THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF WORKS, TRANSPORT AND COMMUNICATION

TANZANIA METEOROLOGICAL AUTHORITY

(TMA)

STRATEGIC PLAN FOR THE IMPLEMENTATION OF THE NATIONAL FRAMEWORK FOR CLIMATE SERVICES (NFCS)

2020 - 2025

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LIST OF ABBREVIATIONS

AMCOMET	African Ministerial Conference on Meteorology
APA	Adaptation Programme in Africa
AU	African Union
AWS	Automatic Weather Station
BRN	Big Results Now
CSOs	Civil Society Organizations
DIDMAC	District Disaster Management Committee
EAC	East African Community
GBS	General Budget Support
GEF	Global Environment Facility
GFCS	Global Framework for Climate Services
GST	Geological Survey of Tanzania
IPCC	Intergovernmental Panel on Climate Change
LGAs	Local Government Authorities
MAM	March April May
MASA	Meteorological Association of Southern Africa
MDAs	Ministries, Departments and Agencies
MHEWS	Multi-Hazards Early Warning Systems
MLF	Ministry of Livestock and Fisheries
MLHHSD	Ministry of Land, Housing and Human Settlements Development
MoA	Ministry of Agriculture
MoHCDGEC	Ministry of Health, Community Development, Gender, Elderly and Children
MoWTC	Ministry of Works, Transport and Communications
NBS	National Bureau of Statistics
NDJFMA	November December January February March April
NEMC	National Environment Management Council
NFCS	National Framework for Climate Services
NFRA	National Food Reserve Agency

NGO	Non-Governmental Organization
NORCAP	Norwegian Capacity
NSC	National Steering Committee
OND	October November December
PDT	Project Delivery Team
PMO – DMD	Prime Minister's Office – Disaster Management Department
PO-RALG	President's Office-Regional Administration and Local Government
PSC	Project Steering Committee
REDMAC	Regional Disaster Management Committee
RISDP	Regional Infrastructure Development Master Plan
SADC	Southern African Development Community
SDGs	Sustainable Development Goals
SPs	Strategic Plans
SWOC	Strength, Weakness, Opportunities and Challenges
TADMAC	Tanzania Disaster Management Council
TANROADS	Tanzania National Roads Agency
TARURA	Tanzania Rural and Urban Roads Agency
TCRA	Tanzania Communications Regulatory Authority
TFNC	Tanzania Food and Nutrition Centre
TMA	Tanzania Meteorological Authority
TMS	Tanzania Meteorological Society
UDOM	University of Dodoma
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
UNSDG	United Nations Sustainable Development Goals
VPO - DoE	Vice President Office - Division of Environment
WIGOS	WMO Integrated Global Observing System
WIS	WMO Information System
WMO	World Meteorological Organization
WWF	World Wide Fund for Nature

GLOSSARY

Climate Service: is the provision of one or more climate products or advice in such a way as to assist decision-making by individuals or organizations

Co-production: is an inclusive, collaborative and flexible means of producing climate services, the process involves different stakeholders that produce and use climate services. Co-production is intended to transform climate data into information and then tailored to meet end users' needs, including providing climate information and advisories that can foster climate smart decision making. Co-production enhance partnership, iterative dialogue and feedback between producers and users of climate services and information.

End users: refers to an individual, community or organisation that use climate services and information.

Global Framework for Climate Services: is the global partnership of government and organizations that produce and use climate information and services.

National Climate Services: are those services that, through a collaborative network of entities under a NFCS, create and provide authoritative, credible, usable and dependable science-based climate information and advice that is of value to government institutions, socio-economic sectors and the broader community.

National Framework for Climate Services: is a mechanism to enhance provision of science-based climate information and products and application for climate risk management

EXECUTIVE SUMMARY

Tanzania has experienced impacts of climate variability and change that include, increase in frequency and magnitude of extreme weather and climate events such as floods and droughts. The impacts regularly have substantial effects on performance of livelihoods and the economy at large. Among the measures to address the impact of climate variability and change is the use of climate services in planning and implementing socioeconomic activities in almost all sectors of the economy. Climate services have been piloted through GFCS. The success of GFCS led to the development of the NFCS to strengthen the institutional capacity in provision and application of climate services for resilience community. This SP has been developed to govern effective implementation of the NFCS for the period of five years from 2020 to 2025. The implementation is guided by existing national laws, policies, strategies and plans as well as international agreements and frameworks.

Chapter one of the SP provides background on climate services in Tanzania, rationale for implementation strategies, focus areas, scope, expected outcome, legal and policy framework and methodology for its development.

Chapter two presents situation analysis on climate change and its impacts in Tanzania, identified gaps in provision of climate services, analyse strengths, weakness, opportunities and challenges in provision of climate services, provide stakeholders analysis focusing on their involvement in the implementation of NFCS activities.

Chapter three provide vision, mission, objectives and guiding principles for the implementation and provision of climate services in the country. The goal of this strategy is to enable effective implementation of the NFCS and enhance adaptation capacity in climate-sensitive sectors, while promoting co-production of climate services and reduce duplication of efforts and/or initiatives in climate change sector.

Chapter four elaborates strategic interventions to address the gaps identified in the situation analysis linked with various activities geared to improve climate services in

the country. This chapter also contain a table which summarizes NFCS objectives, strategic statement, targets, strategic interventions, expected outputs and the proposed financing options for each intervention.

Chapter five gives management and coordination framework of the strategy on the provision and utilization of climate services from national to community level. At national level there will be two committees for overseeing and providing technical services on climate services i.e. TADMAC and TMA respectively. This chapter provides details on responsibilities of each committee involved in the management of the SP.

The last chapter contains monitoring and evaluation mechanisms for measuring and tracking implementation progress of the NFCS. It calls for development indicators based on baseline data collected for the established targets. There are also identified monitoring and evaluation tools and deliverables.

It is anticipated that the strategic interventions of this SP will contribute to effective implementation of the NFCS and enhancement of climate services in the country as the whole.

1.0 INTRODUCTION

1.1 Background

Tanzania like other developing countries has experienced impacts of climate variability and change that include, increase in frequency and magnitude of extreme weather and climate events. Among the measures to address the impact of climate variability and change is the use of climate services in socio economic planning and decisions making. Climate services can help vulnerable communities to address the climate-related risks by providing timely and accessible tailored climate information needed to make well-informed decisions. This underlines the need for better integration of climate services into socio-economic activities, through the implementation of GFCS.

A Memorandum of Understanding (MoU) between the WMO and Norwegian Ministry of Foreign Affairs for the implementation GFCS APA was signed on 20th of November 2013. It was a pilot project implemented in Tanzania and Malawi from 2014 - 2017 for phase I, and 2018 - 2020 for Phase II. The implementation of GFCS APA facilitated the development of quality climate services and promoted its use for management of risks attributed to the impacts of climate variability and change. For sustainability of GFCS, the NFCS in Tanzania was established.

The developed NFCS mimics some of the key issues from the GFCS but it has been further customised to meet the need and context of Tanzania. The aim of establishing NFCS is to enhance the provisional of climate services and promote its use for risk reduction caused by the impacts of climate variability and change. The framework provides a unique opportunity to enhance resilience to climate variability and change through promoting use of climate services, providing evidence for the impacts of climate variability and change and bridge the gap between producer and users of climate services and information. Also, the framework provides an opportunity for involving users in establishing needs, develop appropriate products, identify capacity development requirements and influence direction of observational investments and

research efforts. To ensure effective implementation of the NFCS in the country, this SP has been developed to govern its implementation.

1.2 Rationale of the NFCS Strategic Plan

Climate change is among the most challenging issues facing the society today, as it has been causing severe impacts on many natural systems and different sectors. Prompt and necessary efforts to address the impacts associated with changes and variability of the climate system are imperative. Different actors from different climate-sensitive sectors should join forces in co-producing climate services, so as to enhance resilience and adaptive capacity of the affected sectors. For this to be sustainable, climate services and information should be at the core of planning and decision-making processes. This will effectively contribute in enabling the sectors to adapt and become resilient to the current and projected climate change impacts. NFCS provide an opportunity for different actors and sectors to work together to promote the provisional and use of climate services and information.

This document addresses key issues that are necessary for effective implementation of the NFCS, including roles and responsibilities of different actors in the implementation process. The rationale behind this document is to provide strategic guidance and interventions on how to address insufficient alignment, weak collaboration, inadequate linkages in tapping on synergies in provision and utilization of climate services and information.

1.3 Focus areas of the NFCS SP

Ideally, the NFCS SP provides details of activities to be implemented over a period of 2020 – 2025, with roles and responsibilities, implementing institutions, timeframe, assumptions, short and long-term outcomes, resource requirements and budget. It focuses on understanding of climate risks and vulnerability associated with climate-related hazards; capacity in observations and monitoring of climate systems; provision of climate services at the national and local levels; mainstreaming climate information in development planning and decision making; capacity in developing, packaging and communicating weather and climate information; capacity of users in understanding and application of climate services; and climate related research, modelling and prediction of weather and climate. The priority sectors of the NFCS SP are agriculture and food security; health and nutrition; water, energy as well as disaster risk reduction.

1.4 Scope

The scope covers the strategic interventions of the NFCS on promoting availability, accessibility and usability of climate services to enhance adaptative capacity and reduce vulnerability.

1.5 Expected Outcome

The expected outcome of the NFCS SP is to strengthen the institutional capacity in provision of improved climate services and promote its application to climate sensitive sectors for managing climate risk to enhance community resilience.

1.6 Legal Framework and Policy

The implementation of the NFCS SP 2020 – 2025 is guided by laws, national policies, strategies, plans as well as international agreements and frameworks. Primarily, the implementation of this framework will be governed by the Tanzania Meteorological Authority Act No. 2 of 2019, which mandates the operations of TMA. Other laws

include; Disaster Management Act No.7 of 2015, Tanzania Civil Aviation Act No. 10 of 2003, Environmental Management Act No. 20 of 2004 and other legislations in different government institutions that deal with meteorological aspects.

National policies, strategies and plans that supports the implementation of the NFCS include; Tanzania Development Vision 2025; Tanzania Long Term Perspective plan 2011/12-2025/26; National Disaster Management Policy (2004); National Transport Policy (2003); National Information and Communications Technologies Policy (2003); National Science and Technology Policy (1996); National Environmental Policy (1997); National Agriculture Policy (2013); National Climate Change Strategy (2012) and Intended Nationally Determined Contribution for Tanzania (INDC); National Livestock Policy (2006); Water Policy of 2002; Water management Act no. 11 of 2019 and Water Resources Management Strategic Interventions and Action Plan for Climate Change Adaptation in Tanzania.

The implementation strategy is linked to international agreements and frameworks such as the United Nations Framework Convention on Climate Change (UNFCCC); WMO Convention; Paris Agreement; Sendai Framework for Disaster Risk Reduction 2015 -2030, Tanzania Emergency Preparedness and Response Plan, and other climate related legal policies, strategies and agreements.

1.7 Methodology

The process of the preparation of the NFCS SP commenced after the launching of the NFCS. The national coordinator of implementation of the NFCS nominated the team of experts for the preparation of the strategy, the team was endorsed by TADMAC. The team comprised of experts from TADMAC secretariat and TMA.

In undertaking the assignment, the team conducted a desk review of relevant documents from Government, WMO and other sources. Key documents that were reviewed include: NFCS 2018 -2025, Strategic Plan for Tanzania Meteorological Agency

2017/18-2021/22; other relevant international, regional and national Strategies such as the United Nations Sustainable Development Goals (UNSDG), WMO Strategy 2016-2019, AMCOMET Integrated Strategy for Africa, Meteorological Association of Southern Africa (MASA) Strategic Plan, East Africa Community (EAC) Climate Change Strategy, Southern African Development Community (SADC) Regional Infrastructure Development Master Plan (RISDP 2012-2027), and National Vision 2025.

The draft strategy was presented to stakeholders to incorporate their views. The draft was reviewed by PDT which oversees implementation of GFCS activities at a technical level in Tanzania, TADMAC platform, Tanzania Meteorological Society (TMS) as well as other stakeholders at national and GFCS implementation pilot districts of Kiteto, Kondoa and Longido. Furthermore, a number of written comments were received from Ministries, Departments and Agencies (MDAs), international organizations and Non-Governmental Organizations (NGOs). Lastly a team of experts coordinated by TMA finalized the strategy by incorporating all relevant comments from various institutions, experts, stakeholders' workshops to produce a final document of the SP.

2.0 SITUATION ANALYSIS

2.1 Climate Change and its Impacts in Tanzania

The climate of Tanzania has strong annual and seasonal cycle components, with precipitation being the parameter with highest space and time variability. On average, the country's annual precipitation is 1,042mm, but annual rainfall ranges from 550mm to 2100mm for South and Southwestern highlands, from 800mm to 1800mm over Lake Victoria zone, from 550mm to 1500mm in Northeastern highlands, from 800mm to 1700mm over the Eastern part, and from 550mm to 1000mm in Central and Western regions. The Northern regions of Tanzania experience two rainfall seasons namely March April May (MAM), and October November December (OND), while Central, West and Southern regions experience unimodal rainfall season occurring between November to April in the subsequent year.

Temperature in Tanzania ranges between 14.4°C – 26.4°C. The annual minimum air temperature and maximum air temperature across the stations in Tanzania ranges from 9.6°C – 22°C and 19.1°C – 30.7°C, respectively. The highest temperatures are observed over the Coast and Western parts of the country and the hottest period occurs from October to February or March, with temperature range (25°C – 31°C), whereas the coldest period is often observed between May and August (15°C – 20°C). Climate analysis of recent climate trends reveals that climate change poses significant risks for Tanzania. The analysis of observed data from individual stations in Tanzania done by TMA and other studies reveal that, temperatures in Tanzania have been increasing since 1960's. The mean temperatures across the coastal areas and the islands have increased by approximately 1.9°C between 1961 and 2005. Similarly, in highland areas annual temperature has increased by 1.1°C. The major portion of Western Tanzania has experienced an increase in temperature between 1°C and 2°C from 1974 to 2005. Elsewhere, temperatures have generally increased between 0.2°C and 1°C.

On the other hand, changes in annual rainfall since 1960s are not as dramatic. Across the country, the trends are variable since they reflect the influence of the local climate effects. Climate related extremes have been the dominant trigger of natural disasters. The rainfall pattern is no longer predictable and hence there have been serious recurrent episodes of both excessive and deficient rainfall in recent years. The intensity, duration, and frequency of droughts and floods have increased, and will have serious implications on agriculture, human health, energy, water as well as other human activities.

Several studies conducted recently in Tanzania recognized that climate change and variability is happening and is coupled with significant impact such as floods and droughts. The impacts regularly have substantial effects on economic performance and livelihoods of communities in rural areas that depend on rain-fed agriculture. Drought and dry spells are the major source of famine especially in semi-arid areas because they contribute considerably to crop failure resulting into food insecurity and low-income generation. Other important evidence of climate change often mentioned for Tanzania include receding ice on Mount Kilimanjaro, the rise of sea level that results in to submergence of Islands and intrusion of salt water in shallow wells. Increased cases of Malaria have been reported in the highlands of Tanzania and is linked to the observed warming trend.

Future climate projection for Tanzania reveals that, air temperature for the whole country in all seasons is projected to increase between 3°C and 4°C by 2080 under no action scenario. Warm and cold extremes are also projected to increase in many parts of the country. The frequency and intensity of floods and droughts are projected to increase in Tanzania. But the projection of rainfall amount is variable and depends on the season and geographical areas. It is projected to increase mostly during OND season compared to MAM and NDJFMA (November December January February March April) seasons. In some areas the length of wet season is projected to decrease but increase in other areas.

Global, regional to local impacts of climate variability and change have fuelled a growing public demand for climate services i.e. provision of climate information to assist decision-making by individuals and organizations. There is a call for easily accessible and timely scientific climate data and information to support the government, institutions and individuals to make informed decisions. The integration of climate services will promote resilience in the country and hence reduce vulnerability of individuals and sensitive sectors. Accurate and timely weather and climate forecasts, climate analyses, predictions, dissemination and accessibility will further improve human safety, prosperity and livelihoods as well as preserve precious natural resources for the benefit of communities, especially the most vulnerable.

2.2 Gaps in provision of Climate Services

The major challenges facing effective provision and utilization of climate services include inadequate meteorological infrastructure, inadequate communication facilities; human resource development; dissemination of climate services; etc. These challenges are aggravated by the increasing running cost of operational activities and inadequate government budgetary allocations.

i. Inadequate meteorological infrastructure

Tanzania has unique and diverse climatic characteristics ranging from tropical to arid and semiarid low lands. However, the current observation network is not sufficient enough to capture all climatic regimes and local climate. Also, insufficient data due to low density of station network affects research on climate monitoring, attribution and detection. Moreover, TMA need calibration units for meteorological instrument. These units are vital to ensure accuracy of meteorological data and information. In order to fill the gap in meteorological infrastructure, more weather observation stations are required as indicated in Figure 1.

Despite of the existing network of meteorological stations, TMA needs to increase its number of network of stations to cover the available shortage of 3 Conventional Surface synoptic stations, 68 Automatic Weather Stations (AWS), Surface synoptic stations, 8

Agro-meteorological stations, 100 Ordinary climate stations, 2500 Automatic Rainfall stations, 12 Marine weather stations, 2 Upper air stations, 5 Pilot Balloons, 2 Weather Radars, 10 Lightning detectors and 1 Orbiting satellite receiver.

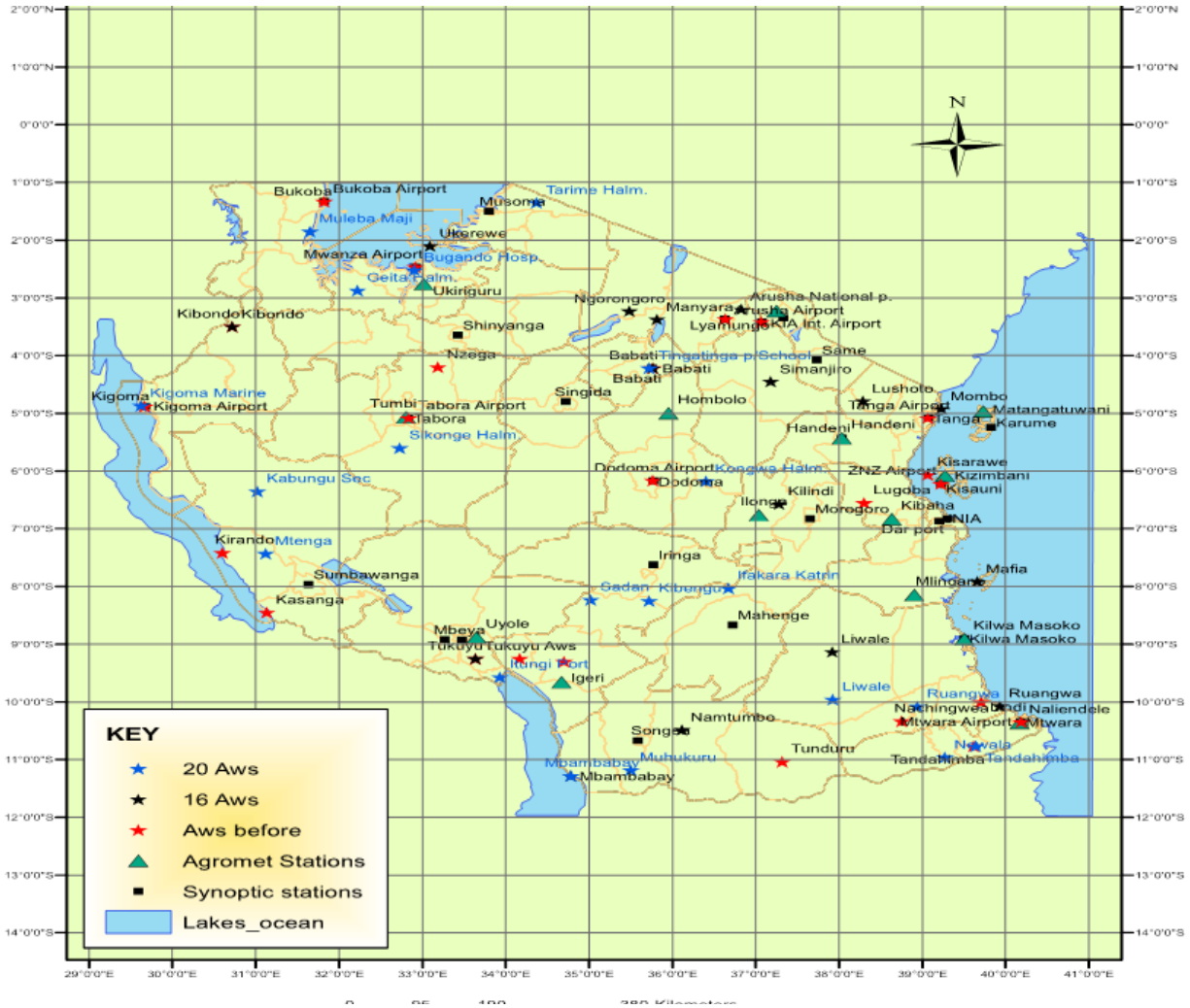

Figure 1: Observation network in Tanzania, source TMA 2019

Forecasting operations require high investments in equipment and technology. Lack of Central Forecasting building at TMA hinders investments and installations of various communication facilities due to conditions set by owners. TMA is equipped with ground satellite receiver called RETIM, which receives information from geostationary satellite. However, in order to improve efficiency and accuracy in weather forecast, there is a need to acquire receiver from polar orbiting satellites for obtaining high resolution information, adequate internet bandwidth and computing facilities for

Numerical Weather Prediction. Moreover, the weather studio needs to be revamped since it lacks important modern facilities.

ii. Inadequate communication infrastructure

In order to fulfil the national and international obligations in the rapid exchange of meteorological data and products, TMA need to enhance its communication facilities. The main challenge facing TMA is outdated telecommunication systems and lack of automatic linkages between national observing networks and national communication centre at TMA.

iii. Human resource development

Having the right expertise is important for the provision of climate services. However, adequacy of well-trained and competent experts required for effective climate services is another challenge that will need to be addressed in the course of implementation of the NFCS.

iv. Dissemination of climate services

There is ineffective linkage between TMA and specific climate information users including disaster management institutions, farmers, media and local community at large. Currently, the dissemination of climate services from the provider to the end user is via the intermediaries such as media and extension officers, who need to be knowledgeable in communicating weather and climate information. The intermediaries need to be well capacitated to ensure effective communication of weather and climate information that will support planning and decision making.

2.3 Strengths, Weakness, Opportunities and Challenges (SWOC) Analysis

SWOC analysis was conducted as a beneficial decision-making tool to establish important overview of the strengths, weaknesses, opportunities and challenges in

provision of climate services. Based on the evaluation of the previous programmes, projects, Strategic Plans (SPs) and the Baseline Analysis of TMA, a SWOC analysis was conducted with results shown in table 1. According to SWOC analysis, the provisional and use of climate services faces number of challenges, which require well-defined strategies to be addressed. There are also a number of weaknesses ranging from inadequate funding, infrastructure and capacity to respond to rapid technological change. On the other hand, in provision of climate services there are strengths and opportunities identified that can be used to improve service delivery. The analysis identified challenges, which have to be taken into account to minimize barriers in delivery and use of climate services.

Table 1: SWOC Analysis

Strengths	**Weaknesses**
1. Establishment of TMA as a designated Authority for weather and climate services 2. Membership of TMA to WMO and various regional bodies and institutions such as EAC, and MASA with its affiliation to SADC policy organs 3. TMA being a national focal point for early warning information 4. Capability of TMA to carry out international and Regional obligations 5. Custodian of national climate databank 6. Recognition of TMA as an authoritative voice on public forecasts and warnings 7. Good governance and rule of law 8. Well trained, competent professional staff 9. Good collaboration with stakeholders and other countries	1. Inadequate meteorological infrastructure and observational network 2. Inadequate communication means 3. Insufficient financial resources 4. Inadequate capacity of calibration of meteorological instruments 5. Limited engagement and partnership with stakeholders 6. Inadequate capacity to respond to rapid technological change 7. Inadequate human resources capacity 8. Use of scientific language/jargon
Opportunities	**Challenges**
1. Support by government and international development partners	1. Existence of unauthorized sources of Meteorological information and

2. Availability of modern technologies 3. Global recognition and investment on climate change 4. Institutional Research and development collaboration 5. Increased public awareness on weather and climate issues 6. Private Sector Partnership 7. Emerging weather and climate sensitive sectors and stakeholders e.g. Oil and Gas 8. Increased demand of tailor-made services 9. Bilateral and multilateral cooperation 10. Good Political-will 11. Use of TRCS networks 12. Existence of NGOs and CBO implementing climate services projects 13. Presence of media and social networks 14. Existence of TMA zonal offices	services 2. High cost of meteorological equipment, instruments and consumables 3. Insufficient financial resources 4. Rapid technological change 5. Inadequate meteorological professional human resources supply 6. Climate variability and change 7. Low uptake and mainstreaming of weather and climate information

2.4 Stakeholders Analysis

Provision of climate services requires partnership and collaboration among and between stakeholders from various sectors. In this SP key partners and stakeholders that are directly or indirectly involved in the implementation the activities of the NFCS are identified and their potentiality is highlighted. These stakeholders have important roles to play in enhancing access and use of climate services to reduce risks associated with climate and weather hazards. Stakeholders are also critical for facilitating the delivery of weather, climate related products and services. Development partners are essential in resource mobilization as well as enhancing cooperation with national and international stakeholders to enable adequate delivery of climate services and enhancing stakeholders' engagement especially policy makers for sustainable implementation of the Framework.

Table 2: List of stakeholders with directly and indirectly potential to implement NFCS activities

No.	Cluster	Stakeholders	Potential
1.	Government Institutions	• President Office-Regional Administration and Local Government (PO – RALG), • Vice President Office (VPO), • Prime Minister's Office Disaster Risk Reduction and Management (PMO-DMD), • Ministry of Agriculture (MoA), • Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC), • Ministry of Lands, Housing and Human Settlements Development (MLHHSD), • Ministry of Water (MoW), • Tanzania Civil Aviation Authority (TCAA), • Local Government Authorities (LGAs), • Tanzania Airports Authority (TAA), • Tanzania People's Defence Forces (TPDF), • Tanzania Shipping Agencies Corporation (TASAC), • River Basins Authorities, • Tanzania National Roads Development (TANROADS), • Tanzania National Parks Authority (TANAPA), • National Environment Management Council (NEMC). • Tanzania Communication Regulatory Authority (TCRA) • Tanzania Rural and Urban	• Feedback and financial support. • Collaboration in DRR initiatives and feedback • Revenue on cost recovery basis. • Access of international funding for climate change projects. • Cooperation in establishing air pollution monitoring stations.

No.	Cluster	Stakeholders	Potential
		Roads Agency (TARURA)	
2.	Academia and Research Institutions	• University of Dar es Salaam (UDSM), • Ardhi University (ARU), • Sokoine University of Agriculture (SUA), • Dar es Salaam Institute of Technology (DIT), • Tanzania Agriculture Research Institutes (TARI), • Tanzania Fisheries Research Institute (TAFIRI), • Tanzania Livestock Research Institute (TALIRI), • National Institute for Medical Research (NIMR), • Ifakara Research Institute (IRI).	• Collaborative research and in observations
3.	Community Representatives	• Farmers associations, • Livestock associations, • Women Groups, • Youth Groups, • Individuals • Communities with special needs (special groups) • Community Based Organisations (CBOs) • Local Government Authorities (LGA)	• Capacity building, Dissemination and use of climate services
4.	Media and Communication	• Radios, • Televisions • Newspapers, • Telephones and mobiles phones, • Telecommunication companies	• Dissemination of warnings and weather information to public and other stakeholders • Enhanced public awareness on weather and climate services

No.	Cluster	Stakeholders	Potential
5.	Technical and financial partners	• UN agencies, • Multilateral and International Organizations,	• Contribution of research and technology • Technical and human resources assistance
6.	Private Sector	• Private Sectors	• Partnerships for provision of services e.g. (observations especially AWS).
7	CSOs	• NGOs, CBOs	• Capacity building and dissemination of climate services
8.	End users	• Farmers, • Livestock keepers • Fishers • Electricity generators • Public Health officers • Water users • Agro dealers	• Use of climate services

3. FRAMEWORK FOR NFCS STRATEGIC PLAN

This NFCS SP has been developed with a vision of improving resilience whilst reducing vulnerability of communities, climate-sensitive sectors and social systems to climate change in Tanzania. Its mission is to establish effective and efficient mechanism to produce, access, and utilise climate services that will aid swift adaptation to climate change and variability in different sectors in Tanzania.

3.1 Vision

To enable better management of risks and utilize opportunities of climate variability and change through development and application of climate services in planning and implementation at all levels.

3.2 Mission

To strengthen efficiency and effectiveness in provision and application of climate services thereby contributing to socio-economic development.

3.3 Goal

The goal of this strategy is to enable effective implementation of the NFCS and enhance adaptation capacity in climate-sensitive sectors, while promoting co-production of climate services and reduce duplication of efforts and/or initiatives in climate change sector.

3.4 Objectives

The overall objective of the NFCS is to enhance socio economic development through provision of science-based climate services and promote its use for climate risk managements and adaptation to the impacts of climate variability and change.

SP of the NFCS aims at providing direction to ensure achievement of the following specific objectives:

i. Enhance capacity in observations and monitoring of climate systems
ii. Enhance understanding of climate risks and vulnerability associated with climate-related hazards
iii. Improve provision of climate services at the national and local levels
iv. Mainstream climate information in development planning and decision making
v. Enhance the capacity in developing, packaging and communicating weather and climate information
vi. Enhance the capacity of users in understanding and application of climate services
vii. Enhance climate related research, modelling and prediction of weather and climate

3.5 Guiding Principles

There are several guiding principles[1] for the implementation and provision of climate services in the country. Some of those principles are as follows:

i. The activities and elements of a climate service should be user centric.
ii. If a climate service function is to improve and succeed, it should be supported by active research.
iii. Advanced information (including predictions) on a variety of space and time scales, in the context of historical experience, is required to serve national needs.
iv. The climate services knowledge base requires active stewardship.
v. Climate services require active and well-defined participation by government, business, and academia.

[1]National Academia of Science Engineering Medicine (https://www.nap.edu/read/10198/chapter/5)

4. STRATEGIC INTERVENTIONS FOR IMPLEMENTING THE NFCS

Strategic interventions are the plans and strategies into action to reach goals. Implementation of interventions includes a strategic mapping which identify and maps the key ingredients that direct performance.

To address the gaps identified in the situation analysis, there is a set of strategies established and linked with various activities geared to improve climate services in Tanzania.

4.1 Strategies to address inadequate meteorological infrastructure

Background: This set of strategies are aimed at addressing inadequacy of meteorological infrastructure and its coordination among sector players for provision of climate services including climate monitoring, attribution, detection and adherence to national and international standards which will contribute to data archiving system of National Meteorological Databank.

Rationale: The required interventions are those that will ensure adequate meteorological infrastructure to comply with the national and international requirements for provision of weather and climate services. The plan involves expansion of observation network to improve provision of meteorological services and enhancing National Meteorological Databank.

In addressing the identified gap under meteorological infrastructure and improvement of national meteorological databank, the objective will be enhancing capacity in observations and monitoring of climate systems.

The Following Specific Activities will be undertaken:

i. Establish weather stations and enhance observation network
ii. Improve database of the existing stations

4.2 Strategies to address inadequate communication facilities

Background: Currently, there are inadequacy linkages between national meteorological observing network and other stakeholder's communication systems at national and international levels in exchange of meteorological data and products. This is observed under national and international data exchange and in linkages between Climate Services Provider and Specific Climate Information Users, including disaster management institutions, farmers, media and local community at large.

The dissemination of climate services involves several stakeholders such as media, extension officers who needs to be knowledgeable in communicating weather and climate information. The intermediaries need to be well capacitated to ensure effective communication that will support planning and decision making.

Rationale: This set of strategies are aimed at addressing inadequacy linkages between national meteorological observing network and other stakeholder's communication systems at national and international levels in exchange of meteorological data and products. There is a need to improve communication facilities with other stakeholders in order to strengthen meteorological data and information communication.

The inadequacy will be addressed by enhancing capacity in developing, packaging and communicating weather and climate information.

Specific actions to be taken will include:

i. Train TMA technical staff in developing, packaging and communicating weather and climate information
ii. Procure equipment and software for preparation and processing of weather and climate information

iii. Train intermediaries in communicating and disseminating weather and climate information
iv. Conduct advocacy and awareness creation to stakeholders
v. Upgrade ICT packages for communicating weather and climate information
vi. Identify channels for communicating weather and climate information

4.3 Strategies to address inadequate facilities in weather forecasting

Background: Forecasting operations require high investments in equipment and technology. In order to improve efficiency and effectiveness in weather forecasting, there is a need to invest in powerful computing forecasting tools and facilities to enhance reliability and accuracy of weather and climate information.

Rationale: The required interventions are those that will ensure adequate facilities in weather forecasting to comply with national and international requirements for provision of weather and climate services including issuance of warnings for severe weather and extreme climate events.

The identified gap will be addressed by enhancing climate related research, modelling and prediction of weather and climate through strengthening data processing and forecasting systems.

Specific actions to be taken will include:

i. Develop and improve weather and climate prediction models
ii. Train TMA experts in Numerical Weather Prediction and climate prediction
iii. Establish satellite receiving centers
iv. Procurement of hardware for weather and climate modelling
v. Carry out climate related research

4.4 Strategies to address human resource development

Background: Expansion of services and an envisaged increase need of meteorological stations require sufficient meteorological personnel. Meteorological profession is rarely available in the local labour market hence maintaining the right expertise across the sector is an on going challenge.

Rationale: The proposed activities will ensure that TMA has sufficient, qualified, and motivated professionals to improve provision of quality climate services at the national and local levels.

The following specific activities will be undertaken:

i. Identify user needs of climate services at national and local levels
ii. Train TMA technical staff at national and local level to produce tailor made products
iii. Preparation of tailor-made products

4.5 Strategies to address inadequate awareness on socio-economic benefits of meteorological information and products

Background: Weather and climate data, forecasts, information and warnings are not utilized fully by intended users on their daily socio-economic activities.

Rationale: The following activities will create awareness on weather, climate information and warnings to socio-economic sectors and the public in general, by using available means of communication. This will enhance the capacity of users in understanding and application of weather and climate information in their socio-economic activities.

The following specific activities will be undertaken:

i. Conduct assessment of socio- economic benefit of climate information

ii. Train intermediaries at National and Local Level to produce tailor made products
iii. Conduct advocacy and awareness meetings to stakeholders on application of climate information

4.6 Strategies to enhance research, modelling and prediction of weather and climate

Background: Climate change is considered one of the most challenging issues facing the society today as it is already causing significant impacts in many natural systems. The links between weather and climate change are complex and intertwined necesitating continuous data collection and monitoring essential variables for detection, modelling and making projections of the climate system, based on plausible future scenarios. There is a need of conducting climate research in order to improve weather and climate prediction.

Rationale: The activities highlighted will enhance weather and climate research, including improvemement of models which will help to understand the weather and climate systems that influence weather and climate predictions. This will lead to improved climate services to targeted communities.

The following specific activities will be undertaken:

i. Develop and improve weather and climate prediction models
ii. Train TMA experts in Numerical Weather Prediction and climate prediction
iii. Establish satellite receiving centers
iv. Procurement of hardware for weather and climate modelling
v. Carry out weather and climate related research

4.7 Strategies for addressing inadequate mainstreaming of weather and climate services into socio-economic activities

Background: Mainstreaming weather and climate services is essential for disaster risk reduction in support of sociol economic development by increasing the ability of communities to respond to weather related events.

Rationale: Economies are largely directly dependent on natural resources, hence vulnerable to climate change. Many development processes, policies and decisions are affected by weather and climate. Weather and climate services are important in supporting institutions to build capacity across climate sensitive sectors of the economy in the face of climate change.

The following specific activities will be undertaken:

i. Conduct awareness/advocacy to planers and decision makers at national and sub-national level on integration of climate information in development planning
ii. Conduct awareness raising to secondary schools students on adaptation and mitigation of climate change impacts in socio-economic activities

The table 3. summarizes NFCS objectives, strategic statement, targets, strategic interventions, expected outputs and the proposed financing for each strategic intervention.

Table 3: Strategic mapping and intervention in implementing NFCS

NFCS Objective	Strategic statement	Goal/Target	Expected output	Strategic intervention	Resources (USD)	Key actors
1.0 Enhance capacity in observations and monitoring of climate systems	In order to provide high quality climate information, it is crucial to have state of the art climate observation and monitoring systems.	To increase number of weather and climate observation and monitoring system in the country	i. Weather stations established and observation network enhanced ii. Database of existing weather stations improved	i. Establish weather stations and enhance observation network	28,555,000	**Co implementor** TMA **Collaborators** • MDAs, • LGAs, • Research organization, • Higher Learning institutions, • DPs, • Civil Society Organizations
				ii. Improve database of existing weather stations	10,000	
2.0 Enhance the capacity in developing, packaging and communicating weather and climate information	Providers of climate information should ensure the provided climate information can be easily understood and communicated without distoring its intended meaning.	Improved capacity of TMA staff in developing well packaged climate information	i. Improved knowledge and skills of technical staff ii. Improved process for preparation of weather and climate information iii. Improved	i. Train TMA technical staff in developing, packaging and communicating weather and climate informatio	40,000	**Co implementor** TMA **Collaborators** • MDAs, • LGAs, • Research organization, • Higher Learning institutions,
				ii. Procure equipment and software for preparation and processing of	70,000	

NFCS Objective	Strategic statement	Goal/Target	Expected output	Strategic intervention	Resources (USD)	Key actors
			knowledge and skills for intermediaries in communicating climate information iv. Improved understanding of climate services to stakeholders v. Improved accessibility of weather and climate information vi. Improved dissemination of weather and climate information	weather and climate information		• DPs, • Civil Society Organizations
				iii. Train intermediaries in communicating and disseminating weather and climate information	50,000	
				iv. Conduct advocacy and awareness meetings to stakeholders	50,000	
				v. Upgrade ICT packages for communicating weather and climate information	120,000	
				vi. Identify channels for communicating weather and climate information	5000	

NFCS Objective	Strategic statement	Goal/Target	Expected output	Strategic intervention	Resources (USD)	Key actors
3.0 Enhance understanding of climate risks and vulnerability associated with climate-related hazards	Climate change impacts have been affecting individuals as well as different sectors in the country. Increasing awareness of climate change risks is an important step in reducing vulnerability.	To ensure all Tanzanian citizens are conversant with climate change and its associated risks	i. Improved understanding of climate related hazards and risks	i. Conduct training to personnel at national and local levels on climate related hazards and risks	40,000	**Co implementor** TMA **Collaborators** • WMO, • PMO-DMD, • MALF, • VPO, • PO-RALG
				ii. Conduct advocacy and awareness creation to stakeholders	40,000	
				iii. Mapping of Climate related Hazards	30,000	
4.0 Improve provision of tailored weather and climate	For individuals and sectors to be able to make infomed smart climate decisions,	To enhance provision, and accessibility of climate services	i. Improved quality of climate services which is reliable and	i. Identify user needs of climate services at national and local levels	20,000	**Co implementor** TMA **Collaborators** • MDAs, • LGAs,

NFCS Objective	Strategic statement	Goal/Target	Expected output	Strategic intervention	Resources (USD)	Key actors
services at the national and local levels	climate services should be readily available and easily accessible by all		accessible ii. Improved capacity of TMA staff to produce tailored climate services as per users needs iii. Identified end user needs for climate services	ii. Train TMA technical staff to produce tailor made products	40,000	• Research organization, • Higher Learning institutions, • DPs, • Non-State actors, • Communities.
				iii. Prepare tailor made products	30,000	
5.0 Enhance the capacity of users in understanding and applying climate services	Failure in understanding climate information can cause failure in applying the information in soci-economic activities. Users should be built with the necessary capacity in applying climate information in their activities.	Increased application of climate information by individuals in their socio-economic activities	i. Improved understanding and application of climate services to stakeholders	i. Conduct assessment of socio- economic benefit of climate information	40,000	**<u>Co implementor</u>** TMA **<u>Collaborators</u>** • MDAs, • LGAs, • Research organization, • Higher Learning institutions, • DPs, Non-State actors,
				ii. Train intermediaries at National and local level to produce tailor made products	50,000	

NFCS Objective	Strategic statement	Goal/Target	Expected output	Strategic intervention	Resources (USD)	Key actors
				iii. Conduct advocacy and awareness meetings to stakeholders on application of climate information	30,000	Communities
6.0 Enhance climate related research, modelling and prediction of weather and climate	Weather and climate research improves models that facilitates understanding of weather and climate systems that influence weather and climate predictions. This leads to improved climate services to targeted communities.	Weather and climate prediction are informed by reasearch	i. Improved weather and climate prediction models ii. Satellite receiving centres established iii. Improved climate and numerical weather prediction iv. Improved production of weather and climate	i. Develop and improve weather and climate prediction models	150,000	**<u>Co implementor</u>** TMA **<u>Collaborators</u>** • MDAs, • LGAs, • Research organization, • Higher Learning institutions, • DPs, • Non-State actors.
				ii. Train TMA experts in Numerical Weather Prediction and climate prediction	100,000	
				iii. Establish satellite receiving centers	80,000	

NFCS Objective	Strategic statement	Goal/Target	Expected output	Strategic intervention	Resources (USD)	Key actors
			information	iv. Procurement of hardware for weather and climate modelling	150,000	
				v. Carry out climate related research	200,000	
7.0 Mainstream climate information in development planning and decision making	As a way of improving resilience of the country towards the impact of climate change, climate information should be at the heart of planning and decisiion making processes.	To promote integration of climate information in development planning and decision making	i. Improved understanding and integration of climate information tin planning and decision making ii. Improved understanding on adaptation and mitigation	i. Conduct awareness/advocacy to planners and decision makers at national and district level on integration of climate information in development planning	50,000	**<u>Co implementor</u>** TMA **<u>Collaborators</u>** • MDAs, • LGAs, • Research organization, • Higher Learning institutions,

NFCS Objective	Strategic statement	Goal/Target	Expected output	Strategic intervention	Resources (USD)	Key actors
			measures of climate change	Conduct awareness raising to secondary schools students on adapatation and mitigation of climate change impacts in socio-economic activities.	50,000	• DPs, • Non-State actors.
GRAND TOTAL (USD)					**30,000,000**	

5. MANAGEMENT OF THE NFCS IMPLEMENTATION STRATEGY

The provision and utilization of climate services require involvement and cooperation among different stakeholders at all levels. Climate services are important for planning and implementation of development activities in almost all sectors of the economy. This SP analyses and establishes a strategic framework which identifies roles and responsibilities of all stakeholders in provision and utilisation of climate services in the country for resilience community. It is expected that everyone will take part in the implementation of the NFCS according to their mandates for the benefit of all.

There will be a framework for coordination on the provision and utilization climate services from national to community level. The management structure, roles and responsibilities of different stakeholders on the implementation of NFCS are as outlined.

5.1 Management Structure

5.1.1 National level

There will be three committees at national level for overseeing and providing technical support on climate services. The committees are: (i) TADMAC, which is composed of Permanent Secretaries from Government Ministries, Heads of early warning institutions and Heads of institutions which provide emergency services, will serve as the steering committee. (ii) TMA will provide technical assistance to TADMAC on all matters concerning climate services provision and (iii) The National Disaster Management Platform will be the major technical forum between providers and users of climate services in Tanzania. The Platform is composed of members from various Ministries, Departments and Agencies (MDAs), Local Government Authorities (LGAs), United

Nations (UN) agencies, International and National Development Partners, Academicians, Private sector, religious/faith groups, CSOs and the media.

Roles of TADMAC

- Provide directives on matters related to climate services to relevant sectors for actions.
- Ensure political support, implementation and sustainability of the NFCS in the country.

Roles of National Disaster Management Platform

- Discuss all major issues on production and use of climate services under NFCS and provide recommendations to TADMAC for decision and directives.
- Provide sector needs and priorities on climate and weather services
- Analyse weather and climate services products and give sector inputs for implementation actions

Roles of TMA

- Coordinate the implementation of the SP in collaboration with other actors.
- Provision of weather and climate services in the country.
- Collaborate with Ministries and institutions to benefit co-production of weather and climate information.

5.1.2 Regional level

At regional level there will be a Regional Disaster Management Committee (REDMAC). REDMAC plays pivotal role for the implementation of disaster management activities in the regions. The committee is composed of members of Regional Secretariat (RS) and other key actors for development in the regions from government, CSOs, FBOs and private sector. The committee will take the responsibility to ensure weather and climate services is an agenda to their normal operation in order to provide a link between national objectives and district priorities. REDMAC will work in close consultation with TMA zonal and regional offices for technical assistance on climate services in the region. There will be a close link between REDMAC and TMA zonal and regional managers through Regional Disaster Management Coordinators.

Roles of REDMAC

- Oversee and coordinate climate services among government institutions, local authorities, communities and other role players.
- Align regional coordination mechanism with TMA zonal and regional offices and facilitate the establishment of regional system for contribution on production and utilisation of climate services.

5.1.3 District level

At district level there will be a District Disaster Management Committee (DIDMAC). DIDMAC is important mechanism to communicate the need and impact of climate services at their areas. This is important committee which can provide feedback from community on the benefit of climate services and provide recommendations for improvements.

Roles of DIDMAC

- Oversee and coordinate climate services at district level.
- Provide views to facilitate provision and utilisation of climate services at their level.

5.1.4 Ward and Village/Street level

At Ward and village level there will be Ward and Village/street Disaster Management Committees. These committees are at the frontline of development effort, where plans are actually implemented. They have to ensure establishment of appropriate structure both for coordination on contribution to production and utilization of weather and climate services at their level.

Roles of Ward and Village/street committees

- Oversee and coordinate utilisation of climate services at their level.
- Facilitate the implementation of climate services programs at their localities.
- Implement awareness programs on climate services to communities.

In addition to actors at national level, implementation of climate services requires cooperation and collaboration with different actors at regional and global level, in terms of support and sharing of technology and innovation, skills development, funding, equipments, software, etc. The implementation of NFCS will nurture on existing mechanisms on establishing and engaging with new opportunities. The current collaboration and cooperation include regional mechanism on East African Community (EAC), IGAD Climate Prediction and Application Centre (ICPAC), South African Development Community (SADC) and at global level through WMO, and multilateral institutions like United Kingdom Met Office (UK MET office).

5.2 FINANCING OF THE STRATEGY

Availability of resources is very important for the implementation of this strategy. To ensure effective implementation, financial, technology as well as technical support is needed. The funds for the implementation will come from the annual government budget and other resources will be mobilized from international community and Development Partners, private sector and individual contributions. All multilateral funds, bilateral funds, International funds, Individual and foundation funds mobilized will be used to implement the strategy.

5.3 RISK ANALYSIS

The provision of climate services for decision-making involves generation, provision, and contextualization of information, knowledge and research findings for decision making at all levels. This requires collaboration of different stakeholders across local, national, regional, and international level in achieving socio-economic values. The government and other organizations work through collaborative mechanisms established at national, regional and global level in the implementation of various activities in provision of climate services. The NFCS provides a mechanism for collaboration in provision of climate services. The framework also draws partners from various key sectors in ensuring the objectives and outcomes are achieved. To ensure this and from best practices and different corporate governance codes; risk management and internal controls are critical elements of good governance in partner organisations.

This section provides information on risks and assumptions for the implementation of NFCS. It also provides summary of risks identified and suggest suitable and applicable mitigation measures. The analysis of potential risks is shown on **Table 4**.

Table 4: Narrated summary of NFCS implementation risks and proposed mitigation measures

S/No.	Program objectives	Risks	Consequences (if the risk is not treated/controlled)	Mitigation
1	Enhance capacity in observations and monitoring of climate systems	Vandalism	Destruction of observational stations	• Locate the observation stations in secured areas • Deploy security mechanism
		Budgetary constraints	Failure to achieve the desired objective	Secure reliable funding sources
		Management commitment	Failure to achieve the desired objective	Prioritise the programme in management activities
2	Enhance understanding of climate-related hazards, vulnerability and risks	Misconception of the training lessons	Failure to understand the training lessons	Avoid complexity in training lessons
		Unwillingness of the public to understand climate vulnerability and risks	Failure to comprehend the concept of climate vulnerability and risks	Enhance public awareness and accountability
		Use of difficulty or uncommon terminologies	Failure to understand the terminologies	Use simple or common terminologies
3	Improve provision of tailored weather and climate services at the national and local levels	Shortage of specialized experts	Delay of provision of climate services	Strengthen institution capacity
		Limited understanding of the importance of weather and climate information	Failure to realize the concept of climate vulnerability and risks	Awareness training
		Weak infrastructure for service delivery	Failure to disseminate weather and climate related information to various levels	Enhance dissemination mechanisms
4	Integrating climate information in development planning and decision making	Inadequacy governance mechanisms	• Inadequate documentation, reporting and accountability requirements. • Un-realization of planned activities	• Communication of the suspected irregularities and the actions taken to decision makers • Adhering to the stipulated procedure and regulations
		Unwillingness of decision makers	Failure to Support implementation of intended activities	Sensitization and advocacy
		Lack of understanding of socio- economic value information used	Planning and decisions vulnerable to the impacts of climate variability and change	

S/No.	Program objectives	Risks	Consequences (if the risk is not treated/controlled)	Mitigation
		Weak institutional framework	Failure to support appropriate integration of climate information in development planning and decision making	Enhance governance
5	Enhance the capacity in developing, packaging and communicating weather and climate information	Inadequate funds	Less accessible climate information and tailored for planners	Reliable funding sources
		Reluctance of the management	Failure to identify the best convectional and innovative way for packaging and communicating weather and climate information	Enhance accountability
		Inadequate competent experts	Low quality and less useful weather and climate information	Provision of short and long term training to experts
6	Enhance the capacity of users in understanding and application of weather and climate services	Lack of knowledge and skill	Failure to apply weather and climate predictions in planning	Training and awareness
		Insufficient funding	Failure to build common ground and supplement opportunities for on-going learning among users of climate information	Reliable funding sources
7	Enhance climate related research, modelling and prediction of weather and climate	Inadequate cooperation and collaboration among institutions and interdisciplinary experts	• Failure to cultivate effectiveness, efficiency and crosscutting collaborations on climate related research, modelling and prediction of weather and climate • Failure to improve and Innovate weather and climate related products and services	Awareness training

S/No.	Program objectives	Risks	Consequences (if the risk is not treated/controlled)	Mitigation
		Unreliable climate products and information	• Loss in trust of climate products and information • Loss of institution credibility	Strengthening modelling and prediction

6. MONITORING AND EVALUATION OF THE NFCS STRATEGIC PLAN

Monitoring and evaluation of the NFCS SP is crucial for measuring and tracking implementation progress. This section explains how the process of monitoring and evaluation will be carried out during the course of implementing the framework.

6.1 Objectives of Monitoring and Evaluation System

The overall objective of this Monitoring and Evaluation System is to guide implementation of the NFCS and its Strategy. The specific objectives of the monitoring and evaluation system are to:

(i) Establish benchmark of indicators for NFCS assessment;
(ii) Set targets and standards for NFCS implementation;
(iii) Avoid duplication of activities and promote synergies among implementers;
(iv) Guide actors' participation in implementation and monitoring activities; and
(v) Control use of resources during implementation.

6.2 Institutional Arrangements for Monitoring and Evaluation System

The overall coordination of the implementation of this strategy will be under the primal responsibility of TMA. TMA will be the overall coordinator for sector specific activities as well as monitoring and evaluation of the framework. TMA will also be responsible for preparing reporting templates for activities both quarterly and bi-annually. Other stakeholders including Government sectors, Ministries, CSOs, media, etc. will be responsible in implementing their activities as per the guiding work plan.

6.3 Monitoring and Evaluation System Indicators

A list of indicators will be developed to track the progress towards achieving the NFCS objectives. The indicators include measurable indicators, qualitative and process indicators. These will be reviewed from time to time to meet additional information requirements necessitated by the new developments. Specifically, baseline data will be collected as benchmark of the framework implementation tracking.

At each particular implementation period, internal and external evaluation system will be undertaken to review the implementation of the strategy. The internal evaluation system will assess systematically and objectively the relevance, processes and performance of the NFCS. The general objective of evaluation is to determine the relevance, effectiveness and impact of policy on the physical environment, social, political and economic development of the country. Both qualitative and quantitative indicators will be analyzed.

6.4 Monitoring and Evaluation Tools and Deliverables

Output and deliverables of M&E system of the NFCS will be as follows:

(i) Progress Reports, using Monitoring System output to both indicate progress and update the NFCS SP, thus making the Strategy a living document
(ii) Analytical reports of different studies to be undertaken
(iii) Communications strategy with an interactive element to facilitate on going feedback from stakeholders
(iv) Client Service Charter; and
(v) The accountability and feedback systems.

These will indicate progress on the implementation of the framework objectives and their targets.

6.5 Monitoring and Evaluation Reports

Types of reports and documents that will be used to inform the monitoring and the evaluation report are as listed in Table 5.

Table 5: Types of Monitoring and Evaluation reports

Types of reports	Contents	Frequency
Project progress report	Consolidated report covering all the activities undertaken at the project level	Quarterly Bi-annually Annually
Climate services comprehensive progress report	Consolidated report covering all the activities undertaken at the organization level	Quarterly Bi-annually Annually
Physical/inventories and financial progress report	Physical progress, revenue and expenditures	Bi-annually Annually
Evaluation Report	Internal and external evaluation reports of various implementation programs	Annually

Table 6: Performance Indicators for the SP Monitoring and Evaluation Framework

NFCS Objectives	Indicators
Enhance understanding of climate risks and vulnerability associated with climate-related hazards	Number of people trained
	Number of workshops/meetings organized or conducted
Enhance capacity in observations and monitoring of climate systems	Number of weather stations established
	Number of weather stations available in the database
Improve provision of climate services at the national and local levels	Number of tailor made climate products prepared and disseminated
Mainstream climate information in development planning and decision making	Number of planners and decision makers reached
Enhance the capacity in developing, packaging and communicating weather and climate information	Number of technical staff trained
	Number of new climate products developed
Enhance the capacity of users in understanding and applying climate services	Number of stakeholders applying/using climate services
Enhance climate related research, modelling and prediction of weather and climate	Number of research reports and publications produced
	Number of models developed or improved

6.6 Reporting Flows

The reporting arrangement in the implementation of the SP will follow the established government reporting system as well as reporting system which will be provided by TMA. All stakeholders that will be implementing this strategy will be required to report to TMA on quarterly and annual basis. Also financial reports pertaining to the implementation of this strategy will be subjected to auditing as per the government regulation.

6.7 Feedback Mechanism / communication arrangement

The information management and communication will follow the institutional arrangement proposed in the SP. TMA will be the core centre of information and communication. Information will be collected from the implementing stakeholders, managed and communicated by TMA. Communication of such information will be done periodically via publication of relevant reports and/or articles. Also, other communication mechanisms may be used to widely reach the targeted audiences and to carter for the rapid increasing demand of climate information. Those mechanisms include social media platforms, climate outlook forums, media houses, promotional materials, etc.

6.8 Review/update of the strategy

The main consideration for review of the SP is the life span of the NFCS. Though it can be reviewed as whole or some components when there is vivid necessity, in order to suit current needs depending on policy and legal changes at national, regional or global level.