6 CLIMATE CHANGE ADAPTATION IN ZANZIBAR AND THE IMPLICATIONS FOR EVALUATION

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INTRODUCTION

Climate change is a global threat posing challenges to the survival of mankind, biodiversity and sustainable development. Climate change is part of the global 2030 Agenda for Sustainable Development and as we all know Sustainable Development Goal 13 addresses climate change. Climate change is a national agenda; it is included in the Zanzibar Strategy for Growth and Reduction of Poverty III, 2016–2020, in particular key result area D on environmental sustainability and climate resilience. Zanzibar is in the process of evaluating the Zanzibar Vision 2020, to be followed by development of the new Zanzibar Vision 2050, which will prioritize environmental sustainability and climate resilience.

Zanzibar, being an island archipelago, already suffers from the threats posed by climate change. In recent decades, Zanzibar has experienced rising temperatures, increased rainfall variability, higher wind speeds and excessive high-tide levels, and an increase in extreme events of climate variability. The latter have led to various effects including droughts and floods which have had major socioeconomic impacts on Zanzibar's development, yet these events appear to be recurring and intensifying phenomena.

CURRENT CLIMATE VARIABILITY

A large proportion of Zanzibar's gross domestic product is associated with climate-sensitive activities, either directly such as agriculture (crop production and fishing) and tourism, or indirectly for example from the use of natural resources. The economy of Zanzibar and the livelihoods of the people are therefore very dependent on the weather and the climate. The islands are also affected by the regional patterns of extreme weather, which lead to major events such as floods, droughts and storms. The study of the economics of climate change in Zanzibar of 2011 summarizes the following findings on Zanzibar's climate variability:

1. Temperatures have been rising over the last 30 years with a strong increase in average and maximum temperatures. The increases are highest in the months from December to May and the highest-ever temperature recorded on the island was over 39°C.

2. The changes in rainfall are complex, and there does not appear to be a simple precipitation trend across the islands. However, there are indications of changes in rainfall variability and there have been higher-intensity rainfall events recorded in recent years. For example, on 5 May 2015, Zanzibar recorded 172.00 millimetres of rainfall in three hours that caused serious flooding in different parts of Zanzibar, both urban and peri-urban. Another event was recorded on 17 April 2016 when 212.4 millimetres of rain fell over seven hours, causing loss of life and property.
3. There are observational trends of increasing wind speeds on the islands over the last 20 years, with an increasing tendency of extreme wind events. The analysis of data shows that the strongest winds are experienced in January, February and August, with the monthly mean wind speeds generally exceeding 10 knots during these months. The data show significant inter-annual variations of the wind speeds with stronger wind speeds than in the previous decade. This would suggest that the wave climate regime has also changed over the last two to three decades, with the tendency of increasing wave activity and associated coastal erosion, especially on shores which lack natural protections.
4. There is some evidence that extreme events are intensifying. The most extreme cases of temperature, heavy rainfall and wind speeds on record on the islands have all occurred over the last 10 years.

MAJOR EFFECTS OF CLIMATE CHANGE IN ZANZIBAR

- Intrusion of saltwater leading to inundation of low-lying agricultural land, making the land that was used for agricultural activities to be unproductive, and to contamination of drinking water, especially the wells that have become salty.
- Increase in sea surface temperature, particularly for shallow water, which led to the bleaching of Zanzibar's coral reefs and caused a decline in the production of seaweed, a major source of livelihood for most women living in coastal areas of Zanzibar. The reduction in productivity in seaweed farming made these women vulnerable.

CLIMATE CHANGE INITIATIVES IN ZANZIBAR

CARRY OUT STUDY ON THE ECONOMICS OF CLIMATE CHANGE IN ZANZIBAR

This study was carried out in 2011 through support from the Department for International Development of the United Kingdom. The work was led by the Global Climate Adaptation Partnership, working with other international and local partners. The study assessed the potential impacts and economic costs of climate change in Zanzibar, and scoped the cost of adapting to these effects over time and the potential

for low-carbon growth. This study provides a good reference for climate change in Zanzibar and the report formed a base for the development of the Zanzibar Climate Change Strategy and Zanzibar Climate Change Action Plan.

DEVELOPMENT OF A NEW ENVIRONMENTAL POLICY THAT INCORPORATES CLIMATE CHANGE

Recognizing the importance of its environment, the Revolutionary Government of Zanzibar launched the first environmental policy for Zanzibar in 1992. However, the policy did not include climate change issues, so in 2013, due to the serious impacts of climate change in Zanzibar and other emerging environmental issues, the government launched a new Environmental Policy. The policy among others includes an analysis and policy statement on climate change issues, stating that "the Government in collaboration with partners will secure national capacity to manage (preparedness, mitigation and adaptation) climate change effects and implement climate change programmes".

Implementation strategies for this policy statement are to:

1. Develop and implement participatory national strategies, programmes and plans on climate change issues.
2. Develop and implement climate change financing mechanisms for Zanzibar.
3. Promote national capacity to address climate change issues.
4. Promote public awareness and education on climate change-related issues.
5. Enhance local, regional and international cooperation on climate change issues.
6. Enhance Zanzibar's climate change governance framework and coordination among stakeholder institutions.

ENACTED NEW ENVIRONMENTAL MANAGEMENT ACT THAT INCLUDES CLIMATE CHANGE

The Environmental Management Act of 1996 was reviewed and the Zanzibar Environmental Management Act of 2015 enacted. Section 25 of the Act directs the establishment of Environment and Climate Change Units in each ministry and local government authority to:

1. Coordinate all matters related to environment and climate change within the respective ministry or local government authority.
2. Consider and mainstream environmental norms and climate change into the policies, plans, programmes, projects and activities of the institutions in the respective sectors.

Based on this Act, the implementing entity for coordination of all climate change issues is the Second Vice-President of Zanzibar, and the Department of Environment coordinates matters related to climate change on a daily basis. Technical and steering committees were also established.

DEVELOPMENT OF ZANZIBAR'S CLIMATE CHANGE STRATEGY

Launched in 2014, the Climate Change Strategy was developed to spearhead climate change interventions in Zanzibar. The strategy envisages building a climate-resilient and sustainable Zanzibar, and provides strategic priorities for addressing climate change through building resilience and developing opportunities for carbon-relevant sustainable development. It considers the key sectoral and cross-sectoral risks and opportunities as well as cross-cutting themes that are important for Zanzibar.

The five priority sectors which have been identified under the Zanzibar Climate Change Strategy are:

1. Building climate information and capacity, disaster risk management and resilient settlements
2. Resilient coastal and marine areas
3. Climate-smart agriculture and improved natural resources management (including freshwater availability and improved land management)
4. Sustainable forests and energy/electricity
5. Sustainable and low-carbon tourism

The strategy further outlines four strategic priorities:

1. Building capacity: interventions that increase adaptive capacity, provide information, raise awareness, help institutions and address barriers
2. Low- and no-regret options: interventions that have benefits in reducing current climate risks, reducing greenhouse gas emissions or are synergistic for both (win-win)
3. Mainstreaming: interventions to mainstream climate resilience and low-carbon development into existing or near-term plans and reduce risks (climate proofing)
4. Addressing future challenges: early actions for future challenges, providing information for later decisions or encouraging robustness and flexibility

ESTABLISHMENT OF 57 COMMUNITY FORESTRY MANAGEMENT AGREEMENTS

Zanzibar initiated the REDD mechanism (reducing emissions from deforestation and forest degradation in developing countries) as well as REDD+, which plays a significant role in conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries. As an outcome of REDD+, Zanzibar has established 57 Community Forest Management Agreements.

CONSTRUCTION OF DYKES

Dykes are constructed in some areas to minimize the impact of saltwater inundation of the coastal farmlands. Nearly 1,840 metres of dykes have been constructed in Zanzibar,

in Tumbe West (250 metres), Ukele (700 metres), Sizini (200 metres), Mziwanda (400 metres), Gando Nduuni (150 metres), Chokaani (20 metres) and Kengeja (120 metres).

CONSTRUCTION OF SEAWALLS AND MANGROVE PLANTATIONS UNDER A LEAST DEVELOPED COUNTRY FUND PROJECT

Along some parts of the coastline of Zanzibar, seawalls have been constructed and mangrove plantations established to minimize the impact of beach erosion, which is currently accelerating at high speed due to changing climate. Five seawalls totalling 420 metres in length (three walls of 100 metres each and two walls of 60 metres each) have been constructed at Kilimani and a 50 metre wall at Kisiwa Panza. About 270 hectares of mangrove vegetation have been planted at Kilimani, Kisakasaka, Tumbe, Kisiwa Panza, Ukele and Tovuni to reduce saltwater intrusion in farms and settlements.

This project was established under the United Nations Framework Convention on Climate Change to support climate change initiatives in the least developed countries.

AFRICAN ADAPTATION PROGRAMME PILOT PROJECT

The project is supported by the Government of Japan through UNDP. It was implemented in Nungwi Village as an adaptation response to the impact of climate change due to salt-water intrusion in all wells and boreholes around the village. The objective was to supply clean and safe water to the community. The project drilled a new borehole some seven kilometres from the village and served about 11,000 people with clean and safe water.

UNDAP ENVIRONMENT AND CLIMATE CHANGE PROJECT

This project aimed at strengthening environment and climate change governance in Zanzibar. It was supported by UNDP through the United Nations Development Assistance Plan. The following project milestones have been realized:

- Zanzibar's Climate Change Strategy has been developed and launched.
- A total of 250,000 mangroves trees equivalent to 100 hectares have been planted in different locations of Zanzibar. The wards (Shehia) that have benefited are Charawe, Ukongoroni, Bwejuu, Michamvi, Pete, Jozani, Muwanda, Kiongwe, Bumbwini Mafufuni, and Bungi in Unguja, and Kengeja, Muwambe, Mtambwe, Shumbamjini, Wambaa, Wesha in Pemba.
- Six community groups (four in Pemba and two in Unguja) were supported in improving water infrastructure for irrigation and fish farming in their local communities so as to increase food security and reduce poverty. A total of 23 farms benefited from this initiative.
- Two hundred beehives, together with necessary tools and equipment, were distributed to 19 local community groups in Unguja and 11 in Pemba. This project is aimed at adding value and production of honey and beeswax at community level.

CONCLUSION

Zanzibar remains particularly vulnerable to the impacts of climate change and unfortunately, the level of understanding of the general public is not adequate. To ensure that no one is left behind, the government has taken the following measures:

- Improved the effectiveness of early warning information. The Commission for Disaster Management was established to ensure that communication and dissemination of information are effective and reliable by establishing an early warning information system, and ensuring that the information reaches (and is understood by) the range of potential users (fishermen, communities at risk, farmers, etc.) on timely basis.
- Enhanced the capability and resources of the Tanzania Meteorological Authority and other related institutions looking at meteorological data (both terrestrial and marine). Key priorities are to improve data collection and interpretation and inform the public from time to time about climate change.
- Promoted institutional capacity for climate change coordination and mainstreamed mechanisms in all sectors of Zanzibar.
- Promoted sustainable forestry management and institutionalized afforestation mechanisms in all level of society.
- Enabled seaweed farmers, the majority of whom are women, to farm at high water levels.
- Undertook an evaluation of areas affected by climate change, with about 20 areas identified. They have been digitized, and show the impact, causes, livelihood activities and proposed measures to mitigate climate change. To ensure that no one is left behind, all stakeholders were involved during the mapping exercise, including citizens (communities), investors, non-governmental and community-based organizations, central government and local authorities. They were involved in the identification of relevant activities at specific areas according to the nature of impact, and they are participating in the implementation of rehabilitation programmes for the affected areas. This was the initial evaluation which identified the affected areas and mapped the magnitude of effects. The evaluation was thorough, and what follows now is the implementation of all identified activities and programmes in all areas, to be followed by the end-of-project evaluation.

However, challenges remain, including:

- The capacity gap of practitioners and communities (we have low adaptive capacity) and technology transfers to make use of technology to minimize risk.
- As mentioned, the construction of dykes and seawalls has not covered all places.

Hence, the Revolutionary Government of Zanzibar is continuing to work with development partners in climate change mitigation to ensure no one is left behind and for future generations.

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