IMPLEMENTATION OF NAPA ERALY WARNING PROJECT IN THE GAMBIA

Regional Training Workshop on Adaptation for African Anglophone LDCs

29th July to 2nd August 2013, Kigali, Rwanda

Bubu Pateh Jallow

Pa Ousman Jarju

Department of Water Resources

7 Marina Parade, Banjul

Republic of The Gambia

NAPA Projects

	Project Title	Total LDCF amount (grant + fees) ($)	Co-financing ($)	Status
1	Strengthening of the Gambia's Climate Change Early Warning Systems	1,164,350	1,605,000	Under implementation
2	Strengthening climate services and early warning systems in the Gambia for climate resilient development and adaptation to climate change – 2nd Phase of the Early Warning Project	8,910,000	25,360,000	Council approved
3	Enhancing Resilience of Vulnerable Coastal Areas and Communities to Climate Change in the Republic of The Gambia	9,955,000	41,538,000	Council approved
4	Adapting Agriculture to Climate Change in the Gambia	6,360,000	29,000,000	Awaiting availability of funds in the LDCF

Strengthening the Gambia's Climate Change Early Warning System

- Project is to strengthen the Climate Change Early Warning System (CCEWS) of The Gambia

- CCEWS is one of the ten priority adaptation activities identified as urgent in the National Adaptation Programme of Action (NAPA);

Goal and Objective

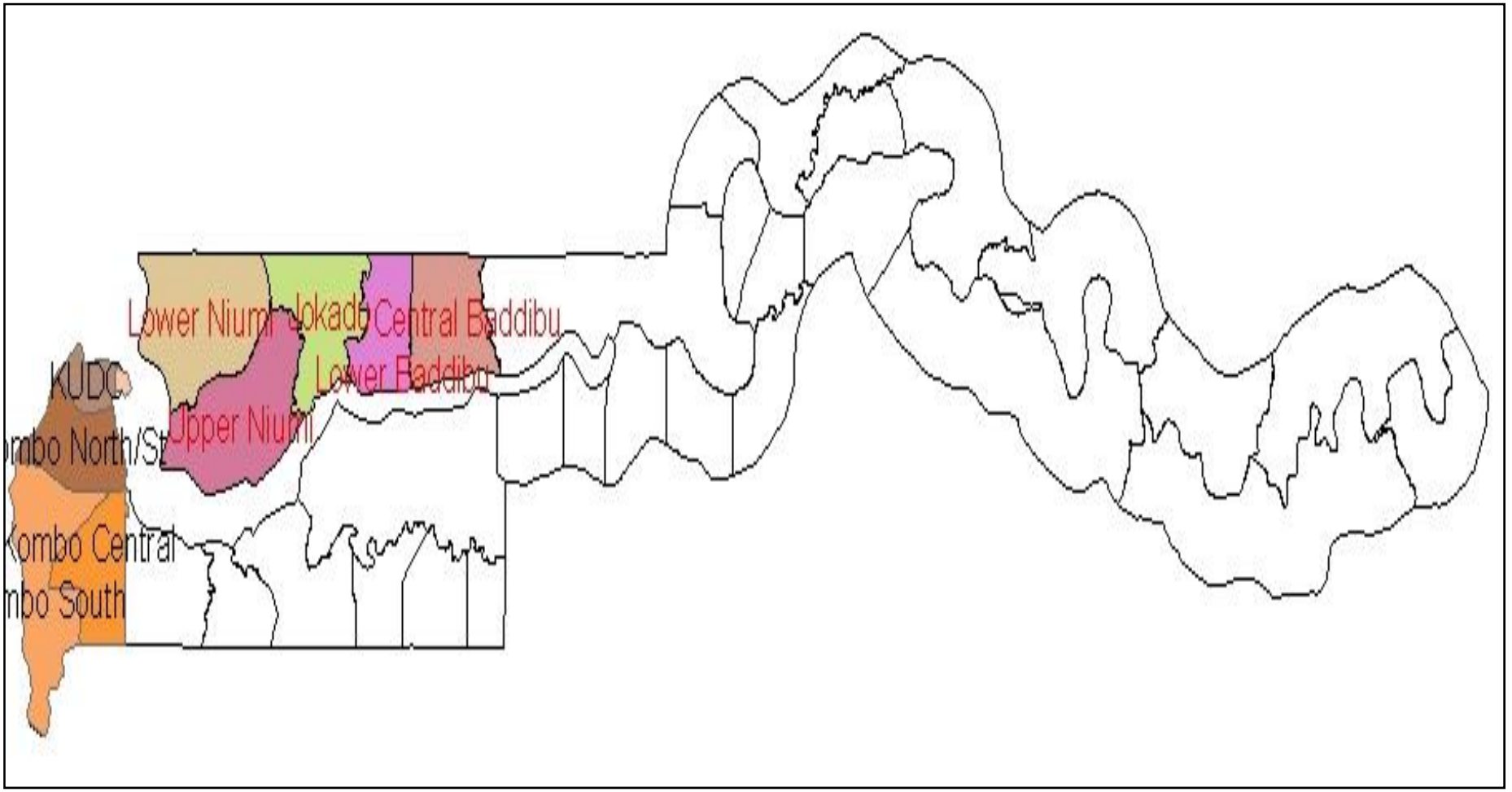
- Goal is to adapt national development in the face of climate variability and change.
- Objective of the CCEWS project is to enhance adaptive capacity and reduce vulnerability to climate change through a strengthened early warning and information sharing mechanism for a better informed decision making by government and affected population.

Expected Outcomes

THREE OUTCOMES

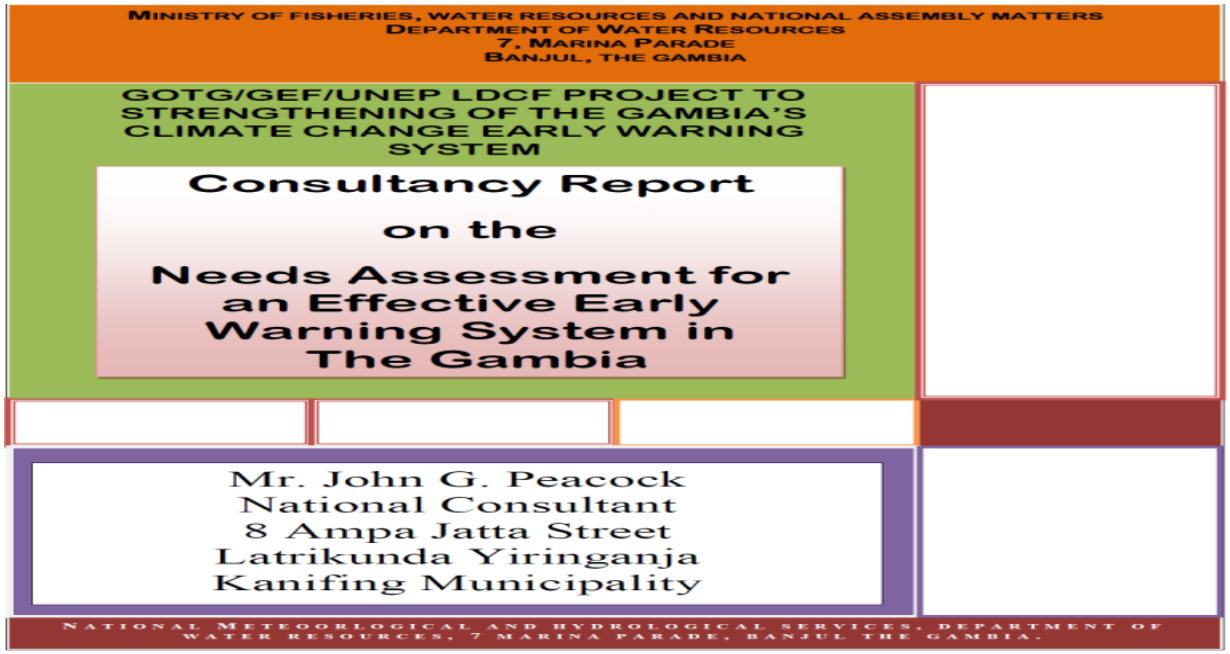
1. **Enhanced capacity of hydro-meteorological services and networks for predicting climate change events and risk factors.**
2. **Effective, efficient and targeted delivery of climate and climate change information including early warnings.**
3. **Improved and timely preparedness and responses of various stakeholders to forecast climate linked risks and vulnerabilities.**

PROJECT SITES



Enhance the capacity of hydro-meteorological services and networks

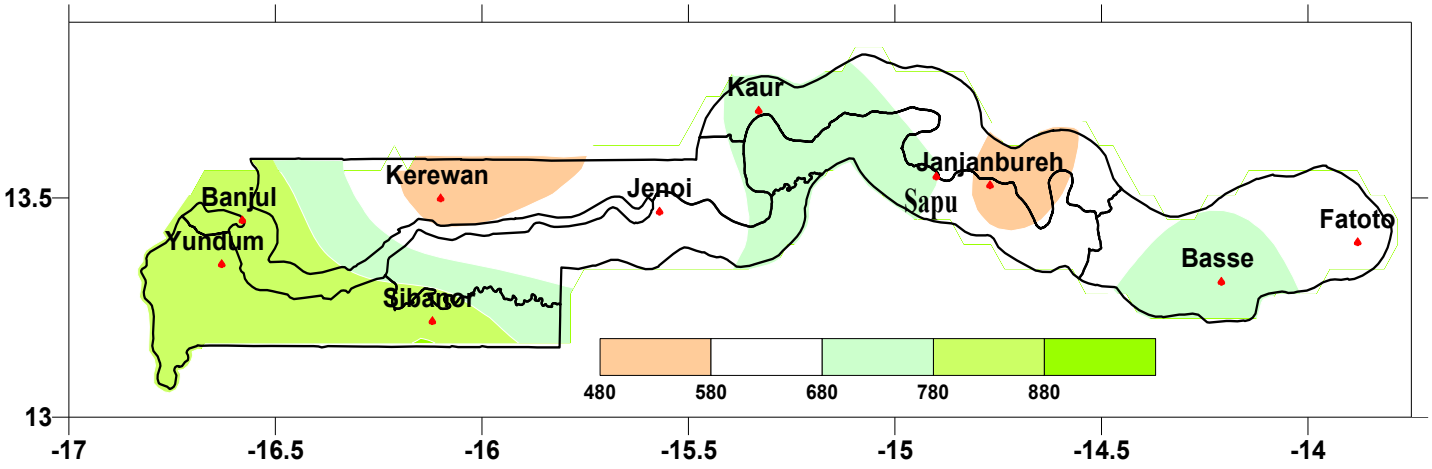
Conducted Needs assessment to confirm previous needs and also determine emerging needs (National Consultant)

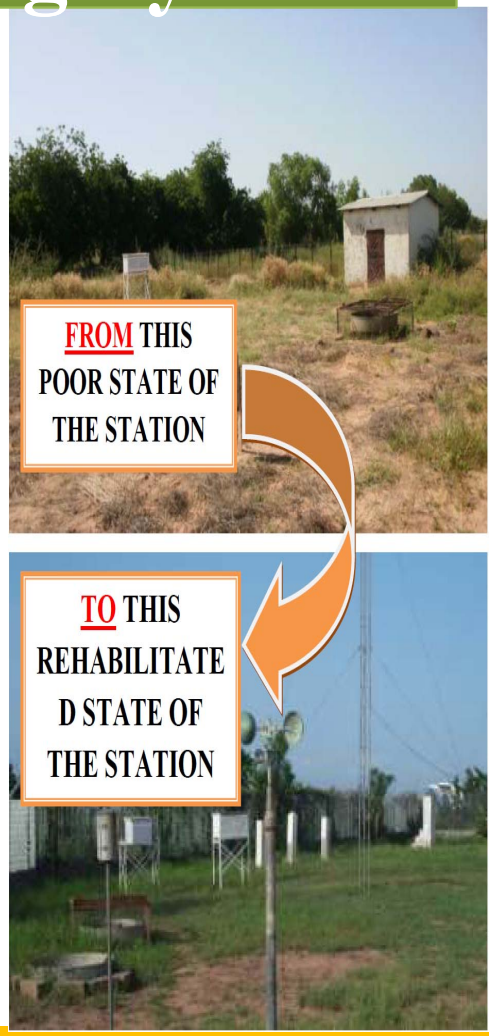


Baseline Infrastructure & Equipment and Needs for Gambia Early Warning System

The Baseline Studies recommend to:

☛Protect and Rehabilitate 10 Meteorological and 17 Hydrological Stations and Equipment by Constructing, Fencing and Rehabilitating Infrastructure





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Baseline Infrastructure & Equipment and Needs for Gambia Early Warning System

- Procure and Upgrade Meteorological and Hydrological Equipment, preferably using Automated and Electronic equipment

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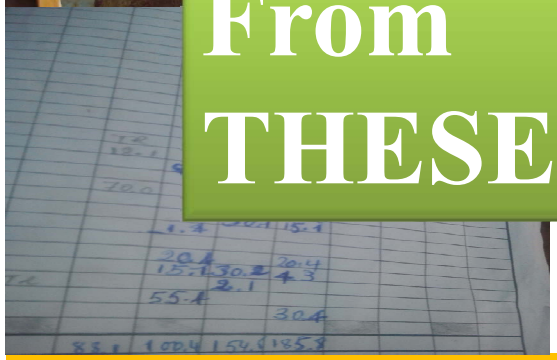

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Marine Automatic Weather and Tide gauge Station

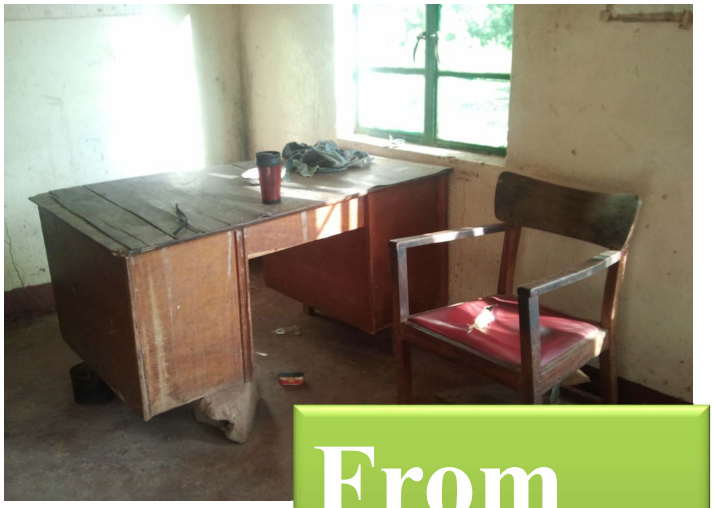
AWS

Tide gauge

Tide gauge

Installing_Tide gauge

Baseline Infrastructure & Equipment and Needs for Gambia Early Warning System



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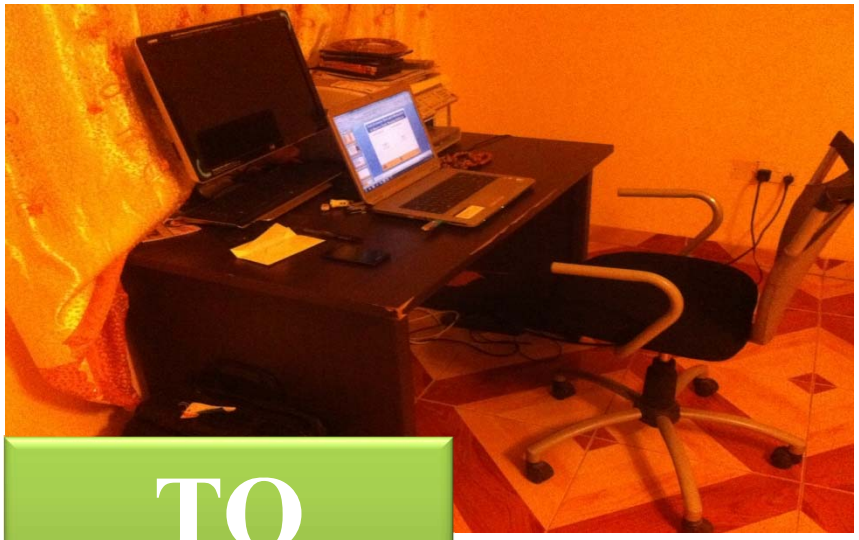

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Baseline Infrastructure & Equipment and Needs for Gambia Early Warning System

- **Need Data Analysis and Software including:**
  - Forecasting tools (High resolution models, guidance from global forecasting centres)
  - Data analysis, storage, processing and presentation tools (computers, printers, projectors)

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Baseline Human Capacity Needs for Gambia Early Warning System

Table 1: Current human resources situation

METEOROLOGICAL SERVICES		HYDROLOGICAL SERVICES	
Optimum	**Current Status**	**Optimum**	**Current Situation**
CLASS I- Meteorologist • PhD Degree - 2 • MSc Degree - 5 • BSc Degree - 14	**CLASS I- Meteorologist** • PhD Degree - none • MSc Degree - 2 personnel • BSc Degree - 5 personnel	**CLASS 1- Hydrologist** • PhD Degree - • MSc Degree - 2 • BSc Degree - 2	**CLASS 1- Hydrologist** • PhD Degree - none • MSc Degree - none • BSc Degree - 1
CLASS II- Senior Level Technician (SLT) • 12	**CLASS II- Senior Level Technician (SLT)** • 3 Personnel	**CLASS II- Senior Level Technician (SLT)** • 4	**CLASS II- Senior Level Technician (SLT)** • None
CLASS III- Middle Level Technician (MLT) • 20	**CLASS III- Middle Level Technician (MLT)** • 6 Personnel	**CLASS III- Middle Level Technician (MLT)** • 8	**CLASS III- Middle Level Technician (MLT)** • 4 Personnel
CLASS IV- Entry Level Technician (ELT) • 40	**CLASS IV- Entry Level Technician (ELT)** • 31 Personnel	**CLASS IV-Entry Level Technician (ELT)** • 15	**CLASS IV-Entry Level Technician (ELT)** • 11 Personnel
SUPPORT STAFF • **24**	**SUPPORT STAFF** • 47 Personnel (without any formal training)	**SUPPORT STAFF** • **8**	**SUPPORT STAFF** • 4 Personnel

Baseline Human Capacity Needs for Gambia Early Warning System

- **Enhance Human Capacity for Effective Early Warning System**
  - Trained 18 Technicians at WRTS
  - 6 Technicians being trained in Nigeria
  - Recruited 3 Degree Holders for further training at the UK Met Office on Modeling, Model Interpretation and Forecasting.
  - **Addition Technical and Professional Training (Meteorology, Hydrology, Climate Modeling, Engineering) Needed at an estimated cost of US$ 1 Million**
  - **Sustainability is assured from Recruitment and through Bonding involving PMO and MoFEA**

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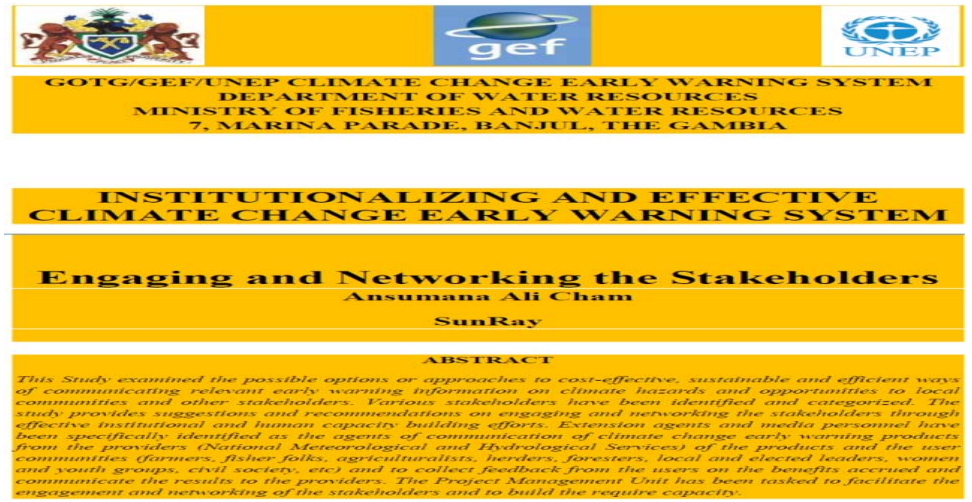
Effective, efficient and targeted delivery of climate and climate change information

- Need for addition information including socio-economic to improve Early Warning Bulletins
- Establishment of an Effective and Sustainable Early Warning System



GOTG/GEF/UNEP CLIMATE CHANGE EARLY WARNING SYSTEM
DEPARTMENT OF WATER RESOURCES
MINISTRY OF FISHERIES AND WATER RESOURCES
7, MARINA PARADE, BANJUL, THE GAMBIA

INSTITUTIONALIZING AND EFFECTIVE CLIMATE CHANGE EARLY WARNING SYSTEM

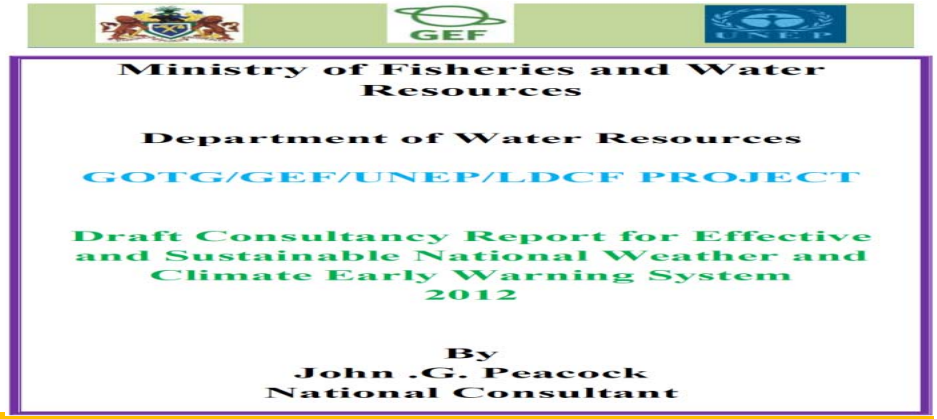
Engaging and Networking the Stakeholders

Ansumana Ali Cham

SunRay

ABSTRACT

This Study examined the possible options or approaches to cost-effective, sustainable and efficient ways of communicating relevant early warning information on climate hazards and opportunities to local communities and other stakeholders. Various stakeholders have been identified and categorized. The study provides suggestions and recommendations on engaging and networking the stakeholders through effective institutional and human capacity building efforts. Extension agents and media personnel have been specifically identified as the agents of communication of climate change early warning products from the providers (National Meteorological and Hydrological Services) of the products and the user communities (farmers, fisher folks, agriculturalists, herders, foresters, local and elected leaders, women and youth groups, civil society, etc) and to collect feedback from the users on the benefits accrued and communicate the results to the providers. The Project Management Unit has been tasked to facilitate the engagement and networking of the stakeholders and to build the require capacity.



Ministry of Fisheries and Water Resources

Department of Water Resources

GOTG/GEF/UNEP/LDCF PROJECT

Draft Consultancy Report for Effective and Sustainable National Weather and Climate Early Warning System
2012

By
John .G. Peacock
National Consultant

Socio Economic Data and Information to Improve Early Warning Delivery

- **This Study has been Commissioned with a view to enriching the products to meet the requirements of a modern climate and climate change early warning system.**
  - Appropriate socio-economic data and information have been identified,
  - Most efficient and effective two way linkages between providers of the above datasets and the NMHS has been suggested,
  - A training programme has been designed for field data collectors,
  - Ways of ensuring effectiveness collaboration between climate forecasters and impacted communities have been proposed.

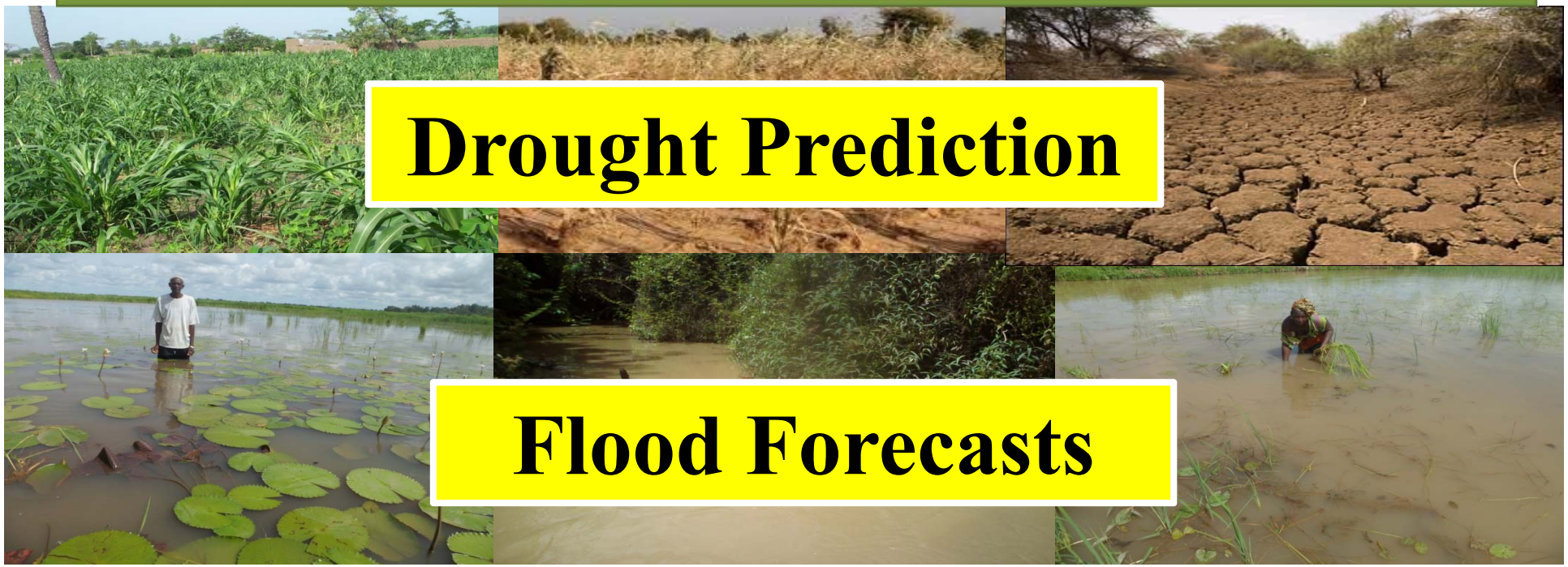
Socio Economic Data and Information to Improve Early Warning Delivery

- Relate Climate Change Early Warnings to social and economic impacts such as:
  - **Choice of agricultural and horticultural crops, practices and calendar activities;**
  - **Short and medium term planning in** Crop farming, Vegetable farming , Animal husbandry including cattle and small ruminants, Fishing & processing of fisheries products, River Transportation, Tourism and leisure, River life-saving and rescue, Security Surveillance, Cultural activities, Natural Resources exploitation such as oyster harvesting and Construction
  - **Seasonal prevalence of illnesses and diseases;**
  - **Potential loss of live and property;**

New Services and Improved Services

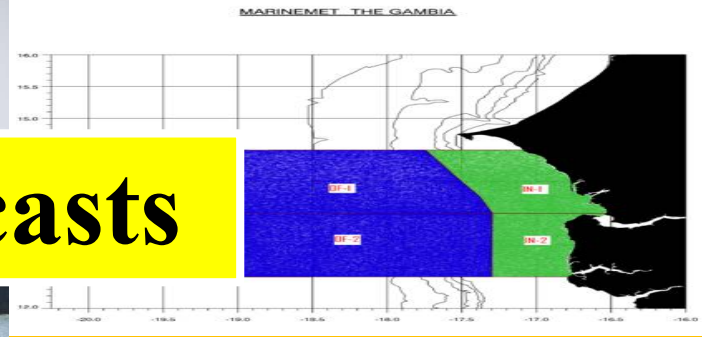
Decision Support tools for a Sustainable Early Warning System for The Gambia *(J. G. L Peacock, 2013)*		
Name of Tool	**Period of Tool**	**What Tool Does**
Nowcasting & Very Short-range	Less than 1day	Early Warning and Advisory of severe and hazardous weather to the General Public and Aviation in particular to plan daily activities.
Short-range	1day – 3days	Forecast guidance on atmosphere and ocean scenarios to the Public, Marine and Energy.
Medium-range (Pentad Outlook)	5 days	Forecast guidance on expected atmosphere and ocean scenarios for Public, Tourism, Construction, Energy and Health
Extended-range (Dekadal Outlook)	10days	Early Warning for Food Security, Agriculture/ Forestry, Fish farming, Parks & Wildlife management, Animal Husbandry, Birds rearing
Long-range	30days – 1year	Short Term Planning and Early Warning on Extremes
Monthly Outlook	1 month	Planning needs in Aviation, Marine, Agriculture, Tourism, Health, Renewable Energy, Insurance,. etc
Seasonal Outlook	3 – 4 months	Planning needs in Agriculture, Water Resources Management, Health, Off-Season Tourism etc.
Annual Outlook	12 months (1 year)	Water Resources Management, Insurance
Climate	>2years	Long Term Planning, Warning and Design/ Development/ Location of structures.
Climate Variability prediction	Expected climate as a result of the variation of inter-annual, decadal and multi-decadal climate anomalies	Water Resources Management
Climate Change prediction	Expected future climate as a result of the influences of both natural and anthropogenic Greenhouse Gases	Scenarios and story lines related to all sectors of the economy especially Agriculture, Forestry, Marine, Health And Energy

New Services and Improved Services



Drought Prediction

Flood Forecasts



Marine Forecasts

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New Services and Improved Services

HYDROLOGICAL WARNING

FGUS73 KSGF 102135 ESFSGF MOC055-056-058-060>062-110400- HYDROLOGIC OUTLOOK NATIONAL WEATHER SERVICE Yundum MO 335 PM CST FRI July 10 2012

WARNING 1:
Over the past couple of weeks, ,significant rainfall has fallen across Banjul, the Tanbi Wetland Area and the Kanifing Municipal Council. The Greater Banjul Area has received 203 mm representing more than 200% of the normal rainfall of 80 mm for Greater Banjul Area in August. As a result most of the GBA is almost back to normal rainfall and in some cases above normal through June 15.

Another heavy rain event is expected to hit the Greater Banjul Area on Monday and Tuesday and could produce flooding early next week.

WARNING 2:
Current weather models indicate a storm approaching the North Bank Region (NBR), basically following the same track taken by recent storms. This means abundant moisture will be pulled into the storm and rainfall amounts greater than 250 millimeters are predicted for the NBR.

As the ground is saturated from recent rains, swelling may occur in small and shallow streams mainly across the NBR, rising close to or above flood stage by Tuesday. This weather outlook will be updated with the latest information throughout the weekend. Another source of current weather information for the NBR is through the NMHS web page of the Ministry of Water Resources. ref: (flash flood early warning system reference guide).

HYDROLOGICAL OUTLOOK

Headline that defines the type of flooding being addressed (e.g., flash flooding, main stem river flooding, snow melt flooding)

Area covered

Predicted timing of the event

Relevant factors (e.g., synoptic conditions, quantitative precipitation forecasts (QPF), or soil conditions)

Definition of an outlook (tailored to the specific situation)

A closing statement indicating when additional information will be provided. (Ref: Flash Flood Early Warning System Reference Guide)

Improved and timely preparedness and responses

- Studies on Baseline and Operations have identified
  - The Providers, Users Communicators of Early Warning Products;
  - Modes of Communication of the Products;
  - Capacity Needs of the Providers, Users and Communicators;
- Designed Strategies and Programmes to achieve the capacity building needs;
- Conducted Capacity Training of Local Community Communication Agents;

COMMUNICATION AGENTS BRIDGE THE GAP

PRODUCERS of Early Warning Information are Scientists who do not speak the language of the USERS

Hence, the need for COMMUNICATION AGENTS that will BRIDGE THE GAP

Most of the USERS are illiterate and cannot understand the language of the PRODUCERS of the information


UNEF
GEF
Capacity Building Workshop on Climate Change
Early Warning System for The Gambia
Office of the Lord Mayor, Kanifing Municipal Coun
3-4 January 2013
National Climate Committee
Ministry of Fisheries and Water Resources


Comfort
PAPER One

Mainstreaming and integration of climate change in Development

- The NAPA strongly advocated for a more systematic consideration and inclusion of climate change related issues in sectoral policies;
- A strong call for more efforts to ensure a more visible mainstreaming of climate change into various sectoral policies during a stakeholder consultation with senior policy makers in key Ministries and Agencies during the Project Development Phase of the Early Warning Project;
- Wide recognition of the importance of climate proofing national and sectoral development policies, programmes and projects

Mainstreaming process in CCEWS

- Identify sectoral policy frameworks (ANR, Energy, Disaster Management, Waste, Decentralization) for a climate sensitive review ;
- Undertake reviews and analyses of selected national and sectoral policy documents for climate sensitive content;
- Revise policy documents to incorporate climate risks and response measures;
- Use dedicated briefings, dialogue sessions and workshops to present outputs of the reviews to decision makers;

Mainstreaming process in CCEWS

- Make recommendations and draft proposals to amend the relevant policies ;
- Engage and use the media for raising awareness on climate change and its potential impacts on various facets of livelihoods in order to sensitize decision makers to mainstream it into various sector policies and development programmes
- Organize bi-annual workshops, seminars and dialogue sessions for senior policy makers to raise awareness of the climate change issues

Mainstreaming process in CCEWS

- Sensitize appropriate government agencies/department with the outputs and recommendations for specific policy changes, using a variety of tools including inter alia: workshops, policy briefs and press conferences.
- Create a consultative forum with major private sector partners
- Deliver information including a set of key messages and training to private sector partners, including on coastal vulnerability, and adaptation

WAY FORWARD

- The need for increased functionality is clearly and adequately outlined;
- Up-scaling of both the project coverage and funding will enable The Gambia to **procure adequate technologies, develop and strengthen the infrastructure and provide the needed institutional and human capacity for an** effective climate change early warning system.

LESSONS HAVE BEEN LEARNT FROM THE FIRST PHASE

Baseline Infrastructure & Equipment and Needs for Gambia Early Warning System

- **Equipment and Infrastructure needs in Phase II include:**
  - ❑ 10 **(+5)** Automatic Weather Stations (procurement and installation)
  - ❑ 2 Upper Air Stations **(PILOT BALLOON STATIONS** (procurement, installation and operation)
  - ❑ Conventional Meteorological Equipment **(INCLUDING STOCK OF SPARES),** including calibration and spares
  - ❑ Hydrological Equipment **(INCLUDING STOCK OF SPARES),** including calibration and spares
  - ❑ Infrastructure (Offices; Observatories and Staff Quarters)
  - ❑ Vehicles for Meteorology and Hydrology Services

Procurement and Installation of Nine Automatic Meteorological Weather Stations (Early Warning Project and ACPC- Climdev-Africa work Programme)

1 AWS310 Weather Station
- QML201 logger
- 2 GB memory card
- BARO-1 air pressure sensor
- 52 Ah Battery
- Solar panel 33 W
- GPRS communication

2 WMT700 Wind sensor
- Not heated

3 HMP155 + DTR503A Relative Humidity and Temperature Sensor

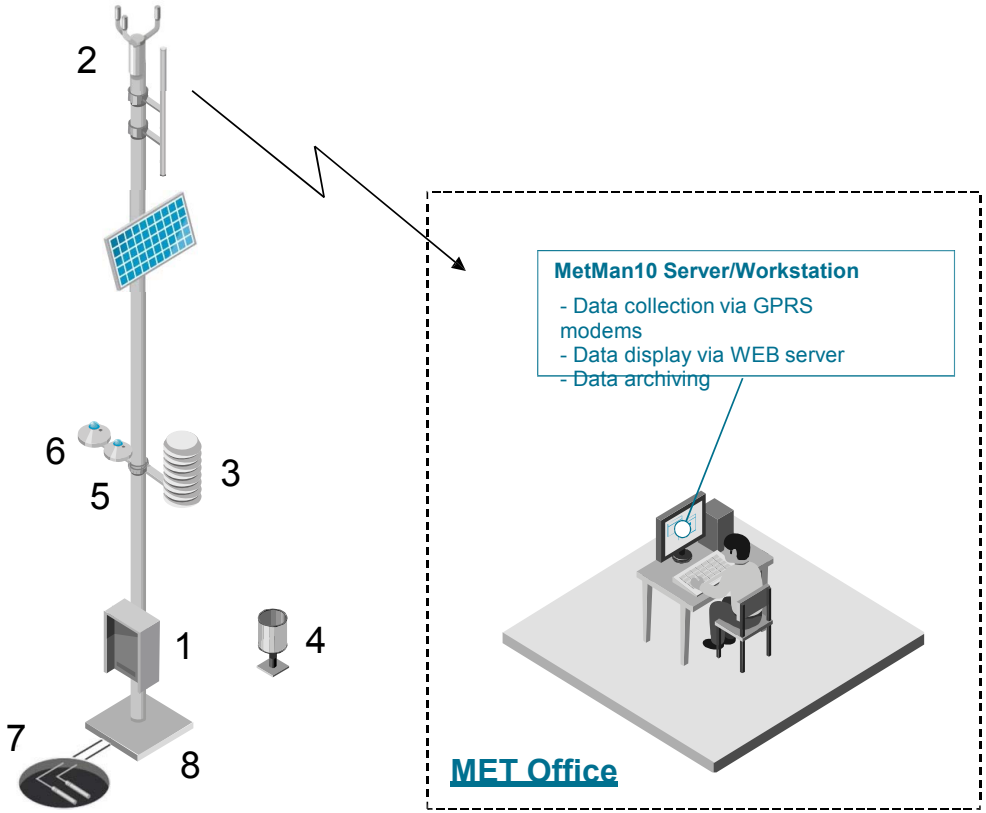
4 RG13 Precipitation Sensor
- Not heated

5 CMP3 Pyranometer (at 5 stations)

6 CGR3 Pyrgeometer (at 1 station)

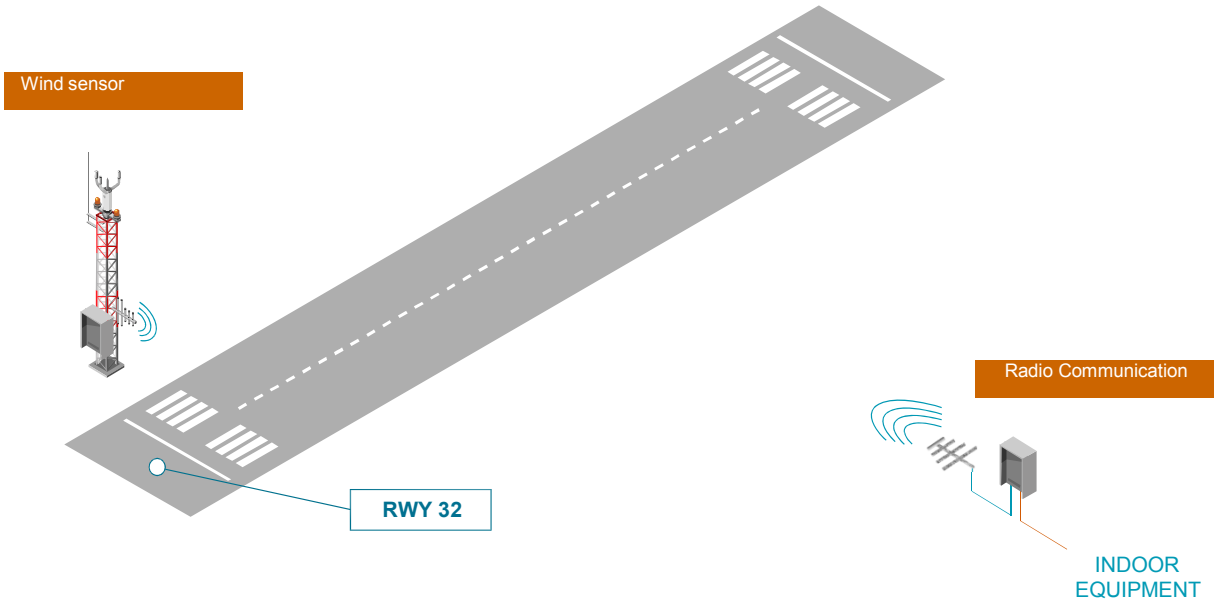
7 QMT107 Soil Temperature Sensor
- 7 measurement levels

8 Mast DKP210, 10 m



Vaisala AviMet AWOS for Banjul Int'l Airport

Existing Sensor Equipment

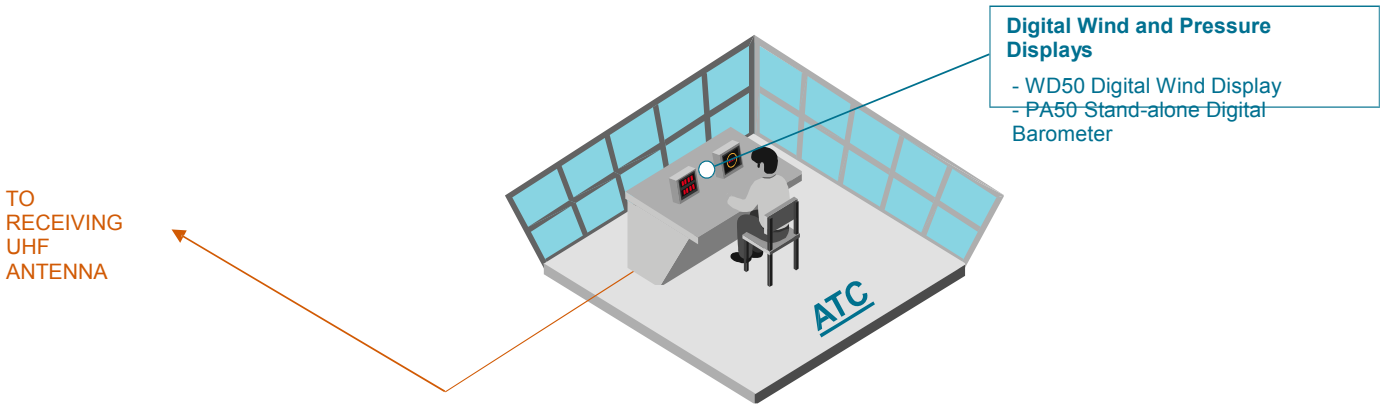


Note: UHF radios operate at 403..470 MHz frequency.

Note: Existing Wind Site at RWY

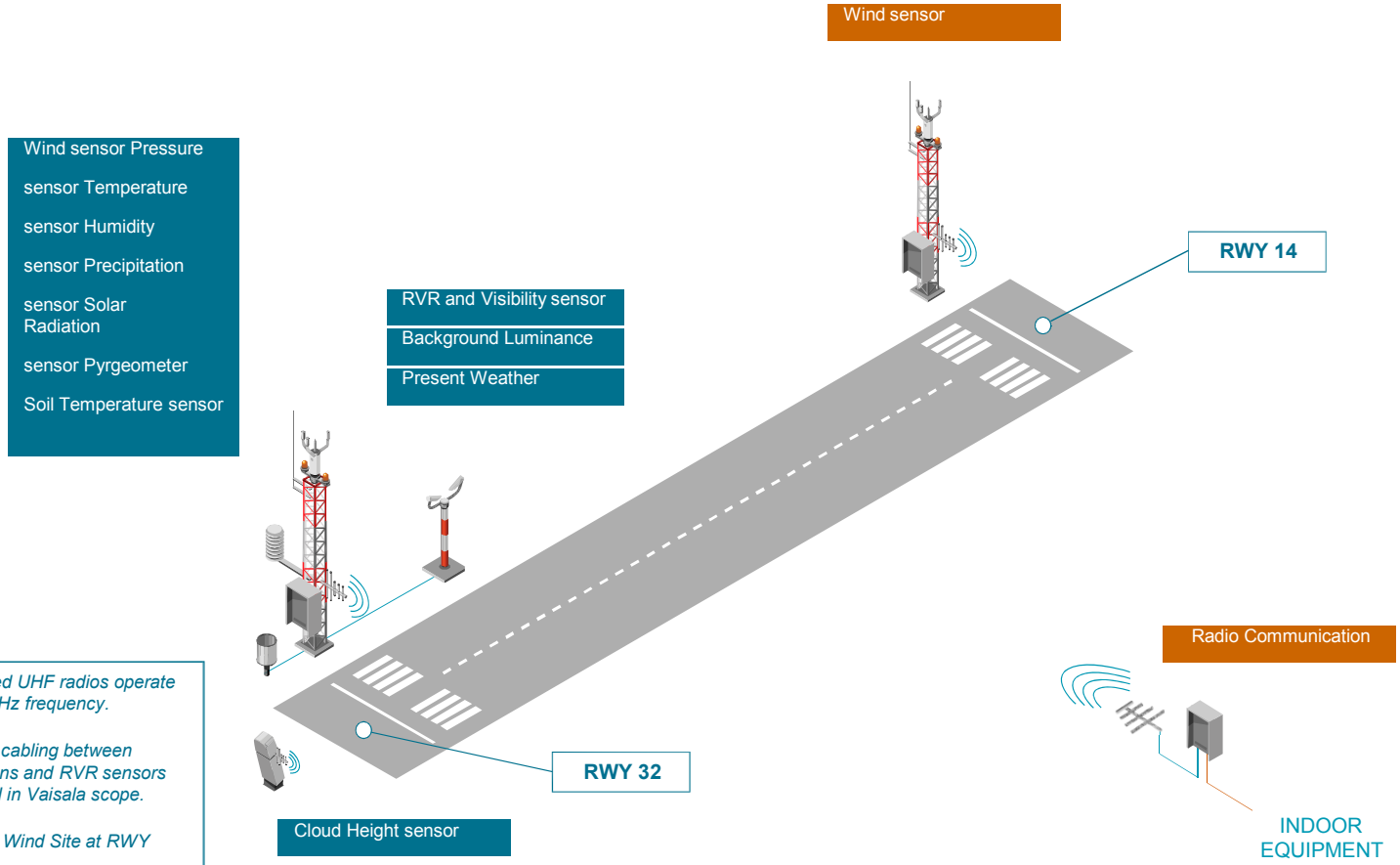
Vaisala AviMet AWOS for Banjul Int'l Airport

Existing Indoors Equipment



Vaisala AviMet AWOS for Banjul Int'l Airport

New Sensor Equipment



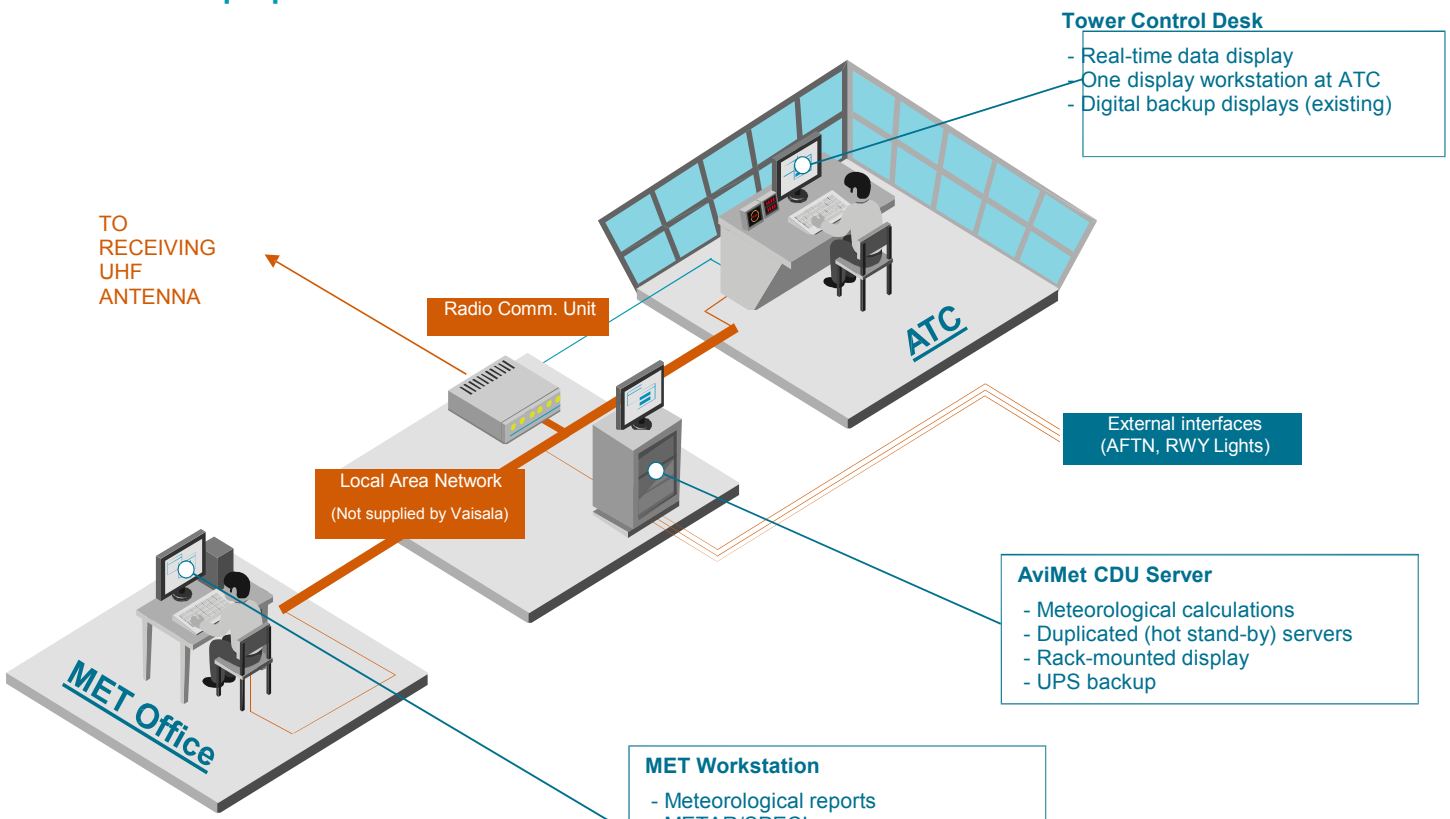
lote: Proposed UHF radios operate t 403..470 MHz frequency.

lote: RS-485 cabling between veather stations and RVR sensors s not included in Vaisala scope.

lote: Existing Wind Site at RWY 2 be moved to RWY 14

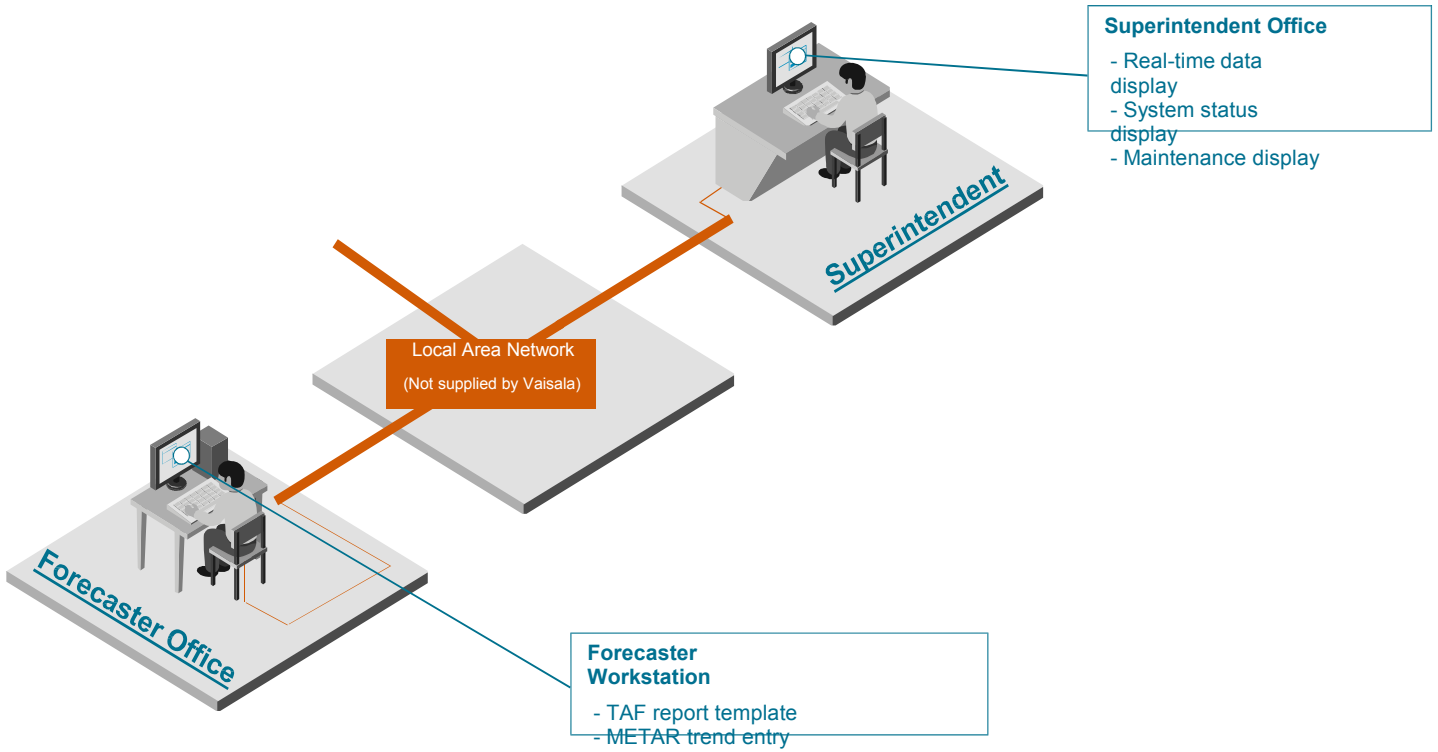
sala AviMet AWOS for Banjul Int'l Airport

ew indoors equipment



Vaisala AviMet AWOS for Banjul Int'l Airport

New Indoors Equipment



WAY FORWARD

- Need to conduct comprehensive quantification and costing of Equipment, Infrastructure, Communication and Training requirements of the Early Warning System;
- Review relevant policies and implementation strategies and Plans developed for climate sensitivity;
- Mainstream climate change and encourage preventative planning and decision making in response to early warnings and climate change trends;
- Continue sensitization and awareness raising of the population;

THANK YOU FOR YOUR ATTENTION