THE REPUBLIC OF UGANDA

The Joint GOU-Development Partners Technical Review (JTR):

The importance of the Meteorological Services

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Purpose of Meteorological Services as stated in the World Meteorological Organization (WMO) Convention

Monitoring weather and climate; providing meteorological, hydrological and related services in support of relevant national needs in the following areas:

- *Protection of life and property*
- *Safeguarding the environment*
- *Contributing to sustainable development*
- *Promoting long-term observation and collection of meteorological, hydrological and Climatological data.*
- *Meeting international commitments and obligations*
- *Contributing to international cooperation.*

The Mandate of Uganda National Meteorological Authority

To promote, monitor weather and climate and to provide weather forecasts and advisories to Government and other stakeholders for use for sustainable development of the country.

Weather and Climate as a Cross-cutting Issue

The success of major planned investments in NDPII and Vision 2040 require reliable weather and climate data and information for, among others;

- **Water resources planning for Power generation, irrigation, domestic and industrial supply, water catchment management plans,**
- **Agriculture planning and productivity –understanding weather extremes especially droughts, floods, seasonal rainfall patterns as well as irrigation planning,**
- **Health and sanitation,**
- **Oil and gas exploration,**
- **Ecosystem planning and management,**
- **Infrastructure development.**

Strategic Direction

The UNMA strategic plan is based on the NDPII and the Uganda Vision 2040 with the following strategic objectives;

1) **To improve the quantity and quality of meteorological services for all stakeholders,**

2) **To promote greater awareness of the benefits of using meteorological services, information and products,**

3) **To build a skilled and motivated workforce through good human resource practices,**

4) **To improve the accuracy and reliability of forecasts and advisory services through the development of climate prediction and short-term weather forecasting capability.**

Strategic Objective 1: To improve the quantity and quality of meteorological services for all stakeholders.

Planned interventions include;

- **Implementation of Quality Management Systems (QMS) for Aeronautical meteorological services. Migration from ISO certification from ISO 9001:2008 to ISO 9001:2015 by August 2018,**
- **Maintenance of Global Meteorological data exchange in support of Global Climate Services,**
- **Increased functionality of major meteorological installations (Synoptic, Agromet and Hydromet stations) from 61.4% to 100%**
- **Expand the network of Automatic Weather Stations (AWS) and increase functionality of Rain gauge stations,**
- **Enhancing the accurate of seasonal climate forecasts.**
- **Timely issuance of seasonal climate outlooks on quarterly basis for the entire country.**

Strategic Objective 2: To promote greater awareness of the benefits of meteorological services and products.

Planned interventions include;

a) **Undertaking awareness programs on weather and climate for stake holders developed and implemented.**

b) **Providing early Warning System on weather and climate under development to be implemented in collaboration with the Office of the Prime Minister (OPM),**

c) **Translating the seasonal climate forecasts into 35 major local languages,**

d) **Popularising meteorology in schools through increasing awareness about weather and climate among the youth and students.**

Strategic Objective 3: To build a skilled and motivated workforce through good human resource practices

Planned interventions include;

a) **Reviewing of the UNMA HR structure to incorporate critical core areas of Climate services and Research as well as Marketing and Publicity.**

b) **Strengthen the volunteer Weather Observers programme to enhance UNMA's ability to collect climate data from the field.**

c) **Revive and strengthen the Uganda Meteorological Society with a view of promoting professionalism in the field of meteorology and general Climate Sciences.**

Strategic Objective 4: To improve accuracy and reliability of forecasts through development of climate prediction and short-term weather forecasting capability.

Interventions include;

a) Establishing an automated weather forecasting system with in-house Numerical Weather Prediction (NWP) capability.

b) Procuring and installing modern weather radars with spatial coverage of the country to enhance real-time weather monitoring,

c) Establishing a Comprehensive Air Quality observation network for Kampala city and at least 20 major urban centers across the country,

d) Installation of a national wide lightning detection system to provide early warning data that can prevent disasters resulting from lightning,

e) Rescuing and digitizing all historical climate data,

f) Enhancing access to climate information products and services relevant to the needs of the public and other stakeholders.

Low Cost investment priorities for UNMA

No.	Low Cost Priorities	Status	Estimated fun
1.	Internet connectivity at 18 synoptic stations	Critical for automation of real-time data exchange	100,00
2.	Automating routine observations (AWS)	30 AWS required in first phase before roll-out across country	600,00
3.	Maintenance of functional UNMA Website	www.unma.go.ug in place, but require maintenance	30,00
4.			
5.	Establishing Forecasting System	Currently running synoptic forecasting system and there is need to automate forecast system	100,00
6.	Establish priority volunteer observer program	Need a budget to support initial phase of at least 50 volunteers	120,00
7.	Wind profilers at Entebbe Airport	Equipment procured for Entebbe Airport, need commissioning	250,00
		Total	1,200,00

High Cost investment priorities for UNMA

No.	Low Cost Priorities	Status	Estimated funds
1.	Network of three (3) Weather Radars	Gov't provided initial funding for one (1) radar	20 Bn
2.	Total lightning detection network	UNMA soliciting and mobilizing funding	3 Bn
3.	Wind profilers at all eight (8) domestic airports	Procured equipment for Entebbe, not for 8 airstrips	5 Bn
4.	Comprehensive Air Quality network (with at least 20 locations).	Air quality sensors lacking and critically required due to massive environmental degradation	1.5 Bn
5.	Fully automated Weather Station network, with (with ~200 stations)	Only 50 AWS installed and 200 AWS required to cover entire country	10 Bn
6.	Establish nationwide volunteer observer program	Budget for 200 volunteer Observers to cover entire country	0.5 Bn
7.	Pilot balloon sounding at Eight (8) domestic aerodromes	All domestic aerodromes lack upper air weather monitoring	10 Bn
	Total		43.8 Bn

Cost Benefit of MET Services: The International Cases

- Several studies have been undertaken in USA, UK, Germany, France, Nordic countries, Australia, China, Eastern Europe, Russia, and Central Asia countries among others, to estimate the economic benefits of selected meteorological services and products (Katz and Murphy 1997; as revealed in the MDA Report)

- All the studies conducted in sectors such as Agriculture, tourism, mining, water resources management and off-shore operations, confirm the existence of actual or potential economic benefits far in excess of the total cost of operation of the NMHS system.

- The Benefit-cost ratios for individual services range from the order of 2:1 up to 100s:1

The International Cases (Cont'd)

In 2003, the total returns to investment in the modernization project in Russia were estimated to be in the range of 400 - 800%. As a result, the Russian Government decided to enhance the modernization package from the original US$80 million to about US$133 million.

- According to a recent study by Xu, the ratio of average annual costs to the overall yearly economic benefits of meteorological service for China Meteorological Agency (CMA) is 1:69.

Conclusions

- The role of the meteorological services in social and economic development is recognized and appreciated.
- UNMA cannot satisfy all the demands for the meteorological services without public and private partnerships.
- Capital investment is needed to revamp the station network..
- **The Benefit/Cost ration is high if quality information is provided to stakeholder to undertake economic activities**
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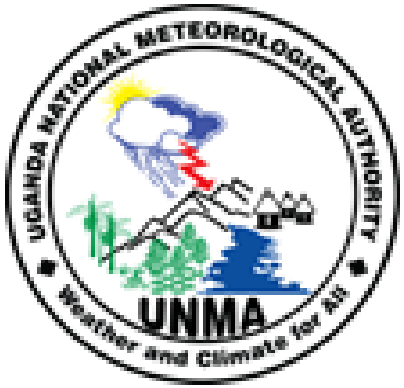

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Thank you for your attention