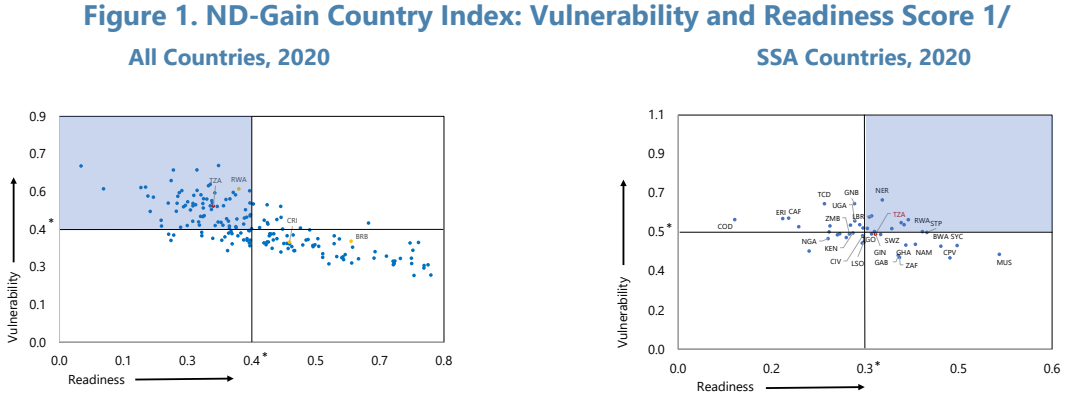
BUILDING RESILIENCE TO CLIMATE CHANGE[1]

Tanzania is highly vulnerable to climate change and at the bottom quartile of readiness score to address its impacts in the global sample. Tanzania is a major food producer, and heavily depends on rain-fed agriculture, but recurrent floods and droughts are increasing in frequency and severity. The Tanzanian authorities acknowledge climate change as a major challenge and are seeking to boost resilience, but the implementation of such plans is at its infancy. Tanzania authorities have expressed interest in the Resilience and Sustainability Trust (RST) to support its efforts to tackle climate change challenges. Against this backdrop, this SIP: (i) presents stylized facts of climate change trends in Tanzania; (ii) examines the macroeconomic impact of climate change, including on economic sectors and food security; (iii) reviews the policy response and explores additional steps for building resilience and improving coping mechanisms; and (iv) analyzes financing implications and sources for climate change adaptation and mitigation.

A. Stylized Facts of Climate Change Trends

1. Tanzania is highly vulnerable to climate change but less prepared to address its impacts compared to most countries in the world. Tanzania is the 45th most vulnerable country to climate change among 182 assessed in the ND-GAIN Country index and the 58th least prepared to leverage investments to adaptation actions among 192 assessed.[2] The high vulnerability score and low readiness score of Tanzania places it in the upper-left quadrant of the matrix for global sample, suggesting the greater adaptation needs and less preparation. But in the matrix for sub-Saharan (SSA) countries, Tanzania is at the intersection of the median of vulnerability and readiness.

Figure 1. ND-Gain Country Index: Vulnerability and Readiness Score 1/



*Median. Sources: ND-Gain Country Index Database; Fund staff calculations.
1/ Readiness core has been recalculated to exclude economic readiness indicator from the World Bank Doing Business Report.

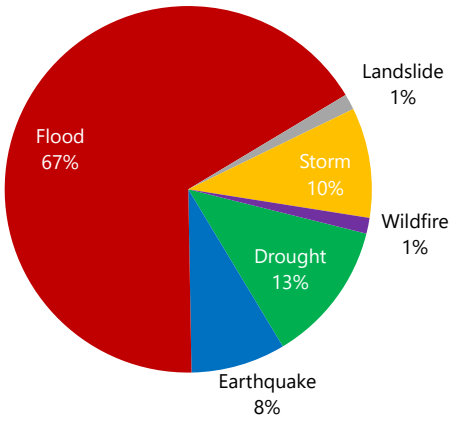
[1] Prepared by Xiangming Fang, Roberta Guarnieri, and Jens Reinke. The authors would like to thank the authorities for their constructive comments and suggestions received during the presentation at the mission's outreach event.

[2] According to the readiness core in ND-GAIN country index, Tanzania is ranked as the 40th least prepared to leverage investments to adaptation actions among 192 assessed. Staff recalculates the readiness score to exclude economic readiness indicator from the World Bank's Doing Business Report. Based on the new score, Tanzania is ranked as the 58th least prepared.

2. Tanzania suffers from recurrent floods and droughts, and the frequency (and severity) of events has been increasing in recent decades, although there is no discernible trend in the share of the population affected by disasters (Figure 1&3). Floods accounted for about two thirds of all natural disasters over the past four decades, increasing from an average of 0.8 floods per year between 1980 and 2010, to 1.8 per year during 2011-22. Droughts were the second most prevalent disaster and the main source of disruption for the population (e.g., 10 percent of the population was affected by droughts in 2006). According to data from EM-DAT, it is also estimated that floods and earthquakes accounted for losses of about US$463.8 million between 1980 and 2022.

Prevalence of Natural Disasters (1980 – 2022)

(Percent of natural disasters)



Sources: EM-DAT; and IMF staff calculations.

3. The floods, droughts and storms have become more frequent in Tanzania, broadly in line with the trend in sub-Saharan Africa (SSA) and the rest of world (Figure 2). Indicating its vulnerability, the occurrence of floods increased more in Tanzanian than other countries over the last decade. The frequency of floods in Tanzania increased by 45% during 2010-2020, while the frequency in SSA and the rest of world decreased by 14 and 15 percent, respectively. Droughts and storms have become more frequent in Tanzania as well but rose in line with other countries in the region and the world. Overall, Tanzania is among the top 10 countries in SSA with the highest frequency of natural disasters, given its total number of floods, droughts, and epidemics. In terms of impact, droughts are the type of natural hazards that affect the largest number of people in SSA due to its impact on rainfed agriculture, and therefore food security. Tanzania's population is most vulnerable to droughts and floods. In 2021, drought affected almost 8,000 people per million population. The number of displaced populations from floods is estimated to have increased from 182 in 2016 to 22,680 in 2020 (National Environmental Master Plan for Strategic Interventions (NEMPSI) (2022-2032)). In addition, droughts and floods have caused substantial property damage including to livestock and crops, houses, and infrastructure.

Figure 2. Types and Frequency of Natural Disasters

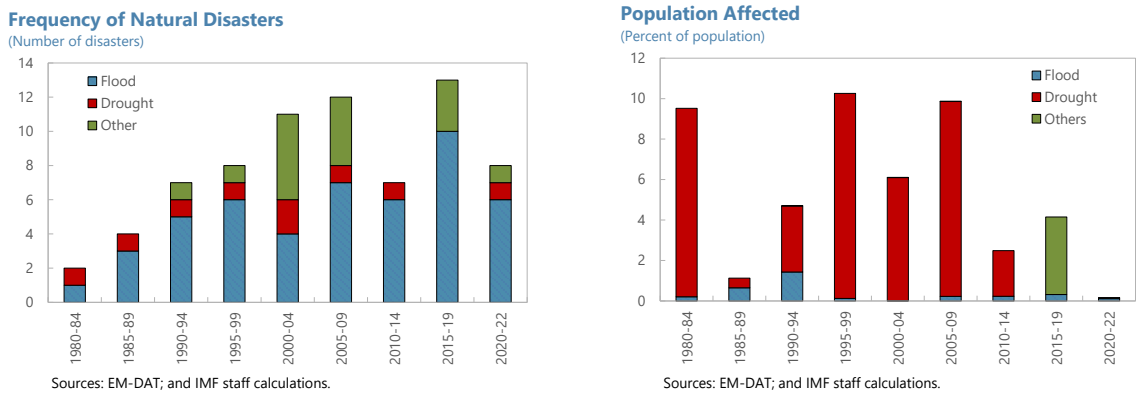
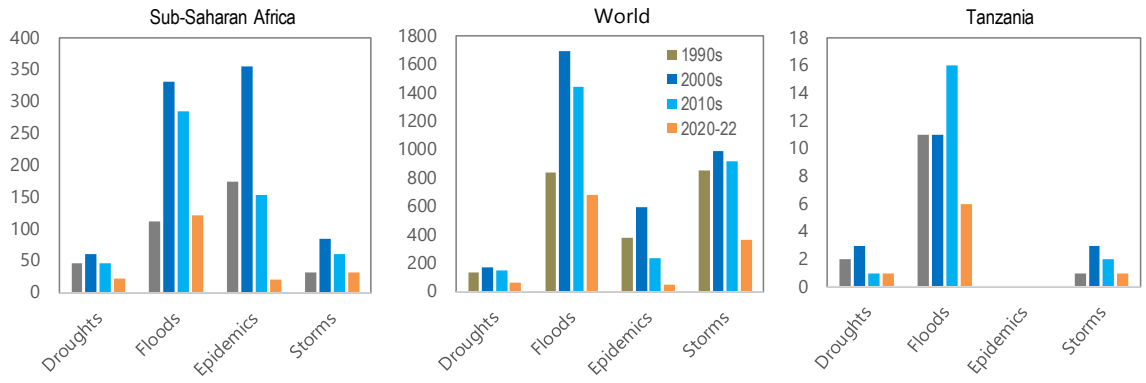
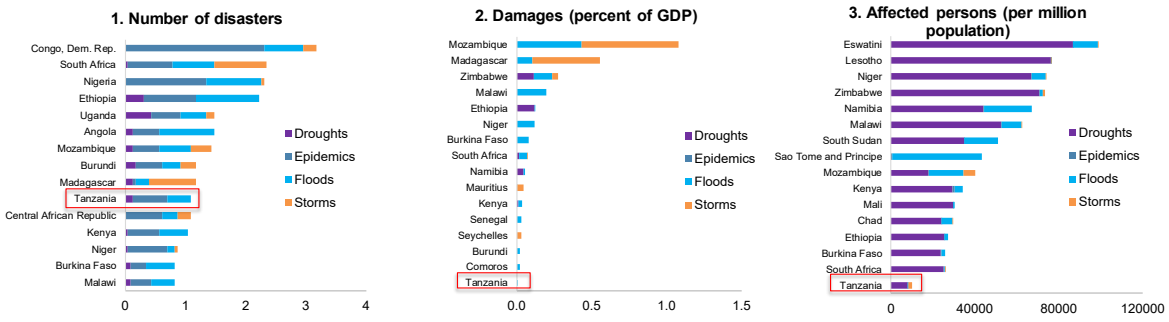


Figure 3. Sub-Saharan Africa and the World: Number of Natural Disasters, 1990s-2022*



Source: EM-DAT, The International Disaster Database, and IMF staff calculations.
* Data as of Oct 24, 2022.

Figure 4. Sub-Saharan Africa: Annual Impacts of Natural Disasters by Country, 2000–22*



Source: EM-DAT, World Economic Outlook, and IMF staff calculations
*Data as of Oct. 24, 2022.

B. The Impact of Climate Change

Projected Climate Change

4. Climate change is projected to increase the frequency and intensity of droughts and floods in Tanzania. The projected climate changes in Tanzania include higher temperature, increased duration of heat waves and dry spells, increased frequency and intensity of heavy rains, and rising sea levels.[3] Average temperature levels in Tanzania have risen steadily over the last few decades and are projected to increase further in the future. According to the forecast in the NEMPSI (2022-2032), the western regions, southern highlands, and central part will be warmer by more than 2°C by 2041, while most regions in the eastern zone will experience a temperature increase of 1°C.[4] In line with rising average temperature, the duration of heat waves and dry spells are projected to rise significantly. In addition, rainfall projections in the NEMPSI indicate that some parts of the country may experience an increase in mean annual rainfall of 18 to 28% by 2100, particularly over the Lake Victoria Basin and North-Eastern Highland. The expected precipitation change in Tanzania is expected to be uneven across regions, suggesting that areas with decreased precipitation will be prone to drought while areas with increased precipitation will be prone to floods. The USAID Climate Risk Profile for Tanzania (2018) suggests that heavy rainfalls are expected to become more frequent (7-40 percent more) due to the increased water vapor holding capacity of a warmer atmosphere, while the intensity of heavy rainfall event is expected to increase by 2-11 percent. Moreover, the sea level of the coast of Tanzania is expected to rise as a result of global warming.

5. Deforestation and other unsustainable practices negatively affect Tanzania's resilience to climate change. Tanzania has one of the fastest rates of deforestation in the world, driven largely by demographic change and the resulting demand for agricultural land and for domestic cooking fuel. It is estimated that 80-90 percent of households use biomass—mainly wood and charcoal—as their main source of domestic fuel (The Potential and Optimal Strategies for Charcoal Sub-sector Development in Tanzania, 2019). Deforested land is at higher risk of damage from floods and droughts, less able to absorb water, and more prone to erosion. The establishment of large plantations of water-intensive crops, such as sugar cane, in semi-arid and climate-sensitive areas further contribute to vulnerability.

Macroeconomic Impact

6. Cross-country analysis on SSA suggests large macroeconomic effects of rising temperature in Tanzania. The IMF's SSA REO (April 2020) finds that the potential impact of climate

[3] The causalities are sometimes complex as are the results. Many observers have noted a relationship between the melting glaciers on Kilimanjaro and climate change. Yet temperatures on Kilimanjaro remain far below freezing; the glaciers are not melting. Scientists now believe that changing currents (caused, inter alia, by climate change) in the Indian Ocean cause a fall of precipitation on Kilimanjaro; as a result, the glaciers are no longer being replenished sufficiently.

[4] According to the World Bank Climate Change Knowledge Portal (2022), as a result of increasing greenhouse gas (GHG) concentrations, Tanzania is projected to face a range of 0.4-4.3°C increase of mean temperature by the end of the century relative to the 1995–2014 baseline.

change on growth is larger and longer lasting in SSA than in the rest of the world, reflecting the region's lower resilience and coping mechanisms, and its dependence on rain-fed agriculture. The REO estimates that economic activity in a given month can shrink by 1 percent when the average temperature is 0.5°C above that month's 30-year average. Given Tanzania's heavy reliance on rain-fed agriculture and insufficient adaptation mechanism, the economic impact of higher temperature would be similar in Tanzania as in other SSA countries. Average temperature has been rising and is projected to rise further in Tanzania. Based on multi-model ensembles used by the World Bank for Tanzania's climate projections, Tanzania is expected to face a range of 0.4-4.3°C increase of mean temperature by the end of the century relative to the 1995–2014 baseline (see World Bank Climate Change Knowledge Portal 2022).[5] The study on the Greater Horn of Africa region shows that rising temperature in Tanzania would likely lead to increased frequency of prolonged drought and extreme heat, while flooding would be exacerbated by intensified heavy rainfalls (Osima et al. (2018)). The combined effect of longer dry spells and heavy rainfall events are likely to slow down growth through its substantial damage to the country's key economic sectors, such as agriculture, tourism, and infrastructure, and energy sectors.

- **Agriculture.** Tanzania has a large and diverse agricultural sector, encompassing traditional export crops (coffee, tea, cashew, sisal, etc.), a booming horticulture export sector, a cattle and meat sector, commercial production of staples (maize, other grains) for domestic and regional markets, and of course subsistence farming. Agriculture is almost entirely rainfed and dependent on seasonal rain patterns; it further depends on often vulnerable physical infrastructure. The agricultural sector accounts for about 25 percent of GDP and employs 75–80 percent of the workforce in the country (USAID, 2018). About 80 percent of agricultural production comes from low-input smallholder farms which are predominantly rainfed and prone to droughts. But the length and intensity of the rainy season have become increasingly unpredictable. Only about 1.5% of national crop land suitable for irritation is irritated, while the national crop land area exposed to at least one drought per year will increase in response to global warming (BMZ and GIZ, 2021). Moreover, the impact of climate change on food production varies by crops. Millet, sorghum, rice, groundnuts and cassava are projected to gain from climate change, but production of maize, the main staple crop nationally and a major export commodity, is projected decrease 8-13 percent by 2050 (USAID, 2018). Livestock production is also at risk from increasing dry spells, flood losses and degraded pasture. Overall, agricultural sector is highly vulnerable to weather variability due to its limited adaptive capacity.

- **Tourism.** Tanzania has globally significant ecosystems and biodiversity with many internationally recognized wetlands and the southern portion of the Coastal Forests of Eastern Africa biodiversity hotspot. The World Economic Forum's Travel and Tourism Competitiveness Index ranks Tanzania 1st in Africa and 12th worldwide for the quality of its nature-based tourism resources. Tourism is a major component of Tanzania's economy. In 2019, tourism sector was the largest foreign exchange earner, the second largest contributor to the gross domestic

[5] These estimates are consistent with the authorities' own projections. According to the authorities' NEMPSI (2022-2032), Tanzania is expected to face a range of 1-2°C increase of mean temperature by 2041.

product (GDP), and the third largest contributor to employment (World Bank, 2021). However, the tourism sector is now at risk from climate change. With rising temperatures and increased frequency and intensity of droughts, wetlands and riverine systems are increasingly at risk of being converted to other ecosystems (BMZ and GIZ, 2021). Increasing temperatures and heavy rainfall also shift the suitable ranges of plant and wildlife species with detrimental impacts for some native specifies, which would threaten important ecosystem services and tourism revenue.

- **Infrastructure.** Droughts and floods have already caused damages to infrastructure, resulting in major economic costs (IMF, 2022). A post-disaster assessment shows that the 2019 Tanga flood severely impacted critical infrastructure including water supply system, electricity networks, roads and bridges, schools, hospitals and residential buildings, and various equipment. According to Tanzanian government's estimate (Tanzania, 2019), the total direct damages and losses are US$19 million. In Dar es Salaam, infrastructure assets with the value of US$5.3 billion are increasingly at risk from flooding and sea level rise (USAID, 2018; Tanzania, 2014). While Tanzania has been most frequently affected by floods (46 times during 1980-2020) based on EM-DAT data, prolonged droughts have led to adverse economic impacts, including the reduction in hydropower capacity. Currently, about 37 percent of Tanzania's electricity generation capacity is based on hydropower, which is susceptible to changing precipitation patterns. Heavy rainfalls in 2017 and 2020 had threatened the structure of dams, whereas dry spells in 2015 led to a near cessation of the Mtera dam (Tanzania, 2021a). To meet future electricity demand, approximately 5,100 MW of hydro capacity is planned over the next twenty years (Tanzania, 2020). Given the climate trends, it is crucial to take full account of climate-related risks in energy infrastructure planning.

- **Other sectors.** Fisheries and construction, which make important contributions to employment and GDP, are also affected by climate change. Fisheries, covering both coastal and regions, provide more than 4 million jobs and are an important food source. Fishing is also threatened by rising sea level and sedimentation exacerbated by heavy rains (USAID, 2018).

Food Security

7. Food production in Tanzania is highly vulnerable to climate change. Given Tanzania's heavy reliance on increasingly unreliable rainfall, current agricultural production will be unlikely to ensure food security in the country nor support the current level of food exports. Both floods and droughts could negatively affect the food security situation via lower crop production and higher post-harvest losses. With every event of flood or drought, there is an increase in food insecurity of 5–20 percentage points (IMF, 2020).

8. Successive shocks from the COVID-19 pandemic and the war in Ukraine and have further increased food insecurity by inflating food import bills. The war in Ukraine drove up prices of food, fuel and fertilizers, exacerbating existing food supply vulnerabilities, which is already weakened under COVID 19 pandemic. Tanzania accounts for 41.2 percent of SSA countries' imported maize and cassava, the two most consumed staples, and also saw food price inflation

compounded by export demand. These challenges are compounding pressures from rapid population growth and a lack of resilience to climate change.

9. Climate change is set to further intensify food insecurity by hampering food production and distribution. Climate change is identified as a primary driver of malnutrition in Tanzania, in addition to demographic change and poverty (Inter-Agency Research and Analysis Network, 2017). Increased food insecurity could weigh on child nutrition, educational attainment, and earnings potential. This could potentially unravel decades of hard-earned improvements in health and education outcomes.

Public Health

10. Climate change is likely to have pronounced impact on public health. Climate change threatens the health and sanitation sector through more frequent incidences of heatwaves, floods, and droughts. Due to increasing temperatures and heavy rainfall events, diarrheal diseases, and malaria, both leading causes of death in Tanzania, are likely to escalate (areas in Tanzania previously free of malaria are now affected, mainly due to rising temperature and moisture levels). Tanzania has the third largest population at risk of this disease in Africa, with 90 % of the population living in malaria areas (MalariaSpot, 2016). Aggressive health programs have reduced malaria morbidity and mortality in recent years, but new cases are emerging in the previously malaria-free highlands due to climate changes. In addition, rising temperatures will result in more frequent heat-related mortality and increased flooding threatens further outbreaks of waterborne diseases.

Inequality

11. Climate change disproportionately affects the vulnerable groups. Climate change is exacerbating already large inequalities, as poorer households are the most adversely impacted. And the post-disaster consumption inequality always widens across households. About half of the population lives below the poverty line and depends on weather-sensitive activities such as rain-fed agriculture, herding, and fishing for their livelihoods. Limited financial buffers and low levels of education and health care impede their ability to adapt to adverse consequences of climate change, raising vulnerabilities to food insecurity and income losses (IMF, 2020).

C. Policy Responses: Adaptation, Mitigation, and Resilience to Climate Change

12. The Tanzania National Climate Change Response Strategy (NCCRS) 2021-26, the Third National Development Plan (FYDPIII), and the NEMPSI (2022-2032) specify policy actions for addressing climate change. The NCCRS 2021-26 updates Tanzania's 2012 climate change strategy It entails a set of adaption and mitigation interventions in major economic sectors, which are designed to strengthen Tanzania's climate change resilience and contribute to global efforts to reduce greenhouse gas emissions. The FYDPIII, which informs national planning across all economic sectors, also contains specific policy actions to promote renewable energy technologies and

strengthen climate change adaptation and mitigation measures. These measures are to be financed through establishing a US$304mn Climate Change Fund and a National Climate Change Financing mechanism, to build institutional capacity for coordinating and enhancing resource mobilization. The NEMPSI (2022-2032) was drafted to guide strategic and coordinated environmental interventions, based on spatial variation of environmental challenges and intervention options. Specifically, it provides an assessment of existing environmental challenges, identifies priority areas for interventions, and establishes intervention options for addressing the environmental challenges. The authorities are also developing an interactive tool, the NEMPSI Dashboard, to allow stakeholders access to environmental data and information.

Table 1. Tanzania: Climate Change Strategies and Institutions[1]

Key Strategies and Plans	Coverage
Updated Nationally Determined Contribution (2021)	Pursuant to Article 4 of the Paris Agreement, Tanzania submitted its updated NDC in 2021 and communicated the commitments towards 2030 in the context of the objectives of the Paris Agreement to hold the increase of the global average temperature to well below 2C above pre-industrial levels while pursuing efforts to limit the increase to 1.5C. The updated NDC covers all key sectors that contribute to the country's mitigation efforts, as well as on the adaptation agenda.
National Climate Change Response Strategy (2021–26)	The National Climate Change Response Strategy (NCCRS) was published in 2021 tandem with the updated NDC. The NCCRS covers the period of 2021-2026 and presents climate actions across sectors to deliver the NDC objectives. The NCCRS includes detailed measures and investments, implementation arrangement, resource mobilization, and the monitoring and evaluation of the NCCRS.
Five Year Development Plan III (2021/22–2025/26)	The Five-Year Development Plan III (FYDP III) is the medium-term national development plan. The FYDP III covers the period of 2021/22-2025-26 and integrates climate change considerations among the guiding principle of Tanzania's development strategy.
National Environmental Master Plan for Strategic Interventions (2022–2032)	National Environmental Master Plan for Strategic Interventions (2022-2032) was published in 2022 and covers the period of 2022-32. The overall objective of the master plan is to guide strategic and coordinated environmental interventions at all levels, based on spatial variation of environmental challenges and intervention options.
Tanzania Vision 2050 (proposed)	The Government of Tanzania is proposing development of Vision 2050 document to formulate a long-term development strategy of the country. This will build the Tanzania Development Vision 2025 and the Long-Term Perspective Plan 2011/12-2025/26. The Vision 2050 is expected to include an emphasis on long-term climate policy and strategic priorities.
National Disaster Management Plan (forthcoming)	As required by the National Disaster Management Act 2015 and the latest amendments in 2022, the government of Tanzania is in the process of developing a National Disaster Management Plan (NDMP). The NDMP is expected to provide an institutional framework for disaster risk management and reduction across levels of government and to be integrated into the country's FYDP.

[1] IMF Technical Report, "Tanzania: Public Investment Management Assessment with Climate Module, 2022.

Table 1. Tanzania: Climate Change Strategies and Institutions (concluded)	
Institutions	**Climate Related Responsibilities**
National Climate Change Steering Committee	The National Climate Change Steering Committee (NCCSC) has been established, chaired by the Permanent Secretary of the Vice President's Office, to ensure coordinated actions across various sectors and institutions. The National Climate Change Technical Committee (NCCTC) has also been established, chaired by the Director of Environment, with the role of providing technical advice to the NCCSC.
Sector Ministries	In the NDC context, line ministries contribute sectoral targets and programs to the national climate strategy, as well as incorporate climate policy targets and goals into their strategies and action plans. Line ministries play a critical role in the development and implementation of climate-relevant infrastructure projects and climate-related rules and regulations.
Ministry of Finance and Planning	The Ministry of Finance and Planning (MOFP) plays a critical role in climate-related public investment planning and budgeting processes, and disaster risk financing. The MOFP coordinates and engages with sector ministries in the implementation of the PIM process and provides relevant guidelines. It is also the counterpart institution for external financing of public investment projects.
Tanzania Meteorological Authority (TMA)	Tanzania meteorological authority provides weather and climate and other related services.
Vice President's Office, Union and Environment	The Vice President's Office, Union and Environment, is responsible for overseeing the implementation of climate related activities and the NDC at the national level. The VPO leads the development of the NDC and the NCCRS, and coordinate with other ministries on their implementation. The VPO is also responsible for the coordination and communication with the UNFCCC.

13. Current and planned interventions have covered several areas. The NEMPSI, NCCRS and FYDPIII are big-picture strategies that need to be supplemented by actionable, fundable, and well-prioritized implementation plans., The authorities have started to identify, plan and implement actions in the following areas:

- **Increasing food security**: The government is promoting investment in irrigation for food production to enhance food security and improving agricultural productivity in more arid areas.
- **Floods prevention and resilience**: The government is advancing in strengthening key infrastructure (e.g., rebuilding highway bridges, flood barriers) to protect transport from disruptions caused by floods. The government also plans to build institutional capacity for sustainable management of water bodies and catchments to reduce flood risks.
- **Reducing charcoal dependence and containing deforestation:** The government promotes the adaption of clean technologies and renewable energy to reduce households' dependence on charcoal and to slow the deforestation rate. Tanzania has been promoting tree planting campaign.

- **Preserving ecosystems**: The government has put in place several measures to safeguard biodiversity and preserve ecosystems, including coastal and marine ecosystem conservation and restoration, wetland conservation and water sources conservation.

- **Other adaptation projects**: The government has implemented some adaptation projects, including Reversing Land Degradation and Food Security in Semi-Arid Areas - LDFS), (2017 – 2022); Ecosystem-Based Adaptation for Rural Resilience in Tanzania, 2018 – 2022; and Construction of sea wall in Mikindani (Mtwara) and Sipwese (Pemba).

14. Macroeconomic resilience to climate change is also enhanced when adapting to changed global economic dynamics and the international climate change agenda. Tanzania's gas reserves could provide valuable revenue while meeting global demand for transition fuels (especially as coal-fired power stations are being phased out) and provide reliable, affordable and comparatively clean energy for domestic users. Tanzania potential for renewable energy (solar, wind, and hydro) together with its strategic location offers a natural advantage for the production of carbon neutral fuels (e-fuel and hydrogen-based fuels) for the global transportation sector. Finally, Tanzania's biodiversity, still high level of forestation and relatively abundant land make it a naturally attractive destination for carbon-offset investments. Realizing these opportunities will require an improved business environment and regulatory reform in the energy sector.

15. Despite its small contribution to the global emissions, Tanzania has committed to a robust climate mitigation goal. In its updated Nationally Determined Contribution (NDC) submitted to the United Nations Framework Convention on Climate Change (UNFCCC) in 2021, Tanzania has set a GHG emission reduction target of 30-35 percent below its business-as-usual (BAU) emission level by 2030 (including mainland Tanzania and Zanzibar). The low ambition scenario, 30 percent reduction, would result in approximately 138 million tons of carbon dioxide equivalent (MtCO2e) lower the BAU scenario by 2030, whereas the high ambition scenario, 35 percent reduction, would result in approximately 153 MtCO2e lower than the BAU scenario by 2030. Tanzania has prioritized four mitigation sectors in the NDC, including energy, transport, forestry and waste sectors. The government also phased out the temporary fuel subsidy in January 2023, which could help reduce greenhouse emissions. Overall, the updated NDC estimates that the total funding required to support the implementation of climate adaptation and mitigation activities would amount to US$ 19.2 billion between now and 2030. The NDC notes that Tanzania needs international support beyond domestic resources for NDC implementation.

D. Conclusion

16. In recognition of its vulnerability to climate change, Tanzania has featured climate goals in its national planning. Strengthening the systems of environmental protection and sustainable use of natural resources are among the key priorities of the Third National Development Plan (FYDPIII). The Tanzania National Climate Change Response Strategy (NCCRS) 2021-26 entails a set of adaption and mitigation interventions in major economic sectors. Other interventions include

the promotion of renewable green energy technologies and strengthening climate change adaptation and mitigation measures.

17. Responding to climate change requires mounting spending and financing. Studies find that responding to climate change by financing adaptation measures will be expensive, but substantially less costly than frequent disaster relief (IMF, 2020). However, ramping up adaptative investment requires mounting financing needs. Tanzania commits to reduce greenhouse gas emissions economy-wide between 30-35% relative to the Business-As-Usual (BAU) scenario by 2030, which is estimated to cost around US$19 billion (Tanzania, 2021b).

18. Effective NDC implementation calls for efficiently mobilizing domestic resources as well as additional financing from the international community. Mobilizing domestic revenues could provide some fiscal space to raise adaptative investment for greater resilience, however Tanzania's effective capacity to undertake strong adaptation and mitigation actions requires financing beyond domestic resources. Accessing grants and concessional financing from development partners is pivotal for NDC implementation, given that the total estimated budget of US$19 billion cannot be met only with domestic resources. Tanzania authorities have expressed interest in the Resilience and Sustainability Trust (RST) to support its efforts to tackle climate change challenges.

19. Private flows could also play a role in advancing climate adaptation. The private sector has an evident interest in investing in adaptation to climate change. The need for private sector contribution is even more pronounced in Tanzania given its sizable needs for adaptation and limited fiscal space. While the estimate of the potential for private investment in climate adaptation is only a small fraction of overall financing needs, private investment remains very important and should be mobilized to the extent possible (Bari and Dessus, 2022).

20. Tanzania has made some progress in addressing climate financing needs, but more financial and technical support are needed. Tanzania is one of few countries with an accredited institution to directly access global climate funds. The OECD climate finance database reports that between 2015 and 2020 Tanzania had commitments for climate-related projects of US$3.8 billion in the form of grants (45 percent), and debt instruments (55 percent), of which 93 percent is concessional. The climate focus of the funds committed were adaptation (48 percent), mitigation (40 percent), and multiple focus (12 percent), mainly in the transport, water and sanitation, energy, and agriculture sectors. However, financing needs remain large to implement aforementioned planned interventions and projects. The government also seeks technical support to enhance capacity in project assessment and execution as well as climate finance access from multilateral funds.

References

Bari, Mounir and Sébastien Dessus, 2022. "Adapting to Natural Disasters in Africa: What is in it for the Private Sector", Working Paper, November 2022, Washington, DC: International Finance Corporation and World Bank Group.

EM-DA, CRED, 2022. UCLouvain, Brussels, Belgium, https://www.emdat.be/

German Federal Ministry for Economic Cooperation and Development (BMZ) and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), 2021. "Climate Risk Profile: Tanzania", Bonn, Germany.

Inter-Agency Research and Analysis Network, 2017. "Overcoming the Challenges of Undernutrition in Tanzania Through 2021," London, UK.

International Monetary Fund (IMF), 2020. "Adapting to Climate Change in Sub-Saharan Africa", Chapter 2, Regional Economic Outlook— Sub-Saharan Africa, April 2020, Washington, DC.

International Monetary Fund (IMF), 2022. Technical Report: "Tanzania: Public Investment Management Assessment with Climate Module", Washington, DC.

MalariaSpot, 2016. "Malaria in Tanzania", https://malariaspot.org/en/eduspot/malaria-in-tanzania/

Notre Dame Global Adaptation Initiative, 2021. "ND-GAIN Country Index",

https://gain.nd.edu/our-work/country-index/

Osima, S. et al. 2018. Projected climate over the Greater Horn of Africa under 1.5°C and 2°C global warming. Environmental Research Letters, Volume 13, Number 6.

Tanzania, Vice-president's Office, 2014. "Second National Communication to the UNFCCC". Dodoma, Tanzania.

Tanzania. Tanga 2019 Flood: Post Disaster Needs Assessment.

Tanzania, Ministry of Natural Resources and Tourism, 2019. "The Potential and Optimal Strategies for Charcoal Sub-sector Development in Tanzania". Dodoma, Tanzania.

Tanzania, Ministry of Energy, 2020. "Power System Master Plan 2020 Update". Dodoma, Tanzania.

Tanzania, Vice-president's Office, 2021a. "National Climate Change Response Strategy 2021- 2026". Dodoma, Tanzania.

Tanzania, Vice-president's Office, 2021b. "Tanzania's Nationally Determined Contribution (NDC)". Dodoma, Tanzania.

Tanzania, Vice-president's Office, 2022. "National Environmental Master Plan for Strategic Interventions (2022–2032)". Dodoma, Tanzania

United States Agency for International Development (USAID), 2018. "Climate Change in Tanzania: Country Risk Profile".

World Bank Climate Change Knowledge Portal 2022.

World Bank, 2021 "Tanzania Economic Update, Transforming Tourism: Toward a Sustainable, Resilient, and Inclusive Sector, July 2021", Washington, DC: The World Bank Group.