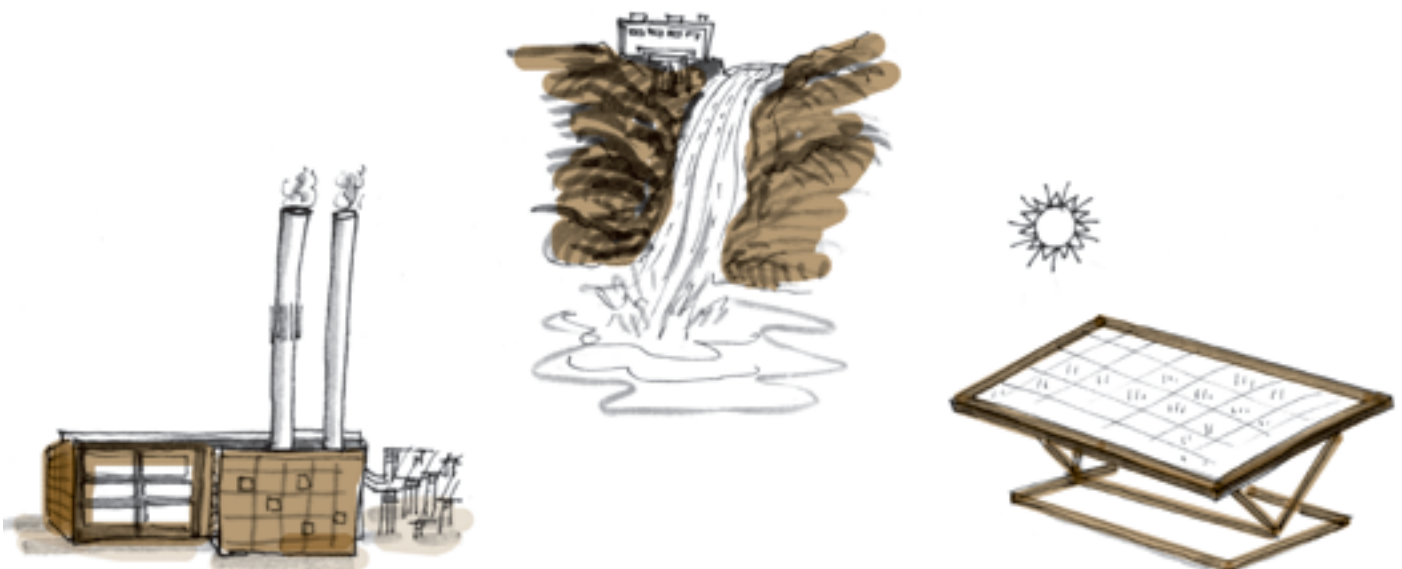
Climate change mitigation refers to ways of reducing the emissions of damaging greenhouse gases that lead to changes in the earth's atmosphere – a main cause of climate change.

Sequestration refers to the absorption of greenhouse gases from the atmosphere by trees or leafy vegetation. Re- or afforestation can aid this absorption.

It is important to find options and strategies for development that do not increase the greenhouse effect and do not affect the earth's climate e.g. design cars that use less fuel; develop environmentally friendly fuel and investigate alternative sources of energy for cooking, heat and industrial use, and avoid felling trees and deforestation. This is called '**mitigation**'.

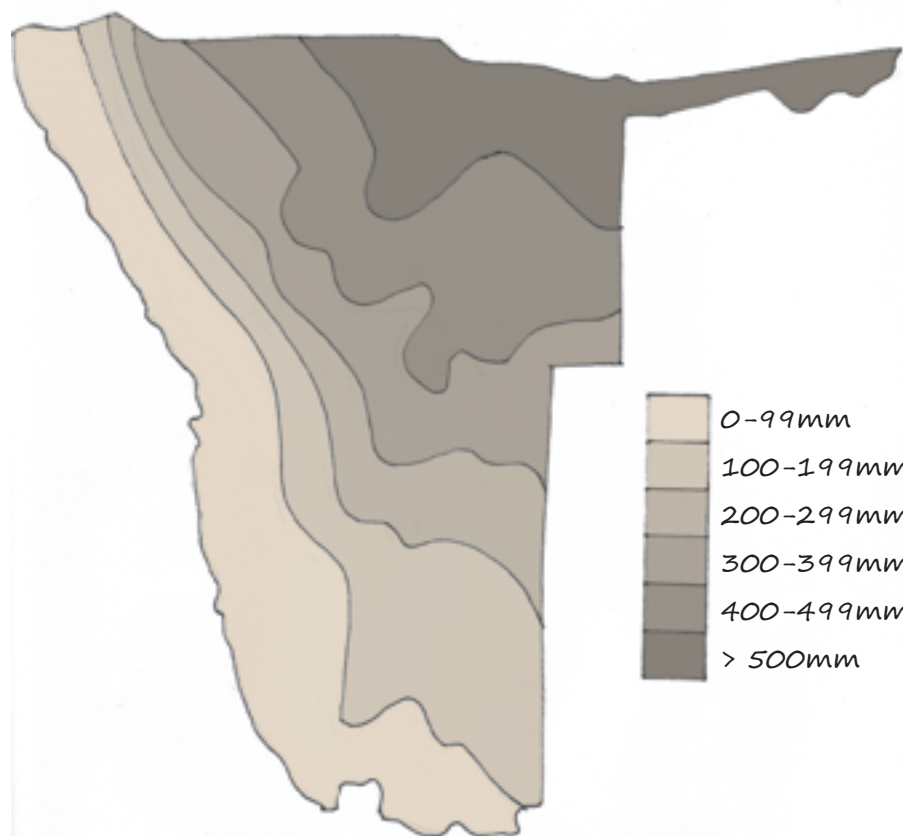


There are options for improving human and industrial uses of resources, which are environmentally friendly and do not contribute to climate change so much and thus could contribute to 'mitigation' of climate change. For example, using solar instead of wood or fossil fuels is the best way of generating energy both for household and industrial uses.



1.3 Namibia's climate

Namibia is the most arid country in sub-Saharan Africa. The weather in Namibia is hot for most of the year, and overall rainfall is low. Not only is rain very limited but also extremely variable from year to year and from place to place. This is called '**temporal**' and '**spatial**' variability. Namibia, with its arid and semi-arid climate, is already subject to large climatic variability, and this is likely to increase with the predicted changes to the earth's climate.

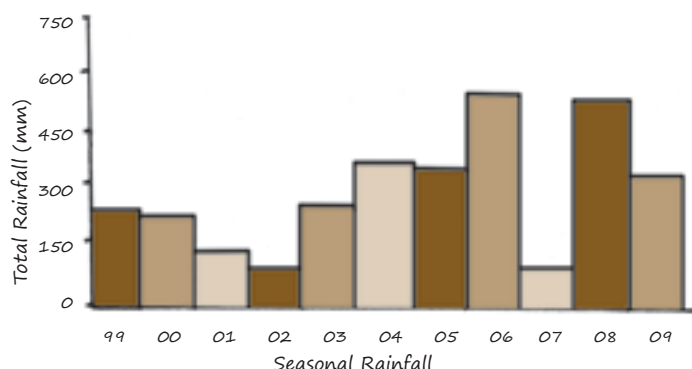
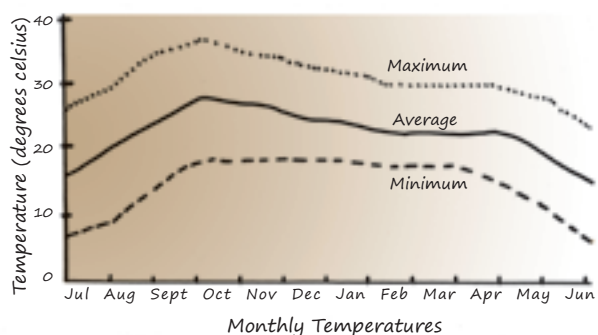


Namibia is the most arid country in sub-Saharan Africa with a highly variable climate. Droughts are frequent and below average rainfall is common. In the Kunene Region, the annual average rainfall ranges between 250-450 mm; as elsewhere in the country, this can be very variable. Temperatures range from a maximum average of over 20°C in winter up to 36°C in summer.

Climatic variability refers to 'normal' variations in climate on temporal or spatial scales beyond that of individual weather events.

Drought is described as a long period of below average rainfall.

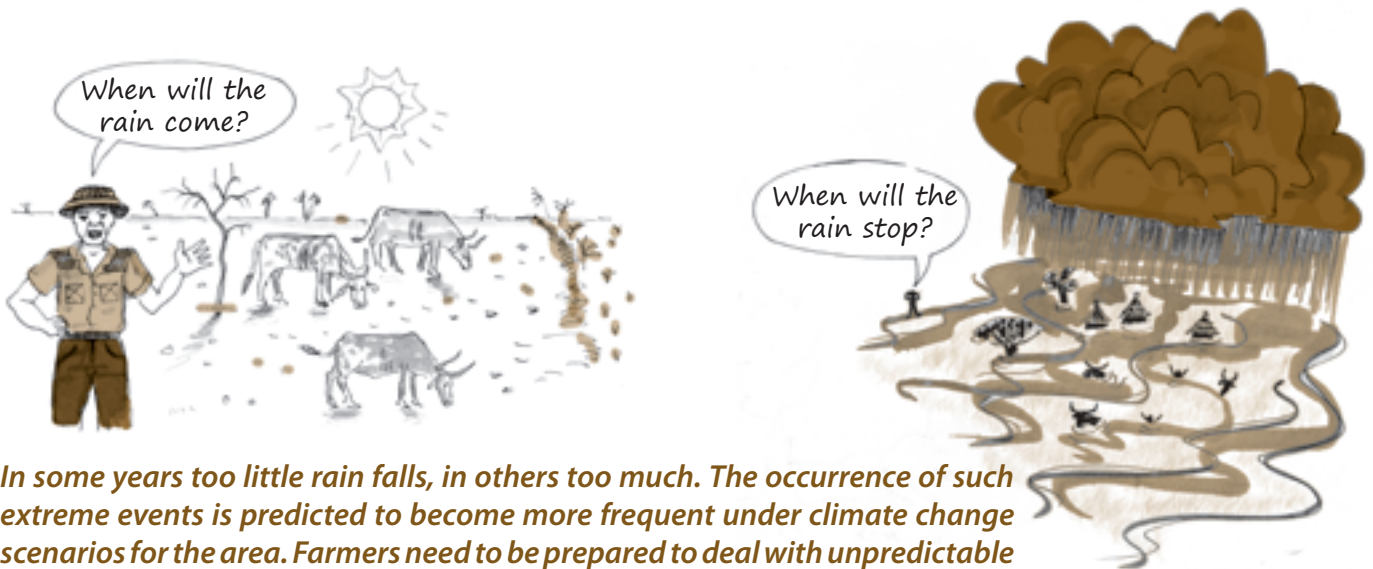
Extreme events could be either extreme floods or droughts, or even other phenomena like extremely cold spells.



It is hard to predict in advance how much rainfall an area will receive. The occurrence of droughts is common, and in certain years, and sometimes for several years in a row (such as the droughts of 1982-87 and 1992-93 in southern Africa), rainfall is so low that crops fail and livestock die. In recent years (2007

and 2010), severe flooding occurred in northern Namibia for instance. This had detrimental effects on housing and infrastructure developments along those river courses. Some people lost their livelihoods and daily life was disrupted for a long time. It is important to prepare for these situations to avoid such damage and disruption.

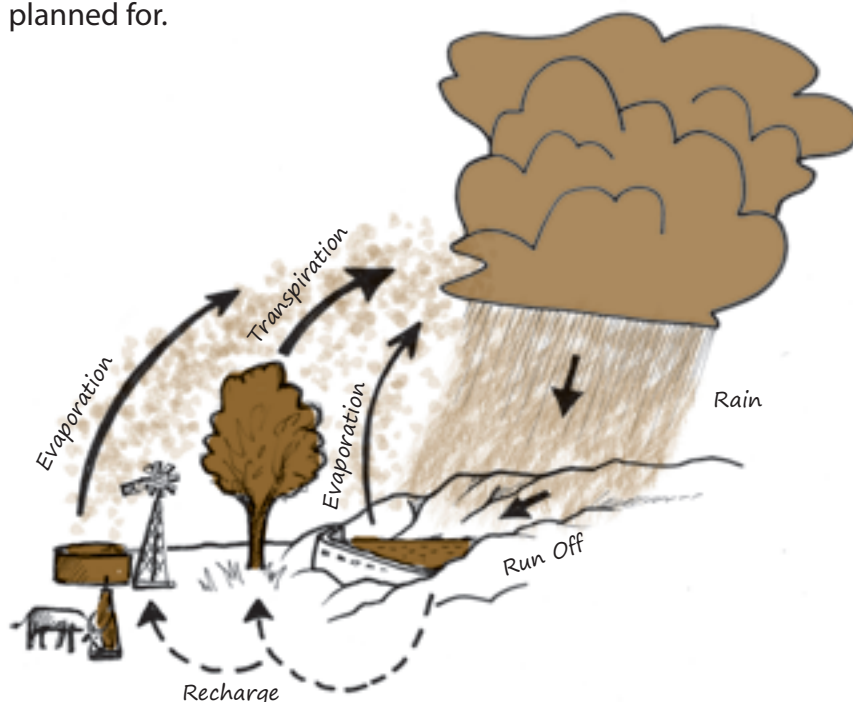
It should be noted that the available climate change projections for the coming 50 to 100 years indicate serious changes in rainfall and water availability throughout the country.



In some years too little rain falls, in others too much. The occurrence of such extreme events is predicted to become more frequent under climate change scenarios for the area. Farmers need to be prepared to deal with unpredictable rainfall and variability.

- Climate trends in Namibia from 1960 to 2006 show that the numbers of days a year with maximum temperatures have increased, while those with minimum temperatures have decreased.
- Rainy seasons have started later and lasted for a shorter period, leading to shorter growing seasons.
- These trends, combined with trends throughout Africa, lead to projections that in the next 50-100 years we will experience a marked increase in temperature and humidity and shorter seasons of more intense rainfall, especially in the northern and central regions of Namibia.

Although there are predicted regional differences, it is clear that there will be changes that must be planned for.



This is a simplified diagram of the water cycle. Rainwater runs off and either infiltrates the soil, runs into the rivers, or fills dams. It refreshes the groundwater and allows plants to grow. Rainfall is the main element that makes our land productive – without rain no plants can grow, animals die of hunger and water sources remain dry. However, the high evaporation rate means that much of the rain returns to the atmosphere.

1.4 Regional profiles

Kunene Region occupies the north-west corner of Namibia. The Skeleton Coast Park forms its entire western boundary with the Atlantic Ocean. The Kunene River with its Epupa Falls forms an international boundary with Angola to the north. Nationally, Kunene is bordered by Omusati Region and the western boundary of Etosha National Park. In the south it forms the southern boundary of most of Etosha National Park and borders Erongo and Otjozondjupa regions. The region is home to the Skeleton Coast Park and a large number of conservancies. Kunene is the second largest region in Namibia after Otjozondjupa. Compared to other regions, Kunene is relatively under-developed, possibly because of its mountainous character.



Annual rainfall increases from west to east from less than 50 mm to 415 mm and is very sporadic. The veterinary cordon fence divides the region into two distinct parts: northern Kunene and southern Kunene. The fence separates farms and wildlife areas for effective disease control. The Kunene Region has the lowest incidence of HIV/Aids in Namibia. Gold, silver, tin, lead, zinc and uranium all occur within the region.

1.5 Climate change projections for Kunene Region

The observed trends in climatic changes and future projections for Namibia are merely indicative. Although regional differences are expected, these are described here on a general level.

For north-western Namibia, apart from temperature changes, rainfall changes have been noticed as an increased length of the dry season, a decrease in the number of consecutive wet days, and overall, a later start and earlier cessation of the rainy season. There has been a tendency towards smaller rainfall totals in the north, although future projections suggest an increase of summer rainfall across much of the country, with high intensities over a shorter time period.

The observed changes in temperature extremes, the length of the dry season and rainfall intensity not only underscore that the climate in Namibia is tending to become drier, but also that climate variability remains a significant phenomenon of long-term climate trends.

What does this mean to people in the Kunene Region?

1.6 Expected climate change risks and how they will affect the Kunene Region

Expected climate changes that will occur are called climate change ‘risks’. Higher temperatures, which lead to greater evaporation, will lead to an overall reduction of water availability (even if there is higher rainfall).

Scientists expect that extreme weather events such as floods and droughts will become more common. Under such conditions it is difficult to make decisions on what to plant and when, and whether to be prepared for flood- or drought-related pests and diseases. The onset of the rainy season will become more variable and prolonged dry spells will also affect the development of good grazing areas.

Most resource users in the Kunene Region rely on livestock farming and other natural resource-based production systems for their livelihoods, which makes them vulnerable to climate change. This is exacerbated by limited infrastructure, food insecurity, poverty, poor access to resources and thus fewer options for adaptation, high rates of HIV/ Aids and other health constraints in many areas. Some people run small businesses, which are also negatively affected by extreme weather events, when local farmers have little income and purchasing power to spare. Other natural resources such as wild fruits, herbs and medicinal plants, wildlife, and nature-based tourism also make an essential contribution to the livelihoods of the people in the regions. Climate change would have an impact on all these resources. It is important to identify the potential impacts clearly to be able to plan for the most appropriate adaptation options.



Not all impacts will necessarily be negative as opportunities may also arise, especially with careful planning.

Over the past decades farmers have already started to react to increasingly difficult and highly variable climatic conditions. The traditionally mobile Ovahimba cattle farmers have practised migratory range management in the arid Kunene environment for hundreds of years. The initiative to turn wildlife conservation into an asset and a community-empowerment strategy can be seen as a natural move towards climate change resilience. The departure from a largely livestock-based livelihoods system to that of diversifying into managing wildlife as a common resource in conservancies, producing biodiversity products such as Commiphora raisins, and engaging in nature-based tourism, are proactive land-use changes that already respond to climate challenges. Such strategies of diversification and sustainable land and resource use could be the starting point for further adaptation planning by communities.

Climate change risk is the actual change in climate predicted for an area and the specific risks these changes pose.

Climate risk management (CRM) is an approach to climate-sensitive decision making. The approach seeks to promote sustainable development by reducing the vulnerability associated with climate risk. CRM aims to maximise the positive and minimise negative outcomes for communities and societies in climate-sensitive areas such as agriculture, food security, water resources and health.

Climate change impacts are the consequences of climate change on natural systems.

Climate change adaptation can be defined as a process by which strategies to moderate, cope with, and take advantage of the consequences of climatic events are enhanced, developed and implemented.

Preparedness is the state of being ready or prepared for action, which relates directly to adaptation.

Coping strategies are a range of climate sensitive actions put into place, with outcomes that are beneficial or negative but tolerable; beyond the 'coping range', the damages or losses are no longer tolerable and the society (or system) is said to be vulnerable.

Here are a few examples of expected climate change impacts specifically highlighted during the consultations in the Kunene Region organised by sector 'themes'.

a. Sporadic droughts

Persistent dry spells and frequent droughts are perhaps the most visible and readily felt impacts of climate or weather related impacts in the Kunene Region. Every year farmers anticipate the rain – and grazing resources are eagerly sought after. Poor livestock condition and loss of animals are the result of poor rainfall years. Overstocking in times of limited resource availability often leads to severe long-term impacts such as soil degradation and bush encroachment. The risk of unintended veld fires increases when biomass accumulates and dries up after good rainfall years.

b. Livestock farming and animal health

Considering that the Kunene Region is among the most arid regions in the country and subject to naturally highly variable conditions, it is clear that agricultural production will be very marginal and even livestock farming has to be conducted in a highly adapted manner. The mobile Ovahimba people migrate with their livestock herds and with the rainfall. Sedentary farmers in the region often overstock and land degradation is often the unintended result – leading to a long-term loss of rangeland productivity. Livestock farming, if not carefully managed, is very problematic in this region, and a major shift from livestock production to wildlife-based tourism has taken place naturally over the past decade.

Under increasingly unpredictable and potentially more arid conditions, already marginal rangelands will become even more difficult to manage. Poor animal health because of difficult climatic conditions, poor grazing and limited water are all aspects that would contribute to poorer production levels and potential land degradation. Soil erosion, loss of soil fertility and loss of vegetative productivity are already major problems in some areas of the Kunene Region.

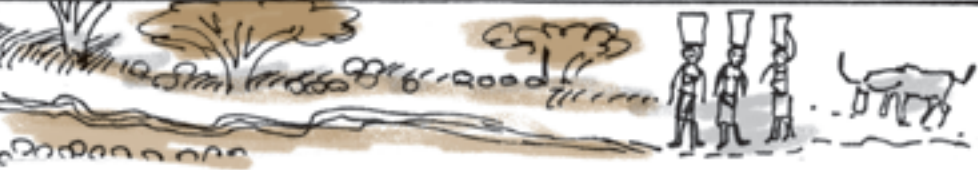
c. Food security

Hunger is already endemic among rural and poor populations in Kunene, worsened during prolonged drought conditions. Most depend on livestock-based products such as milk and meat in their diets, and especially the Ovahimba people who live locally, are extremely vulnerable to impacts of climate change. With few opportunities for employment and cash income, they already have difficulty purchasing food. Overall there is limited economic opportunity for local people in the

Kunene Region, other than from tourism. Under the climate change scenario, food insecurity will worsen and the number of people at risk from hunger will also increase.

d. Wildlife and biodiversity products

A shift from livestock-based to wildlife-based production is seen as a good adaptation strategy, given the projected climate for Namibia. Wildlife is generally better suited to highly variable climates and natural migratory patterns will place less stress on environmental resources such as soils, grazing/ browsing and water. There are numerous conservancies in the Kunene Region, which can be seen as contributing towards the implementation of climate risk sensitive land-use strategies.

Sector Themes	Expected climate change impacts
Sporadic Droughts	 
Livestock farming and animal health	
Wildlife and biodiversity	
Nature-based tourism	
Public health	
Water resources	

Expected climate change impacts on major sectors and some initial key 'themes' need to be understood and addressed.

In the Kunene Region numerous wild plants and biodiversity products are harvested. The distribution of local biodiversity is expected to change under current climate change projections, and species distributions may change in the future. The natural habitat of the black rhino, which is a flagship species in the Kunene Region, may change and it may become too arid for these natural browsers to survive. On the other hand, different important wildlife and plant species may become more abundant in the same area, although this potential change of distribution is not very well understood at present.

During local consultations farmers indicated that they are already observing a change in biodiversity, which could potentially be aggravated in the future, leading to a loss of ecosystem resilience and thus natural adaptive capacity.

e. Nature-based tourism

Tourism is already a flourishing sector in the region, with innovative community and business partnerships evolving. If well managed, such approaches can help build climate change resilience. However, threats such as the projected water crisis for Namibia will also pose difficulties for tourism, which is considered a water intensive industry. Additionally it will be important for Namibia to find ways of identifying itself as a carbon neutral destination – many international visitors will not want to further contribute to climate change by aggravating global CO² emissions. Namibia is a distant destination and long-haul flights are a major cause of global warming.

f. Public health

An even hotter and more arid climate for Namibia, with more extreme weather events such as droughts and floods, would clearly have implications for the health of inhabitants. People who are already vulnerable, such as children and the elderly, or those who are ill e.g. from HIV/Aids, are particularly at risk.

Water-borne diseases will become a threat in years of flooding, with diarrhoea, cholera and malaria becoming particularly severe. Areas in Namibia that are currently considered to be malaria free may become areas where it is prevalent. In drought years respiratory infections and under-nutrition with associated side effects may cause serious health problems.

There are a great number of other sectors and sector themes that are very important in the Kunene Region, such as those relating to climate change impacts on education, the role that poverty plays in creating vulnerability and how run-off from Angola may have an impact on the nearby Ruacana hydro-electric power station and newly planned hydro-electric infrastructure in the region. These could be examined and developed in future discussions.

g. Water resources

Large areas of the Kunene Region have little or no groundwater and no access to permanent water sources. This means that under the projected climate impacts for north-western Namibia even more severe water shortage can be expected in the future. This can have serious impacts on local livelihoods, even though the region is relatively sparsely populated. The potential damming of the Kunene River at Baines Mountains for a hydro-electrical station presents a different scenario, as it would potentially have to deal with other climate risks, depending on run-off water from southern Angola.

Adaptation aims to reduce vulnerability and improve the capacity of people, especially those who rely on agriculture for their livelihoods, to adapt. Generally it is believed that without adaptation, living conditions will severely degrade, while with good adaptation efforts, prosperous lives can be achieved even under the difficult climatic conditions expected.

CLIMATE CHANGE

Life without adaptation



AFFECTS US ALL

Life with adaptation



2. What can we do about climate change? Adaptation!

2.1 What is Climate Change Adaptation (CCA)?

CCA is an accepted term and refers to the capacity to deal with climate change challenges by changing and 'adapting' lifestyles, farming practices and overall land use to address the expected changes.

Adaptation aims to reduce vulnerability and improve the capacity of people to adapt, especially those who rely on agriculture for their livelihoods. Generally it is believed that without adaptation, living conditions will degrade severely, while with good adaptation efforts, prosperous lives can be achieved even under the difficult climatic conditions expected.

2.2 Why is adaptation necessary?

While people often react to floods or droughts as they occur, they have also used adaptation strategies based on available resources and prior experience and knowledge of past weather patterns for a long time. Current coping strategies could include storage of seeds (vegetables, maize) in granaries for future use or set up small-scale home gardens especially during difficult periods, as well as actively moving livestock to cattle posts or where emergency grazing is available. However, these measures are no longer adequate for coping with the expected long-term impacts of climate change. This is particularly true with our rapidly increasing population.

Adaptation is necessary to prevent potential damage that can be caused by impacts of climate change. Through adaptation, threats to human health, economic development, property, infrastructure and ecosystems can be minimised. Lives will be saved and the cost of climate change can be reduced. There is a lot we can learn from past experiences and the adaptations used, and we should keep improving on them through planning and discussion.

2.3 The adaptation 'process'

Adaptation entails a planning and implementation process that would include parts or all of the following steps:

1. Understanding the climate change risk in the area
2. Identification of expected climate impacts
3. Identification of impacts already observed and existing coping mechanisms (e.g. what is being done 'naturally' to cope with existing climate variability and climate change)
4. Development of a joint strategy (e.g. community level or constituency level) on how best to address climate change through adaptation
5. Ensure that vulnerable groups are not further marginalised by gender insensitive planning (undertake a gender screening exercise and include women and youth empowerment activities)
6. Identification of potential adaptation options and specific measures/actions that address some of the key challenges
7. Implementation of strategy and priority adaptation measures/actions
8. Monitoring and evaluation of implementation to test success.



2.4 Some adaptation options relevant to the Kunene Region

This section provides examples of **adaptation options** concentrating on farming and various natural resource uses, but is also applicable to other themes. Many other options may be available and need to be explored. This information toolkit can only provide some initial ideas that communities need to develop together.

Developing community or constituency-level adaptation strategies: a first step in addressing climate change is to identify the problem and then develop a systematic plan of how to deal with the challenge. This is best done with community members or even at a constituency level. The steps provided above may be helpful in developing such a strategy.

Land-use planning and promotion of climate-compatible land uses and associated production systems:

land-use options that are better adapted to the prevailing variable and naturally extreme arid climates of north-western Namibia should be promoted. A shift from livestock to wildlife-based production systems is an example that might be useful in the Kunene Region, with tourism presenting promising opportunities.

Formal and collective land-use planning can help farmers manage resources better and reduce their vulnerability to climate change.





Adaptive livestock management: it is important to improve livestock management practices and ensure that they are adapted to the locally prevailing climate. Learning from the highly mobile Ovahimba people living in the Kunene Region, traditional livestock herding is currently being applied, even in more sedentary communities through guided herding practices. Such practices should be up-scaled to mirror the traditional system. De- and re-stocking in response to rainfall and available grazing should be applied by farmers in line with seasonal weather conditions.

Additionally, farmers can select breeds and species that are better adapted to warmer and drier climates. New breeds may be better adapted to increased temperatures, or traditional breeds could be improved to yield better production levels.

Investments in animal health can go a long way to protecting livestock from falling ill or perishing during extreme weather conditions. Improving access to veterinary support can help to improve the building of adaptive capacities.



Wildlife management, tourism and conservation: wildlife populations are highly migratory in arid environments, and take advantage of good rainfall and associated grazing by moving enormous distances. Conservation contributes greatly to Namibia's flourishing tourism industry, which markets the country as one of the world's leading nature and landscape destinations. Even though Namibia's arid environments seem vast and expansive, it is important to keep them healthy and resilient to be able to buffer the expected impacts of climate change. It will be expensive to forego long-term conservation goals for short-term economic benefits.

Wildlife species that usually occur in drier and hotter climates may change their usual distribution ranges naturally and are generally better adapted to local conditions than livestock. The formation of conservancies for management and utilisation of wildlife is an option that could be considered.

Promotion of biodiversity products: income from biodiversity products, such as the raisins of the *Commiphora* tree, is an example of how local incomes can be diversified using natural products. Investments into developing markets and helping local people to tap into these opportunities can help build adaptive capacities.

Alternative livelihood opportunities: in the Kunene Region, where livelihood opportunities mostly revolve around livestock farming and nowadays tourism, opportunities for other and alternative/additional income must be sought. Further strategic development of tourism-based incomes could contribute to building adaptive capacities, including strong pro-poor tourism investment policies, craft development, employment in local level conservation efforts and SME developments.

Savannah and woody vegetation management: the established savannah ecosystems must be more specifically conserved. Deforestation is becoming a major problem in the Kunene Region, with no control over trees being cut for charcoal production. Charcoal production, if not from invader bush, is a very poor use of slow growing woody vegetation in an arid country such as Namibia, and releases damaging greenhouse gases. Specific conservation efforts will promote ecosystem resilience and thus better adaptive qualities. Trees and other woody vegetation also act as sponges to absorb gases that contribute to climate change and improve the environment for people and animals by providing shade.



Prevention of land degradation and rehabilitation: land degradation is a major problem in most of Namibia's regions, including the Kunene Region, and undermines efficient adaptive capacities. Proactive investment in sustainable land management (SLM) will have major climate change adaptation benefits. Rehabilitating degraded land can also make significant contributions to capturing carbon – thus contributing to direly needed mitigation.

Improved food security and nutrition: while crop production is not really common and possible in the Kunene Region, promoting small vegetable gardens for improved household nutrition can be a powerful strategy. Green leafy vegetables and fruit are important for healthy diets and contribute essential minerals and vitamins to a largely meat-based diet. Unhealthy people are particularly vulnerable to increasingly challenging changes in climate. Local water recycling or rainwater harvesting techniques may render such small-scale gardens suitable even in north-western Namibia, where lack of water is a limiting factor.

Fire management: fire is a key environmental issue mainly in northern and eastern Namibia, but has also been reported from areas in the Kunene Region. Fires can be important for landscape management, but methods to prevent fires and improve management of wildfires when they do occur, need to be investigated. The setting and maintenance of cut-lines is one intervention that can be effective.

Alternative energy and water sources: developing alternatives for using wood as an energy source can help curb the high deforestation rates as well as promoting overall development and building resilience among local communities. Capturing water from local rainfall events through rainwater harvesting, building of earth dams, as well as improved local-level management of scarce water resources could help to do more with less. In terms of water consumption it is clear that planned mining activities in the area would be large-scale water uses that would compete with needs of local livestock herders – and adequate solutions are needed to ensure that future climatic changes are considered in policy directives.

Flood-proofing investments: floods in the Kunene Region occur mostly along the Kunene River and in ephemeral river beds, where flash floods can be a problem. It is important to continue providing warnings to local people about such temporary floods so that they do not get caught by them. Overall there should be contingencies made to cater for seasonal floods, which are normal, but might worsen in future. For example, tourism infrastructure along the Kunene River should be built with the flood risk in mind.

Improved Early Warning Systems (EWS) and information on CC and CCA: in all Namibian regions, as with most rural communities, it is clear that there is a need for basic information on climate change and adaptation. This would provide farmers with knowledge on when the start of the rainfall season could be expected or whether rainfall is expected to be higher or lower than average, allowing them to decide what crops to plant. It would also allow resource users to better prepare for expected challenges such as floods or droughts.

3. Climate change adaptation: community planning tools

The 'adaptation process' consists of a number of key steps that will assist communities in dealing with climate change. The tools should be introduced to communities by facilitators who have been trained in the methodology.

A reminder of steps for adaptation (Section 2.3):

1. Understand climate change risks in the Kunene Region
2. Identify expected climate impacts
3. Identify impacts already observed, existing coping mechanism and root cause analysis
4. Identify potential adaptation options
5. Screen and adjust for gender sensitivity
6. Develop a joint strategy for adapting to climate change
7. Implement strategy and priority adaptation measures/actions
8. Monitor and evaluate implementation.

The following pages contain some practical **community planning tools** which could assist communities to develop adaptation actions within their constituencies. The proposed tools are examples of possible methods – although other, more familiar tools may be preferred and adapted to the needs and circumstances of specific communities. Agricultural technicians or health outreach staff in the area can work with communities on applying these tools and may even suggest additional tools.

The following tools can be applied to the eight steps mentioned earlier:

- Tool 1:** Community – expert exchange discussions and introduction to climate change thematic
- Tool 2:** Understanding the context: natural resources and resource management practices mapping and the link to climate change
- Tool 3:** Root cause analysis (Problem Tree)
- Tool 4:** Finding a solution through the Sun Ray Exercise
- Tool 5:** Screening tool for gender sensitivity
- Tool 6:** Developing a community based CCA strategy and putting it into action
- Tool 7:** Example of an adaptation measure
- Tool 8:** Participatory monitoring and evaluation.

Step by step application of tools – how to!

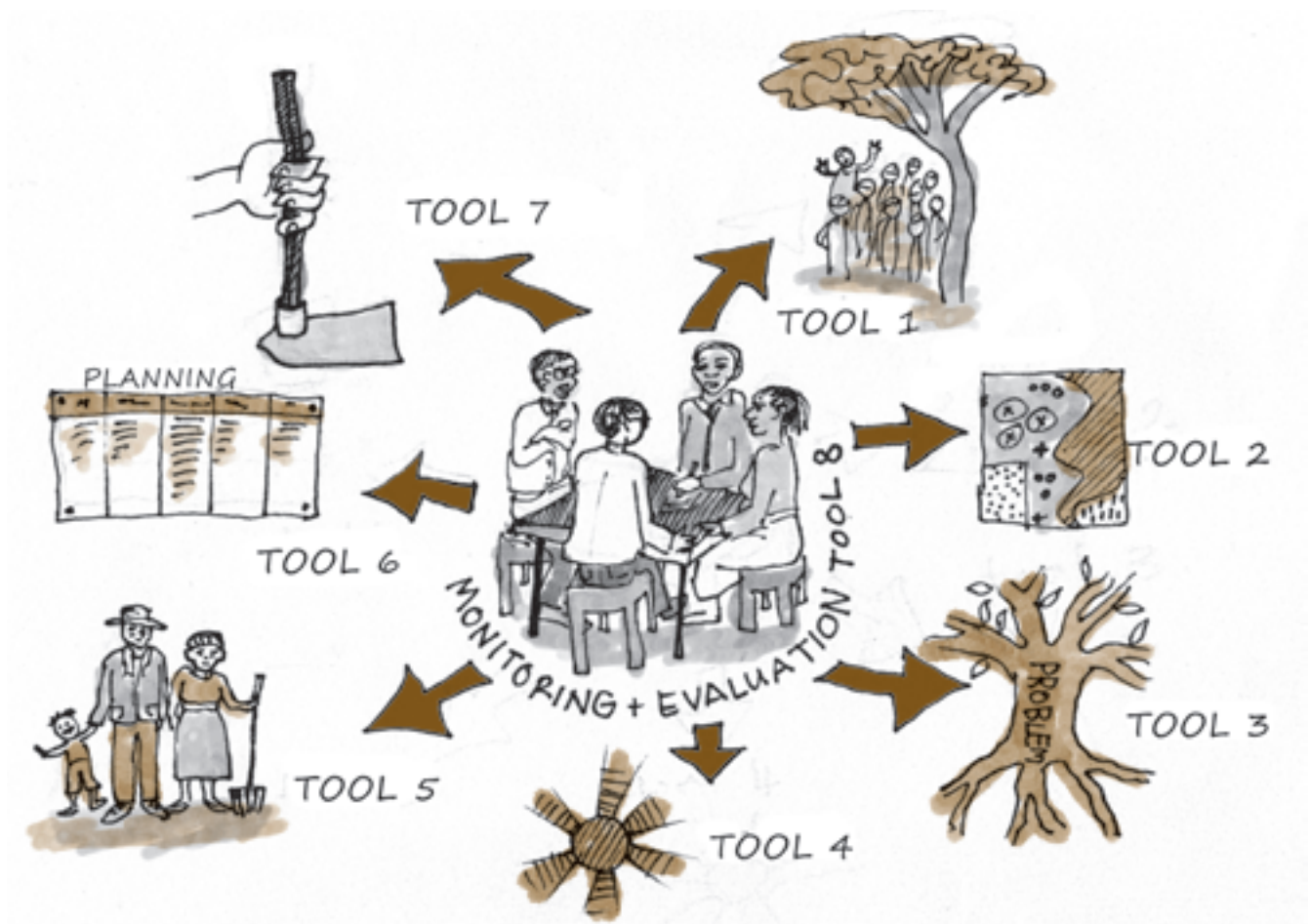
Tools 1 to 8 build on one another – and form a feedback loop. It is important to work through all of them in that order, as they are designed to help facilitate the identification of the complete problem, finding solutions and adaptive management processes with a participatory monitoring and evaluation component contributing to ongoing learning.

The tools can be used by a group, a couple or a community, or just by an interested individual.

Steps include:

1. Plan a community consultation on climate change issues; introduce the toolkit; read/introduce/discuss climate change context (**Tool 1**).
2. Discuss how climate change already affects the area and what the impacts are; draw a resource map (**Tool 2**).

3. Identify a key problem and analyse (the climate change related) root causes (**Tool 3**).
4. Brainstorm possible solutions to addressing the climate change related problem (**Tool 4**).
5. Screen whether the proposed adaptation measures are gender sensitive and take care not to introduce additional discrimination. Plan alternative measures or mitigation strategies if gender imbalances could be perpetuated by a planned action (**Tool 5**).
6. Develop an action plan for how to address all key climate change problems (**Tool 6**); repeating Tools 3, 4 and 5 as often as needed to address all key foreseen climate change related challenges.
7. Identify practical adaptation measures or solutions to the various action points. Many innovations are needed. **Tool 7** only gives one example of a possible adaptation solution. You probably have many of your own ideas.
8. Linked to the action plan (**Tool 6**), a monitoring and evaluation plan should be developed and implemented in a participatory manner. All community members should not only be involved in checking on the progress made on the implementation of the plan of action, but should also monitor and evaluate the usefulness of the adaptation innovations put into place (**Tool 8**). Any lessons learnt should be applied in the revision of the plan – and for an improvement of the innovations. It is important to incorporate gender issues at this level as well.





Tool 1: Community - expert exchange discussions and introduction to climate change thematic

Addresses CCA planning Steps 1, 2, 3; forms basis for planning Steps 4, 5 and 6

As a first step it is important to create a platform for climate change and climate change adaptation as a discussion issue. This information toolkit could form the basis of information on what climate change is, why it is important, and what adaptation options are used already. People knowledgeable on the subject, e.g. from MAWF, MoHSS or MET, could join the discussions. During the preparation phase of this toolkit, a team visited both the Kunene Region and discussed some of these issues with farmers and other community members. So there are already 'sensitised' people in each of the constituencies, who can serve as useful resource persons.

Purpose: To establish awareness about climate change and sensitise community members to the issues of climate change.

Materials: This Climate Change Adaptation Toolkit is available as a prepared presentation. Copies can be obtained from the regional councils or the CCA Project Management Unit at the DEA/MET. See contacts in the list at the end of the toolkit.

Methods:

1. Invite a group of interested community members to a community meeting on climate change and adaptation; farmers but other stakeholders should also attend. Members of Water Point Management Committees or Conservancy Committees may wish to follow their organisations' usual procedures and only use the resource material for topical guidance.

2. Develop a meeting agenda; the overall purpose of the



meeting(s) would be to develop a community Adaptation Strategy and put it into action. The tools presented in this toolkit, or other useful methodologies for joint planning and awareness-raising can be used.

3. Prepare for the meeting; have all materials in place and set up a meeting venue. If applicable, ensure that arrangements for lunches and other refreshments are made and well organised. Make sure that a visit from an outside expert, if required, is properly planned for.

4. Conduct the meeting according to an agenda; allow for extensive group interaction and discussion. What do fellow community members understand about climate and climate change? How do they feel it affects them – or will affect them in future? What are concerns and potential opportunities?
5. If a series of meetings is planned, develop a meeting schedule with the other community members that suits everyone. Ensure that everyone understands how the various meetings are linked and what outcomes are expected.





Tool 2: Understanding our context: natural resources and resource management practice mapping and the link to climate change

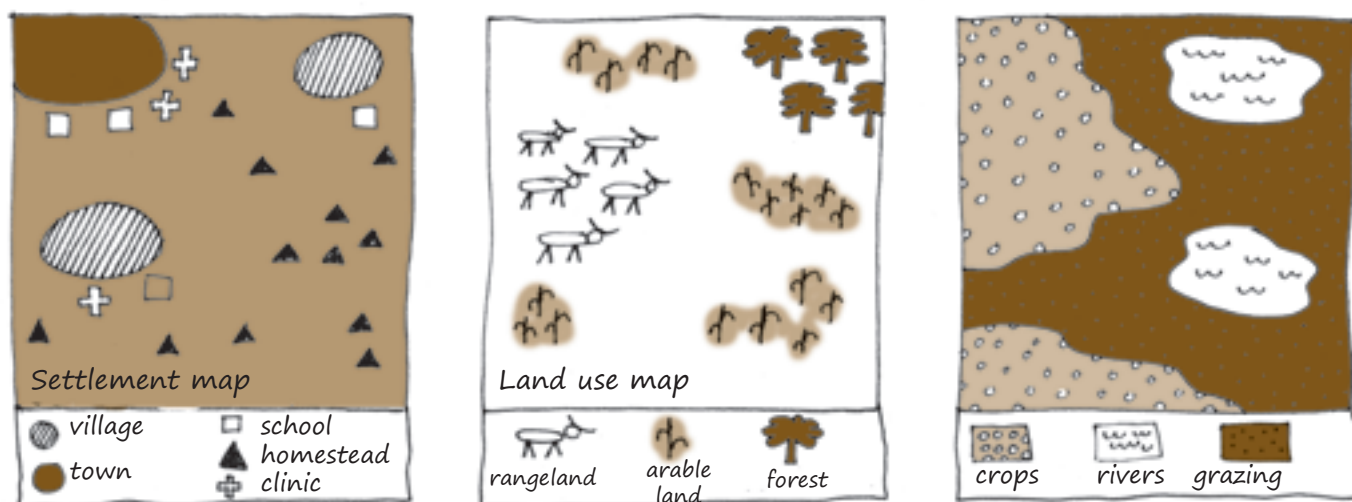
Addresses CCA planning Steps 1, 2, 3; forms basis for planning Steps 4, 5 and 6

After a general discussion on climate and climate change, the focus should move to the context of the environment, farming and resource use and management practices of the community. This leads to identifying environmental challenges (frequent droughts, pests) and changes that need to be managed and whether these are considered to be related to climate change. Participatory methods such as the Participatory Rural Appraisals as well as resource materials, such as those for conservancies and community forests can be used to extract this information. This toolkit presents only some selected methods. Many communities already have resource and land-use management plans which are invaluable tools for the adaptation strategy development process.

1. Mapping

Purpose: To collect and discuss information on land and resource use in the community or constituency including location of settlements and access to land and resources; additionally, to map environmental parameters such as the location of water channels, distribution of soil and vegetation types; to pinpoint the location of settlements, waterholes and other important infrastructure.

Materials: Flip chart paper, markers/pens, coloured pens, masking tape, Prestik, relevant and available maps (e.g. topographical maps, Google earth images of the area, existing maps from previous mapping exercises). 'Draft maps' can be drawn on the ground.



Methods:

1. Discuss the exercise with the group and identify the types of maps that they will need to develop a good story line that will aid the climate change adaptation planning process. These could be (i) village/settlement/infrastructure map, (ii) a land-use map, and/or (iii) a resource distribution map (soil types, vegetation types).
2. Based on the types of maps selected, form mapping teams whose task will be to develop the specific maps.
3. Explain to all participants that they will draw a map from their knowledge of their land, in their own way. Be clear about what the participants need to record.

4. Ask everyone to collect piles of objects such as sticks, stones, leaves, seeds and petals of different colours, to form about 10 piles of different objects.
5. Find a clear piece of ground in the area on which to draw the map.
6. Ask the group to identify a person to lead the mapping process; i.e. to use a stick to draw important landmarks. This will form the framework of the map onto which other items can be added. Landmarks may include roads or tracks, villages, mountains or hills or specific infrastructure such as water points.
7. The mapping team should think of other items that they can add to the map, for example hunting camps, spirit sites, airstrips and petrol stations or stores.
8. Choose a symbol from one pile collected in Step 4 to represent the item. For example, a white stone might represent a water point; a dark stone might represent the settlement. Place one of these symbols at each separate location. Allow the team time to check and discuss the accuracy of placements and to amend the map as necessary, until everyone is happy with it.
9. Ask the team to transfer the map onto a piece of flip chart paper. The team will need to devise alternative symbols to represent the mapped items and should draw them as a key down one side of the sheet of paper. Initially the map can be drawn by pencil to allow for correction, and later with coloured pens.
10. Where necessary, add names to places e.g. towns and features such as water channels, rivers and floodplains.

Time: 2 hours

2. Seasonal calendars

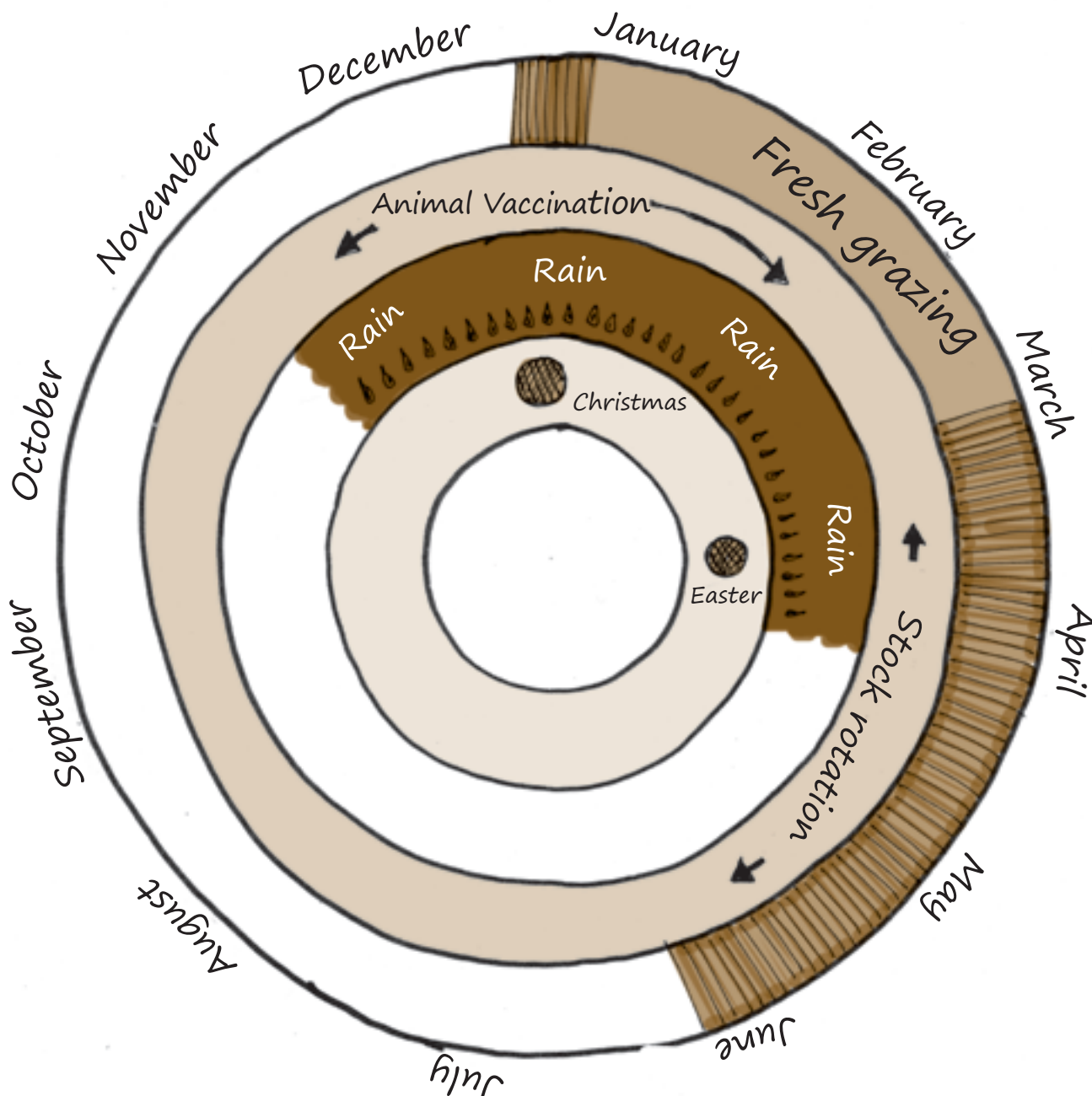
A seasonal calendar is a tool for documenting regular cycles such as seasons and significant events that occur during a year and influence the life of a community. It provides a general picture of important environmental, cultural and socio-economic periods throughout the year. The seasonal calendar is of particular value as it allows local farmers to represent their understanding of seasons from their cultural and environmental context. These are often different from 'official' seasons and the international calendar. A seasonal calendar is particularly valuable for assessing climate and climate change impacts, and could indicate changes in the timing of the onset of the rainy season or the growing season.

Purpose: To develop a local community seasonal calendar, focusing in particular, but not only, on the agricultural cycles observed in the Kunene Region.

Materials: Flip chart paper, markers/pens, masking tape, Prestik, coloured pens.

Methods:

1. Form seasonal calendar teams with a mix of old and young people. Provide each team with pens and paper.
2. Draw a large circle on the flip chart paper provided for each group. Mark the top of the circle to represent the beginning of the year, and then explain that the bottom of the circle is halfway through the year and the top is back to the start and a new year.
3. Have the groups divide the circles into 12 sectors and for each sector have participants discuss, identify and mark with different coloured pens (key) their local observations with regard to the following:
 - a. Forests/birds – flowering of trees/migration of birds
 - b. Agriculture – ripening of fruits/planting and harvesting of crops
 - c. Weather – rainy periods/dry periods/floods/droughts
 - d. Social events – major village functions/celebrations.



4. Once completed, have each group discuss their calendar and ask the other groups to comment and add to the chart.
5. Draw a copy of the combined calendars onto paper with coloured pens. Use local symbols to represent each item. Draw the key on one side.
6. You can adapt this method to draw events along a timeline. You could also map several years along a timeline to detect longer-term changes. You can adjust the method according to the information needs for your planning purposes.

Time: 2 hours

3. Resource inventories

Communities generally have an intimate knowledge of the plants and animals in their areas and have specialised understanding of the way plants and animals relate to other aspects of their environment. This inventory is a quick method of obtaining an inventory of plants and animals in an area and what natural resources are commonly used.

Purpose: To collect information on biodiversity and natural resources use in the area.

Materials: Flip chart paper, books of plants and animals and other resource materials, pens.

Methods:

1. Divide participants into four groups or as appropriate –
 - Plants, including medicinal plants and those processed for trade
 - Agricultural plants
 - Wildlife and birds
 - Fish/aquatic animals and plants
2. Ask each group to fill out the following in column format on the flip chart paper:
 - Name of plant/animal in an accessible language (Otjiherero, Nama/Damara and English)
 - Uses/significance
 - Abundance or scarcity
 - Locality
3. Once each group has finished entering their results, swap with the next group and continue until they have all had a chance to contribute to the thematic flip chart papers.
4. Get the groups to present their results and discuss.

Time: 2 hours

4. Linking results to climate change

Purpose: To identify changes to the environment and community life in the area that may be linked to climate change.

Materials: Flip chart paper, results from previous activities, pens.

Methods:

Mapping

Ask the participants to review the sketch maps and mark changes that have occurred over the past five, ten or twenty years. The changes should be in terms of grazing areas, relocation of houses, changes in fishing and agricultural areas, as well as forest areas. As the participants mark these changes on the map, ask them to provide more details about them. Record the results.

Seasonal calendar

Ask the participants to review the seasonal calendar. Discuss changes or uncommon events that they have observed in the seasons or climate in recent years. These can be events such as prolonged drought, increased rainfall, early fruiting/flowering of trees etc. Record observed changes and discuss. It would also be possible to discuss changes during several years if a longer-term timeline was developed.

Resource inventory

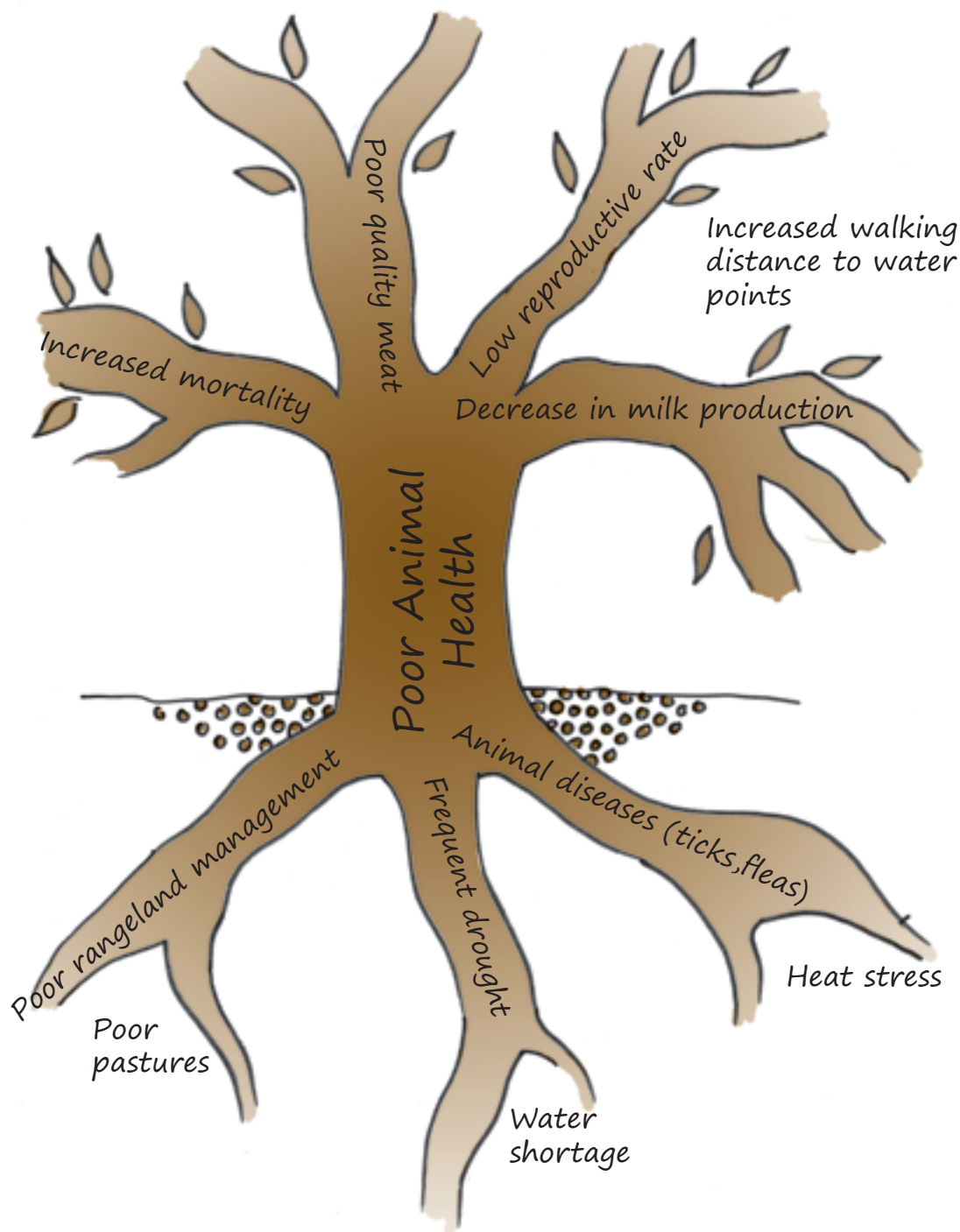
Ask the participants to look at the inventory and identify those plants and animals that are becoming scarce. Ask them to discuss and record possible causes for their decline and the likely impact of their loss on community life.



Tool 3: Root Cause Analysis using a 'Problem Tree'

Addresses CCA planning Steps 1, 2, 3; forms basis for planning Steps 4,5 and 6

In order to decide what effective actions are needed to resolve a problem, the problem itself needs to be clearly understood. A Root Cause Analysis is a useful tool that breaks down a problem into separate parts, identifies the dominant causes and clarifies the most effective areas for action. Climate change is a complex concept and in order to avoid it being seen as the underlying cause for all community problems, a broad overview of all contributing factors is necessary to determine whether it is indeed the dominant factor.



Example of a Problem Tree

Purpose: To determine whether identified community problems are directly related to climate change.

Materials: Flip chart paper, markers/pens, an example of a Problem Tree, coloured cards, Prestik.

Methods:

1. Ask participants to form groups of approximately five people, and generate a list of current problems that they think are related to climate and climate change. Write the results from the groups onto one flip chart sheet, by having each group present their results to the plenary. Ask all community members to prioritise the problems by a show of hands or by 'vote'. To 'vote', each community member has 'three votes', which they indicate with a mark (e.g. a cross) behind the problems they identify as the most important.
2. Use one of the prioritised problems and discuss with the general meeting what the 'problem', 'cause' and 'effect' is, using the Problem Tree. The problem forms the trunk of the tree. Explain that the tree is sick and that this is often caused by problems that need to be identified in its roots. Encourage participants to brainstorm about the causes of the problem by asking the question 'why?'. Draw a root for each cause identified and write it in the relevant root.
3. Repeat the question 'why?' for each cause mentioned in Step 2, to identify secondary causes. Write these lower down the roots, below the 'primary' causes identified. Allow participants to continue until they can identify no more secondary causes.
4. Then ask participants to identify primary effects or impacts of the problem by asking 'what happened?'. Draw a branch for each effect, and write the effect on the branch.
5. For each effect identified, repeat the question 'what happened?' to identify secondary effects. These form the leaves of each primary effect branch. Allow the participants to continue until they can identify no more effects of the problem.
6. After one problem has been dealt with in this way, encourage each group to take a separate priority problem and follow the same process to discover its root cause and effects.
7. Once the groups have completed their Problem Trees, ask them to present the results for discussion. It is important to identify the relationship of the problem to climate and climate change very clearly at this stage.
8. Keep the Problem Trees as a basis for the identification of 'adaptation options' and the development of the 'Adaptation Strategy'.

Time: 4 hours

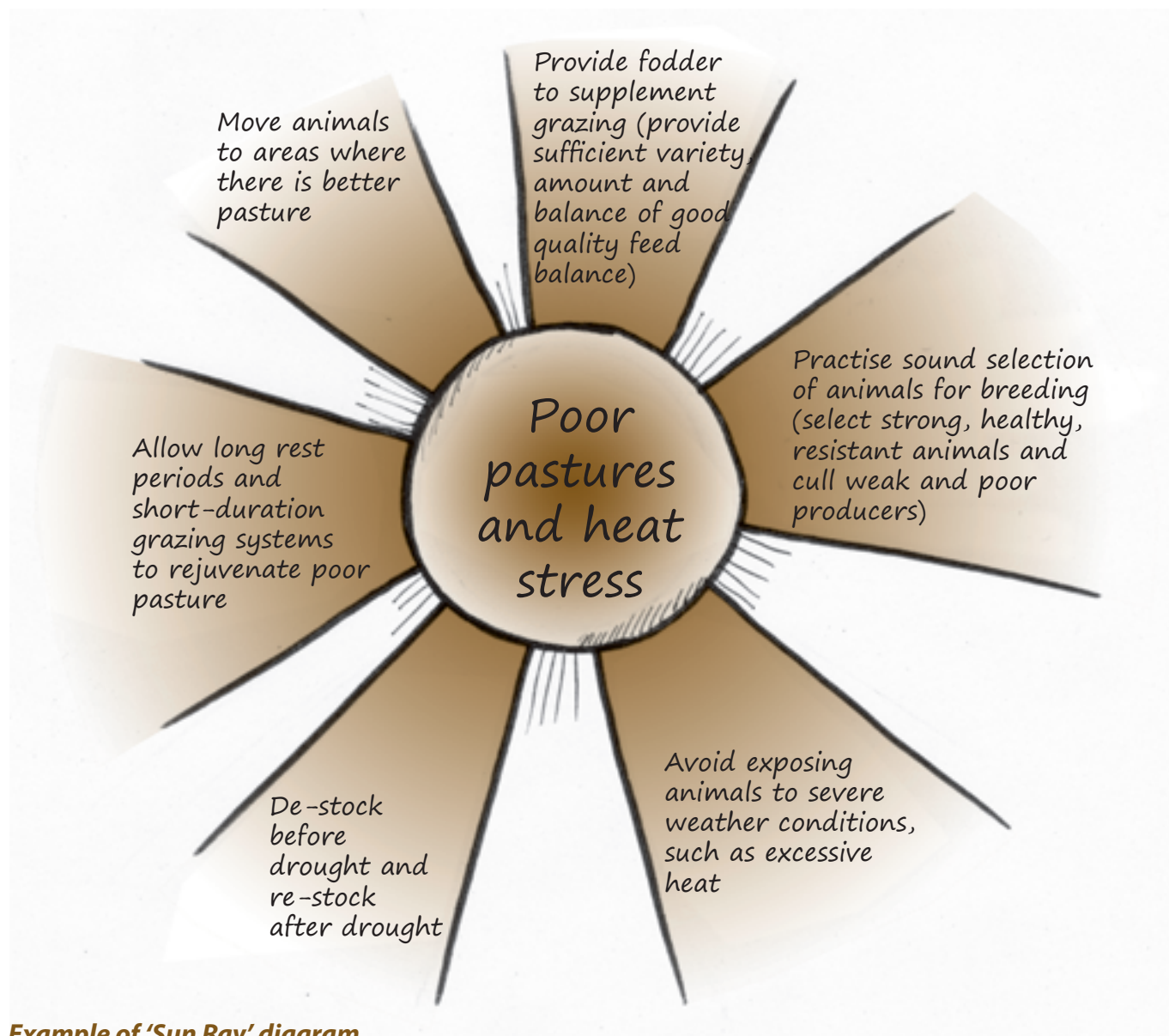


Tool 4: Finding solutions through the Sun Ray Exercise

Addresses CCA planning Step 4; forms basis for planning Steps 5 and 6; builds on Root Cause Analysis

The Sun Ray Exercise is a participatory tool that allows brainstorming of ideas to solve a problem in an ordered and logical way. It is a visual method that develops solutions and breaks them down into achievable activities.

Materials: Flip chart paper, markers/pens, coloured cards or stickers, Prestik.



Example of 'Sun Ray' diagram

Methods:

1. Form Sun Ray Exercise groups (can be the same groups as for the Root Cause Analysis).
2. Ask each group to draw the outline of the sun and rays coming out of it and choose a different primary root cause of a problem identified during the Root Cause Analysis to write in the face of their sun.
3. Ask each group to brainstorm general solutions needed to address their root cause. Each team should write the solutions on pieces of paper and stick them at the ends of the rays.

4. The group now needs to discuss methods of achieving each solution at the end of the rays and to write the answers on separate pieces of paper to stick below the specific solutions. These are usually potential adaptation options, or measures and actions. Add new rays for new solutions as they come up during the discussions.
5. Where the team has identified large or complex activities for achieving general solutions, break them down into smaller activities by adding more ideas next to the rays. Keep working on these until all possibilities are exhausted.
6. Check that all the rays add up to a full solution to the problem. Take out those that are unnecessary and add new solutions if more are needed. Rearrange items if necessary.
7. Nominate one person from each group to draw up the final Sun Ray on paper with input from their group.
8. In a plenary session, discuss which adaptation options, or measures and actions will be more effective than others. Discard those that participants consider ineffective or very difficult to implement, or include them as a low priority. Discuss why an action seems most appropriate for a particular problem/objective. Record specific details or information on how the action will work. Ask the participants to explain the reasons behind the chosen suitability assessment, as sometimes options may have been applied in the past and they may have insight into their effectiveness, which it is important to record.
9. Keep for further use/integration into the Adaptation Strategy.

Time: 2 hours



Tool 5: Gender Screening Tool

Gender is a socially and culturally constructed definition of women and men. It is determined by perceived functions, responsibilities, and roles attributed to women and men in society and in public and private life. There is a perception that climate change impacts will be unequal due to cultural factors, norms and traditions, and also socio-economic status. In the past, women usually looked after the house while men were away at work earning an income. This gives rise to the perception that women are more vulnerable to climate change impacts than men. This is particularly so for rural women, who are often disadvantaged when it comes to getting income generating opportunities, and who, in some traditions, do not have direct land rights.

Gender analysis

Gender analysis aims to thoroughly examine the differences in women's and men's lives, covering things that lead to economic and social inequity for women. It is concerned with the underlying causes of these inequalities, and also aims to achieve positive change for women. Men and women have different interests determined by their ethnic identity and social position. This is a crucial consideration for a clear understanding for policy development and thus service delivery. In the context of climate change, gender analysis provides a benchmark for understanding climate change impacts on different genders. It also highlights existing capacities or lack thereof that men and women have, to deal with climate change.

Gender analysis ensures maximum participation by women and increases benefits from women's skills to society. Gender analysis is applied in this tool to ensure that women and men are consulted equally and are involved in identifying adaptation options and measures to deal with the threats posed by climate change. This analysis will provide information about different impacts of climate change as well as how climate change may challenge the existing division of tasks, responsibilities and resources between men and women in any given community. It also aims to ensure that adaptation measures are put into place that do not further discriminate and disadvantage women in our society.



Purpose:

1. To determine the groups most vulnerable (women or men) to climate change impacts and variability
2. To determine who climate change has been and is affecting and whether one group is affected more than another
3. To determine differences in capacity (between men and women) required to deal with the impacts of climate change
4. To ensure that women – and other vulnerable groups – are not further disadvantaged and discriminated against.

Materials: This Climate Change Adaptation Toolkit, flip chart paper, marker pens, coloured cards and Prestik.

Methods:

1. Select up to ten participants, using gender as one of the criteria in selecting these people (five women and five men) from the group present.
2. Ask the group to draw rough pictures of how they were affected by climate variability and change in the past twenty years or so. They should keep in mind the people (women or men) who were most affected by these events and draw what sort of impacts they experienced. This could be the effects of floods, droughts, loss of stock, failing crops or other impacts on the people in question.
3. Open up the debate for all participants to comment on the drawings.
4. Choose another group of about ten people (equal numbers of women and men).
5. Ask the new group to draw rough pictures about how they perceive climate change is currently affecting them.
6. Ask the group to present their drawings to the general meeting for discussion and comment (if necessary).
7. Once all the drawings are complete and have been discussed, count the number of women and men drawn in the sketches. Keep a note of the separate numbers.
8. Select another group of equal numbers of men and women.
9. Ask this group to draw pictures of skills and resources present in their community. These should directly relate to the impacts mentioned during Steps 2 and 5 of this exercise. Count the skills and resources drawn that reflect women and those that reflect men.
10. Based on the total women and men counted in Step 7 above, determine which group is more vulnerable to climate change impacts. Similarly, based on the skills and resources that women and men have as illustrated in Step 9, determine which gender has more capacity and access to resources than the other.
11. Now check the proposed solutions in the Sun Ray Exercise (Tool 4) and discuss whether they do indeed cater for the needs of women and men, and if there are adaptation activities that specifically address the needs of women.
12. Discard or re-plan proposed adaptation measures that further disadvantage or discriminate against women, or other vulnerable groups.

Time: 2 hours



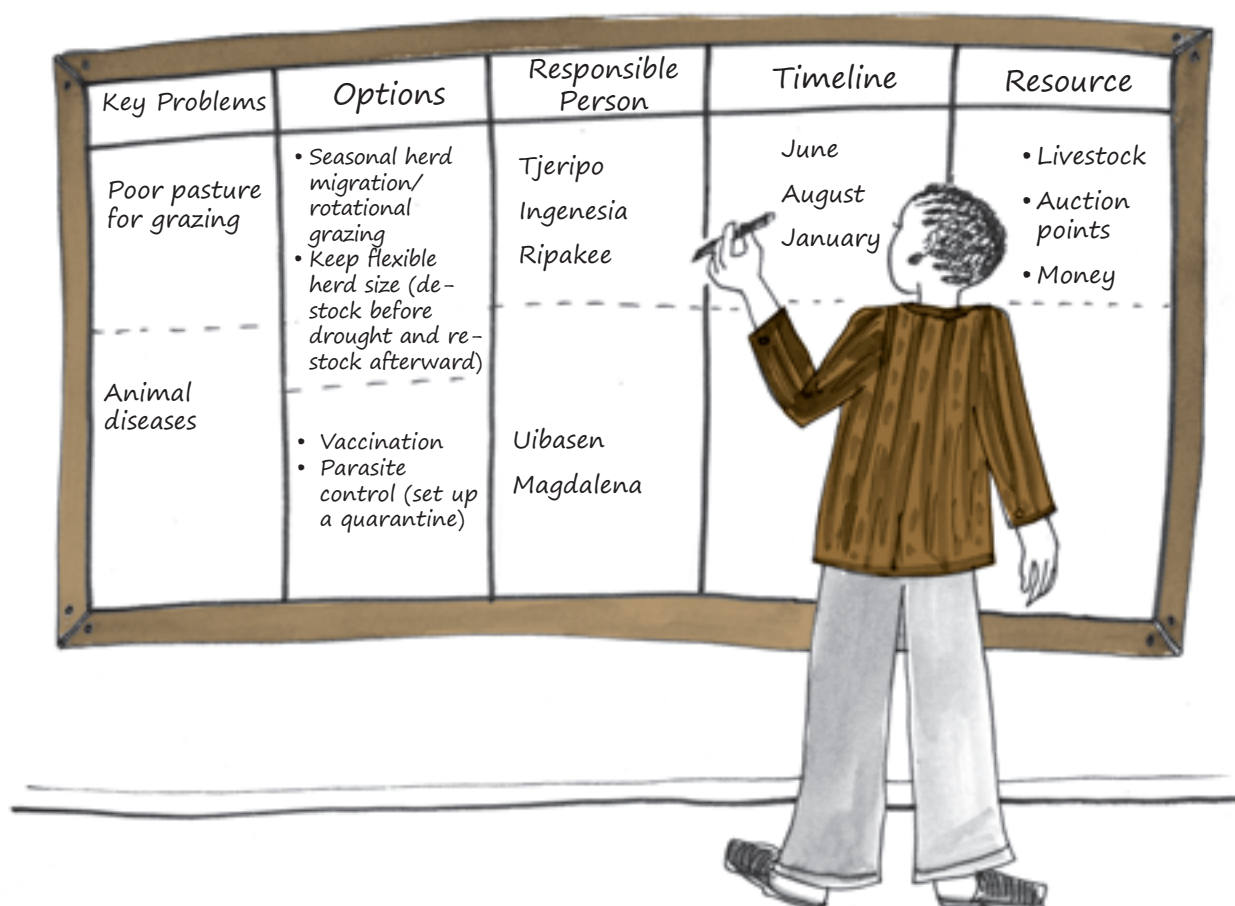
Tool 6: Developing our community-based CCA strategy and putting it into action

Addresses CCA planning Step 6; forms basis for planning and implementation of Steps 7 and 8; builds on Root Cause Analysis, Sun Ray Exercise and the Gender Screening Tool

This tool builds on the results of the previous exercises to arrange their results in a systematic way. The development of a log frame or table of action is central to the exercise. A log frame identifies what and how solutions can be achieved, who is responsible, by when they are to be achieved and what resources will be required.

The far left column lists the key problems identified during the Root Cause Analysis (water scarcity, food insecurity) or the objectives that have arisen from them (responsible water resource management, forest protection). The second column lists the 'options/actions/measures' developed for each of the problems during the Sun Ray Exercise. Across the remaining columns of the table, add 'Responsible person', 'Timeline' and 'Resource required'. An extra column labelled 'Indicators', which will help you monitor the implementation of your strategy can also be added and links to Tool 8.

It is very important to incorporate the findings from the gender sensitivity analysis to ensure that the planned actions do not further marginalise already vulnerable groups. On the contrary, to achieve it is critical to specifically promote and support such vulnerable groups, so it would be beneficial to include specific women and youth empowerment components into community climate change adaptation.



Purpose: To systematically process the information from the previous exercises and include them in a community Adaptation Strategy (action plan/work plan).

Materials: Flip chart paper, markers/pens, and coloured cards or stickers, Prestik, blank log frame table prepared beforehand (see example).

Methods:

1. Explain the purpose of the activity to the general meeting; present the blank log frame table and explain how it should be used.
2. Decide on and write the problems/objectives in the far left column and the measures/actions that were identified in the column next to them.
3. Carefully examine the table together and make additions/changes if they seem to be important. Ensure that all options are explored and reflected in the table, as this will form the backbone of the community adaptation plan.
4. Ask participants to form smaller working groups which each select one or two of the problems/objectives to work on.
5. Ask each group to go through their chosen measures/actions and work and agree on what should be written in the remaining columns.
6. Ask each group to present their log frame tables and recommendations to the general meeting. The community needs to discuss the proposals of each presentation and find consensus, as this will be their community adaptation strategy and everybody needs to be comfortable with it.
7. The plan should now be transferred onto A4 paper, if possible on computer, so that copies can be reproduced and made accessible to as many community members as require it. If there is no computer available, try to make photocopies.
8. Now for the important implementation of the strategy and plan. It would be best to appoint a responsible person to followthrough the planned actions. The presence of a formal Community Based Organisation would make the task easier, but traditional leadership structures or structures established through e.g. MET, MAWF or MoHSS extension services would also be suitable.
9. Monitoring and Evaluation (see Tool 8) is very important and provision for it should specifically be made in the Adaptation Strategy. Each community meeting should contain a section to discuss progress made on the implementation of the strategy/plan and to re-plan, if needed. Planning and implementation are usually ongoing and 'adaptive' processes. Measures/actions that were unsuccessful, for example, should be discontinued and better solutions found.

Time: 4 hours



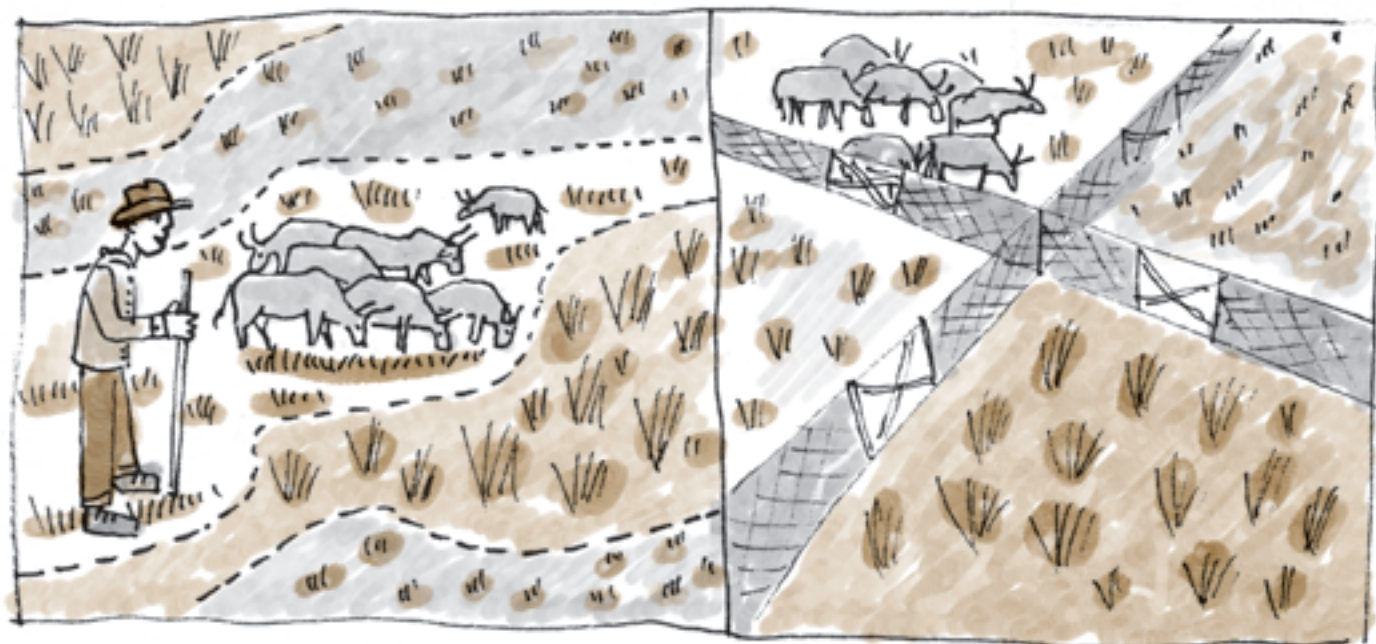
Tool 7: Example of an adaptation measure - rotational grazing or active herding

*This is the final output of Tools 1, 2, 3, 4, 5, and 6 and is called **Community Adaptation Plan (CAP)** or **Community Adaptation Strategy (CAS)**. Based on what you (the community) have discussed, you can implement the adaptation strategy you have designed during Tool 6. An example of an adaptation strategy is given within this section.*

The process in which livestock (cattle, goats, donkeys, horses and sheep) are strategically moved to partitioned pasture areas to allow vegetation in previously grazed pastures to regenerate is called rotational grazing. It is an important strategy farmers can use to ensure that grasses grow undisturbed in the 'resting' pastures.

Rotational grazing is not only meant for commercial farms, but communal farms can also be divided into camps. This encourages an even distribution of grazing throughout a closed camp and allows for resting periods in between. It further allows the maintenance of healthy forage/pastures/grasses. It is important to be active in the management of livestock.

The current practice on most communal farms is **continuous grazing**, which allows livestock to graze anywhere. This does not give the pasture the opportunity to grow as it would have if it had been left undisturbed. The practice leads to overgrazed and under-grazed areas.



Benefits of practising rotational grazing:

- Limits soil compaction which encourages root growth
- Reduces soil erosion due to the presence of continuous ground cover throughout the year
- Reduces overgrazing and land degradation
- Reduces weeds because of the ample resting periods
- Improves nutrient distribution (manure) since livestock have only a fixed period in a camp

- Allows a longer grazing season because of shorter forage recovery periods
- Improves animal productivity due to good management and also more efficient use of forage
- Promotes better control over livestock and builds familiarity with individual animals
- Allows pastures to recover and stay productive for longer
- Wastes less forage. This is one of the main advantages. Confining animals to paddocks results in more uniform grazing and less waste.
- Improves management. Moving livestock every week helps you to observe them and become more aware of what's happening, both with the livestock and with the pastures.



Tool 8: Example of participatory monitoring and evaluating

Further develops CCA planning Step 6 and builds on Step 7; it forms the basis for adaptive management of the interventions that have been implemented and the improvement of the innovations; it leads to the reiterative planning implementing – monitoring and evaluation (M&E) process.

This monitoring and evaluation activity tool checks that all activities included in the action plan are actually being implemented and followed up on successfully. It also 'tracks' and assesses whether the actions and innovations that have been implemented have the desired effects and truly help build adaptive capacity and climate change resilience. 'Maladaptive' practices, would lead to more vulnerability and the practices that generally perform poorly under the climatic conditions will be identified, reviewed or discontinued.

After the 'resources required' column of the action plan in the log frame, an indicator of progress or success for each planned activity and/or innovation was included. Progress towards the indicator can be assessed through research by the community or farmers. Community learning can thus be facilitated – and a systematic follow-up on the action plan can be set in place.

The gender sensitivity tool should remain an underlying concept in this participatory M&E exercise so that any negative impacts of the adaptation interventions observed on already vulnerable groups such as women, youth and the elderly can be reported and rectified. Frequent update meetings and events are needed for formal reviews of progress. Actions that do not bear the intended results should be replaced by new interventions.



Purpose: To systematically track and assess (i) progress towards the action plan, and (ii) the performance of the adaptation action/innovations that were implemented for their adaptation value. Periodic replanning of the action plan should take place, based on participatory farmers learning and assessment.

Materials: (i) Flip chart paper, markers/pens, and coloured cards or stickers, Prestik, blank log frame table prepared beforehand (during planning and formal plan assessment process, linked to Tool 6). (ii) Potentially, specific research tools and materials to initiate farmers' action research on the performance of adaptive innovations.

Methods:

(i) Progress assessment on action plan

1. Explain the purpose of the activity; present the action plan previously developed.
2. Look at the indicators of each planned measures/actions one-by-one, and ask community members to provide their information on the performance of the indicators (preferably based on real data/tracking information).
3. Carefully examine the table and review poorly implemented activities. Identify the causes for the poor performance (e.g. action not followed through on, or adaptation measures that do not generate the intended adaptation benefits) and make recommendations for additions/changes to the plan.

(ii) Performance of the implemented adaptation action/innovation

1. Identify a relevant indicator during the plan of action development.
2. Develop a few basic steps for how best to monitor and track the performance of the adaptation action/innovation (e.g. develop example in line with Tool 7).
3. Identify responsible community members to follow through on monitoring activities.
4. At community meetings share progress and if available, demonstrate tracking data.
5. Make recommendations towards improvement, continuation or discontinuation of interventions and integrate relevant steps into iterative planning of plan of action.
6. Share lessons learnt with other communities and practitioners; also try to solicit outside advice.
7. Monitoring and evaluation is very important and provision for it should specifically be made in the adaptation strategy. At each community meeting you may wish to discuss progress made on the implementation of the strategy/plan and re-plan, if needed. Planning and implementation are usually ongoing and 'adaptive' processes. Measures/actions that were unsuccessful, for example, should be discontinued and better solutions found.

Time: 1 hour during planning; ongoing throughout adaptive measure implementation.

CHECK LIST	
TOOL 1	☒ ☒
TOOL 2	☒ ☒
TOOL 3	☒ ☒
TOOL 4	☒ ☒
TOOL 5	☒ ☒
TOOL 6	☒ ☒
TOOL 7	☒ ☒
TOOL 8	☒ ☒

My notes

This image shows a full page of blank handwriting practice paper. It features 20 evenly spaced, horizontal brown lines running across the entire width of the page. The lines are thin and consistent in color, providing a guide for letter height and placement. There are no margins, text, or other markings on the paper.

My notes

[illegible]

My notes

This image shows a full page of blank handwriting practice paper. It features approximately 28 evenly spaced, horizontal brown lines running across the entire width of the page. The lines are thin and consistent in color, providing a guide for letter height and placement. There are no margins, text, or other markings on the paper.

My notes

This image shows a full page of blank, lined paper. It features approximately 20 evenly spaced, horizontal brown lines running across the width of the page. The lines are thin and consistent in color, set against a plain white background. There are no margins, text, or other markings present.

Useful contacts

MINISTRY OF ENVIRONMENT AND TOURISM (MET)

MET Head Office

P/Bag 13346, Windhoek
Tel: (061) 284 2111
Fax: (061) 229 936

Opuwo District Office

P.O. Box 78, Opuwo
Tel: (065) 273 003
Fax: (065) 273 171

MINISTRY OF AGRICULTURE, WATER AND FORESTRY (MAWF)

MAWF Head Office

P/Bag 13352, Windhoek
Tel: (061) 208 7111
Fax: (061) 229 961

Directorate of Forestry (DoF), Opuwo

P/Bag 298, Opuwo
Tel: (065) 273 003
Fax: (065) 273 105

Directorate of Veterinary Services (DVS), Opuwo

Tel: (065) 273 154
Fax: (065) 273 3105

MINISTRY OF REGIONAL AND LOCAL GOVERNMENT AND HOUSING AND RURAL DEVELOPMENT (MRLGHRD)

Kunene Regional Council

P/Bag 502, Opuwo
Tel: (065) 273 953
Fax: (065) 273 077

MINISTRY OF HEALTH AND SOCIAL SERVICES (MoHSS)

Kunene Regional Directorate

P/Bag 3004, Opuwo
Tel: (065) 273 026
Fax: (065) 273 022

MINISTRY OF LANDS AND RESETTLEMENT (MLR)

Kunene Regional Office

P/Bag 3025, Opuwo
Tel: (065) 273 587
Fax: (065) 273 487

OTHER IMPORTANT CONTACTS IN REGION

Integrated Rural Development and Nature Conservation (IRDNC)

P.O. Box 353, Opuwo
Tel: (065) 273 257
Fax: (065) 273 187

OTHER IMPORTANT CONTACTS

United Nations Development Programme (UNDP)

P/Bag 13329, Windhoek
Tel: (061) 204 6111
Fax: (061) 204 6203

Integrated Environmental Consultants Namibia (IECN)

P.O. Box 86634, Eros, Windhoek
Tel: (061) 249 204
Fax: (061) 249 205

Small Grants Programme (SGP)

P. O. Box 245, Windhoek
Tel: (061) 248 345
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