

# Lessons from the Modernization of National Meteorological and Hydrological Services (NMHSS)

## ‘A CASE STUDY OF THE ZAMBIA METEOROLOGICAL DEPARTMENT.’

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# Introduction

- Since 1967 when the **Zambian Meteorological Department (ZMD)** was established, most of the weather observations were done using the traditional manual weather measuring instruments.
- However, from 2013 to date, **ZMD** started the modernization program that involved the installation of **Automated Weather Observation Stations (AWOS)** from one in 2013 to 68 operational AWOS to date. A further 30 AWOS are expected to be installed before the end of the year(2018).



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# Background and motivation to the study

Most countries from the developing world have been undergoing National Meteorological and Hydrological Services (NMHSs) for the 21<sup>st</sup> Century World Bank modernization projects with the main objective of minimizing risks, ensuring safety and protecting life, goods and property. However, according to the co-operation framework of World Bank-Global Facility for Disaster Reduction and Recovery (GFDRR)-InterMET Asia 2018 conference **“since 2010 there has been significant growth in the flow of funds to the developing world but results are often unsatisfactory with ‘sustainability’ being the major challenge”**.



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# Objectives of the Study

## **Main Objective:**

To establish some of the challenges associated with sustaining the operations of AWOS

## **Significance of the Case study:**

- To expose, explain and share some of the challenges that are associated with **sustainability** of the modernization programs.
- To help other developing countries to undertake modernization programs with lessons learnt from the **Zambian** case in mind.

# Automatic Weather Observation Station (AWOS)



Gender Equality



# AWOS parameters sensors



- **Wind(speed and direction)**
- **Visibility**
- **Background Luminance**
- **Present Weather**
- **Cloud Height**
- **Air Temperature**
- **Barometric Pressure**
- **Rain Amount**
- **Relative humidity**
- **Insolation**



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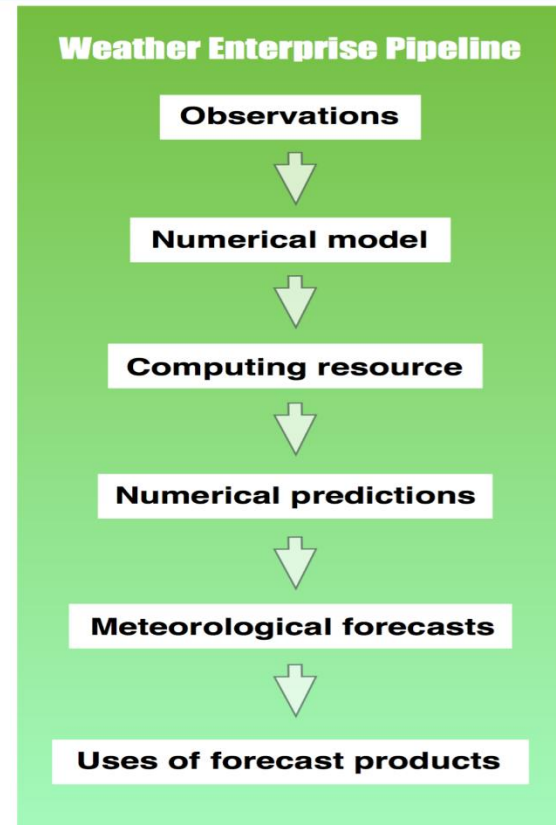




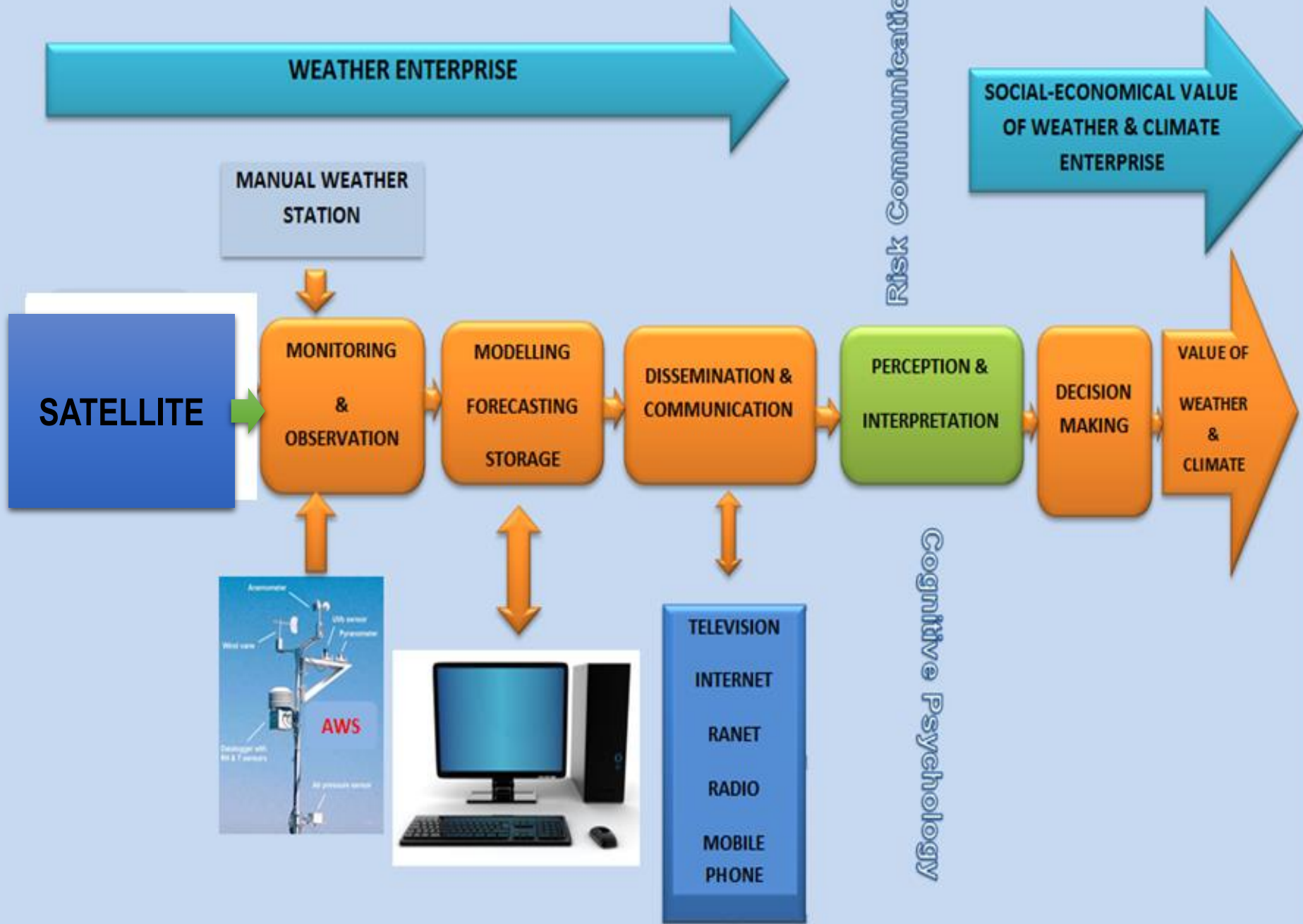
# Zambia Meteorological Department(ZMD)

## Value chain (based on the WMO Global Weather Enterprise Model) key elements:

- A well-established and successful National public-private partnership (PPP) with ZMD in which both partners share common goals.
- There are new opportunities emerging to develop this partnership further that will enable the whole weather enterprise concept in ZMD to grow and produce more accurate and reliable weather forecasts.
- The urgency to do this comes from the need to be even more effective in reducing loss and damage through saving lives and protecting the build-infrastructure (roads, bridges, railways, etc) because of vulnerability to weather hazards in a changing climate.



SOURCE: <https://public.wmo.int/en/resources/bulletin/weather-enterprise-global-public-private-partnership>



# Research Findings

- Modernization in the Zambia Meteorological Department (ZMD) has proven to be good because it has added value to many of the application of weather products and services of the economy.
- Modernization doesn't come cheaply. In case of ZMD, it has made the Department think outside the box in order to sustain the operations of the AWOS.

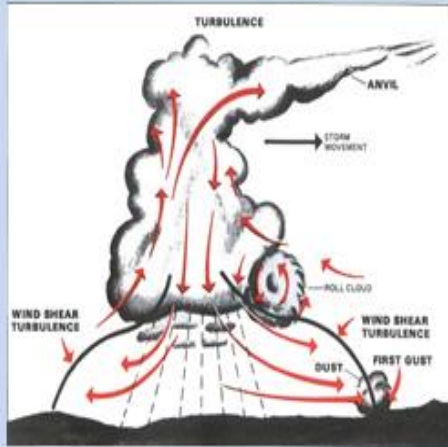


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# VALUE ADDED-EARLY WARNING SERVICES



WARNING OF AVIATION HAZARDS



DROUGHT MONITORING



BUSH FIRE MONITORING



FLASH/FLOOD WARNING



WARNING OF HEAT WAVES



CROP MONITORING AND YIELD FORECAST

# Sustainability lessons learnt

- Need for strategic investments through human resource in-house and out-house trainings. (e.g. ZMD is just in the process of stationing a technician at each of the 10 provincial stations to be responsible for all AWOS in a province, thus reducing cost)
- Need to collaborate with institutions of higher learning (e.g. ZMD has an MOU with the University of Zambia (UNZA) for value addition in the V-chain and SLA with Mulungushi University (MU) for undergraduate training )
- Need to enhance linkages with central, local government, water authorities and the private sector. (e.g. ZMD is already working well with network providers for concessions)



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# Sustainability lessons learnt -----Continues



Automatic weather observation stations (AWOS) that are installed at learning institutions (e.g. Schools, farmers' training institutes) tend to be more secure in terms of vandalism and less costly in maintenance than those installed elsewhere.

# Conclusion

- The modernization of Zambia Meteorological Department (ZMD) operational services has been realized through strategic and challenging investments, and through step-by-step improvements designed to enhance service delivery to end users and mobilize human resources to meet growing societal needs.
- It is envisaged that the study will also foster and encourage communication and exchange of knowledge on best practices among NMHSs especially with the advent of the Global Weather Enterprise (GWE) concept.



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End

Thank you very much for your attention

**Merci de votre aimable attention**



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