REPUBLIC OF KENYA

MINISTRY OF ENVIRONMENT AND FORESTRY

KENYA METEOROLOGICAL DEPARTMENT

METEOROLOGY POLICY

MAY 2019

ACRONYMS AND ABBREVIATIONS

1	AMCOMET	African Ministerial Conference on Meteorology
2	AU	African Union
3	BEAMS	British East Africa Meteorological Society
4	CDACC	Curriculum Development Accreditation and Certification Council
5	EAMD	East African Meteorological Department
6	QMS	Quality Management Systems
7	ICAO	International Civil Aviation Organization
8	ICPAC	IGAD Climate Prediction and Applications Centre
9	GDP	Gross Domestic Product
10	IPCC	Intergovernmental Panel on Climate Change
11	KAA	Kenya Airports Authority
12	KCAA	Kenya Civil Aviation Authority
13	KMA	Kenya Maritime Authority
14	KMD	Kenya Meteorological Department
15	KMS	Kenya Meteorological Society
16	KNQA	Kenya National Qualification Authority
17	NCCD	National Climate Change Directorate
18	NDMA	National Drought Management Authority
19	NMS	National Meteorological Service
20	NMHS	National Meteorological and Hydrological Service
21	RCC	Regional Climate Centre
22	RIMES	Regional Integrated Multi hazards Early Warning System
23	RSMC	Regional Specialized Meteorological Centre
24	TVETA	Technical and Vocational Education Training Authority
25	UNFCCC	United Nations Framework Convention on Climate Change
26	UNISDR	United Nations International Strategy for Disaster Reduction
27	WMO	World Meteorological Organization

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CHAPTER ONE: INTRODUCTION

1.1 Background

1.1.1 Meteorology is the scientific study of the atmosphere. Meteorological Services fall into five broad categories in weather and climate namely: the provision of historical information; current state; future state; weather advisories, alerts and warnings; as well as the conduct of research. The ultimate objective of meteorological services is to assist socio-economic sectors make informed decisions to enhance efficiency, reduce the risks and derive economic benefits from associated weather and climate conditions.

1.1.2 Social and economic drivers require targeted improvements in weather, climate, water, and related environmental information and services. Risks associated with climate variability and extreme environmental events create social and economic stresses that call for a new approach to meteorological, hydrological, and climate services in order to ensure the safety and security of humankind and the sustainable development of adaptive economic strategies. Responding to these risks is critical given population growth in environmentally vulnerable regions and in the recent past, the increase in intensities and frequencies of extreme weather events. At the same time, while the future state remains uncertain, there is need to ensure that the public and policymakers are better informed of the impact of meteorological services on humankind.

1.1.3 The development agenda for Kenya is being widely affected by climate change and its resultant impacts, which could cost the economy a significant amount of the country's Gross Domestic Product (GDP). The cumulative impacts of climate change, therefore, have the potential to reverse much of the progress made towards the attainment of the United Nations' Sustainable Development Goals and the country's development blueprint -Vision 2030.

1.1.4 National Meteorological and Hydrological Services (NMHSs) require more autonomy. Those NMHSs that have transformed into autonomous or semi-autonomous agencies or authorities have been observed to have improved operational efficiency, research and development. This has been reiterated in the East African Community region, as a means of not only improving service delivery but streamlining meteorological policy in the region.

1.1.5 It is necessary to strengthen the country's capacity for research and development in the operational issuance of adverse weather forecasts (early warnings and advisories) and climate information (climatological statistics, trends and projections into the future) as well as product delivery to the end-users. This is will promote sustainable development through alleviation of poverty and at the same time create wealth through the improvement of livelihoods of communities, enhancement of safety of life and protection of property.

1.1.6 The negative impacts of climate change, and the associated adverse weather and extreme climate events have resulted in the proliferation of several organizations providing various forms of weather/climate services. However, the quality of some of these services does not meet required standards on the basis of instrument specifications, data observation, processing and dissemination.

1.1.7 It is, therefore, against this background that this Policy proposes a broad range of measures and actions to address key meteorological issues and challenges. It further seeks to provide the framework for an integrated approach to planning, implementation of various meteorological policy measures and recommends a legal and institutional framework as well as governance measures to support the achievement of the desired goals and objectives.

1.2 Rationale of the Policy

1.2.1 Meteorological services in Kenya have been provided without an Act of Parliament. In the absence of the Act, there has been lack of effective regulation on provision of meteorological services and clear guidelines on resource mobilization and revenue collection. The presence of multiple players in observation and provision of weather and climate information is a positive sign of the mutual interests and roles, but this makes coordination efforts and investments in the management and regulation of standards regarding weather and climate infrastructure installations, observations, analysis, data management and dissemination uniquely significant. A coordinated approach could yield enhanced monitoring and evaluation, resource pooling, effective and efficient use of resources as well as governance.

1.2.2 The mandate of National Meteorological Services (NMSs) emanates from the World Meteorological Organization (WMO) Convention adopted on 11 October 1947 (and revised in 2007), and which Kenya subscribed to on 2nd July 1964. The Convention reaffirmed "The vital importance of the mission of the National Meteorological and Hydrological Services (NMHSs) in observing and understanding weather and climate and in providing meteorological, hydrological and related services in support of relevant national needs which should include the following areas:

(i) Protection of life and property;
(ii) Safeguarding the environment;
(iii) Contributing to sustainable development;
(iv) Promoting long-term observation and collection of meteorological, hydrological and climatological data, including related environmental data;
(v) Promotion of endogenous capacity-building;
(vi) Meeting international commitments; and
(vii) Contributing to international collaboration.

1.2.3 In line with this Convention, the Kenya Meteorological Department (KMD) as the National Meteorological Service (NMS) is designated the *single authoritative voice and source on* weather and hydrological warnings and is also responsible for climate, air quality, and tsunami warnings. In this respect:

(i) The views of KMD are considered to be scientifically sound and impartial when advising the public and private sector, national and county governments.

(ii) The KMD continuously monitors the earth's environment, develops predictions of potential changes related to weather, climate and water, and issue as timely and accurate warnings as possible of most hydro-meteorological hazards.

(iii) The NMS also generate and make available essential environmental information, products, and services in support of air, land and sea transportation, urban and regional planning, development of new and renewable energy resources, sustainable agriculture, human health, Disaster Risk Reduction, management of water resources, including recreation, sports and tourism.

1.2.4 The Department has been operating on Presidential Executive Order No. 1 of 5th June 2018 on the reorganization of the Government of the Republic of Kenya. This Executive Order place the Kenya Meteorological Department under the Ministry of Environment and Forestry.

1.2.5 The World Meteorological Congress, which is the supreme body of the WMO, in its 13th Congress affirmed the importance of having national legal instruments that define the mission and mandate of NMS to ensure clarity in the definition of the responsibilities and recognition of their contribution to the society to facilitate allocation of adequate resources.

CHAPTER TWO: JUSTIFICATION FOR METEOROLOGY POLICY

2.1 Status of Meteorology in Kenya

2.1.1 In Kenya, meteorological observations started in 1890 at the then Mombasa Old Observatory. However, organized meteorological services were established in 1929 as part of the British East African Meteorological Service (BEAMS), which was an inter-territorial service covering Kenya, Uganda, Tanganyika and Zanzibar, and Northern Rhodesia (presently Zambia).

2.1.2 The BEAMS became a branch of the Meteorological Office of the Air Ministry of the United Kingdom in 1943, and was known as the Royal Air Force Organization (RFO). The main mandate of the Service was issuance of forecasts for military aviation. The facilities made available during the war, particularly with respect to communication and special observations by aircrafts, resulted in a significant increase in knowledge of weather conditions in East Africa. This increased understanding led to considerable improvement in the accuracy of forecasts. BEAMS became a department under the British East African High Commission (BEAHC) between 1947 and 1948 and renamed the East African Meteorological Department (EAMD).

2.1.3 In 1965, the EAMD was placed under the East African Common Services following the establishment of the East African Community (EAC). With the break-up of the then EAC in 1977, all the common services collapsed and their functions transferred to the jurisdiction of the respective Partner States. In the case of Kenya, the Kenya Meteorological Department (KMD) was established, but without an Act of Parliament, as a department in the Ministry of Power and Communications.

2.1.4 Since 1977, KMD has been domiciled in various ministries including Power and Communications; Transport and Communications; Information, Transport and Communications; Transport; Environment and Mineral Resources; Environment, Water and Natural Resources; Environment, Natural Resources and Regional Development Authorities and currently under the Environment and Forestry.

2.2 Policy context

2.2.1 **Kenya Constitution 2010:** Chapter 5 on land and environment part ii gives provision for the state to ensure sustainable exploitation, utilization, management and conservation of the environment, work to achieve and maintain a tree cover of at least 10% of the land area; encourage public participation in the management, protection and conservation of the environment; protect generic resources and biological diversity; establish systems of environmental impact assessment, environmental audit and monitoring of the environment; eliminate processes and activities that are likely to endanger the environment. NMS plays a crucial role to provide timely and effective weather information to achieve the above.

2.2.2 **Water Act 2016**: This is the principal legal instrument for governance of water resources in the country; covering water resources, and water storage and sewerage services. The Water Act is in place to ensure effective management and use of water resources. The meteorology policy will complement the Water Act by providing weather and climate advisories for management of the water catchment under the Water Act.

2.2.3 **Kenya Airports Authority (KAA) ACT 1991** established a fund known as Kenya Airport Fund that included monies from the air passenger service charges according to the Air Passenger Service Charge Act of 2014 revised on 2018, for air navigation services. Air Navigation Services defined in the KAA Act 1991 includes meteorological services provided for safety of aircraft and regularity of flight.

2.2.4 **Kenya Civil Aviation Authority (KCAA):** The civil aviation act (No. 21 of 2013) on the civil aviation (meteorological Services for air navigation) regulation 2018, states that the Meteorological Service shall in accordance with the regulation provide aeronautical meteorological services for flight information region, international waters and other areas which lie outside the Kenyan territory.

2.2.5 **Climate Change Act No.11 of 2016**: To review and determine mechanisms for climate change knowledge management and access to information while strengthening approaches to climate change research and development training and technology transfer, the role of the National Meteorological Services is critical in meeting this goal of the climate change Act.

2.2.6 **Forestry Conservation and Management Act No 34 of 2016**: established Kenya Forest Services charged with management regulation and protection of all forests in the country while Kenya Forest Research Institute to carry out research on all forests and seedlings. Weather and climate information is crucial to the operation of their activities.

2.2.7 **Kenya Maritime Authority (KMA) Act of 2012** provides for the State Corporate to enforce safety of shipping conduct investigation into maritime casualties (wreck) ensure collaboration with other public agencies (Kenya Ports Authority, Kenya Navy, Kenya Meteorological Department) the prevention of marine source pollution, protection of marine environment and response to marine environment incidences.

2.2.8 **National Drought Management Authority (NDMA) Act (2016):** Drought coordination institutional framework ensure that action taken by all stakeholders in response to drought and climate change risks is timely, harmonized and effective**.** Meteorological services are key stakeholders in provision of advisories and early warning information thus the meteorology policy will complement the ACT of NDMA.

2.2.9 **East African Community (EAC):** The 12th meeting of the EAC Sectoral Council on Transport, Communications and Meteorology (TCM) held on 21-24 September 2015, urged Kenya and Burundi, the only Partner States that had not effected the transformation of their National Meteorological Services, to expedite their transformation from the main civil service to semi-autonomous Government Agencies. This is expected to improve service delivery as well as expedite implementation of meteorological programmes in the region.

2.2.10 **IGAD Regional Climate Centre:** IGAD Climate Prediction and Applications Centre (ICPAC) has been designated as the World Meteorological Organization (WMO) Regional Climate Centre (RCC) of excellence in provision of climate services to national and regional users. The Regional Climate Centre (IGAD-RCC) organizes Climate Outlook Fora for the Greater Horn of Africa for the three major rainfall seasons in the region. These fora provides regional climate forecasts and other products that support regional and national climate activities, and thereby strengthen the capacity of WMO members in the Greater Horn of Africa region to deliver better climate services to users.

2.2.11 **African Ministerial Conference on Meteorology (AMCOMET):** AMCOMET established by the First Conference of Ministers responsible for Meteorology through the Nairobi Ministerial Declaration (in April 2010), is a high-level mechanism for the development of meteorology and its application in Africa. The declaration recognizes that weather and climate are central to the socio-economic development of any country. They committed to strengthen and sustain the NMSs by providing them with all necessary resources and adequate institutional frameworks to enable them fully perform their roles as a fundamental component of the National development infrastructure contributing to security and sustainable development particularly poverty reduction efforts, climate change adaptation and disaster risk reduction. Further, during the 3rd Session of the African Ministerial Conference on Meteorology (AMCOMET-3) held in Praia, Cape Verde on 13-14 February 2015, it was noted that a number of NMHSs in Africa had transformed into autonomous agencies and/or authorities and that consequently, they had improved operations and service delivery. This policy will give an institutional framework to NMSs created to address the envisaged issues as highlighted in the integrated African strategy on meteorology which was created by the Nairobi Declaration.

2.2.12 **African Union (AU):** one of the goals of Agenda 2063 is modern agriculture for increased productivity and production. Weather and climate information therefore has to be sufficiently researched and improved to meet this goal. Embracing the blue economy in Africa is another goal to accelerate growth in the Continent.

2.2.13 **International Civil Aviation Organization (ICAO) (DOCUMENT 8896 of 2017):** Manual of meteorological practices states that meteorological service for international air navigation is provided by meteorological authorities designated by states. Details

of meteorological service to be provided for international aviation are determined by each state in accordance with provisions of ANNEX III and with regional agreements which apply to specific areas designated as air navigation regions by ICAO. The information provided includes observations and reports of actual weather conditions at aerodromes and forecasts, it is made available at aerodrome meteorological offices and is disseminated as appropriate to aeronautical users, including operators, flight crew members, air traffic services units, search and rescue services units, airport management.

2.2.14 **Intergovernmental Panel on Climate Change (IPCC):** the role of the IPCC is to provide policy makers with regular scientific assessments on climate change, its implications and potential future risks, as well as to put forward adaptation and mitigation efforts. This scientific assessment determines the state of knowledge on climate change. The National Meteorological service is the scientific body that has the capacity to undertake such assessments.

2.2.15 **UN Framework Convention on Climate Change (UNFCCC)** treaty adopted in 1992 whose objectives is to stabilize greenhouse gases concentration in the atmosphere at a level that would prevent dangerous anthropogenic interference with climate systems. The Paris agreement under this convention has legal force applicable to all parties with the long term goals of capping global average temperatures at below 2^0 C above preindustrial levels; to limit temperature increase to 1.5^0 C; increase ability to adapt to adverse impacts of climate change and make finance flows consistent with a path way towards climate resilient development

2.2.16: **UN Convention to Combat Desertification**

The UNCCD is particularly committed to a bottom-up approach, encouraging the participation of local people in combating desertification and land degradation. The UNCCD secretariat facilitates cooperation between developed and developing countries, particularly around knowledge and technology transfer for sustainable land management. The Convention addresses specifically the arid, semi-arid and dry sub-humid areas, known as the drylands, where some of the most vulnerable ecosystems and peoples can be found.

2.2.17: **Convention on Biological Diversity**

A multilateral treaty with goals to conserve biological diversity, and the sustainable use of its components. The convention reminds decision makers that natural resources are not infinite and set out a philosophy of sustainable use.

2.2.18 **United Nations International Strategy for Disaster Reduction (UNISDR)**: according to the UNISDR strategic framework 2016- 2021 there is a need to substantially reduce disaster risk and losses for a sustainable future in line with the Sendai Framework. Research indicates that 90% of natural disasters are weather and

climate related. The prevention of new and reduction of existing disaster risks and strengthening resilience through multi-hazard disaster risk management is therefore necessary.

2.2.19 **World Meteorological Organization (WMO):** The WMO Technical Document No.947 notes that over half of the NMSs operated by Members of WMO have formal legal instruments (such as a law, act or decree) covering their responsibilities, the establishment and operation of their facilities, and government regulation and legal responsibility. Other issues included in the legal instruments are the roles of NMSs in the prevention/mitigation of natural disasters, international cooperation, and supplementary provisions and funding.

2.2.20 **Joint Technical Commission for Oceanography and Marine Meteorology (JCOMM):** worldwide marine meteorological and oceanographic communities are working in partnership under the umbrella of the WMO-IOC Joint Technical Commission for Oceanography and Marine Meteorology, in order to respond to interdisciplinary requirements for meteorological and ocean observations, data management and service products. The policy will create an environment to improve collaboration in research and analysis of data to improve maritime forecasts**.**

CHAPTER THREE: SITUATION ANALYSIS

3.1 It is recognised that weather climate and related environmental conditions have a significant influence on the socio-economic development of countries world-wide. The increase in world population, and extension of settlement and life supporting activities, in areas vulnerable to the impacts of weather-climate-and water related disasters, makes it necessary to improve the capacities of NMSs to provide better services to reduce disaster risk, and support national development of life supporting activities. The increase in the intensity of natural hazards due to climate variability and change poses critical challenges to the countries. These challenges have far reaching socio-economic devastations and miseries.

3.2 Currently, there exists an environment of uncontrolled/ unregulated mushrooming of service providers in the field of meteorology due to increased user demands, increased frequency in episodes of severe weather and extreme climate, the emergence of internet-based service providers which have exposed the user to unreliable and unauthenticated services and products.

3.3 The private sector has invested extensively in the science, technology, delivery, and marketing of value-added weather products. As a result of these investments, the private sector delivers made-to-order weather information that strengthens a business' performance. The private sector is in the forefront of developing creative products for the media that substantially improve the display and communication of weather and climate information to the general public. However, there is lack of control and standardization in installation of meteorological instruments, methods of observations, data quality control, processing and archiving in the country.

3.4 There is a proliferation of non-professionals or unqualified persons offering weather and climate services in the Country. There is need to register a professional body which promotes the understanding of meteorology and its applications, as well as to regulate the practitioners in this field.

3.5 The IMTR WMO designated regional training centre, for English speaking African countries provides education and training that supports the regions' meteorological and hydrological services. Though its training programmes have played a significant role in the development and strengthening of the NMS locally and internationally, it lacks a legal framework to train, examine and award Diploma Certificate in accordance with the KNQA Act 2014.

3.6 This Policy will address all the challenges enumerated above by creating Meteorological Agency/Authority, regulatory authority, training school and a professional body. These institutions will have their mandates to address specific areas of interest in provision of meteorological services.

CHAPTER FOUR: GOALS, OBJECTIVES AND GUIDING PRINCIPLES

4.1 Overall goal

The overall goal of the national meteorological policy is to guide the provision of efficient and effective weather and climate services for the safety of life, protection of property and safeguarding the natural environment.

4.2 Policy Objectives

The objectives of the policy are to:

(a) have in place a legal and institutional framework for the management, understanding and exploitation of meteorological services;
(b) provide meteorological and related services in support of relevant national, regional and international needs
(c) facilitate the integration of weather and climate information in the decision-making processes of climate sensitive sectors
(d) promote domestication, coordination and utilization of benefits from international conventions on meteorology;
(e) strengthen education and training in meteorology and related sciences;
(f) promote research and development in the field of meteorology and related sciences;
(g) promote and enhance cooperation, partnerships and collaboration locally and internationally for the enhancement of utilization of meteorological services.

4.3 Guiding Principles

(a) ***Right to information***: Every citizen in Kenya has a right to have easy access to weather and climate information and a duty to apply this information for economic benefits.
(b) ***Good Governance***: Rule of law, effective institutions, transparency and accountability, access to information and non-discrimination will be integrated in meteorological management.
(c) ***Public Participation***: A coordinated and participatory approach in the provision of meteorological services will be enhanced to foster participation of relevant government agencies, county governments, private sector, civil society and communities in planning and implementation and ensure informed decision making is undertaken in the utilization of the services.
(d) ***International Cooperation***: International Standards and best practices will be domesticated and implemented cooperatively for effective, efficient and quality meteorological services
(e) ***Equity:*** The countrywide distribution of the basic meteorological infrastructure will ensure equitable access to vital weather and climate information for sustainable development
(f) ***Subsidiarity:*** The provision of meteorological services will be through national and decentralized authority and responsibilities to the grassroots level.
(g) ***Research, education and knowledge***: Key decisions on meteorological management shall be informed by climate science, founded on appropriate knowledge derived from research, professionalism and international best practices.

(h) ***Indigenous knowledge***: Indigenous knowledge related to the science of weather and climate will be harnessed and integrated with the scientific knowledge for improving service delivery.

(i) ***Commercial meteorological services:*** Some meteorological services shall be provided in a commercial manner.

(j) ***Non-discrimination:*** meteorological services shall be provided non-discriminatively in terms of gender, ethnicity, religion and race.

CHAPTER FIVE: POLICY THEMES FOR METEOROLOGY

The infrastructure that is necessary for provision of weather and climate services include the following:

a) Observations networks
b) Telecommunications networks
c) Data Processing, Analysis and Forecasting
d) Database Management and archival
e) Meteorological applications and dissemination
f) Human Resource Management and Development

The goal of this Policy is to provide a framework for the provision of meteorological services for safety of life, protection of property and safeguarding the natural environment for socioeconomic development. This policy has been formulated to address a number of challenges facing the above areas.

5.1 Observations networks

5.1.1 Meteorological observation encompasses monitoring of stations, weather buoys and other devices that collect and transmit meteorological parameters. The data, weather and climate pattern that these networks provide is invaluable for planning in the agriculture, food security, health, aviation, water resources and marine sectors of Kenya. There exist inadequacies in siting, installation, methods of observation, calibration and maintenance of instruments and equipment. There is therefore need to foster and strengthen collaborative management of observation and networks among all the actors involved.

5.1.2 Life depends on a healthy environment, but the interwoven systems of atmosphere, oceans, watercourses, land and biosphere, which form the natural environment, are threatened by human activities. The NMS provides reliable scientific data and information on aerosols, greenhouse gases, selected reactive gases, ozone, ultraviolet radiation and precipitation chemistry (or atmospheric deposition).

Policy Statements

The Government will:

a) *Ensure adherence to the Guide to meteorological instruments and methods of observations (WMO No. 8) which is the authoritative reference for all matters related to instrumentation and methods of observation;*
b) *Ensure increased investment in meteorological instruments and observations systems and a coordinated development of networks;*
c) *Promote multi-sectorial collaboration in meteorological and environmental data observation.*

5.2 Telecommunications networks

5.2.1 Effective and reliable telecommunication networks for weather and climate includes the exchange and facilitation of the flow of data in a timely and cost-effective way ensuring that all Member States of the WMO have access to data and products in accordance with approved procedures.

5.2.2 The National Meteorological Services establish and operate telecommunication networks that together form the WMO Global Telecommunication System which facilitates rapid exchange of observations data and products to enable the NMSs worldwide meet their national, regional and international obligations. Meteorological Telecommunication is faced with a challenge of coordinating rapid exchange of time critical data; lack of a real time push and pull mechanism including multicast and broadcast implemented through a dedicated and reliable telecommunication means (WMO WIS) providing a guaranteed quality of service.

Policy statements

The Government will:

a) Build capacity for the national meteorological service provider to become a global meteorological information exchange centre;

b) Ensure uninterrupted connectivity to public and dedicated communication networks at a capacity that is sufficient and supports appropriate level of availability and capacity necessary to meet the requirements of meteorological telecommunications.

5.3 Data Processing, Analysis and Forecasting

5.3.1 The observations and data gathered by NMSs are processed to generate products that can support decision making. The quality of the products is dependent on the adequacy of the processing facilities and human resources. All NMSs contribute to these products through the sharing of observations which are the basis for generating the forecasts and warnings.

5.3.2 WMO has designated some NMSs as Regional Specialized Meteorological Centres (RSMC) which provide forecasts products to all other NMSs within a geographical region. The NMSs utilize the RSMC products to develop forecasts and warnings of severe weather and extreme climate events for their respective countries to support socio-economic development activities.

Policy statements

The Government will:

a) Upgrade the severe weather modelling infrastructure for the RSMC;

b) Support provision of adequate facilities for the processing of data to produce products;

c) Support capacity building for generation of weather and climate products.

5.4 Database Management and archival

5.4.1 Any data on paper registers can easily be damaged by tear and wear, fire, water, dirt, and pests. It can also be misplaced, stolen or mutilated. Every effort is therefore made to minimise these risks through data rescue process that involves repairing, reconstructing, making electronic copies of the paper registers and storing them in well-organized computerised climate documents management system, where they can easily be managed, protected, accessed and preserved for posterity.

5.4.2 In the wake of improved data collection infrastructure, the volume of data received at the NMS will increase exponentially. Data management and archival systems are necessary for storing and retrieving of *big data*. A climate data management system, for an integrated high capacity computer-based system that facilities effective archival, management, analysis, delivery and utilisation of a wide range of climate data would be good for managing the big data.

5.4.3 To ensure data security and safety, the NMS established by this Policy needs a data recovery centre at a remote location.

Policy Statements

The Government will:

(a) Support development of a national meteorological data policy;

(b) Establish a national meteorological climate data management system;

(c) Continue facilitating data rescue in efforts to discover and recover climate data.

5.5 Meteorological Applications and Dissemination

Weather, climate and water impact on agriculture and fisheries, energy, transport, health, insurance, sports, tourism and many more socio-economic sectors. The NMS promotes the application of meteorological, climatological, hydrological and oceanographic information in all human activities. This Policy will address the following areas**:**

(i) Aviation Meteorological Services
(ii) Marine Meteorological Services
(iii) Land transport services
(iv) Hydro-meteorological forecasting and prediction Services
(v) Agriculture and food security
(vi) Bio-meteorological services
(vii) Energy sector services
(viii) Climate information services
(ix) Disaster Risk Reduction services
(x) Public Weather Service

5.5.1 Aviation Meteorological Services

5.5.1.1 The NMS provides data, products and services that contribute to the safety of military and civil aviation sector and the economic operation of the sector both nationally and internationally. By increasing the efficiency of aviation operations, NMSs also

contribute to a reduction in aircraft emissions and their resulting impacts on global climate change and stratospheric ozone.

5.5.1.2 According to the reference manual of WMO No. 958, the AMDAR system utilizes the existing the aircraft on board sensors, computers and communication systems to collect, process, format and transmit meteorological data to ground stations via satellite or radio links.

5.5.1.3 The economic and social benefits that can be derived from air transport make it one of the world's most important industries. Air transport is a critical factor in the world trade and plays a major role in global development. Advances in air transport require that the delivery of services to the sector be improved with a view to promoting the safety, regularity and efficiency of international air navigation. Such improvement requires more competent staff and appropriate infrastructure.

5.5.1.4 The implementation of Quality Management Systems (QMS) for aeronautical meteorological services for international air navigation comprising procedures, processes and resources necessary to facilitate quality management of the meteorological information supplied to users is of paramount importance as is the demonstrating of competencies for aeronautical meteorological personnel as provided in ICAO Annex III.

5.5.1.5 According to ICAO Annex III, each Member State designates a meteorological authority to provide meteorological service for international air navigation on its behalf.

Policy Statements

The Government will:

(a) Support and maintain the aviation meteorological infrastructure at all airports in line with the WMO technical Document NO. 49 part II and ICAO Manual of Aeronautical meteorological practice (Document 8896);

(b) Develop guidelines to implement and provide support to Quality Management Systems for aviation;

(c) Ensure adherence to Quality Management Systems for the provision of meteorological services in air safety navigation;

(d) Designate the National Meteorological Service as the Meteorological authority as defined in ICAO Annex III;

5.5.2 Marine Meteorological Services

5.5.2.1 The world's oceans – their temperature, chemistry, currents and life – drive global systems that make the earth habitable for humankind. Our rainwater, drinking water, weather, climate, coastlines, much of our food, medicines and even the oxygen in the air we breathe, are all provided and regulated by the sea. Living oceans absorb carbon dioxide from the atmosphere and reduce climate change impacts.

5.5.2.2 Marine conditions significantly influence the weather affecting, safety of life, economic development and management of important coastal resources. NMSs have a public responsibility to protect their populace from adverse weather and climate events over the oceans and inland water bodies.

5.5.2.3 The oceans also provide convenient transport routes for everything from food and fuel to construction materials, chemicals and household items. The equipping of ships for weather observations and the support of drifting-or fixed buoys observations can improve marine forecasts and warnings. Where tidal gauges have been installed, these and related meteorological observations should be provided to the NMSs. On the other hand, support to the marine transportation and offshore resource industries for oil, gas and energy maybe funded through cost recovery or as provided as a commercial service by the NMS. Past and present weather information is necessary to enable search and rescue operation, water sports, tourism, fishing activities and security operations.

5.5.2.4 Pollution in the oceans and lakes caused by oil spills, plastic waste and solid waste requires wind and under currents information. NMSs provide the relevant data as required to manage the pollution.

Policy Statements

The Government will:

a) *Promote partnerships with stakeholders in the maritime transport sector.*
b) *Strengthen technological and infrastructure capacity for timely provision of marine weather information*
c) *Strengthen marine meteorological observations network, create marine meteorological research centre*

5.5.4 Land transport services

5.5.3.1 Meteorological information is crucial for early warning purposes to road and rail users and aims at reducing accidents and associated impacts, while assisting operators manage safety, planning economy of operations and regulations. Among the weather and climate challenges associated with surface transport is reduced visibility due to fog, smog, storms and dust-storms; infrastructure damage as a result of avalanches, flooding, slippery wet surface and strong winds. Climate information is key in the design and planning of roads, railways and bridges although the uptake of weather information by the road and railway operators is still low in the country.

Policy Statements

The Government will:

(a) Promote partnerships between the NMS, road and railway stakeholders to ensure proper designing and efficient operation in the sector;

(b) Encourage continuous monitoring of road and rail networks and issuance of early warning of adverse weather conditions;

(c) Facilitate NMSs to install necessary weather sensors to monitor weather changes along highways and railways for early warning;

(d) Facilitate road transport authorities to mount appropriate signage for hazardous weather warning;

(e) Support research in surface transport operations in relation to weather and climate.

5.5.5 Meteorological Services for Agriculture and Food Security

5.5.4.1 Timely and accurate forecasts of the onset, cessation, distribution and amount of seasonal rains are needed to improve agricultural productivity. Seasonal rainfall forecasts and quantitative predictions are used to advise on the time to prepare land, cultivate, types of crops to plant, and transplant, apply fertilizer, spray against pesticides, and harvest.

5.5.4.2 During rainy seasons, accurate short-term forecasts of days of rain and no-rain are needed to assist farmers and other decision-makers to determine the appropriate times to apply pesticides and herbicides as well as other cultivation practices. The forecasts help prevent the application of chemicals or use of other practices at ineffective times. There are many benefits of this information, among them increased production, savings on chemical costs, reduction of pollution of ground water and streams, among others. Lack of awareness, limited intake of climate early warning services.

5.5.4.3 National Meteorological Services meet the needs of farmers, herders and fishermen to develop sustainable agricultural systems, improve production and quality, reduce losses and risks, decrease costs, increase efficiency in the use of water, conserve natural resources, decrease pollution from chemicals that contribute to the degradation of the environment.

5.5.4.4 Climate information is used mainly for agricultural planning purposes, while recent weather data and weather forecasts are used mostly in current agricultural operations.

Policy Statements

The Government will:

(a) Strengthen NMS indigenous capability to provide relevant meteorological services to agriculture;

(b) Foster a better understanding by farmers and other end users in the agricultural sector of the value and use of meteorological information in planning and operational activities.

5.5.6 Hydro-meteorological forecasting and prediction Services

5.5.5.1 Communities and socio-economic sectors have varying degrees of vulnerability to extreme hydro-meteorological events such as floods, landslides and droughts which may cause, injuries and deaths, damage to infrastructure and negatively impacting economic growth. For sustainable economic development, management of resources and reduction of vulnerabilities to related disasters, reliable, accurate and timely hydro-meteorological information is essential. It plays a very important role in decision making when addressing mitigation, preparedness and response strategies/plans.

5.5.5.2 In view of the above, it is necessary to build capacity for generating timely, accurate and reliable hydro-meteorological (hazard) information, including early warning in order to contribute to the reduction of societal and economic vulnerabilities. Specialized hydro-meteorological information is required for decision making.

Policy statements

The Government will:

a) *support capacity building for a national-integrated hydro-meteorological information and decision support system for hydro-meteorological forecasting;*

b) *Strengthen partnerships with other institutions to ensure an effective hydro-meteorological monitoring, forecasting, prediction and hazards early warning system is in place.*

5.5.7 Bio-meteorological Services

5.5.6.1 Temperature and precipitation trends influence the seasonality and distribution of infectious diseases. Extreme weather events threaten the lives, livelihoods and food security of vulnerable populations. Climate and hydrological cycles influence life-bearing food security as well as drinking water and sanitation. Air quality and atmospheric conditions determine human exposure to hazardous elements, including natural and anthropogenic air pollutants, and ultraviolet (UV) and other forms of radiation.

5.5.6.2 The WHO/WMO Joint Office for Climate and Health, established mid-2014, provides WMO with new technical expertise in public health, and strengthens WMO collaboration with WHO and other health partners. It takes the lead in the implementation of health sector activities under the Global Framework for Climate Services (GFCS) to accelerate health sector access to and use of relevant climate, weather and environmental information for health risk management.

5.5.6.3 The services required for the good health, safety and well-being of the country's population can be significantly improved by enabling the NMS to develop early warning and response systems.

5.5.6.4 The essential components of bio-meteorological early warning systems are the identification of weather situations that adversely affect human health, the monitoring of meteorological forecasts, mechanisms by which warnings are issued when a weather situation that could adversely affect health is forecast, and public health activities to reduce or prevent weather related illness and death.

Policy statement

The Government will:

(a) Support the NMS to develop bio-meteorological early warning systems;

(b) Explore technological options for the design and delivery of appropriate bio-meteorological infrastructure, information and advisories to the public;

(c) promote research to establish relationship between weather and human health and derive climate thresholds that result in outbreaks

(d) Implement health sector activities under the Global Framework for Climate Services to accelerate health sector access to and use of relevant climate, weather and environmental information for health risk management.

5.5.8 Energy sector

5.5.7.1 Energy systems are the engine of economic and social development. Energy is essential

to practically all aspects of human welfare – access to water, agricultural productivity, health care, education, job creation, environmental sustainability. Energy investments represent a sizeable portion of Gross Domestic Product but, at the same time, energy sector emissions account for the largest share of anthropogenic greenhouse gas emissions.

5.5.7.2 Decarbonisation of the energy sector requires an accelerated uptake of weather/climate-dependent renewable energy generation, particularly for wind, solar, geothermal, biomass and biogas which are already increasing their market share of the renewable energy sector each year. Further integration of more renewable energy requires the use of weather and climate information for optimally balanced energy production and demand patterns. Specific climate services are being developed towards this goal. This includes a set of climate-based tools for assessing the

adequacy of future energy distribution in line with the Paris Agreement and the Sustainable Development Goals.

5.5.7.3 A major challenge for managers of hydroelectric facilities is to match energy generation to seasonal and long-term water supplies, and often to competing water demands for human use and irrigation needs. During periods of drought, the demand for electricity has to be balanced against the need to conserve scarce water supplies. Long climatic records on the year-to-year variability and the duration and intensity of past drought events are essential to the design process and are crucially important in the effective operation of reservoirs. Utilization of weather and climate information as provided by the National Meteorological Service is key in the growth and development of the energy sector.

Policy statements

The Government will:

(a) Develop the necessary infrastructure for production of weather and climate information required by the energy sector;

(b) Promote investment in exploitation of the renewable energy sector;

(c) Promote partnerships between NMS and energy stakeholders in the use of weather and climate information for design, planning and management of the various energy resources;

(d) *Build capacity for the sustainable generation of industry-specific weather and climate information for the energy sector.*

5.5.9 Climate information services

5.5.8.1 Climate information services helps individuals and organizations make climate smart decisions. Climate services equip decision makers in climate-sensitive sectors with better information to help society adapt to climate variability and change. the NMS contributes to the science of climate change in the negotiations relevant to Kenya in the United Nations Framework Convention on Climate Change (UNFCCC).

5.5.8.2 Climate services involve systematic observation, monitoring and detection of climate change as a contribution to scientific basis in the understanding of the changing climate in order to build resilience of communities and the economy against the associated adverse impacts through adaptation and mitigation.

5.5.8.3 The NMS also monitors environmental pollution, greenhouse gases, and other atmospheric constituents including ozone and aerosols over the Kenyan atmosphere as a contribution on issues relevant to the Montreal Protocol and Vienna Convention on substances that deplete the ozone layer.

Policy statement

The Government will:

a. *Employ climate information and knowledge for appropriate evidence-based decision-making;*
b. *Support development of a National Framework for Climate Services;*
c. *Facilitate access to climate data by different individuals and organizations.*

5.5.10 Disaster Risk Reduction

5.5.9.1 Natural disaster risk reduction is achieved by concerted efforts between the various stakeholders, with the National Meteorological service providing disaster early warning information. There is need for systematic efforts to analyse and manage the causal factors of disasters, through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and environment and improved preparedness for adverse events.

5.5.9.2 Enhancing the contributions of NMS to disaster risk reduction at all levels in a more coordinated, cost effective, systematic and sustainable manner

Policy Statements

The Government will:

a. *Increase availability of and access to multi-hazard warning systems and information for disaster risk reduction*
b. *Promote partnerships and service delivery agreements between the NMS and different users of products and services.*
c. *Promote cooperation and collaboration with other national, regional and global specialized agencies in Disaster Risk Reduction issues.*

5.5.11 Public Weather Services

5.5.10.1 The core business of NMS is to serve public good by providing reliable and timely weather, climate and related information to the community at large. These services have an essential role to play in bringing about disaster reduction through delivery of quality public weather services, including provision of weather forecasts, early warnings and hazardous weather, outreach activities to enhance public awareness of weather hazards, interpretation and use of weather information, as well as collaboration with disaster relief organizations to minimize loss of life and property.

5.5.10.2 The NMS is designated as the national authority for weather forecasting in Kenya, several other players offering weather and climate information acquires weather data and information from unauthenticated sources, which they disseminate to end users. The quality of such information may not be up to required standards.

5.5.10.3 The RAdio and InterNET (RANET) program operated by the NMS provide weather and climate information services to vulnerable communities in their local languages to militate against severe weather events.

5.5.10.4 In recognition of the role of indigenous knowledge (IK) at the community level it is necessary for NMS to harness and integrate IK and the scientific knowledge with a view of improving service delivery.

Policy Statements
The Government will: *(a) Put in place a regulatory framework for the dissemination of weather and climate information and products;* *b) Support the development and enhancement of dissemination structures to improve the uptake and usage of the weather and climate information and products;* *(c) Promote partnerships with stakeholders in disseminating good quality weather and climate information;* *d) Promote awareness and preparedness to help citizens make best use of forecasts and warnings*

5.5.12 Human Resource Management and Development

5.5.11.1 The advances in scientific knowledge and technology have led to more accurate forecasts and general improvement of the quality of meteorological services. This has enabled NMSs to respond appropriately to the increased demand for weather and climate information in the face of negative impacts of adverse weather and extreme climate events on various socio-economic sectors. Demand for sector specific weather information, as opposed to generalized weather forecasts, has underscored the need for specialized skills. Consequently, there is need for continuous capacity development to not only keep abreast with technological changes, but also ensure the users access accurate, relevant, timely and quality weather and climate information.

5.5.11.2Building a critical mass of professionals in the National Meteorological Service is an investment that requires short and long term approach. The short term training and targeted courses are important for development of knowledge, attitudes, skills and other competences as well as managerial development, while the long term training in various thematic areas enhances specialisation.

Policy Statements
The Government will: *(a) Ensure staffs undergo continuous professional development in line with the national and international standards;* *b) Ensure that the Authority will have sufficient staff equipped with necessary skills; knowledge and competencies;*

CHAPTER SIX: METEOROLOGICAL EDUCATION & TRAINING, RESEARCH AND DEVELOPMENT

6.1 Education and Training

6.1.1 Education and training is offered to assist National Meteorological Services in developing and delivering the weather climate and water related services required for the safety and wellbeing of the population and to become full partners in global collaborative efforts. This works centers on the development of human resources.

6.1.2 In Kenya, education and training in Meteorological science is done at Universities and the Institute for Meteorological Training and Research (IMTR). IMTR is a training institution within the Kenya Meteorological Department (KMD) and is designated as a component of World Meteorological Organization (WMO) Regional Training Centre (RTC), for English-speaking Africa.

6.1.2 There are twenty-eight (28) WMO-RTCs in the world, of which, eight are in Africa. The IMTR/WMO-RTC Nairobi has over the year's ranked number one (1) in Africa and Number three (3) in the world. The Institute undertakes Education and Training in Meteorology, Climatology, Aeronautical Meteorology (Civil and Military), Agro-meteorology, Marine Meteorology and Physical Oceanography, Satellite Meteorology and GIS, Hydrometeorology, Climate Change, Instruments Maintenance and Calibrations, Meteorological Coding and Methods of Observations.

6.1.3 It is a constant challenge to increase the capacity of the WMO education and training community to meet initial education needs as well as the need for ongoing continuous professional development. As demand expands for weather, climate and water services to include disaster risk reduction in forecasting, the challenge gets even greater. The WMO Global Campus, which builds upon the existing network of WMO RTC's helps members to meet this need by making more opportunities available through increased cooperation and collaboration between the centers and affiliated training institutes.

6.1.4 Though its training programs has played a significant role in the development and strengthening of the National Meteorological Services (NMSs) both local and International, it lacks institutional legal framework to train, examine and award certificates in line with the Technical and Vocational Education Training Authority (TVETA), TVET-Curriculum Development Accreditation and Certification Council (CDACC), Kenya National Qualification Authority (KNQA), WMO and ICAO Standards and Practices.

Policy Statements
The Government will: *(a) Enact a Bill to establish the Kenya School of Meteorology* *b) Ensure the National and International Curricula Standards are maintained in accordance to TVET-CDACC, WMO and ICAO requirements;* *(c) Support modernization of the School facilities in line with the current International Operating Standards, Practices and Procedures (WMO Manual No 1083);* *d) Develop human resource through training provision of educational material and awarding fellowship* *e) Foster collaboration and cooperation between the School and other Training institutions in the field of Meteorology*

6.2 Research and Development

6.2.1 Research and development is a key area of the NMS whose main objective is to understand the dynamics and processes of the earth – atmosphere – ocean systems in order to improve observations, predictions, service delivery of weather and climate information over Kenya and surrounding regions.

6.2.2 Research improves the quality and accuracy of weather, climate and environmental forecasting and prediction by facilitating analysis and prediction of variability and change in Earth systems which is critical to the needs of the United Nations Framework Convention on Climate Change (UNFCCC) and the Intergovernmental Panel on Climate Change (IPCC) Assessment Reports. The NMS is the focal point for coordinating scientific assessments on the state of knowledge on climate change and scenarios.

6.2.3 There is a need to strengthen structured systems for peer review, research ethics, and publications of research findings, open access to research reports and collaborative research with other specialised institutions for a deeper understanding of the earth atmosphere systems.

Policy statements

The Government will:

(a) Enact a Bill to establish a professional body to coordinate meteorological research and publication;

(b) Promote operational research and development programs and projects that transfer knowledge and technologies for sustainable development;

(c) Foster collaborative research among relevant institutions;

(d) *Support infrastructure development for research and application of research findings;*

CHAPTER SEVEN: LEGAL AND INSTITUTIONAL FRAMEWORK

The implementation of a policy requires operationalization through an effective legal framework consisting of an Act of Parliament and through other relevant policies, which reflect and advance the principles contained in the policy. Existing legislation should also be reviewed to streamline them with the policy in addition to international agreements, conventions, and treaties to which Kenya is a party.

7.1 Legislative Framework

For a long time, meteorological services in Kenya have been provided without a legal framework in regulating meteorological services in the country. In this regard, there is an urgent need for a legislative framework that will enable the creation of a body corporate to operationalize this Policy.

Policy Statement

The Government will:

(a) Enact a Meteorology Bill;

(b) Establish Kenya National Meteorological Authority to implement this Policy.

7.2 Partnership and Stakeholder Collaboration

The success of this policy is highly dependent on the strength of linkages and partnerships that the National Meteorological Service is able to forge both with existing institutions and related sectors able to support its mandate as well as funding mechanisms. To be effective, this policy must be clearly linked with the work of other government departments and agencies, technical partners, the private sector and relevant stakeholders and work in concerted efforts with other global and regional frameworks.

Weather and climate patterns recognize no boundaries and no nation can be entirely self-sufficient in the production of all its meteorological and climate services. There is urgent need to work jointly and in synergy, to contribute effectively and efficiently to the development of countries by exploring the full potential of meteorological and related sciences. NMSs therefore need to foster cooperation and build partnerships with other countries and international, regional or global organization to promote cooperation in the provision of meteorological services.

Policy statement

The Government will:

a) Promote partnerships and collaboration of all partners/institutions in the meteorology sector;

b) Identify appropriate structures to synchronize various sector policies that address weather and climate;

7.3 Regional and International Obligations

7.3.1 Kenya has regional and international responsibilities designated by the World Meteorological Organization (WMO) and the International Civil Aviation Organization (ICAO).

These responsibilities are:

(a) to facilitate the rapid regional exchange of meteorological data and products through the WMO Information System Data Collection and/or Production Centre (WIS/DCPC) which is a Regional Telecommunication Hub (RTH);

(b) Regional Specialized Meteorological Centre (RSMC) to facilitate research in satellite meteorology, monsoonal flows and tropical cyclones prediction and tracking in the south-western part of the Indian Ocean;

(c) Regional Instrument Centre (RIC) to maintain the standards of meteorological instruments in Africa to WMO standards through measurement, instrument inter-comparison and calibration;

(d) Regional Training Centre (RTC), responsible for conducting meteorological training and skills development;

(e) Regional Specialized Meteorological Centre for severe weather forecasting demonstration project for East Africa.

(f) Monitoring the global atmospheric chemical composition and background air pollution relating to the quality of air and climate change at the Global Atmosphere Watch (GAW) station on Mt. Kenya; and

(g) ICAO Meteorological Watch Office at Jomo Kenyatta International Airport (JKIA) responsible for the Flight Information Region (FIR) to monitor meteorological hazards and issue SIGMET warnings on severe weather, volcanic eruptions and tropical cyclones for air navigation services to enhance safety of Kenyan airspace in line with Annex 3 of the Chicago Convention.

Policy statement
The Government will support the Kenya Meteorological Authority in fulfilling its Regional and International obligations

7.4 Affiliation

In fulfilment of Kenya's national, regional and international service obligations, Kenya is a signatory to a number of international conventions and treaties, under which it cooperates with various organizations. In this regard, the NMS is obligated to make annual subscriptions to some of these organizations. These organizations are:

(i) World Meteorological Organization (WMO);
(ii) International Civil Aviation Organization (ICAO);
(iii) African Centre of Meteorological Applications for Development (ACMAD);
(iv) Kenya Meteorological Society (KMS);
(v) African Ministerial Conference on Meteorology (AMCOMET);
(vi) Intergovernmental Panel on Climate Change (IPCC);
(vii) IGAD Climate Prediction and Application Centre (ICPAC).

(viii) Regional Integrated Multi-Hazard Early Warning System (RIMES) for Africa and Asia;
(ix) Aircraft Meteorological Data Relay (AMDAR)
(x) Data Buoys Cooperation Programme
(xi) West Indian Ocean Marine Sciences Association (WIOMSA)

Policy statement

The Government will ensure adequate budgetary allocation to the NMS to facilitate payments of annual subscriptions to national, regional and international institutions.

7.5 Financing of National Meteorological Services

7.5.1 Different options exist for funding the provision of meteorological services and for charging the information provided. The basic infrastructure and general forecasts, warnings and alerts have public good properties of non-rival consumption and high costs of exclusion. These, therefore, require direct government funding that favour free provision at zero prices to all.

7.5.2 The sources of funding for NMS shall be as spelt out in the Exchequer allocations for recurrent and development expenditure for public good. Other sources shall be through generation of revenue through specialized services, aeronautical meteorological services, maritime services, Service Level Agreements, royalties, licenses, fees, projects, donations and grants will also act as a source of revenue for the NMS.

Policy statements

The Government will:

(a) Support the NMS through direct budgetary allocation from the Exchequer for public good services;

(b) Establish resource mobilization mechanisms and strategies to augment the NMS funding for private good services.

CHAPTER EIGHT: IMPLEMENTATION FRAMEWORK

8.1 Policy Coordination

8.1.1 It is recognized that weather, climate, water and related environmental conditions have a significant influence on the socio-economic development of countries worldwide. This Policy recognizes the role of the two levels of government in the country.

8.1.2 The increase in world population, and extension of settlements and life supporting activities in areas vulnerable to the impacts of weather-, climate- and water-related disasters makes it necessary to improve the capacities of NMSs, especially in developing and least developed countries, to provide better services to reduce disaster risks, and support national development and life supporting activities. The increase in the frequency and intensity of natural hazards due to climate variability and change poses critical challenges to many countries.

Policy Statements

The Government will:

(a) Put in place an enabling institutional framework for effective implementation of this Policy.

(b) *Streamline and strengthen the capacity of Meteorological service provision at the National and the County levels in order to make them more effective and participatory.*

8.2 Monitoring, evaluation and reporting

8.2.1 The Government will develop an implementation plan for this policy with the participation of local, regional and international stakeholders in the meteorology sector. It will also designate the roles and responsibilities of all parties and include a set of performance indicators and measures to assess progress towards the achievement of the set goals in this policy. In addition, the NMS shall develop a monitoring and evaluation framework to assess the impact of the policy on the set targets.

8.3 Implementation of the policy

8.3.1 The government shall develop an implementation plan with the participation of all partners and stakeholders in the field of weather and climate at both national and county levels. The implementation plan will designate the roles and responsibilities of all parties. The implementation plan will also include a set of performance indicators and measures to assess progress towards the effective coordination of all weather, climate and environmental observations, telecommunication, processing, data management, archival and dissemination.

8.4 Review of the policy

8.4.1 Given the dynamic change in the science of meteorology, this Policy will require to be reviewed periodically to respond to changes in observation technology, data transmission, weather and climate forecasting techniques, increased interest in the uptake of weather and climate information at local, regional and international level and to integrate best practices.