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Adaptation

Technical Report 5

Developing Adaptation Actions

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Glossary of terms and acronyms

ASC	Adaptation Sub-Committee
ASALs	Arid and semi-arid lands
DRR	Disaster risk reduction
ENSO	El Niño Southern Oscillation
FAO	Food and Agriculture Organization
FEWSNET	Famine Early Warning Systems Network
GCM	Global Circulation Model
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIS	Geographical Information Systems
GOK	Government of Kenya
ICRISAT	International Crops Research Institute for the Semi-Arid-Tropics
IDP	Internally Displaced Persons
IFPRI	International Food Policy Research Institute
ILRI	International Livestock Research Institute
IOD	Indian Ocean Dipole
IPCC	Intergovernmental Panel on Climate Change
ITCZ	Inter-Tropical Convergence Zone
KMD	Kenya Meteorological Department
KSH	Kenyan shillings
MEMR	Ministry of Environment and Mineral Resources
MTP	Medium Term Plan
NAdP	National Adaptation Plan
ATAR	Adaptation Technical Analysis Report
NCCRS	National Climate Change Response Strategy
NGO	No-governmental organisation
RCM	Regional Climate Model
ROK	Republic of Kenya
SEI	Stockholm Environment Institute
TWG	Thematic Working Group
UKCIP	UK Climate Impacts Programme
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNHCR	United Nations High Commissioner for Refugees

UNISDR United Nations International Strategy for Disaster Reduction
WHO World Health Organisation
WRI World Resource Institute

Adaptation. Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. (IPCC AR4 WGII, 2007).

Adaptive capacity (in relation to climate change impacts). The ability of a system to adjust to climate change (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities, or to cope with the consequences. (IPCC AR4 WGII, 2007)

Baseline/reference. The baseline (or reference) is the state against which change is measured. It might be a 'current baseline', in which case it represents observable, present-day conditions. It might also be a 'future baseline', which is a projected future set of conditions excluding the driving factor of interest. (IPCC AR4 WGII, 2007)

Capacity building. In the context of climate change, capacity building is developing the technical skills and institutional capabilities in developing countries and economies in transition to enable their participation in all aspects of adaptation to, mitigation of, and research on climate change, and in the implementation of the Kyoto Mechanisms, etc. (IPCC AR4 WGII, 2007)

Climate change. Climate change refers to a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcings, or to persistent anthropogenic changes in the composition of the atmosphere or in land use. (IPCC AR4 WGI, 2007)

Climate threshold. The point at which external forcing of the climate system, such as the increasing atmospheric concentration of greenhouse gases, triggers a significant climatic or environmental event which is considered unalterable, or recoverable only on very long time-scales, such as widespread bleaching of corals or a collapse of oceanic circulation systems. (IPCC AR4 WGII, 2007)

Climate variability. Climate variability refers to variations in the mean state and other statistics (such as standard deviations, the occurrence of extremes, etc.) of the climate on all spatial and temporal scales beyond that of individual weather events. Variability may be due to natural internal processes within the climate system (internal variability), or to variations in natural or anthropogenic external forcing (external variability). (IPCC AR4 WGI, 2007)

Downscaling. Downscaling is a method that derives local- to regional-scale (10 to 100 km) information from larger-scale models or data analyses. Two main methods are distinguished: dynamical downscaling and empirical/statistical downscaling. The dynamical method uses the output of regional climate models, global models with variable spatial resolution or high-resolution global models. The empirical/statistical methods develop statistical relationships that link the large-scale atmospheric variables with local/regional climate variables. In all cases, the quality of the downscaled product depends on the quality of the driving model. (IPCC AR4 WGI, 2007)

Ecosystem services. Ecological processes or functions having monetary or non-monetary value to individuals or society at large. There are (i) supporting services such as productivity or biodiversity maintenance, (ii) provisioning services such as food, fibre, or fish, (iii) regulating services such as climate regulation or carbon sequestration, and (iv) cultural services such as tourism or spiritual and aesthetic appreciation. (IPCC AR4 WGII, 2007)

Emission scenario. A plausible representation of the future development of emissions of substances that are potentially radiatively active (e.g., greenhouse gases, aerosols), based on a coherent and internally consistent set of assumptions about driving forces (such as demographic and socioeconomic development, technological change) and their key relationships. (IPCC AR4 WGI, 2007)

Extreme weather event. An extreme weather event is an event that is rare at a particular place and time of year. Definitions of *rare* vary, but an extreme weather event would normally be as rare as or rarer than the 10th or 90th percentile of the observed probability density function. (IPCC AR4 WGI, 2007)

Greenhouse gas (GHG). Greenhouse gases are those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of thermal infrared radiation emitted by the Earth's surface, the atmosphere itself, and by clouds. This property causes the greenhouse effect. Water vapour (H₂O), carbon dioxide (CO₂), nitrous oxide (N₂O), methane (CH₄) and ozone (O₃) are the primary greenhouse gases in the Earth's atmosphere. (IPCC AR4 WGI, 2007)

Impacts. The effects of climate change on natural and human systems. Depending on the consideration of adaptation, one can distinguish between potential impacts and residual impacts:

- **Potential impacts:** all impacts that may occur given a projected change in climate, without considering adaptation.
- **Residual impacts:** the impacts of climate change that would occur after adaptation. (IPCC AR4 WGII, 2007)

Likelihood. Likelihood refers to a probabilistic assessment of some well-defined outcome having occurred or occurring in the future, and may be based on quantitative analysis or elicitation of expert views, (IPCC AR4 WGII, 2007).

Maladaptation. Any changes in natural or human systems that inadvertently increase vulnerability to climatic stimuli; an adaptation that does not succeed in reducing vulnerability but increases it instead. Spending a disproportionate amount of effort and investment focussed upon adaptation beyond what is required. (Adaptation Sub-Committee, 2010).

Mitigation. A human intervention to reduce the sources or enhance the sinks of greenhouse gases. (IPCC AR4 WGI, 2007)

Risk. Combination of the probability (likelihood) of an event and its consequences (ISO/IEC, 2002).

Resilience. The ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organisation, and the capacity to adapt to stress and change. (IPCC AR4 WGII, 2007)

Sensitivity. Sensitivity is the degree to which a system is affected, either adversely or beneficially, by climate variability or change. The effect may be direct (e.g., a change in crop yield in response to a change in the mean, range or variability of temperature) or indirect (e.g., damages caused by an increase in the frequency of coastal flooding due to sea-level rise). (IPCC AR4 WGII, 2007)

SRES scenarios. The storylines and associated population, GDP and emissions scenarios associated with the Special Report on Emissions Scenarios (SRES) (Nakićenović *et al.*, 2000), and the resulting climate change and sea-level rise scenarios. Four families of socio-economic scenario (A1, A2, B1 and B2) represent different world futures in two distinct dimensions: a focus on economic versus environmental concerns, and global versus regional development patterns. (IPCC AR4 WGII, 2007). The following terms are relevant for a better understanding of the structure and use of the set of SRES scenarios (IPCC AR4 WGI, 2007):

- **Scenario family Scenarios** that have a similar demographic, societal, economic and technical change storyline. Four scenario families comprise the SRES scenario set: A1, A2, B1 and B2.
- **Illustrative Scenario.** A scenario that is illustrative for each of the six scenario groups reflected in the Summary for Policymakers of Nakićenović and Swart (2000).

They include four revised scenario markers for the scenario groups A1B, A2, B1, B2, and two additional scenarios for the A1FI and A1T groups. All scenario groups are equally sound.

- **Marker Scenario.** A scenario that was originally posted in draft form on the SRES website to represent a given scenario family. The choice of markers was based on which of the initial quantifications best reflected the storyline, and the features of specific models. Markers are no more likely than other scenarios, but are considered by the SRES writing team as illustrative of a particular storyline. They are included in revised form in Nakićenović and Swart (2000). These scenarios received the closest scrutiny of the entire writing team and via the SRES open process. Scenarios were also selected to illustrate the other two scenario groups.
- **Storyline.** A narrative description of a scenario (or family of scenarios), highlighting the main scenario characteristics, relationships between key driving forces and the dynamics of their evolution.

Storm surge. The temporary increase, at a particular locality, in the height of the sea due to extreme meteorological conditions (low atmospheric pressure and/or strong winds). The storm surge is defined as being the excess above the level expected from the tidal variation alone at that time and place. (IPCC AR4 WGI, 2007)

Threshold. The level of magnitude of a system process at which sudden or rapid change occurs. A point or level at which new properties emerge in an ecological, economic or other system, invalidating predictions based on mathematical relationships that apply at lower levels. (IPCC AR4 WGII, 2007)

Uncertainty. An expression of the degree to which a value (e.g., the future state of the climate system) is unknown. Uncertainty can result from lack of information or from disagreement about what is known or even knowable. It may have many types of sources, from quantifiable errors in the data to ambiguously defined concepts or terminology, or uncertain projections of human behaviour. Uncertainty can therefore be represented by quantitative measures, for example, a range of values calculated by various models, or by qualitative statements, for example, reflecting the judgement of a team of experts. (IPCC AR4 WGI, 2007)

Vulnerability. Vulnerability is the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and variation to which a system is exposed, its sensitivity, and its adaptive capacity. (IPCC AR4 WGII, 2007)

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1. Introduction

1.1 Background and purpose

Kenya is already extremely susceptible to climate-related events and such events pose a serious threat to the socio-economic development of the country. Droughts and floods in particular are having devastating consequences on the environment, society and the wider economy. In addition to this, projected future increases in temperature, changes in rainfall abundance, sea level rise and frequency and severity of extreme events will place greater strain on natural resources such as land and water and contribute to deterioration in food security, political stability, health and poverty. There are however a number of opportunities that are also being explored resulting from a changing climate.

To address the challenges posed by a variable and changing climate in a systematic manner, the Government of Kenya (GoK) formulated and published a National Climate Change Response Strategy¹ (NCCRS) in April 2010. The NCCRS's primary focus is to ensure that climate change adaptation and mitigation measures are integrated in all government planning and development objectives. On the basis of the evidence of climate change in Kenya and associated impacts available at the time of publication, the NCCRS presents an initial set of adaptation interventions for the county, with estimated activity costs provided.

Building on the work of the NCCRS, the Adaptation Technical Analysis Report (ATAR) process, the main technical input for the preparation of the first draft Kenya National Adaptation Plan (NAdP), has deepened understanding of current and future climate impacts in Kenya (assessing future likelihood and consequence of impacts), as well as knowledge of adaptation actions ongoing in, planned for and recommended for Kenya. Cognisant of existing NCCRS adaptation recommendations, and with this new information available, 'long-lists' of potential adaptation actions have been developed as part of the ATAR and in preparation for the NAdP for each Medium Term Plan (MTP). Long lists were reviewed by the Thematic Working Group (TWG) and other stakeholders in April 2012, with feedback provided, and validated in June 2012. Priority adaptation actions for each theme were then identified with supporting information on context, current status of activities, lead agency to take priority actions forward, stakeholder support required, indicative timeframe, costs (where available) and immediate next steps also provided.

This adaptation report is a technical report which details the methodology used for developing adaptation actions, and thus supports the ATAR.

1.2 Key concepts

In the context of managing the impacts of a variable and changing climate, the phrases 'adapting to climate change' and 'building resilience to climate change' are often used interchangeably. Adaptation is defined by the Intergovernmental Panel on Climate Change (IPCC) as:

“adjustment in natural *or human systems* in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities”² (IPCC, 2007, p.869).

'Resilience' is defined by the IPCC as:

“the ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organisation, and the capacity to adapt to stress and change”² (IPCC, 2007, p.880).

For developing countries in particular, adaptation (or resilience-building) measures are intrinsically linked to sustainable development as development oriented results, such as poverty reduction, improved nutrition or enhanced education. These will reduce vulnerability to climate change, and thus the risk to lives and livelihoods³. As such, development, equity and adaptation goals can be jointly pursued by initiatives that promote the welfare of the poorest members of society⁴.

Climate change adaptation is also closely linked to disaster risk reduction (DRR) as both fields aim to reduce vulnerability of communities and achieve sustainable development⁵. The linkages and commonalities between these two fields are outlined in Table 1.1. DRR explicitly deals with current climate variability and can be seen as the first line of defence against climate change, an essential part of adaptation. Conversely, for DRR to be successful, it needs to take account of the shifting risks associated with climate change and ensure that measures do not increase vulnerability to climate change in the medium to long-term⁶. Potential adaptation actions are therefore not always explicitly referred to as ‘adaptation’.

Table 1.1. Summary of commonalities between climate change adaptation and disaster risk reduction. Source: United Nations Framework Convention on Climate Change, 2008, p14⁷.

Common areas	Explanation
Aim	Both aim to build resilience contributing to sustainable development in the face of hazards
Influence of poverty, and vulnerability and its causes	The severity of the conditions caused by climate change and disasters is influenced by poverty and by vulnerability and its causes
Vulnerability reduction focused on enhancing capacity, including adaptive capacity, and devising responses in all sectors	Assessing risk and vulnerability is fundamental to both subjects. Reducing vulnerability requires multi-stakeholder participation
Integration in development	Both must be integrated into development plans and policies
Local level importance	Measures to relieve risk and adapt to climate change must be effective at the local level
Emphasis on present day conditions	Increasingly it is recognized that the starting point is in current conditions of risk and climate variability (i.e. ‘no regrets’)
Awareness of need to reduce future impacts	Despite a tradition based on historical evidence and present day circumstances, the aim of disaster risk reduction to build resilience means that it cannot ignore current and future climate change risks
Appropriateness of non-structural measures	The benefits of non-structural measures aid both current and less well understood future risk reduction needs
Full range of established and developing tools	For example: early warning systems; seasonal climate forecasts and outlooks; insurance and related financial risk management; building design codes and standards; land-use planning and management; water management including regional flood management, drainage facilities, flood prevention and flood-resistant agricultural practices; and environmental management, such as beach nourishment, mangrove and wetland protection, and forest management
Converging political agendas	At the international level, the two policy agendas are increasingly being discussed together, including through the Bali Action Plan (decision 1/CP.13) and the Hyogo Framework for Action

In the context of linkages between adaptation, development and disaster risk reduction, it is worth noting that much of the adaptation financing that is currently available (e.g. Special Climate Change Fund, The Adaptation Fund) stipulates distinguishing between baseline development needs and the value added contribution – additionality – of the proposed results in the context of climate change. Where this is required, guidance is available on how to develop adaptation initiatives that are distinct from baseline development (e.g. Designing Climate Change Adaptation Initiatives: A UNDP Toolkit for Practitioners).³

1.3 Structure of this report

Following this introduction, the methodology for developing adaptation actions for the ATAR is presented in sections 2 to 6. Section 2 briefly describes the overall process of moving from an understanding of climate impacts and risks to a NAdP. Section 3 describes the process of collating information on adaptation actions already underway in, planned for and recommended for Kenya. Section 4 describes the development of adaptation long lists for each MTP theme, while Section 5 indicates how prioritisation of actions was undertaken. Comments on the presentation and implementation of resilience pathways are provided in Section 6. While this report does not provide adaptation action outputs themselves, it does signpost the reader to where these can be found in the main ATAR document.

2. Methodology: Adaptation decision-making framework

In line with best practice in policy-making and decision-making more generally, the overall approach that was agreed with the GoK's Climate Change Secretariat to assess climate impacts and risks in Kenya and subsequently develop the NAdP is a risk management approach based on the UK Climate Impacts Programme (UKCIP) Risk and Uncertainty Framework⁸. As described in section 1.2.2 of Technical Report 1 Risk Assessment Report (TR1), there are a range of possible methodologies currently used and advocated worldwide to guide decision-makers through the challenges associated with managing climate change impacts and risks, and dealing with associated uncertainties. The chosen approach blends two stand-out frameworks, vulnerability-based and risk-based, by addressing both the need to reduce vulnerability to existing climate variability as well as build resilience to projected future climate risks.

The UKCIP-based framework is acknowledged by the IPCC as one that deals effectively with assessing current responses to climate variability and extremes, adaptive responses to future climate and the limits of adaptation; linking adaptation to sustainable development; engaging stakeholders; and decision-making in the face of uncertainty². It is adopted by the World Bank in a developing country context¹, is acknowledged in UN guidelines as being a complete framework for evaluating the impacts of, vulnerability and adaptation to climate change⁹, and is referred to by UNDP as being distinctive in its way of dealing with uncertainty³.

The framework comprises eight stages as shown in Figure 2.1. Stages 1, 2 and 3 were addressed in the TR1. Stages 4 and 5 are addressed in this report with relevant outputs presented in Chapter 7 of the ATAR. Stage 4 covers the process of identifying potential adaptation actions in response to the climate impacts and risks assessed in stage 3. Stage 5 addresses adaptation option appraisal, including the prioritisation of actions. Stage 6, focused on making decisions, is partially addressed here and in the ATAR in the context of ATAR validation. Stages 7 and 8 however should be implemented by the GoK and other stakeholders after publication of the ATAR and NAdP. As described in the TR1, this framework provides an iterative process that allows new evidence and policy initiatives to be incorporated as they emerge, and thus can be adapted over time. This is important in terms of allowing the integration of lessons learned from existing adaptation activities (most of which have not yet undergone a formal evaluation process which has been made available to the Kenyan government), and also of revised information on climate vulnerabilities, impacts,

¹ The World Bank Energy Sector Management Assistance Programme (ESMAP)'s work on adaptation seeks to develop and test processes to mainstream climate risk management into energy sector planning and operations in a developing country context. HEAT, ESMAP's Hands-on Energy Adaptation Toolkit, is based on the UKCIP (2003) Risk and Uncertainty Framework.

risks, costs, benefits, etc. The proposed eight stages of decision-making will therefore not always follow on from one another sequentially.

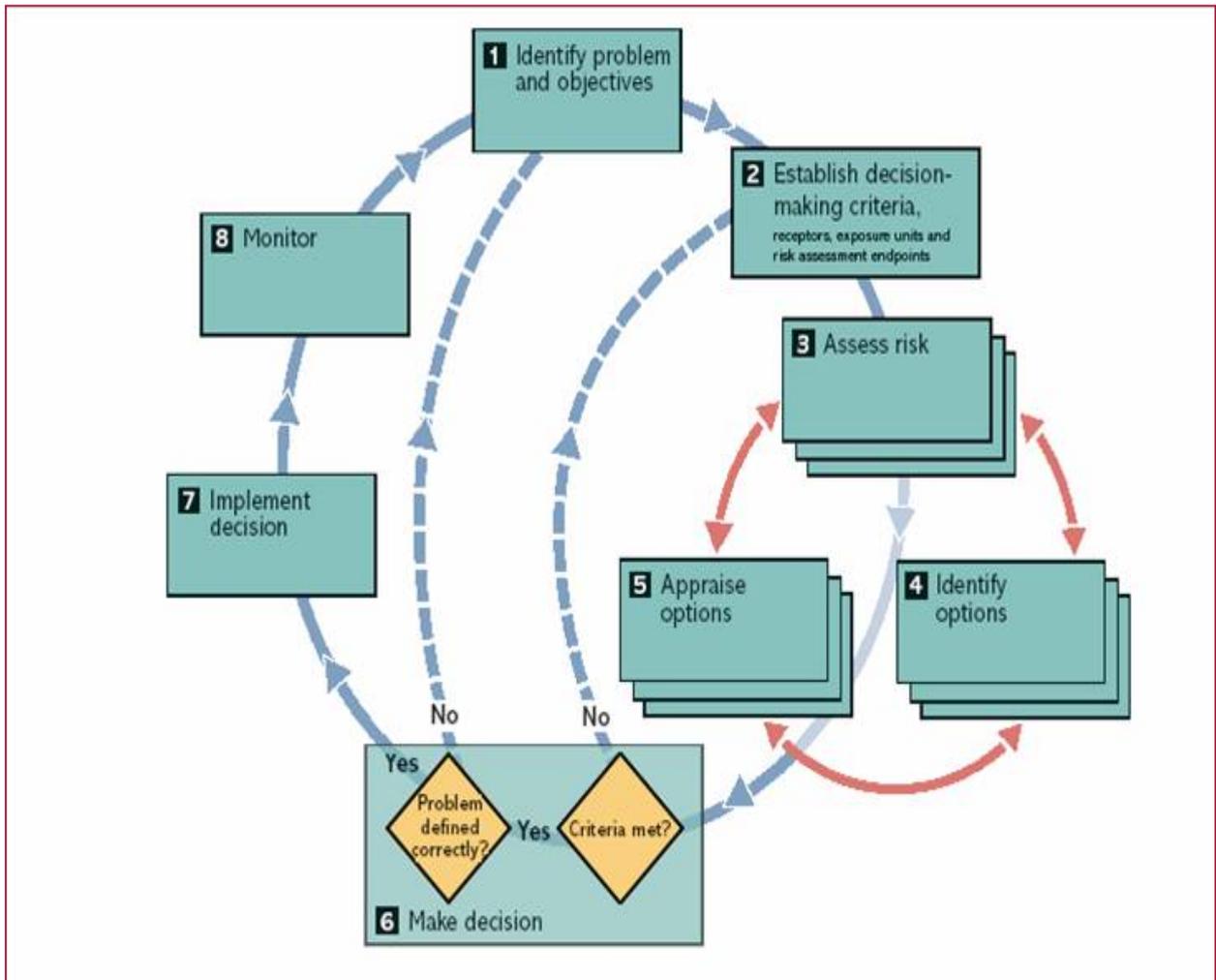


Figure 2.1. The UKCIP risk-based decision-making framework for climate change adaptation

Following this over-arching framework, the process illustrated in Figure 2.2 was followed in order to move through UKCIP (2003) stages 4 to 6. The different components of this process are explored in detail in the following sections of this report.



Figure 2.2. Process for identifying, appraising and presenting adaptation actions for the Kenyan ATAR (in preparation for the NAdP) with a view to making decisions on and implementing priority adaptation activities

3. Methodology: Documenting adaptation actions already underway in, planned for or recommended for Kenya

Kenya's main priority is climate change adaptation because of the current climate impacts being experienced. These include impacts mainly associated with drought and floods which have enhanced vulnerabilities both at national and county levels. As such adaptation actions to address existing vulnerabilities have been on-going at all levels even if the terminology of 'adaptation' is not used. The process therefore sought to first document the current on-going adaptation actions which would then serve as baseline for the National Adaptation Plan. This was done through:

- Literature review of government documents which included the Vision 2030, First National Communications and various sector plans and reports. The full list is in reference section of the ATAR.

- Literature review of civil society (CSOs) actions and key informant interviews with stakeholders. Refer to the Technical Report 7 on civil society, lessons learnt and cases in Appendix 1 for more details.
- Literature review of private sector adaptation actions and key informant interviews with stakeholders. Refer to Technical Report 4 for more details.
- Literature review and key informant interviews on the availability and accessibility of climate data. Refer to Technical Report 8 for more details.
- Adaptation actions and gaps were also sourced from the legal and regulatory component of the National Climate Change Action Plan process which produced legal working papers for the environment, water and sanitation, tourism, agriculture, physical infrastructure and disaster preparedness sectors.
- Very useful information collected from 10 county consultations held in Nakuru, Eldoret, Nairobi, Kisumu, Kakamega, Nyeri, Embu, Garissa, Mombasa and Kajiado also contributed to the adaptation actions portfolio.

The information collected from these sources has been integrated into the ATAR. It should be noted that not all actions documented have the ‘adaptation’ terminology. Thus any action that sought to build adaptive capacity, enhance resilience or reduce vulnerability was recorded as an adaptation action. The NadP database currently has over 200 main adaptation programmes/projects recorded and over 500 sub records. The main objective of the database is to serve as the main source of adaptation information for stakeholders from government, development partners, civil society, academia and the private sector. This information is meant to be used when:

- a. Planners and decision makers need to know what type of adaptation actions are being implemented, the scale of the interventions, geographical location and implementing agency so that they can allocate government resources to the gaps.
- b. Civil society and academia need to know which other agency or government body is addressing similar climate change adaptation issues for lesson learning and complimenting efforts as opposed to duplication. The range of adaptation issues range from risk and vulnerability assessments, academic and social research, livelihood interventions to policy advocacy amongst others.
- c. Government finance and treasury officials can use the database to understand the financial resources being used for different interventions and can then allocate resources accordingly.
- d. The private sector can use the database to identify gaps that they are willing to support in building resilience.

The CCS (or other appointed organisation) will need to update and maintain this database, the details of which are provided in the supporting text to the database

4. Methodology: Developing adaptation actions for the National Adaptation Plan

As agreed with the GoK Climate Change Secretariat, and in order to develop a robust and appropriate set of adaptation actions for the Kenyan NAdP, it is essential that the NAdP derives from evidence-based climate risk assessments. As such, adaptation actions were developed for the ATAR based on the existing body of information² on climate impacts and

² The scope of the project did not include undertaking new vulnerability assessments, impact modelling or risk assessments.

risks in Kenya which is presented in TR1. Further to this, it was also agreed that actions would be developed based on adaptation activities already underway in Kenya, those planned for in Kenya and those that have been recommended by various stakeholders. This ensures that adaptation actions in the NAdP build on work that has already been conducted in this field to date and are Kenya-specific. Of particular importance in this respect is building on the NCCRS.

In order to maximise the relevance and utility of the ATAR and in turn the NAdP for end-users it was decided with the TWG that adaptation actions would be organised according to MTP theme. Adaptation actions are thus arranged according to the existing Kenyan structure for delivering development and economic growth. This allows users to easily map the relationship between identified climate risks and proposed adaptation actions. The 24 MTP themes for which adaptation actions have been developed are presented in Table 7.1 in the ATAR.

Using the available knowledge on vulnerability, impacts and climate change, adaptation actions were developed for the ATAR (in preparation for the NAdP). Development of actions was also conducted in the context of basic principles for good adaptation. These include the identification of 'no regret', 'low regret' and 'win-win' options from the outset due to their cost effectiveness and multiple benefits. A no regret adaptation option is one which would be justified under all plausible future scenarios, even in the absence of climate change; a low regret adaptation option is one for which the implementation costs are low, while the benefits under projected climate changes are potentially large; while a win-win action reduces the impacts of climate change and has other environmental, social or economic benefits⁸. This also involved avoiding maladaptive options, which inadvertently increase vulnerability to climatic stimuli or involve spending a disproportionate amount of effort and investment focussed on adaptation beyond what is required^{2,10}.

Additionally, actions were identified that 'build adaptive capacity' and 'deliver adaptation action'. This typology, derived from UKCIP¹¹, was agreed with the TWG in late 2011 as being a sensible method to help describe and differentiate adaptation responses. The breakdown of components of this typology, agreed with the TWG, is presented in Appendix 1 of this document.

Finally, in terms of developing adaptation actions, actions were developed at the national level. Thus actions are focused on the role of national level bodies, particularly national government, and also including research institutions, NGOs, private sector and civil society organisations, in providing an enabling environment for adaptation at all levels of society. Rather than developing appropriate actions that can be undertaken at the individual, household and community level across all regions of the country, which is beyond the scope of this work, actions under each MTP theme are intended to provide the best possible supporting environment for adaptation at the regional and local level, for example, through provision of regulation, policy, financial support/ services, infrastructure, information and education. Final long lists and exact action wording were agreed and validated in June 2012 by the TWG and other relevant stakeholders and are presented in Appendix 2 of the ATAR.

As shown above, while a rigorous method has been used to identify potential adaptation actions, there are some limitations to long list outputs. First, the level of current understanding of current climate impacts and future climate change risks in Kenya varies across sectors and geographic settings³. While decision-making is indeed possible in the face of this uncertainty, in some cases more detailed work is required in order to develop appropriate adaptation actions and avoid maladaptation. This is particularly the case for understanding impacts and recommending adaptation responses in less well studied parts of Kenya. Second, despite the existence of many adaptation pilot projects in Kenya, it is not yet

³ This is detailed in Chapter 2 of the ATAR and in TR1.

possible to recommend the up-scaling of many of these activities as full project appraisals have not been completed or documented to allow lesson learning and demonstrate successes. By documenting adaptation actions underway in and planned for in Kenya as part of the ATAR, as well as their existing monitoring and evaluation systems, a strong foundation for this has been laid. Some immediate next steps following publication of the ATAR and NAdP are therefore to appraise existing adaptation activities and initiate the roll out of successful activities in other geographical regions, communities or sectors.

Finally, adaptation actions recommended for Kenya in the relevant literature are often based on common sense, expert judgement but are not grounded in detailed analysis or appraisal of alternative options. As such, some adaptation actions recommended in the ATAR and NAdP will require more detailed appraisal of alternatives, particularly incorporating emerging cost-benefit data. An excellent example of an existing detailed adaptation option appraisal process in Kenya is the T21 analysis being conducted under the Ministry of Planning which is currently being updated. More information about this is available in Chapter 5 of the ATAR.

5. Methodology: Prioritising adaptation actions for the National Adaptation Plan

In order to prioritise adaptation actions under each MTP theme long list, as requested by the MEMR Climate Change Secretariat, the first step was to agree a set of criteria for prioritisation. The project team reviewed adaptation action prioritisation criteria used worldwide in Least Developed Country National Adaptation Programmes of Action (NAPAs), National Adaptation Plans, national strategies and other relevant contexts in order to compile a possible list of criteria. Through an iterative and collaborative review process with the TWG, including an online survey in October 2011 and workshop discussions in March and April 2012, feedback was provided by the TWG and other stakeholders on which criteria would be most useful to the Kenyan context, including whether they could be assessed in practice. It was also agreed that criteria would be applied to prioritise actions for implementation in the short term, i.e. the next five years, in line with the next MTP planning horizon.

Following this consultation period, the final criteria used to prioritise actions were agreed and are presented in Table 5.1. As shown, there are three criteria:

- 1) is the action timely?
- 2) does the action enable climate resilient decisions to be made?
- 3) does the action build adaptive capacity?

These three criteria derive from the typology used in the United Kingdom's Adaptation Sub-Committee (ASC)¹² adaptation preparedness ladder which is presented in Chapter 7 of the ATAR. Moving on from the ASC typology, and in order to provide greater clarity on the meaning of each criterion, the project team incorporated comments from the TWG consultation process to develop five or six key elements for each criterion.

The range of elements selected seek to find an appropriate balance between prioritising actions that address current climate variability and those that are focussed on addressing future impacts. As illustrated in Table 5.1, three of the 16 final elements predominantly address current climate variability, two predominantly address future climate change and all other elements address both. Further to this, the decision was taken to weight the scoring for elements predominantly addressing current climate variability more heavily. This places

greater focus on existing climate impacts which are already affecting lives and livelihoods in Kenya. As such, actions demonstrating those elements focussed on current climate were allocated a score of two per element, whereas actions demonstrating all other elements were allocated a score of one per element (see Table 5.1). The highest possible score for an adaptation action was therefore 19. All actions on MTP theme long lists were scored by the project team according to the final set of criteria and the top ranking ten actions were selected as priorities.

While this has allowed the prioritisation of actions under each MTP theme, it is important to note that views on what constitutes a priority will be divergent across government ministries and other stakeholders. As such, it is recommended in the ATAR that all priority actions are approved by each MTP theme lead agent prior to implementation. This presents an opportunity for MTP theme leads to align priority adaptation actions with the priorities of their relevant thematic area/ministry. In developing the next NAdP, it is also advised that prioritisation criteria are reviewed, including a consideration of a five point scoring system which would be more viable when there is a greater body of information against which to score actions. This is in line with the overarching iterative approach recommended for decision-making on climate change.

Table 5.1. Prioritisation criteria, including breakdown of elements, applied to select priority adaptation actions. (indicates that the element refers predominantly to current climate variability, ++ indicates that the element refers predominantly to future climate change, no symbol indicates that the element refers predominantly to both current climate variability and future climate change).**

Criteria	Elements					
Is the action timely?	Will this action deliver a quick response to and management of existing adverse climate impacts? ** (Double weight)	Will the action reduce adverse impacts of current climate variability (e.g. drought, flood, changing rainfall patterns)? ** (Double weight)	Is the action required because there is a long lead-in decision timeline with action needed to be taken now to prepare us for the future? ++	Does the action support sustainable livelihoods, poverty reduction and wider Millennium Development Goals? ** (Double weight)	Does the action integrate climate variability and future climate change into decisions being taken regarding long-lived fixed assets/policies? (e.g. does the action take advantage of available intervention points to integrate climate change into decision making)?	Does the action have the potential to deliver mitigation co-benefits (i.e. the action directly offers the opportunity to reduce greenhouse gas emissions, assist in low carbon pathway development)?

Does the action enable climate resilient decisions to be made?	Will the action address current vulnerabilities and future impacts of climate change?	Is the action aligned with existing national development and sectoral plans and does it deliver on development priorities?	Will the action explicitly incorporate the impacts of future climate change and their uncertainties into key government decisions? ††	Will the action provide decision makers with guidance to identify/quantify key climate hazards, vulnerabilities, impacts, risks and/or manage uncertainties?	Does the action have a high cost-effectiveness ratio?	NA
Does the action build adaptive capacity?	Does the action involve data collection, monitoring, research and/or analysis?	Does the action involve knowledge transfer, awareness-raising and/or learning?	Does the action explicitly involve working in partnerships?	Does the action enable resources to be made available or used more effectively (resources can include technical, financial, material, natural, human)?	Is the action flexible (i.e. a measure that can be reviewed and adjusted periodically as our understanding of climate impacts knowledge advances)?	NA

6. Methodology: Presenting and implementing MTP theme resilience pathways

As presented in Chapter 7 of the ATAR, priority adaptation actions for each MTP theme are documented in resilience pathways, one each for the 24 MTP themes. Each pathway is focused on the next five years and thus actions are recommended for implementation in 2013-2017. As stated in the ATAR, it is strongly recommended that priority actions to be taken in the medium and long term should be prioritised as the first five year NAdP time period draws to a close. This will allow new evidence and findings to be incorporated into the prioritisation exercise but not exclude the use of long lists developed for the purposes of the present ATAR.

Further details on the next steps for implementing MTP resilience pathways are provided in Chapters 7 and 9 of the ATAR on resilience pathways and next steps, respectively.

Appendix 1: A typology of adaptation actions at the national level- ‘building adaptive capacity’ and ‘delivering adaptation action’.

Note: there can be overlap between categories and as such each category is not mutually exclusive.

Table A1.1. Building adaptive capacity

Action type	Description/example
Research	<ul style="list-style-type: none"> • Research and analysis to reduce uncertainties prior to investing in risk management measures. We note the importance of defining which actors and institutions will conduct research. • Support programmes that provide higher resolution data on future climate variability and climate change. We note the need to build human capacity for undertaking actual scenario modelling based on downscaled climate data • Improve understanding of the relationships between climate-related factors and national economic, social and environmental performance • Develop new and improve existing impact models, e.g. tailored to cropping and agricultural systems across the country • Develop/support/follow in-depth integrated national-level/sectoral climate change risk and vulnerability assessments • Understand the process of national level integration and planning for adaptation, and identify relevant actors and their contributions • Undertake cost-benefit analyses and multicriteria decision support analysis of national level risk management measures where necessary • Prioritise research agenda to generate evidence for shaping national policy and actions. We note the need for research on the economics of climate change.
Data collection and monitoring	<ul style="list-style-type: none"> • Collect data to feed into risk assessment tools • Ensure high data quality standards and reliable archiving systems • Introduce and implement national monitoring and evaluation strategies related to climate impacts and adaptation • Monitor climate impacts on national development targets • Monitor effectiveness of national/sectoral adaptation and learn lessons • Monitor new developments in climate change science

Action type	Description/example
Awareness-raising and organisational learning	<ul style="list-style-type: none"> • Assess existing capacity and undertake training, staff development and capacity-building programmes for nationally-relevant stakeholders, e.g. using climate and impact model outputs, undertaking risk assessments, how to manage uncertainties, support staff in effectively integrating climate change impacts into the Ministry of Planning’s T21 model. • Buy-in from key national stakeholders – ministries, counties, donors, national level CSOs, private sector representatives (e.g. from Kepsa). • Understanding the impacts at regional, national, county and community levels • Create mechanisms and strengthen networks for learning across stakeholders and from local to national level • Undertake publicity and advocate counties for consideration for climate risk and adaptation planning
Changing policy and practice	<ul style="list-style-type: none"> • Develop/amend national policy and practice to ensure the economy, society and environment are resilient to/take account of changing climatic conditions (e.g. integrating climate change adaptation into Medium Term Plans under Vision 2030) • Integrate climate resilience into national regulation, statute, codes and standards, best practice guidelines, and resource allocation • Enforce relevant standards and regulations (e.g. adaptation, development). • Support international efforts to integrate climate resilience into statute, policy and practice.
Working in partnership	<ul style="list-style-type: none"> • Work in partnership with stakeholders to understand climate change risks and develop coordinated adaptation measures: government, regulators, donors, CSOs, private sector. • Work in sectoral-based partnerships, as well as supporting cross-sectoral coordination • Partnership working helps to avoid conflicts between different organisations’ adaptation strategies • Work with international organisations and other governments, e.g. on technology transfer and adaptation in international agreements.
Allocating time and resources	<ul style="list-style-type: none"> • Evaluate time and resources required at a national and sectoral level for adaptation and build into relevant planning processes. • Understand time and resource implications for counties and communities and their impact on national policy. • Allocate resources appropriately in response to evaluation.

Table A1.2. Delivering adaptation action

Action type	Description/example
Transfer: Spread/share risk	<ul style="list-style-type: none"> • Diversify economic activities and locations of key economic and social infrastructure to spread risk • Transfer risks through shared investment.

Action type	Description/example
Treat: Avoid negative impacts	<ul style="list-style-type: none"> • Consider climate resilience as part of selecting sites for new national investment – avoid locations where risks may be unmanageable (e.g. low-lying coastal land) • Integrate technical/management solutions into national projects that build robustness against climate change (e.g. build climate change contingency into construction/retrofit of hydropower infrastructure).
Tolerate: Accept risks	<ul style="list-style-type: none"> • Accept risks where they cannot be managed or where cost-benefit analyses indicate that it is not worthwhile to make changes • Accept that some nationally important economic activities may not be able to occur in current locations in the future (e.g. shift in area suitable for coffee/tea production).
Terminate: Bear loss	<ul style="list-style-type: none"> • Bear losses where they cannot be avoided – for instance, loss of coastal areas to sea level rise and/or increased rates of coastal erosion where risks are too expensive to rectify.
Exploit opportunities	<ul style="list-style-type: none"> • Develop plans and projects that are eligible for international funding opportunities for climate change adaptation actions. • Change location and nature of economic and social activities to benefit from changing climatic conditions.

Derived from West and Gawith (2005),¹¹ validated by TWG in 2011.

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- ¹ Government of Kenya. 2010. *National Climate Change Response Strategy*
- ² Intergovernmental Panel on Climate Change. 2007. *Climate Change 2007: Impacts, adaptation and vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Parry, M. L., et al. (eds). Cambridge University Press, Cambridge, United Kingdom.
- ³ UNDP. 2010. *Designing Climate Change Adaptation Initiatives: A UNDP Toolkit for Practitioners*. UNDP Bureau of Development Policy.
- ⁴ Burton, I. et al. 2007. Adaptation to climate change in the context of sustainable development and equity. In: Intergovernmental Panel on Climate Change. 2007. *Climate Change 2007: Impacts, adaptation and vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Parry, M. L., et al. (eds). Cambridge University Press, Cambridge, United Kingdom.
- ⁵ UNISDR. 2012. United Nations International Strategy for Disaster Reduction website. See www.unisdr.org/we/advocate/climate-change (Accessed: 13 April 2012).
- ⁶ Mitchell, T. And van Aalst, M. 2008. *Convergence of disaster risk reduction and climate change adaptation*. A review for the UK Department for International Development (DfID).
- ⁷ United Nations Framework Convention on Climate Change. 2008. *Integrating practices, tools and systems for climate risk assessment and management and strategies for disaster risk reduction into national policies and programmes*. Technical Paper.
- ⁸ Willows, R. I. and Connell, R. K. (eds) 2003. *Climate adaptation: Risk, uncertainty and decision-making*. UKCIP Technical Report. UKCIP, Oxford.
- ⁹ United Nations Framework Convention on Climate Change (UNFCCC) Secretariat. 2005. *Compendium on methods and tools to evaluate impacts of, and vulnerability and adaptation to, climate change*. UNFCCC.
- ¹⁰ Adaptation Sub-Committee. 2010. *How well prepared is the UK for climate change?* Adaptation Sub-Committee, UK.
- ¹¹ West, C.C. and Gawith, M.J. (eds). 2005. *Measuring progress: Preparing for climate change through the UK Climate Impacts Programme*. UKCIP, Oxford.
- ¹² Adaptation Sub-Committee. 2010. *How well prepared is the UK for climate change?* Committee on Climate Change, London.