

Climate-Induced Loss and Damage in Tanzania: An Obstacle to Sustainable Socioeconomic Development

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Summary

Disastrous weather extremes and slow-onsets due to climate change and variabilities in Tanzania are vibrant and posing serious loss and damage to economy and life supporting systems. The coastal areas are the most vulnerable and experiencing highest damages compared to other parts of the country. Central sectors for economic development and poverty reduction such as water, energy, agriculture, natural capital (ecosystems and biological diversities), and infrastructures are already suffering terrible loss and damage which might decelerate the country's move to achievement of sustainable development goals. Integrated short, medium, and long-term actions by the government and partners are imperative to realize the vision 2025 objectives before the loss and damage is irreversible.

1.0 Introduction

Climate change and variability is now vibrant and already instigating calamitous rapid and slow-onset extremes such cyclones, heatwaves, hurricanes, severe thunderstorms, windstorms, sea-level rise, abnormal precipitations and associated flooding all over the world including Tanzania leading to increased loss and damage, displacement, disrupted food chains as well as threatened livelihoods (Burck et al., 2019; IPCC, 2019; Schaeffer et al., 2014; USAID, 2018). It causes loss and damage to human life, productive systems, property, infrastructure, wider socioeconomic systems and the natural environment (UNFCCC, 2018). Economic and non-economic loss and damages related to these climatic tragedies have been severe especially in poor countries like Tanzania and affect community development and national GDP. Loss and damage is already a significant consequence of inadequate ability to adapt to changes in climate patterns (Mechler et al., 2019). Although not given special consideration in development programmes, plans, and strategies, climate change-induced loss and damages are slowing the motion towards sustainable development and poverty graduation in Tanzania. Current climate change projections in Tanzania.

Increased temperatures, prolonged droughts and erratic rainfall are resulting in significant impacts to public health and livelihoods, with climate projections indicating that the situation is expected to intensify (WHO, 2018)

2.0 Loss and damages in Tanzania

2.1. Coastal zones

Tanzania has an approximate of 15 million people (25% of the country) settling within the coast of the Indian ocean made of five regions of Tanga, Coast, Dar Es Salaam, Lindi and Mtwara covering 15% of the country's total land area (URT, 2012). The coastal ecosystems interact with each other and together sustain a tremendous diversity of marine life, which is an important source of sustenance of coastal communities.

Recent study in Pangani and Bagamoyo by Tondelo et al (2019) has revealed a significant reduction in the size of arable land and turning it into saline caused by rising sea-level while increasing temperature has

Recommendations

- *Coast management policy required;*
- *More adaptation and capacitating projects by NGO & CSOs;*
- *Build stronger/ resilient infrastructure;*
- *Increase budget allocation for disaster relief;*
- *Climate disaster insurance.*

shifted the fishing grounds into deeper seas making difficulties for subsistence fishing. Rising sea-level has also resulted into coral reef breaching, disappearance of mangroves, salt water intrusion which reduces fishing activities due to disappearance of fish breeding sites among other factors.



According to the recent IPCC report (2018) current ecosystem services from the ocean are

expected to be reduced at 1.5°C of global warming, with losses being even greater at 2°C of global warming. The risks of declining ocean productivity, shifts of species to higher latitudes, damage to ecosystems (e.g., coral reefs, and mangroves, seagrass and other wetland ecosystems), loss of fisheries productivity (at low latitudes), and changes to ocean chemistry (e.g., acidification, hypoxia and dead zones) are projected to be substantially lower when global warming is limited to 1.5°C (IPCC, 2018)

Salinization of coastal land means the loss of arable land for subsistence farming by the poor coastal communities. On the other hand, statistics indicates Tanzania has been continuously bearing the weightiest burden of undue flooding, that threatens infrastructure assets worth \$5.3 billion in the city of Dar es Salaam alone, a country's major business hub and home to about 5 million people. This makes this busiest capital more vulnerable to flooding, which weakens the ability of its residents in accessing their working places, clean water and better sanitation (Makoye, 2017). Such losses and damages are key factors neglecting the opportunity for coastal communities to graduate from poverty and being resilient.

2.2. Water Resources

Tanzania is famous for its abundant water resources across the country which play vital role for economic activities like Agriculture. In most rural areas, majority populations without water supply infrastructure depended on natural outflow of water in river streams for their domestic and animal uses. While Tanzania is not categorized as a water-scarce country, climate change does present a significant threat to the country's freshwater resources (Crawford & Terton, 2016). Rural water supply services by the government are insufficient to cover the losses and damages from impacts of climate change and hence hampering the efforts to rural development and resilience. On the other hand,

Recommendations

- *Increase rural water supply;*
- *Rain water harvesting*
- *Increased implementation of Integrated Watershed Management programs,*

flooding in urban areas have been causing greater damage to water supply infrastructure. Moreover, reduced surface water quantity and quality, coastal cities will increasingly rely on groundwater, which is already at risk of salt water intrusion (USAID, 2018; WHO, 2018).

Further reports have revealed massive disappearance of river streams, springs, wetlands and dams over the last three decades (URT, 2015b) which is associated with great reduction in amount of rainfall in many areas of the country as well as increased temperature leading to higher levels of evapotranspiration. In some areas, perennial rivers have changed to seasonal rivers, consequently leading to shrinkage or disappearance of subsequent wetlands, with severe effects on biodiversity (URT, 2015a). USAID (2018) has reported that increased temperatures, longer dry spells and heavy rainfall events threaten Tanzania's nine major river basins and the continent's three largest lakes (Victoria, Tanganyika and Nyasa). Yet climate analysis have reported annual rainfall has decreased at an average rate of 2.8mm per month (3.3%) per decade (Irish Aid, 2018) with the greatest annual decreases in the southern most parts of Tanzania.

2.3. Biodiversity Loss

Biodiversity and biodiversity-based ecosystems services are intrinsically dependent on the climate. Tanzania was once said to be leading in biodiversity and ecological systems richness across the tropical regions in Africa. These have been playing a robust role in national GDP through tourism and offering life supporting services to most rural populations (Crawford & Terton, 2016). It is said that, the annual per capita value of subsistence use of forest products in rural areas, for instance, has been estimated as USD 25–50, with forests providing 90% of energy supplies, 75% of building materials and 100% of traditional medicines (Irish Aid, 2018).

Recommendations

- *Renewable energy to avoid dependence on biomass;*

Despite the biodiversity richness and conservation commitments in place, Tanzania's biodiversity is experiencing substantial reduction in ecosystem quality and species numbers and diversity associated to the effects of climate change.

Reports have portrayed unequivocal loss and damage of natural biological systems due to impacts of climate changes and variability. Loss of forest biodiversity, disappearance of wildlife habitats, increased risk of bushfires, ecosystem shift from forests to grasslands, shifts in agro-ecological zones, Changes to habitats and ecosystems, and water shortages-a key threat to wildlife

are among climate-induced loss and damage reported to have setbacks to national development endeavors (Crawford & Terton, 2016; IrishAid, 2018) and fights against poverty.

2.4. Agricultural Loss and Damage

Agriculture is a central sector of the Tanzanian economy which generates 25% of GDP, 24% of exports, and is the mainstay of 75 – 80% of livelihoods in the country including the majority of the poor (URT, 2014). Agriculture practices in Tanzania mainly depend on the seasonal rainfall on which are dramatically decreasing seasons to seasons. The adverse impacts of climate change in agriculture sectors include reduced crop yield due to drought and floods, reduced water availability, etc.,

Climate-related loss and damage risks are already costing the agriculture sector at least \$200 million per year and without urgent adaptation these costs are likely to increase with rising climate variability (URT, 2014). Rainfall decreases of 10% have been correlated

Recommendations

- *Increased budget and extension services for climate smart agriculture;*
- *Rain water harvesting,*
- *Soil and water conservation technologies*
- *Adopt conservation agriculture*

with a 2% decrease in national GDP, and a temperature rise of 2°C could reduce maize yields by 13% and rice by over 7%, both of which are probable in Tanzania over the next century.

Climate-induced loss and damage in the Tanzanian agriculture sector has been associated with shifts of agroecological zones, drying of surface water resources, soil loss from flooding, increasing drought and associated aridity conditions resulting into loss of arable land. All these risks combined with other many socioeconomic and environmental factors delay the efforts to achieve sustainable development especially rural development and resilience.

2.5. Infrastructural Damages

In recent years, Tanzania has made a considerable milestone in construction of economic infrastructure such as asphalt roads and gravel roads in rural areas, bridges, airports, the National



Fibre Optic Cable network named as National ICT Broadband Backbone (NICTBB), electricity lines, water dams, and harbours. Improving these infrastructures has been critical for the country to expand its internal and external trade and commercial

activities to facilitate sustainable development and poverty reduction (AfDB, 2013).

Recently, climatic disasters in the country have been destructing physical infrastructures particularly roads and bridges blocking economic activities (URT, 2012). Flash flooding is main climatic stressor leading in damages, interfering with communication between neighboring places within and outside the municipality. Estimates of medium-term costs to address future climate change are typically of the order of \$250 – 1000 million per year for Tanzania by 2030, focused on enhancing climate resilience

Recommendations

- *Engineering design considering flood simulations;*
- *Resilient infrastructure*
- *Flooding simulation and mapping across the country.*

The study on the economic impacts of climate change estimates that the cost of building adaptive capacity, enhances resilience against future

climate change and rehabilitation of damages in Tanzania is close to \$ 100 to 150 million per year (IrishAid, 2018). The World Bank (2018) informed that only one flooding-event (about three 3 days of heavy rainfall) costs about 100 Million USD which happens to be 2-3% of the annual national TZ-GDP. The report further states that aggregate models indicate the net economic costs could be equivalent to a further 1 to 2% of GDP per year by 2030 (IrishAid, 2018). This scenario, coupled with high population growth and an urbanization rate of 30%, will result in increased consumer and credit demand and will also trigger increased demand for social amenities and infrastructure.

3.0 Conclusion

Future climate projections and modelling in Tanzania indicates worst conditions over the current climatic stressors. This suggests direct warning of the amplified loss and damage of economic infrastructural systems. Damage repair expenditures are anticipated to multiply and hence leading to inaction in public services delivery and ultimately delaying sustainable development. Tanzania's overall development policy is outlined in Vision 2025, which sets future development objectives for the country. Unfortunately, less attention is given to climate induced loss and damage that is not well mainstreamed although it seemd to have considerable negative impacts over plans and strategies for sustainable development and poverty reduction. The coastal areas are said to be more vulnerable to climate induced loss and damage and hence calling for exceptional consideration.

4.0 References

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Coalition Members

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