Climate Change in Tanzania:

Review of Potential Indicators

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# Executive Summary

This report summarizes the current state-of-art on climate change (CC) indicators for key sectors in Tanzania. The main conclusion is that there is great potential to set up a comprehensive, nation-wide database and data collection system, but the mechanism to do this is still lacking. This is a result of broader challenge for the climate change agenda in Tanzania, ensuring sufficient resources and politically strong leadership to steer the process.

We find that some key sectors, particularly agriculture, have made some good head start in collecting data relevant for CC monitoring, others, such as energy and natural resources, are likely to follow in due course. In this respect, we could not find an establish framework for CC agenda as such in Tanzania, so part of the work under this review focused on setting up the fundamentals of a CC framework. The framework in Tanzania requires the following pillars:

* Policies; Policies with good coverage are mostly in place in Tanzania, but UN REDD Tanzania and NAPA revision are still needed, which are some of the key elements on the way forward. Next year will be crucial in ensuring that the platform is established to move forward on the CC agenda according to Tanzania’s international commitments.
* Government commitment; The Copenhagen Summit aftermath is hopefully translating into concrete measures to be taken further, what is Tanzania’s role and responsibility on the agenda remains to be seen. In this respect, the fact that Copenhagen Summit failed to put numerical values to impact on countries such as Tanzania.
* Financing; CC agenda requires significant resource mobilization, both domestic and international. Pledges have been made internationally to have financing available for CC activities, but since they are filtered through a global competition for the resources, domestic resource mobilization is equally important. Allocations to environmental and CC related activities need to match the ambition level of the Government to drive the agenda forward.
* Implementation capacity; There are serious needs to develop and broaden capacity of key agencies working with the CC agenda in Tanzania.
* Inter-sectoral cooperation; This will be crucial element on the way forward to ensure that policies and implementation capacity are utilised in an optimal way through policy coherence, coordination and effective resource management.

Based on our findings we have suggested both linking up climate change more firmly with the second phase of MKUKUTA as well as a roadmap on some of the key steps to take next. We conclude that in terms of the General Budget Support, there are several potential entry points for CC to feature more prominently in the discussions. However, as the report indicates, these are on the agenda for the future years to come, pending in particular on Government’s progress on its own reform agenda on CC.

# Introduction

Tanzania is in its final year of implementing MKUKUTA, the National Strategy for Growth and Reduction of Poverty 2005-2010. During this period the global debate on issues related to environment and climate change (CC) has progressed significantly, yet the MKUKUTA monitoring indicators do not provide a comprehensive picture of climate change issues in Tanzania. As the stock-taking report states, ”climate change is far from being systematically mainstreamed in national development planning, such as the MKUKUTA, sector and local government plans”. Annex 2 of this report provides a review of current MKUKUTA monitoring indicators that are related to environment and climate change agenda.

Related to the MKUKUTA implementation, the General Budget Support (GBS) development partners have provided the Government of Tanzania non-earmarked financing of approximately USD 700 million a year. Perhaps, since Tanzania is still in the ratification process of several international commitments, raising the CC agenda implementation issues in the GBS context is a process to be included for future years. However, it is important to take stock of the state-of-the-art as the next MKUKUTA is being prepared where climate changes will feature as one mainstreamed themes, and to raise the climate change issues higher on the agenda of the Government and the development partners.

MKUKUTA review is presently ongoing and reviewers are among other things analysing and advising the MKUKUTA drafting team on the poverty-environment linkages with a particular focus on implications of CC on poverty alleviation. This report is structured in the way that it feeds into the review. The MKUKUTA reviewer emphasized on the need for CC progress indicators for Tanzania. MKUKUTA will address climate change as a cross-cutting theme, which will lead to revisions of the monitoring indicators, as the MKUKUTA monitoring framework is being updated. We expect that through our discussions with relevant Government staff and reviewers the recommendations on indicators in this Chapter can be taken into consideration as potential new indicators for the next phase of MKUKUTA.

The recently completed high-level dialogue in the COP-15 Summit in Copenhagen did not provide a firm stand as to how will Tanzania benefit from the on-going process of emissions controls? The outcome of the Summit indicates that Tanzania along other poorest countries will continue to benefit from the emissions trade, but the outcome was not clear on what is the magnitude of gains for a given country. However, the continuation of a transfer mechanism is in itself an important process for Tanzania, as it can be one of the monitored areas under Tanzania’s CC agenda.

The focus of this brief assignment was to review potential indicators of climate change progress in Tanzania. Like most poor countries Tanzania has already experienced impacts of climatic changes due to a weak economy and low adaptive capacity. Sectors seriously affected include agriculture, water, energy, forestry etc. In response to anticipated CC impacts and other environmental concerns, Tanzania has ratified various multilateral environmental agreements and has undertaken various actions at the national level to document its commitment in reducing CC impacts. Moreover, Tanzania has received support from various donor agencies on environmental and CC impacts in particular. However, there is an information gap on the progress of the various measures taken regarding the CC issue in Tanzania. This report presents a review of potential progress indicators in Tanzania that are and/or can be used to assess Tanzania’s efforts in the CC issue. The report includes both macro level indicators and sector specific indicators for the most affected sectors. The aim of this review is to start a constructive dialogue between the government of Tanzania and the Development Partners on the CC issue in Tanzania. For definitions, we adopt IPCC definitions throughout the report.

The report is organised as follows. First, Chapter 2 provides an overview of Tanzania’s commitments both for environmental issues in general and for climate change issues in particular. We then present experiences from other countries in the region (Democratic Republic of Congo (DRC), Kenya, Mozambique and South Africa) and Bangladesh in Chapter 3 to illustrate how the climate change issues have been addressed in these countries. In Chapter 4 we then move on to look at the climate change indicators from different sectors in Tanzania to set up a proposal for a climate mitigation and adaptation framework in Tanzania. This is done with the precaution that there is a lot of work on-going, so the proposed framework will most likely serve as a platform for evaluation of progress made in implementing these initiatives. In addition, it can also in many instances highlight existing information gaps. Finally, we provide some concrete recommendations for a roadmap on increased monitoring of climate change agenda in Tanzania.

# Environment and climate change agreements of Tanzania

## 2.1. Overview

The United Republic of Tanzania (URT) is a signatory to a number of multilateral environmental agreements (MEAs) and protocols that address various aspects of the environment as summarized in Table 1. Tanzania has undertaken various actions regarding the implementation of these agreements at the national level including their integration within existing national policies, strategies, and development goals. However there are gaps remaining regarding actual implementation of these strategies at the national level. Following the table is a summary of Tanzania’s national level responses to the three most important agreements namely the UN Framework Convention on Climate Change (UNFCCC), Convention on Biological Diversity (CBD) and the Kyoto Protocol. Details about other agreements are annexed to this report.

While UNFCCC and the Kyoto Protocol are directly focusing on CC, the rest do not focus on CC alone, but more on environmental issues in general. The most important international agreement on climate change is the United Nations Framework Convention on Climate Change (UNFCCC) of 1994 and its complementary protocol – The Kyoto Protocol of 1997.

We provide a summary of actions taken by the Government of Tanzania as process indicators for GoT’s commitment in this Chapter.

**Table 1.** Tanzania’s international agreements on environment and climate change.

|  |  |  |
| --- | --- | --- |
| No. | Agreement/Convention | Date GOT Ratified |
|  | Convention on Biological Diversity (CBD) | June 1996 |
|  | Convention to Combat Desertification (CCD) | June 1994 |
|  | United Nations Framework Convention on Climate Change (UNFCCC) | April 17 1996 |
|  | Kyoto Protocol to the UNFCCC | August 2002 |
|  | Convention on Wetlands of International Importance Especially as Waterfowl Habitats (Ramsar) |  |
|  | Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) |  |
|  | Convention on the Control of Trans Boundary Movements of Hazardous Waste and their Disposal (Basel) |  |
|  | Stockholm Convention on Persistent Organic Pollutants (POPs) |  |
|  | Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol) |  |
|  | Convention for the Protection of the Ozone Layer (Vienna Convention) |  |
|  | Protocol on Bio-safety (Cartagena Protocol) |  |

## 2.2. The United Nations Convention on Biological Diversity (UNCBD or CBD)

CBD aims at promoting the conservation of biological diversity, sustainable use of its components and fair and equitable sharing of the benefits arising from utilization of genetic resources. Although CBD does not focus directly on climate change, it realizes climate change as one of the major threats to biodiversity conservation. Discussions are already underway at the international level to include CC in the next CBD since the current CBD expires in 2010. Several actions have been undertaken at the national level to document GoT’s commitment in relation to CBD including:

* Development of the National Environmental Action Plan (NEAP) of 1994 that culminated to the formulation of the National Environmental Policy (NAP) in 1997.
* Enacting of the National Environmental Management Act (EMA) of 2004.
* Establishment and staffing of environmental management units in GoT ministries. Environmental Management Units are responsible for implementation of EMA at the sector/ministry level using the Environmental and Social Management Framework (ESMF). Most Environmental Management Units are still at their infancy stage since they were established within the last four years.
* Establishment of environment focal points at the LGA/district level and natural resources committees at the village government level as part of decentralizing environmental management in Tanzania
* Creation of the Division of Environment (DoE) under the Vice President’s office which has three roles related to environmental management in Tanzania namely: Formulation of policy on environmental coordination and monitoring environmental issues; Environmental planning policy-oriented and; Environmental research.

## 2.3 The United Nations Framework Convention on Climate Change (UNFCCC)

The ultimate goal of the UNFCCC is to stabilize atmospheric greenhouse gases concentration at a level that prevents dangerous anthropogenic interference with the climate system. The convention puts a mandate for emissions reductions on Annex One countries. Developing countries like Tanzania do not have an emissions reduction mandate under this convention. However parties to the convention are required to communicate to the conference of the parties strategies planned to be implemented regarding climate change mitigation and adaptation at the national level.

**The Kyoto Protocol**

Under this protocol industrialized countries and the European Union have agreed to reduce their emissions by 5% in 2012 against their 1990 levels. Annex One countries can achieve emissions reductions through three flexible market based mechanisms namely: the emissions trading, joint implementation (JI) and clean development mechanism (CDM). Developing countries like Tanzania can participate through CDM projects. Tanzania and Africa in general is yet to benefit from CDM projects since as of December 2009, only about 2% of CDM Projects globally were from Africa. There is only one approved CDM project in Tanzania and 4 are in the pipeline.

Tanzania’s national level responses regarding UNFCCC and the Kyoto Protocol include:

* Submission of Tanzania’s National Initial Communication to the UNFCC in 2003. The Communication documents sources of GHG emissions in Tanzania, and strategies to mitigate and adapt to climate change for Tanzania.
* Established a Designated National Authority (DNA) that will oversee implementation of CC related activities at the national level particularly reviewing and recommending CDM Project Development Documents (PDD) to the CDM Executive Board. The VPO serves as the DNA.
* Prepared and submitted a National Adaptation Programme of Action (NAPA) that prioritizes adaptation options in the country to reduce CC impacts. The NAPA document was supposed to be a strategic fundraising document to access UNFCCC funding mechanisms on adaptation. However, there has been inadequate funding for adaptation at the international level since contributions to the fund by industrialized countries is voluntary. Only one of the 14 identified projects in the NAPA Document has been implemented.
* Participate in meetings of the party (MOP) for the Kyoto Protocol and conference of parties (COP) for the UNFCCC. Tanzania has been represented by the Ministry of Environment, VPO – DOE and other stakeholders including official observes such as the Tanzania Natural Resources Forum (TNRF). Important milestones that Tanzania has agreed to include the Nairobi framework on vulnerability and adaptation to CC, the Bali roadmap on reduced emissions from deforestation and degradation (REDD) and the Copenhagen Accord. Following the Bali road map and in line with on-going negotiations for REDD, Tanzania has already started a process of formulating the national REDD strategy by formulating the National REDD Framework in 2009.

Indicators deriving from GoT’s commitment to CC agreements:

* Number and content of related policies, strategies and acts enacted at the national level
* Number of CC related projects/programmes implemented by GoT, DP and NGOs
* Established government MDAs focusing on environment and CC in particular e.g Environmental Management Units in each Ministry
* GoT Budget/Funding for environment and CC activities in particular
* National adaptive capacity measured in terms of GDP growth, gini coefficient and other indicators of national economic development
* Number and content of related research reports on environment and CC in particular by both GoT MDAs, academic institutions, DPs, NGOs, independent researches etc
* Awareness among public leaders on CC issues as indicated by frequency of reference to CC by leaders at various levels in various fora e.g Pres. Kikwete’s recent remarks during the world food summit in Italy.
* Mainstreaming of CC issues within existing national policies/programmes/institutions etc

However, these activities and indicators do not automatically translate into reduced risk and vulnerability of the country to CC impacts. Therefore there is a need to combine these indicators with other indicators to assess impacts of the various strategies undertaken in enhancing Tanzania’s capacity to respond to the CC issue.

## 2.4. Identified gaps

Although Tanzania has developed policies and established institutions/structures for environmental management and climate change issues, there are still existing gaps especially in policy implementation. This assignment complements findings from the climate change stocktaking report that details implementation gaps on environmental management and climate change in particular in Tanzania. Some of the implementation gaps include:

* NAPA implementation: only one of the fourteen prioritized projects is under implementation. We can identify two broad setbacks to implementation of NAPA projects: First, NAPA projects fail to compete for funding against projects from other countries implying inadequate project formulation; Second, inadequacy of funding at the international level since contributions to the Adaptation Funding by Annex One countries is voluntary
* Poor CDM Implementation capacity: There are fewer than three approved and registered CDM projects in Tanzania and four are in the pipeline out of 28 projects from East African countries. Tanzania is likely to benefit from Afforestation and Reforestation (A/R) CDM Projects, however the capacity to develop CDM PDDs and subsequent is seriously lacking
* Inadequate institutional coordination on CC issues due to low capacity of the VPO to coordinate all environmental and climate change activities in Tanzania among other factors
* Inadequate financial resources within responsible institutions in implementing environmental management and CC activities
* Lack of a coordinated approach in responding to the climate change issue: the NAPA document is not comprehensive enough since it does not include aspects of Disaster Risk Reduction and Vulnerability
* Climate change has not so far been adequately mainstreamed or integrated in sector specific plans and strategies. Where efforts have been initiated as in the water, agriculture and livestock sectors, there are still remaining implementation gaps of the identified strategies/processes
* Lack of a coordinated Monitoring and Evaluation Framework for CC Related strategies in Tanzania. For instance, in the forest sector, the M & E Unit in the Ministry, only monitors and evaluates projects implemented by the Ministry while there are numerous forest related projects implemented by NGOs and the private sector.

# Climate change agenda in other countries in the region

This assignment reviewed national level responses and indicators deriving from such processes in other countries to inform the climate change process in Tanzania. Four countries were initially selected namely Democratic Republic of Congo, Mozambique, Kenya and South Africa. Bangladesh is included so as to inform this assignment on how Tanzania can improve its CC agenda particularly as related to Disaster Risk Reduction and Management.

Mozambique and DRC were selected as peers to Tanzania in terms of NAPA processes and REDD projects. Kenya and South Africa were selected primarily to see how formulation of National Climate Change Response strategies (NCCRS) compares to NAPA. Moreover Mozambique is a GBS country but have no climate change indicators developed yet. South Africa is relatively advanced in the climate change issue compared to Tanzania, therefore this assignment wanted to see what Tanzania can learn from South African experience. Bangladesh is also featured in the Annex as it has really taken major steps towards a solid and holistic CC framework.

Kenya, Mozambique, DRC, and Tanzania heavily rely on climate sensitive sectors for their economies hence making them more vulnerable. This similarity further influenced the selection of these countries in undertaking this assignment. Through discussion with DPG E on the draft report, it was suggested that Bangladesh be included since it started mainstreaming CC issues since 2005 compared to other countries that have just started. Experiences from Bangladesh could inform the CC process in Tanzania irrespective of contextual differences. Details of the reviews of other countries are included in the Annex 3 of this report and below is the indicators/synthesis deriving from this review.

**Table 2.** Conclusions from other countries’ experiences.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Kenya | South Africa | Mozambique | DRC |
| Institutional set up |  |  |  |  |
| NAPA/NCCRS | NCCRS | NCCRS | NAPA | NAPA |
| Impact studies | Conducted and selectively focused on semi arid areas of the country |  | Conducted and Included in the NAPA | Not conducted sector wide: focused mainly on forestry |
| National institutions dealing with CC activities | NEMA and the Ministry of Env. And Mineral Resources: NCCRS proposes a CC Commission |  | Ministry of Environment | Ministry of Environment |
| Number of CC related projects in the country | N/A | N/A | N/A | N/A |
| Major CC responses in the country | NCCRS, KACCAL, Technology Needs Assessment, National Initial Communication, DNA Formulation  (however implementation is lagging behind) |  | NAPA, Technology Needs Assessment, National Initial Communication, DNA Formulation  (however implementation is lagging behind) | NAPA, Technology Needs Assessment, National Initial Communication, DNA Formulation  (however implementation is lagging behind) |

For the countries identified there are certain similarities with Tanzania. Some of the countries are more advanced in their response to the climate change issue than Tanzania while some are lagging behind. However, common areas of concern include:

* The need to focus on agriculture since it is the economic mainstay of these countries (employs the largest portion of the productive workforce, contributes the largest portion to the national GDPs among all sectors, is highly vulnerable to CC since it is mainly rain-fed agriculture)
* The need to have institutional coordination for effective response to the CC issue
* The need to mainstream CC issues within existing national strategies and sector plans
* The need to focus on avoided deforestation since deforestation is the main source of GHG emissions in these countries
* The need to focus more on adaptation than mitigation since GHG emissions from these countries are insignificant at the global level except for South Africa
* The need to promote/embrace technology transfer
* The need to develop and implement more strategic and robust national responses to climate change impacts

**Ways to measure advancement of CC agenda include:**

* Number and roles of national institutions dealing with climate change activities
* Number and size (geographical/population coverage) of climate change related projects/programmes by various stakeholders in the country
* Number and focus of strategies/policies/acts related to CC issue at the country level
* Institutional capacity of various institutions addressing the CC issue at the country level
* Institutional coordination and collaboration on the CC issue
* Mainstreaming of CC agenda in national development strategies such as poverty reduction strategies, millennium development goals, among others.

**Outcome Indicators:**

* Improved adaptive capacity from local to national level: either measured in terms of reduced CC impacts, or using agreeable metrics of adaptive capacity or using data that reveal reduced vulnerability. These metrics arrive at the same conclusion given the relationship between adaptive capacity, vulnerability and impacts
* Reduced CC impacts measured as magnitude of impacts compared using time-series data separating extreme and non-extreme events
* Reduced vulnerability to CC impacts e.g through shifting to alternative socio-economic activities that are less vulnerable to CC impacts
* Contribution of CC related activities to the gross domestic production (GDP) e.g. CDM mitigation activities, REDD projects,
* Reduced sector specific vulnerability for the sectors most vulnerable to CC impacts and those sectors contributing the largest portion to GDP namely agriculture, natural resources (forestry, wildlife, fisheries), water, energy and transport: measured in terms of the magnitude of avoided impacts.

# Sector-specific CC indicators

## 4.1. Data collection arrangements in Tanzania

This section provides a brief overview of major data collection systems in Tanzania and their usefulness before moving to sector-specific data issues.

MKUKUTA Monitoring System (MMS) uses data from several sources to report on broad range of MKUKUTA indicators. Sources are both periodic (survey data) and annual (administrative data). Those MKUKUTA indicators, listed in Annex 2, that are related to CC are of both types and data on some is available only every 4-5 years.

National Bureau of Statistics (NBS) is in charge of majority of data collection in Tanzania. Major surveys conducted include Household Budget Survey (HBS), Agricultural Census, Demographic and Health Survey (DHS) and National Panel Survey (NPS), the latter of which is to be conducted on annual basis. The Statistical Master Plan and new Statistics Act will empower the NBS

The State of the Environment (SOE) reporting system is a nation-wide data system, which potentially could produce at regular intervals reliable and wide coverage data on environmental issues in Tanzania. There have been problems in setting up the system to report on timely manner. When in full operation, the report would ideally be the sole source of climate change relevant information.

One of the potentially rich data sources, the Local Government Monitoring Database (LGMD), is currently not collecting data. This is unfortunate as the system is by coverage nation-wide at district level and even the basic set of data collected has several indicators that are useful in CC monitoring. Indicators under agriculture, water and sanitation and poverty would already give a good coverage of environment and CC issues.

Overall, all the initiatives and structures mentioned here are of nation-wide coverage and can offer the required data collection framework for climate change indicators. However, at the moment none of the systems is able to provide comprehensive and periodically updated information that would report on CC in a conclusive manner. It seems that the existing set up would be sufficient source of information, if utilized properly.

This assignment reviewed ongoing activities in each of the selected sectors in Tanzania to identify which activities focus on CC or can be labeled as CC related activities. For those activities, monitoring frameworks and data collection methodologies were reviewed as well. This work has built on earlier work by Kerstin Pfliegner, who in 2008 produced a report on data collection for the environment and natural resources related indicators in the PAF. That report captured the state-of-the art of information collected for PAF as in 2009. It shows clearly which agency is responsible for which data collection. This information is of course limited only to those indicators and processes which were part of the PAF at that stage. It is therefore necessary to broaden the scope of the work and to review information available from sectors that are dealing with climate change issues but were not included in the PAF 2009.

The following review places a strong emphasis on the agricultural sector. There are several reasons for this. The agriculture sector is the most economically important sector for the Tanzanian economy as it employs over 85% of the productive work force and contributes over 40% of the national GDP. Also, it is important due to the fact that it is the sector that is already undertaking a number of activities related to CC issue.

## 4.2. Agriculture

**Sector policy**

The policy in use is the 1997 Agricultural and livestock Policy which is outdated and does not focus on CC in particular. Recent changes in the ministry’s structures and responsibilities have separated livestock and agriculture and the new Agriculture Policy will reflect this. The new policy will be published anytime soon pending the President’s signature. Moreover, the new policy have specific focus on CC whereby it includes a framework for assessing impacts of CC on the agricultural sector and proposes mitigation and adaptation options. The sector is the most important sector for Tanzania since it contributes around 40% share of the GDP and employs over 85% of the productive work force, including peasant farming. Moreover the sector is highly vulnerable to climatic changes since it is primarily rain-fed and small scale agriculture. Irrigation agriculture accounts for less than 3% of all agricultural activities in the country. This assignment pays more attention to this sector than other sectors given its economic and livelihood importance in Tanzania.

The ministry has an environmental management unit that was established in (year) according to section two of the environmental management act (2004). The ministry did not have a specific focus on climate change until recently (June 2009) but some of past activities relate to CC, particularly on the adaptation side.

**UN 11th Program on Environment and Climate Change**

Perhaps this is the most important program in the sector. In collaboration with the Food and Agriculture Organization (FAO), the Ministry of Agriculture started a program in June 2009 that assess climate change impacts on the agricultural sector, identifies best adaptation strategies already undertaken by individual farmers and strategise on enhancing farmers’ adaptive capacity. A bi-annual and annual report will be published. The first report is expected early next year. The delay in publishing the report was to due delays in disbursement of funds for this programme. Assessment is done country wide according to the agro-ecological zones as detailed in the National Initial Communication to the UNFCCC and the NAPA Document.

Indicators deriving from this assessment include:

* Crop productivity aggregated at four governance levels: Village, District, Regional and National
* Shifting arable land with changes in temperature and precipitation as detailed in the NIC and NAPA documents
* Changes in cropping patterns (mono-crop Vs mixed farming, timing (earlier or later), crop types, seed varieties, fertilizers, pesticides and herbicides)

**PADEP and ASDP Information, ESMF.**

Participatory Agricultural Development and Empowerment Program (PADEP) aimed at empowering local people to increase food productivity through adoption of high yield crop varieties, employing soil conservation farming practices and shifting cropping and farming activities to increase productivity. This was not a response to CC in particular but to the stresses that farmers were already experiencing including droughts and erratic rainfalls. PADEP expires in June 2010 and will be replaced with Agricultural Sector Development Program (ASDP). ASDP takes lessons learnt from PADEP and is scaled up from 32 districts to 133 districts in Tanzania. Both use the environmental and social management framework (ESMF) to assess impacts of agricultural activities on the environment and social systems. ESMF is the framework used to screen projects’ impacts on the environment and social systems. ESMF screening indicators include: effects on forests, wetlands, soil conservation, water points. If a project proposed by farmers is found to have any of the above impacts it will be rejected. These indicators are related to CC in that deforestation results into emissions whereas wetland and water point loss result to poor adaptive capacity and hence more vulnerable to CC impacts. Moreover ASDP is a mechanism for achieving green revolution in Tanzania. ASDP will be implemented in close collaboration with five lead ministries of Agriculture, Cooperatives & Food Security, Water & Irrigation, Trade & Industries, Livestock & Fisheries, and Prime Minister’s Office Regional Administration and Local Governments.

**Other responses in the ministry**

The ministry has its own research institutions in the seven zones that provide assistance to farmers. The strategic planning which is about to be published pending the President’s signature emphasizes on the need for demand-driven responses/assistance to farmers rather than top-down approaches. Assistance provided already include research and production of high yield crop varieties, pest resistant, drought tolerant, early maturing and crop varieties that are less susceptible to diseases. Moreover the ministry collaborates with other private institutions under public-private-partnership (PPP) arrangements to provide these services such as the Sokoine University of Agriculture in carrying out soil analysis and marketing agents in distributing agricultural inputs to farmers in the country. However challenges still remain such as timely supply of farm inputs before the season. *One experience from Same district can be used to highlight how these challenges have been overcame.* *This experience is part of an on-going project called Climate Change Adaptation in Africa – Research to Policies for Adaptation that aims at bridging the gap between climate change researches and policy processes implemented in three countries of Kenya, Tanzania and Malawi in collaboration with IDRC/DfID, IDS/Sussex*

**Food Security Strategies**

The Ministry has a Food Security Department that among other things manages the National Grain Reserve in Morogoro. The government buys surplus food produced in the country and stores it in the national grain reserve. In times of food shortages, the government sells the stored food at subsidized prices to people. Distribution of food is based on needs in the affected districts.

In collaboration with the Tanzania Meteorological Agency, the Ministry has an early warning system in place that informs farmers regarding the onset and amount of rainfall and therefore advice on the timing and types of crop to be planted. For instance, if drought is anticipated farmers will be advised to use early maturing and drought resistant varieties or plant drought resistant crops instead of usual crops planted. However, there are still challenges remaining regarding timeliness and packaging of information to be user friendly among farmers. *Again use the Same case study to highlight on how this has been resolved and how it can be scaled up to the national level.*

**CC Related indicators**

The environmental management unit of the Ministry of Agriculture have prepared a list of indicators to be used in assessing impacts of climate change in the agriculture sector (attached document). In summary they include:

Biophysical indicators and quantitative changes:

* Changes in the location of optimal growing areas for given crops, resulting in the shift of cropping zones
* Changes in crop yield
* Changes in the type, location, and intensity of pests and diseases
* Changes in the mix of crops grown and hence in the type of farming, and rural land use
* Changes in the production, farm income, and rural employment
* Changes in the rural income, contribution to national GDP, and agricultural export earnings

Indicators based on quantitative description:

* Yields for the crops to be studied both mean and time series (to evaluate natural yield variability as a baseline)
* Production (both regional and national statistics)
* Crop management at the local and regional level (for example, crop sowing dates, crop varieties, labour, fertilizers and irrigation inputs)
* Land use (to enable spatial extrapolation from sample sites across the study area)
* General socio-economic data (e.g. the contribution of sample sites’ agricultural production to total output of the study area, percentage of working labour in the agricultural sector)

This assignment identifies the following framework of assessment as relevant per ToR. The aim is identify which indicators can be used by the GoT and DP-E to assess impacts of CC Related activities in the agricultural sector. The above indicators can feed into the suggested framework below for the agricultural sector. The main goal for various CC related activities in the agriculture sector is to mitigate impacts and enhance adaptive capacity of the sector. The sector performance can be assessed in terms of avoided impacts in the sector measured in terms of:

Reduction of CC impacts on crop yield aggregated upward from village level, district, regional and national production. This can be measured in terms of income from agriculture or yield aggregated at the national level.

## Water

The water sector is likely to be affected by impacts of climatic changes in Tanzania in various ways: biophysical aspects such as floods and droughts; weak management of water resources; inadequate financial resources and an outdated water resources act that has no specific focus on climate change.

However, there is a number of climate change related initiatives undertaken under the ministry to respond to already experienced and expected impacts of climatic changes on the water sector in Tanzania. The Ministry of Water and Irrigation is currently implementing the largest water project in sub-saharan Africa named ”water sector development programme (WSDP)” One component of the WSDP is integrated water resources management (IWRM). IWRM includes environmental and climate change related aspects of water management. Specific CC related initiatives in the water sector include:

* IWRM Water Resource Strategic Plan that aims at improving data collection on water resources across the country, increase the number of hydrostations (five stations have been established already and six more are to be established), increase the number of hydrometric stations (rainfall/floods) to measure the quality and quantity of water in relation to CC in order to monitor rainfall and floods amount, WSDP priority infrastructure on management of floods and droughtd through establishment of the Dam Safety Unit to rehabilitate dams for water storage in light of CC
* Collaboration with TMA on data collection and sharing using rainfall stations
* Implementation of a number of transboundary water resources management including the SADC Water Course Project, Songwe River Basin Development Project, Zambezi Action Plan Project that resulted to the formation of the Zambezi Water Course Commission (ZAMCOM) to be implemented in13 countries, Tanzania is in the process of ratifying this commission
* Specific collaboration with the Ministry of Agriculture on water for irrigation schemes. The Irrigation Division was previously under the Ministry of Agriculture but following recent cabinet changes by the President, the division is now under the Ministry of Water and Irrigation.
* A mapping exercise is underway to map all major water points and their status in Tanzania
* Established basin water management for the nine river basins in Tanzania

The sector ministry identifies the following CC related areas for future consideration:

* Review of the Water Resources Management Act in light of climatic changes impacts
* Carry out research on the vulnerability of the water sector to CC and identification of adaption options
* Capacity development within the sector of effective management of water resources in light of anticipated CC impacts
* Improve data collection and information dissemination on the status of water resources in Tanzania

Indicators to measure advancement of response to the CC issue in the water sector: :

* % of household with access to clean and safe water including sanitation services
* Amount of water available and allocated to various major uses: hydropower generation, irrigation, industrial production, and domestic consumption
* Formulation and implementation of a capacity development framework for effective water resources management in Tanzania
* Existence of plans to integrate climate change issues in water resources management in Tanzania
* Effectiveness in water services provisions to ensure value for money
* Behavioural change among consumers to promote efficient water use for the major consumers (domestic, industrial production, irrigation and hydropower generation)

## Energy

There is no particular policy document or strategy in the energy sector on climate change and actions related to CC impact assessment are taken on case-to-case basis. There are several on-going initiatives under the Ministry of Energy and Minerals (MEM) that do support the long-term sustainable energy provision:

* Exploring the use of new and renewable forms of energy, such as solar ( Currently 1.7 MW production in Tanzania available), Sustainable Solar Market Packages programme under TEDAP programme has been launched in Rukwa region with the aim is to reduce CO2 production, windmill ,geothermal sources and biogas.
* Improving energy efficiency: the ministry has been carrying energy audit in government buildings to see if there is any leakages, the aim is to reduce energy consumption , save money and the environment, waste management
* Awareness creation programmes to the public on the best use of air conditioners, use of energy saving bulbs etc.
* Replacement of heavy oil in power generation and use natural gas instead

In addition, there are several other initiatives planned to take place in the future that address some of the other concerns the Ministry is dealing with:

* Development of biofuel policy, legal and Regulatory framework
* Dissemination of efficient technologies in biomass sector
* Through Rural Energy Agency to facilitate the access to modern energy services by rural population instead of relying on traditional biomass fuels
* Survey of available potential of mini hydro power stations in the country
* Sensitization of small scale miners to plant trees once they clear for mining as well as filling the pits once they open the land
* Sensitizing large scale miners on intensive use of energy especially those mines which are not yet connected to the grid
* Phasing out of leaded fuel in transport sector

MEMs plans vision regarding climate change can be summarized as follows: Climate change is real and is happening what is needed is adaptation though it is costly. MEM has to improve the panning by integrating climate change in its development plans and budgets, as well as creating a conducive environment to promote partnership with private sector in addressing climate change. This work needs to be integrated to national CC mainstreaming agenda.

Energy generation in Tanzania is mainly hydro-based. Therefore, there is a need for strong/close collaboration between the ministries of energy and water in managing water resources for energy generation. Below are climate change related indicators with regard to the energy sector:

* Energy generation capacity by source (hydro, wind, solar, gas)
* % of population connected to the national grid
* National energy generation capacity
* Number of projects/programmes on alternative energy sources

## Forestry

The forestry sector is affected by Climate Change both directly and indirectly. Direct effects include changes in biophysical factors such as water, wind, CO2 concentration and temperature that directly affect plant growth as detailed in the National Initial Communication to the UNFCCC. The National Initial Communication predicts shifts in agro ecological zones to their drier types in Tanzania with climatic changes. Indirect effects of CC on forests include increased deforestation as humans increasingly become dependent on forests for their livelihoods. Forestry management is under the Mnistry of Natural Resources and Tourism (MNRT) in close collaboration with local government authorities (LGAs). Forest management is primary done through patrols to reduce threats to forest conservation. Major threats include forest fires, tree felling for timber, charcoal, building materials, grazing land and expansion of agricultural soils. These threats are likely to increase with CC impacts. Major initiatives that relate to CC in the forestry sector include:

* The launch and implementation of the UN REDD Project
* Aforestation and Reforestation projects linked to Carbon Trading
* Joint Forest Management with local communities

Potential indicators in this sector are mainly related to REDD. Indicators include:

* Rate of deforestation by factor and geographical location. e.g fire, agricultural expansion, charcoal production, timber etc
* Revenues from sale of forest products
* Proportion/% of households depending on forests for energy resources
* Hectares of land under forest fire annually
* Amount and quality of forest reserves to monitor both deforestation and degradation by type
* Number of REDD projects in the country: revenues generated, distribution, forests protected etc.
* Number of forest related carbon trading projects other than REDD, e.g. CDM A/R

Current data collection arrangements: The Forestry and Beekeeping Division has a monitoring and evaluation department that evaluates all government forest projects. Therefore, NGO implemented forest projects are not monitored by the Division. In collaboration with NBS, FBD collects information on people's dependence or utilization of forest products. With the recently started Forest Inventory, it is expected that the stock data available after completion of the Inventory will allow monitoring more effectively the rate of deforestation. This is likely to lead to improved monitoring indicators for the forestry sector.

# Suggested framework for measuring overall progress of CC initiatives in Tanzania

## 5.1. The elements

There are certain conditions that can be identified for a framework to measure the CC agenda implementation. In this Chapter we try to sketch elements of a framework that could work in Tanzania.

Policies are important. They are mostly in place in Tanzania, but UN REDD Tanzania and NAPA revision are still needed, which are some of the key elements on the way forward. Next year will be crucial in ensuring that the platform is established to move forward on the CC agenda according to Tanzania’s international commitments.

Government commitment defines the implementation opportunities. The upcoming Copenhagen Summit is hopefully translating into concrete measures to be taken further, what is Tanzania’s role and responsibility on the agenda remains to be seen.

Financing has to be of sufficient size and be based on credible expenditure plans that address the key priorities. CC agenda requires significant resource mobilization, both domestic and international. Pledges have been made internationally to have financing available for CC activities, but since they are filtered through a global competition for the resources, domestic resource mobilization is equally important. Allocations to environmental and CC related activities need to match the ambition level of the Government to drive the agenda forward.

Implementation capacity; There are serious needs to develop and broaden capacity of key agencies working with the CC agenda in Tanzania.

Inter-sectoral cooperation; This will be crucial element on the way forward to ensure that policies and implementation capacity are utilised in an optimal way through policy coherence, coordination and effective resource management.

The research carried out in the previous chapter to derive the baseline on climate change indicators in Tanzania suggests that Tanzania is in the early stages of setting up any framework for assessment of climate change mitigation and adaptation measures. However, there are certain measures that can be identified based on best practices from other countries. In this regard, the proposed framework here aims to map out the commitments Tanzania has made, their relationship to mitigation and adaptation measures by institutions and sectors, and the current status of available indicators and their availability. This framework allows to make several observations in terms of areas where some progress has been made and areas where more work is needed to develop climate change indicators.

**Table 3.** Proposed setting for climate change indicators.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tanzania’s International Commitment |  |  |  |  |  |
| Mitigation measure | Institution | Sector | Indicators | Data collection | Feasibility/ timeframe |
| REDD | MNRT/VPO/IRA | Forestry | Deforestation rate  Adoption of alternative energy sources  Adoption of alternative livelihoods activities  % change in proportion of rural households reliance on forest products  Revenue from sale of Carbon credits | MNRT  MEM  NBS – HBS/National Census  NBS/HBS/National Census  MPEEE - Economic Survey | After Forestry inventory  Annual, available  Periodic, available  Periodic, available  Annual, possibly available |
| Adaptation measure | Institution | Sector | Indicators | Data collection | Feasibility/ timeframe |
| Enhanced capacity for autonomous adaptation in the agriculture sector | MAFS | Agriculture | Food crop production  Agriculture income  Proportion of agriculture to national GDP  Number and coverage of adaptation projects implemented | MAFS, LGAs, Agric Survey  Agric Survey, Economic Survey,  VPO/Sectors | Annual, available  Periodic, available  Annual, available  Not known, possibly available |

## Preparation of next MKUKUTA

In preparation of the next MKUKUTA we refer to guidance provided in the earlier stocktaking report, prepared in June 2009. The on-going MKUKUTA review has climate change as one of the cross-cutting themes to be mainstreamed. We therefore can synthesize from the presentation of the basic framework the following elements for the next MKUKUTA:

1. Support to CC monitoring through a robust data collection system with sufficient coverage. Current systems provide only partial information.
2. Mainstreamed CC agenda in MKUKUTA is needed. This needs to be inclusive in key sector strategies and actions, not imposed over and above by a strategy that has no sector level buy in.
3. Costing framework for priority expenditures needs to be credible. There will be competition for resources across sectors and priorities and CC needs to be featured in a way that gives sufficient resources to move ahead through prioritized interventions over the 5-year period. Unless this is the case Tanzania’s momentum to move ahead on CC agenda will most likely be lost.

These are key elements that are required to be able to utilize the opportunity of next MKUKUTA to effectively address the CC challenges remaining in Tanzania.

# Recommendations

## 6.1. Climate change road map

Due to the limited scope of this study, we have not been able to map out a comprehensive road map.. This study expected to include a synthesis of solid outcomes from the Copenhagen Conference, however, the talks were not successful in reaching full agreement. Three key outcomes were observed: that the talks were successful in raising the climate change agenda to the highest level of government, that at least the international community have reached a political consensus on the long-term global response and that the talks resulted in almost full decisions to implement rapid actions on climate change. Tanzania’s interest from the Copenhagen Conference was in the areas of mandatory funding for adaptation by industrialized countries. Another related outcome that concerns Tanzania regards a revived commitment by Norway, France, Brazil and the U.S. on REDD. However, irrespective of the outcome of the conference, several activities need to take place and in an organized manner to support the development of coherent framework to progress the CC agenda in Tanzania. These steps identified here build on the information presented in the previous Chapter. Based on the framework, we can suggest the following:

The first step is to ensure that Tanzania has a champion of the CC mitigation and adaptation. At the moment, the role of VPO-DoE is to coordinate, not to implement or impose CC agenda. This role needs to be revamped. Thus, the first recommendation is:

1. Empower VPO-DoE to allocate funds to sector ministries to implement CC agenda.

The way to increase VPO’s presence in the CC dialogue in Tanzania is to allocate funding through VPO to sector ministries. This would ensure that the scarce resources available are used in the most effective way. Ministries could submit their CC agenda for VPO for a review and allocation of resources could take place through the importance and cost-effectiveness of proposed interventions. This would make the line ministries compete with each other and to come up with better proposals.

1. Create a platform for climate change agenda in Tanzania.

It has been shown in the past studies and during this exercise that development partner’s support to climate is fragmented. Small projects have appeared across sectors and regions, but a holistic view is lacking. We propose that the framework described in the previous chapter and this road map would be used to highlight where support is needed over the medium-term to ensure that some key activities are carried out, while at the same time VPO should work on establishing a CC coordination unit.

1. Address the role of key sectors in contributing to mitigation and adaptation for CC

There is need to broaden the dialogue to have a coordinated response from all the sectors to joint problem. In some cases, inter-linkages between sectors need to be assessed to avoid conflicting policies on land use and management etc.

1. Move towards secondary sectors for CC

Several sectors in Tanzania can be crucial for CC agenda in the future, yet they have not been addressed properly hitherto. We propose that the following sector policies would be added to CC dialogue in Tanzania: transport and infrastructure, industries, health and standards.

## Linking climate change initiatives in Tanzania with the GBS

During the process of preparing this report several potential ways to include CC into the GBS context were considered. There are several entry points to GBS process: The GBS Performance Assessment Framework (PAF), which has several assessment layers (underlying processes, temporary process actions (TPAs) and outcome indicators) and the GBS Annual Review, where selected key issues are discussed every year. An underlying process is defined as a sector or a programme, which is important for the GBS provision and which in most cases is reviewed on annual basis. The outcomes of these reviews are then considered in the context of the GBS PAF matrix. Temporary process actions, on the other hand, are specific actions, usually with a timeframe of less than a year and which can be concrete actions taking or processes to improve identified bottlenecks in key processes. Outcome in their turn are reported on annually and targets are set for future years on rolling basis. We can conclude on the outcome of the considerations of these elements in the GBS process as follows:

**PAF Underlying Process**

Currently, one of the underlying processes in the PAF is environment. Climate change does feature in the discussions evolving around this underlying process, and in the future CC could be considered a separate underlying process. However, this should take place only when appropriate institutions and financing framework are in place for the CC in Tanzania. The process should also contain an element on assessment to be able to conclude whether the progress has been satisfactory or not.

**PAF Temporary Process Action**

Currently there are several initiatives on-going in Tanzania that most likely will over the time qualify for a TPA on process, if they are moving slowly or facing obstacles that make their implementation difficult. At the time of this assessment, though, none of the processes had reached, according to our assessment, a stage, where a TPA could be set to steer a process. However, with particular reference to need to set up the institutional framework for CC coordination and monitoring, and the planned work on UN REDD action plan in Tanzania, we can foresee several potential TPAs that could be considered for PAF 2011.

**PAF Outcome Indicators**

The most logical entry point for discussions in the context of the GBS is the outcome indicators in the PAF matrix. The first issue we propose to be monitored is the non-tax revenue from carbon emission trading, to be formulated for instance:

*Revenues generated from mitigation actions in Tanzania particularly from carbon trading of emissions reduction units.*

Alternatively, for adaptation the following outcome indicator could be considered:

*Number of districts with an assessment report on climate change impacts on the agricultural sector.*

**GBS Key issue discussions**

Key issue discussions during a GBS Annual Review focus on issues that are in the heart of GBS provision to Tanzania. It is possible that over the course of the time climate change issues will also feature in these discussions, but this would most likely take place if Tanzania was lagging behind in meeting its international commitments or would act contradictory to the best practices.

# Annex 1 – Terms of reference for the consultancy

**Climate Change: Review of Potential Indicators**

1. **Background**

Climate change (CC) is a rapidly growing concern for the Government of Tanzania and development partners alike. Policy and strategy processes related to CC are being undertaken in some sectors. CC is a cross cutting issue affecting a number of sectors including forestry, agriculture, water, lands, energy, infrastructure and others.

Moreover, the number of donor funded CC projects is rapidly increasing, and it is expected to continue to increase over the next years, and there is an emerging need to monitor the overall effect these projects over the next year. However, currently no overarching framework for CC exists that could serve as a tool to monitor the overall impact of the projects.

Consequently, there is a need to survey possible indicators related to climate change in Tanzania. This assessment would be done in close cooperation with relevant Development Partner Groups and GOT stakeholders. This could also serve to help mainstream CC related issues in the development processes in Tanzania, including the new Mkukuta and its related follow up processes. Processes of relevance would be e.g. the policy processes for REDD, development of a new NAPA, policies on energy, policy process on biofuels etc.

Furthermore, the importance of CC in the current development processes may warrant an inclusion of CC indicators in the framework of relevant sector reviews. This review also will probe various options for including CC in various sector PAFs.

Tanzania is a signatory to Multilateral Environmental Agreements (MEAs) like UNFCCC, UNCCD, UNCBD and others, and each of these places some responsibilities on its members. Assessing the follow up of MEAs could be one source of potential indicators on CC issues.

Moreover, Tanzania has a well established annual review cycle of General Budget Support (GBS), and the dialogue between the GOT and DPs in this context typically raises issues of high concern to both parties. The process includes an annual assessment of indicators in the Performance Assessment Framework (PAF) linked to the national Poverty Reduction Strategy (PRS), or Mkakati wa Kukuza Uchumi na Kupunguza Umaskini Tanzania (MKUKUTA) in Swahili. The output of this consultancy could potentially serve as an input into this process with the aim of raising CC to a higher level of dialogue.

1. **Purpose**

The assignment will review existing national policies and policy processes, as well as international obligations of Tanzania based on its commitments in MEAs, regional and global organisations and processes. This should be matched with an assessment of how current PAF indicators at relevant sector, cluster, and overall levels reflect these obligations and ambitions. Relevant sectors include e.g. agriculture, energy, forestry, infrastructure, lands, and water. A review of possible new or revised process and/or outcome indicators will be based on this background. Climate change is expected to have profound effects on agriculture, forests, water management, the transport sector, energy supply, health and a number of other sectors. To ensure the involvement of affected sectors, indicators related to CC relevant effects in the sector may become tools for attracting attention and resources from government or donor budgets.

The purpose of having good indicators related to CC would be to guide policy decisions and resource use of the government at central and local levels. The purpose of this exercise of assessing possible CC indicators is to provide guidance to DPs and the GOT in the process of discussing adjustments of the relevant PAF indicators. The next PAF revision will take place in November 2009, and the agreed PAF will form the basis for the following GBS annual review in 2010. The assignment will (i) review existing indicators that may be relevant for CC and existing indicators in sectors affected by CC, and (ii) discuss options for introducing new or revised indicators.

The consultant will bear in mind that both DPs and GOT have a strong preference for using existing indicators that GOT already are monitoring or have signed up to monitoring. The assignment will discuss the strengths and weaknesses of the various options and possible means of measuring changes in the measured parameters, and challenges hereto. This will be used initially in the GBS donor group, and eventually in the deliberations with the Government on possible revision in the list of indicators

1. **Scope of work** 
   1. Review Tanzania’s current obligations in relation to MEAs, and current policies of relevance for CC
   2. Review, compile, and summarize GOT commitments on CC related processes. Provide overview over relevant indicators deriving from these commitments.
   3. Review and compile information on current existing CC relevant indicators from the various relevant sectors in Tanzania and a small selection of other countries
   4. Assess and suggest possible new or revised outcome and process indicators and assess their potential effect on processes and decisions related to CC mitigation and adaptation. (including review of experiences from other countries)
   5. Provide an overview of existing methodologies for documenting changes of the variables used in the potential indicators, and an assessment of the availability of information in Tanzania on the proposed variables
   6. Assessment of the overall value and potential challenges of introducing indicators related to CC. Consider feasibility and cost of collecting data.
   7. On basis of the above, suggest a framework for measuring overall progress of CC initiatives in Tanzania.
   8. Proposal for a choice of the ”top two” candidates for CC related indicators for CC adaptation and mitigation respectively, with a description of their possible impact, risks and methodology of data collection

3.9 Identify critical processes that could remove bottlenecks or move the CC agenda forward and suggest potential process action indicators (TPA) for PAF.

1. **Implementation of the assignment**

* The Embassy of Norway will invite proposals from a small selection of qualified service providers. The Embassy will contract a team of 1- 2 consultants after reviewing the candidates in collaboration with key development partners
* Qualification of consultants
  + 5 year experience in CC issues, M&E techniques, performance frameworks, and demonstrated knowledge of GBS issues.
  + Master’s degree in Economics, Development Studies or CC related fields

- Sources of information

* GBS PAF and annual work plan
* GBS PFM
* DOL overview Tz
* CC policy documents
* Contacts with other countries GBS secretariats, donor headquarters and country offices etc.

- Timetable for preparation

Total time for assignment: 4 weeks. 2 week for preparation and field work. A preliminary report with summary of conclusions and recommendations should be presented upon departure from the field work, and a final draft should be presented one week after finalising the field work. One week will be used to finalize report after the consultant has received comments on the draft report.

1. **Reporting**

The team shall submit a draft report with and executive summary before November 1st 2009. The report will be in English, and should not exceed 20 pages plus relevant annexes.

The consultant will also report to the development partner group for GBS, for Environment and for other relevant sectors in a joint meeting. The team will also report on and discuss their findings in a mini-seminar with relevant stakeholders from government, civil society and academic institutions.

# Annex 2 – MKUKUTA monitoring indicators linked to climate change

This assignment has identified the following as CC related indicators from MKUKUTA One that can be modified to be included in the MKUKUTA Two to elevate the CC focus in the process. This assignment has taken into consideration that data collection for MKUKUTA One indicators is already in place and therefore there will not be a need for new methodologies for data collection unless where the methodology has not been working as envisaged. For each indicator the institution responsible for data collection and coverage is included immediately after the indicator. Explanation in italics elaborates on the CC link with the indicator mentioned.

Cluster 1: Growth and Reduction of Poverty

Cluster wide indicators

* GDP growth per annum, MPEE/Econ survey Geo (N)
* GDP growth of sectors per annum *focusing on those sectors mostly affected by CC,* MPEE/Econ Survey, Geo (N), Sectors (Agriculture, Natural Resources, etc)

**Goal specific indicators**

Goal 3: Improved food availability and accessibility at household level in urban and rural areas

*For the three indicators selected below, important in relation to CC is noting changes over time with implementation of planned adaptation and also with enhanced capacity for autonomous adaptation*

* Food self sufficiency ratio, MAFS – NFS Geo (N/R/D)
* Number of districts reported to have food shortages, MAFS – NFS Geo (N/R/D)
* % change in food crop production MAFS – Agric Survey, Geo (N/R/D)
* Proportion of households who take no more than one meal per day NBS – HBS / Agric Survey Geo (N/R/D)

Goal 4 and 5: Reducing income poverty of both men and women in rural and urban areas

* % of smallholders using modern methods of farming (irrigation, fertilizers and improved seeds) NBS – Agric Survey Geo (N/R/D)

*considering modern methods as coping strategies to CC impacts, assessing the contribution of CC related activities mainly adaptation in enhancing smallholders in using modern farming methods*

* % of smallholders who accessed formal credits for agricultural purpose NBS – Agric Survey, HBS Geo (N/R/D)

*computing the contribution of CC related activities in the provision of these credits. Availability of credits will enhance adaptive capacity of smallholders for both planned and autonomous adaptation*

* % of smallholders who have one or more off-farm income generating activities NBS – Agric Survey, HBS Geo (N/R/D)

*considering off-farm income generating activities as coping strategies to CC impacts in the agriculture sector; computing the contribution of planned and enhanced capacity for autonomous adaptation in facilitating smallholders’ ability to engage in productive and sustainable off-farm income generating activities*

* % of households whose main income is derived from harvesting, processing and marketing of natural resources products NBS – HBS /MNRT Geo (N/R/D)

*since natural resources are affected by CC, a reduction in the indicator will imply less vulnerability but also an indicator to measure sustainability of the practice in terms of enhanced regeneration capacity of natural resources will imply effective adaptation to CC impacts*

Goal 6: Provision of reliable and affordable energy to consumers

* % increase in number of customers connected to the national grid and off-grid sources of electricity MEM, National/Stations

*The increase in this indicator can be interpreted to indicate a reduction in reliance over forests as energy sources (charcoal and firewood)*

* % of households in rural and urban areas using alternative sources of energy to wood fuel (including charcoal) as their main source for cooking HBS – Census Geo (N/R/D)
* Total electricity generating capacity and utilization. MEM, National/stations

*Similar interpretation as the first indicator above for goal 6.*

# Annex 3 – Experiences from other countries

## Bangladesh

Bangladesh is frequently cited as one of the most vulnerable countries to climate change because of its disadvantageous geographic location; flat and low-lying topography; high population density; high levels of poverty; reliance of many livelihoods on climate sensitive sectors, particularly agriculture and fisheries; and inefficient institutional aspects. Many of the anticipated adverse affects of climate change, such as sea level rise, higher temperatures, enhanced monsoon precipitation, and an increase in cyclone intensity, will aggravate the existing stresses that already impede development in Bangladesh, particularly by reducing water and food security and damaging essential infrastructure. These impacts could be extremely detrimental to the economy, the environment, national development, and the people of Bangladesh.

Bangladesh has developed some capacity for dealing with the impacts of climate change at the national level, and policy response options have been mobilised that deal with vulnerability reduction to environmental variability in general, and more recently, to climate change in particular. In addition, Bangladesh has for some time been recognised as a particularly vulnerable country by the international community, and has received disaster management and adaptation support in several sectors.

There is no comprehensive national policy in Bangladesh that specifically targets climate change risks. However, the Bangladesh government is aware of the importance of climate change, as well as the country’s historical sensitivity to climate variability in general, and there are several policy response options that exist that relate to climate change. These include: indirectly addressing the impacts of climate change through programmes that *reduce vulnerability* through for example poverty alleviation, employment generation, crop diversification; directly addressing *vulnerability to climate variability* and extreme events through disaster risk reductions and management schemes; and specifically *targeting climate change* by mainstreaming climate change into sectoral plans and national policies. A selection of policies that reduce vulnerability to climate variability, and also specifically climate change, will be discussed here.

***Vulnerability Reduction***

In Bangladesh ongoing projects address food insecurity and food production shortfalls by crop diversification and generation of alternative employment opportunities aimed at community development, agricultural development, credit facilities, and infrastructure improvement. Fish and shrimp production for domestic consumption and exports are promoted with special emphasis on rural poverty alleviation and employment generation. All such developmental programmes are important in enhancing the resilience of the poor.

***Disaster Management and Climate Risk Management***

Bangladesh has a Participatory Disaster Management Programme (PDMP) with a focus on disaster management and prevention, and also adaptation to climate change. The focus is on ‘soft’ measures to reduce the impacts of disasters, with an emphasis on preparedness, such as: awareness raising of practical ways to reduce disaster risks and losses, to strengthen national capacity for disaster management; enhance knowledge and skills of personnel in handling disasters; establishing disaster action plans in the most disaster prone areas; promoting local-level risk reduction measures; and improving early warning systems.

In 2003 Bangladesh also established a Comprehensive Disaster Management Programme (CDMP) with UNDP and other donor assistance, with the aim of refocusing the government towards greater emphasis on disaster preparedness and risk reduction. CDMP has a number of disaster management components, among them to establish an integrated approach to climate change and disaster management, expanding risk reduction approaches across a broader range of hazards, with specific reference to climate change. There are three main areas of focus:

1. Capacity building for the Ministry of Environment and the Department of Environment to coordinate and mainstream climate change into their existing activities;
2. Strengthening existing knowledge and information accessibility on impact prediction and adaptation;
3. Awareness raising, advocacy and coordination to promote climate change adaptation into development activities.

Capacity building included assisting the creation of a ‘climate change cell’ within the Department of Environment (DOE) to build government capacity for coordination and leadership on climate change issues. The cell coordinates awareness raising, advocacy and mechanisms to promote climate change adaptation and risk reduction in development activities, as well as strengthening existing knowledge and information accessibility on impacts and adaptation to climate change.

The climate change cell is informed by another component of CDMP, the Local Disaster Risk Reduction Facility (LDRRF). LDDRF aims to improve coordination between development-orientated and disaster management aspects of the Government of Bangladesh at the local level.

Bangladesh therefore has fairly effective mechanisms in place for disaster management and climate risk management (CRM), however, there is room to improve the functioning effectiveness of this system. The UNDP suggest that an *Integrated National Framework for CRM and DRR*, broader understanding of climate change risks and impacts at all levels, as well as capacity building for assessing risks and analysing them with sectoral and cross-sectoral perspectives and implications.

***Mainstreaming climate change into development and national planning***

The Bangladesh government is integrating climate change into sectoral plans and national policies. For example, recommendations from the World Bank (see below) on the impacts of climate change have been incorporated into coastal zone management programs and adopted in the preparation of disaster preparedness plans and a new 25 year water sector plan. In agriculture, research programs have taken place in light of climate change information, particularly drought and saline tolerant rice varieties. Bangladesh’s interim poverty reduction strategy paper (I-PSRP) recognizes the direct link between poverty and vulnerability to natural hazards, and notes that the incidence of disasters is likely to increase rather than decrease as a result of global warming. The I-PSRP has been criticised for not specifically mentioning climate change in the context of planning vulnerability measures. However, in November 2007 the Government announced an initiative to formally incorporate the impacts of climate change into all development plans in PSRP revisions, proposing a draft policy and action plan by October 2008.

Other national policies of relevance to climate change include: The National Water Policy (NWP), announced in 1999, which was the first comprehensive look at short, medium and ling term perspectives for water resources in Bangladesh; followed by the National Water Management Plan (NWMP) in 2001 that looked at the implementation and investment responses to address the priorities identified in the NWP. The NWP does not explicitly mention climate change, however climate change is recognised by the NWMP as one of the factors determining future water supply, including the impacts of sea level rise, which guides the implementation of the NWP. Further, many of the NWP and NWMP priorities are synergistic with climate change adaptation, such as the recommendation in the NWP for early warming and flood proofing systems. Other environmental policies, including the National Environmental Management Plan (NEMAP), the National Land Use Policy, and the National Forest Policy, do not make specific reference to climate change.

***Climate change policies, planning and institutions***

Bangladesh is signatory to the United Nations framework Convention on Climate Change (UNFCCC). In 1992, the Government of Bangladesh signed the UNFCCCC, and ratified in 1994. The Ministry of Environment and Forest (MOEF) is responsible for coordinating the UNFCCC process in Bangladesh.

Bangladesh has undertaken a number of significant projects and achieved several milestones in the area of climate change:

• Signed the UNFCCC on 09.06.1992 and ratified it on 15.04.1994

• Accessed the Kyoto Protocol on 21.08.2001.

• Participated in the US Climate Change Country Study Program and prepared its emission inventory and vulnerability assessment in 1994.

• Participated in the Asia Least Cost Green House Gas Abatement Strategy (ALGAS) Study in 1995-98. The ALGAS study included the formation of the national GHG abatement strategies consistent with national development priorities, and preparation of portfolio of GHG abatement projects.

• Submitted its first National Communication to the UNFCCC in 2002. Bangladesh has taken up a project ”Bangladesh: Climate Change Enabling Activity ”Self Assessment Exercise” as a first step to prepare its Second National Communication in the near future.

• Completed a National Adaptation Plan of Action (NAPA) and has already submitted the NAPA to the UNFCCC in November 2005.

• Under the Clean Development Mechanism Bangladesh has established a two tier Designated National Authority (DNA). The tiers are National CDM Board and National CDM Committee. The DNA so far has approved four projects in waste and energy sectors of Bangladesh. These projects are at different stages of implementation. These projects are:

1. Landfill Gas Extraction and Utilization at Matuail by Waste Concern.

2. Composting Project at Gazipur and Kanchpur by Waste Concern

3. Installation of 30,000 Solar Home Systems (SHS) in rural households by Grameen Shakti and BCAS

4. Promotion of Energy Efficient Compact Florescent Lamp (CFL) in Rural Bangladesh (100,000 incandescent lamps to be replaced by CFL) by Grameen Shakti and BCAS

Notable among these efforts in relation to climate change impacts is that Bangladesh was the first country to complete a National Adaptation Programmes of Action (NAPAs), which are documents produced by the Least Developed Countries for the UNFCCC to identify immediate and urgent needs for adaptation to climate change. Bangladesh successfully completed the NAPA in 2005.

The NAPA Document focuses on six sectors but in reality more sectors are covered:

1. Forestry, Biodiversity and Land-Use
2. Agriculture, Fisheries and Livestock
3. Water, Coastal Areas, Natural Disaster and Health
4. Livelihood, Gender, Local Governance and Food Security
5. Industry and Infrastructure
6. Institutional and Policy Issues

## Kenya

Kenya is actively participating in climate change activities. Many of climate change related activities are funded by bilateral and multilateral agencies, but channelled through the government. The private sector's involvement is mostly in carbon markets where some CDM projects have been approved and registered. Some of the organizations involved in climate change activities in Kenya include:- The ministry of Environment and Mineral Resources formerly the ministry of Environment and Natural Resources. The name change was mainly for political reasons in forming the coalition government. Important works undertaken by the ministry include the First National Communication to the UNFCCC, Technology Needs Assessment, and the on-going consultancy on National Climate Change Response Strategy (NCCRS) to be launched in December. The Prime Minister's Office has an interim climate change coordinating unit. Permanent structures are expected to be established once the strategy in preparation is completed. Another important institution is the National Environment Management Authority (NEMA) which also functions as the Designated National Authority (DNA). Organizations with climate change projects in Kenya include Oxfam, DfID, USAID, DANIDA, GTZ, Care Kenya, etc.

NEMA in collaboration with the Ministry of Environment and Mineral Resources, are responsible for coordination and implementation of all environment related strategies in Kenya. NEMA’s five year strategic plan (2005-10) does not have a specific focus on climate change but the goals and objectives mentioned will enhance Kenya’s capacity to respond to the climate change. From various related reports available on NEMA’s website, it is clear that Kenya is undertaking significant efforts in linking the environment and sustainable development since Kenya’s economy largely depend on the environment and natural resources. Sectors that receive special focus in relation to climate change in Kenya include the agriculture, forestry, water, health, transport and energy. Also a special program focusing on dry-lands is being implemented called ”Kenya Adaptation to Climate Change in Arid Lands Project (KACCAL).”

The State of Environment Report 2006/7 focused on ”Effects of Climate Change and Coping Mechanisms in Kenya” covering a period of two years. The report provides information on climate change, its causes and manifestation; effects on various sectors, socio-economic status and livelihoods. In addition, the report analyses coping mechanisms to climate change as well as the policies, governance and institutional framework available to mitigate its effects. Indeed, this report provides a basis for assessing Kenya’s coordinated efforts at the national level regarding its commitment on the climate change issue.

## South Africa

South Africa represents the front-runner in Africa for climate change analysis and policy. South Africa was chosen as one of the countries to be reviewed because it stands out as an example of level where Tanzania should be heading for instead of remaining with its peers. As early as in 2003 a lot of research on climate change was produced to analyse the economic impact of climate change in South Africa.

The identification of South Africa’s sources of emissions has been easy, half of them come from Eskom, the government’s power company, which produces 95 per cent of South Africa’s power supply, of which 90 per cent is originating from coal.

It is envisaged that carbon capture and storage would probably become mandatory for all new coal-fired power stations in the country. While the technology is still in development, all new coal-fired power stations would have to display a readiness to implement the technology.

A scenario has been presented under which South Africa would see its greenhouse gas emissions gradually increasing over the next few years before reaching a plateau of about 550 megatons of carbon equivalent, just over 100 megatons more than the 2003 level of 446 megatons. Once it had reached that level, there would be a decline in greenhouse gas emissions if action were taken now, while the transition toward a low-carbon economy would not cost the country any jobs.

The government of South Africa considers the transition in energy production towards nuclear and renewable energy as the only way to ensure the levels of emissions will drop permanently. South Africa’s other problem, the impact of drought, has been less discussed with, and obviously more challenges lie ahead in dealing with the mitigation of impacts of drought on the economy, particularly on the agriculture sector.

# Annex 4 – People met

(to be updated for the final report)

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| Name | Position/Institution |
| Prof. Kassim Kulindwa | MKUKUTA Reviewer  Economics Department  University of Dar es Salaam |
| Prof. Pius Yanda | Director  Institute of Resources assessment  University of Dar es Salaam |
| Dr. Emmanuel Mpeta | Director – Research  Tanzania Meteorological Agency |
| Charles Meshack | Executive Director  Tanzania Forest Conservation Group |
| Rahima Njaidi | Director  MJUMITA – Community Based Forest Management Network |
| Evarist Nashanda | Forest Officer  Catchment Forest, Nature Reserve and REDD  Forest and Beekeeping Division  Ministry of Natural Resources and Tourism |
| Dr. Julius Ningu | Principal Agricultural Officer/ Environmental Specialist  Environmental Management Unit  Ministry of Agriculture, Food Security and Cooperatives |
|  | DPP  Ministry of Water and Irrigation |
| Fred Nelson | Member – Executive Committee  Tanzania Natural Resources Forum  Independent Consultant – Maliasili Initiatives  Member – Carbon Tanzania |
| Cassian Mumbi (PhD) | Director  Njiro Wildlife Research Centre  Tanzania Wildlife Research Institute (TAWIRI) |
| Conrad Joseph Ndomba | Livestock Officer  Ministry of Livestock development and Fisheries |
| Adeodather V. Lupindu | Ministry of Livestock Development and Fisheries |
| Freddy K. Manyika | Senior Environmental Officer  Vice President’s Office |
| Ivar Jorgensen | Royal Norwegian Embassy |
| Trond Augdal | Royal Norwegian Embassy |
| Lars Mikkel Johannsen | Embassy of Denmark |
| Theodore Silinge | Principal Forest Officer  Ministry of Energy and Minerals |