

# **TECHNOLOGY TRANSFER, CAPACITY BUILDING, TRAINING AND DEVELOPMENT OF RICS (THE NIGERIAN EXPERIENCE)**

**Adeniji E. O. et al**  
Nigerian Meteorological Agency  
Abuja--Nigeria

## **1.0 INTRODUCTION:**

Meteorological services globally under the auspices of World Meteorological Organisation (WMO), relies on the use of various instruments and sensors of different forms (digital or analogue) for terrestrial monitoring of different and dynamic weather parameters: precipitation, temperature, winds, humidity, pressure, evaporation etc. The instruments or sensors for monitoring these parameters in developing countries especially Africa come from the western and advanced WMO member nations as donations or purchase. Similarly, training on sustainability of these instruments and other meteorological equipment come from the same source. It is evident that weak economies of most countries and under funding of meteorological institutions in developing countries especially in Africa has forced most National Meteorological and Hydrological Services (NMHSs) to operate with obsolete equipment. Nigerian Meteorological Agency, in pursuance of the WMO standard for weather monitoring coverage has over 50 synoptic/ airport stations, over 150 rainfall/climate and agro-meteorological stations. The capability (conventional instruments/automatic weather stations) to sustain production of regular and reliable meteorological data, from these stations budget wise is a burden on the institution like in other countries in RA 1. Technical support in form of equipment donation from WMO and other advanced member nations can not support these.

The road to relevant in self reliant on meteorological instruments and capacity building should hence forth go beyond basic equipment donation , seminars on technology transfer and capacity building for the developing nations

The activities of WMO-CIMO related to capacity building in developing countries will be attended especially by increasingly supporting intensive technical empowerment to sustain local content development of conventional instruments, automatic weather station (AWS) assemble, calibration, repairs and maintenance of instruments.

Involving and equipping the established Regional Instrument Centres RIC's and establishing new ones in the regions where there is none for obvious regional development and support activities. It is however important to note that the available base workshops and human resources in some countries, if properly harnessed can support production of the basic conventional instruments requirement, calibration and assemble automatic weather stations for use in the region.

## **2.0 DEVELOPMENT OF REGIONAL INSTRUMENT CENTRES (RICs)**

Most of the existing NMHSs workshops or regional instrument centers in RA I such as South Africa, Kenya, Nigeria, Ethiopia, Egypt and a host of others have shown serious interest and commitment in achieving technological growth. The workshops can support local fabrication of conventional instruments like: evaporation tank, hook gauge and still well, rain gauge, wind vane, digital instruments and assemble AWS. They can also calibrate some meteorological and industrial weather instruments. Presently these workshops or regional instrument centers operate with obsolete equipment and cannot sustain the self-reliant bid. The NMHSs workshops and RICs need to be upgraded with modern calibration and fabrication equipment, specialized engineering/technical and craftsman training.

### **2.1 PURPOSE:**

The purpose of establishment of Regional Instrument Centres (RICs) could be viewed from two main standpoint of technological divide.

- First for the technologically advanced countries; to ensure constant testing and comparison of instrument operational efficiency, methods and maintenance of regional and international standards.
- In the developing countries of RA I (Nigeria); the drive for the status of WMO regional instrument center is primarily to create enabling environment, attract WMO assistance for capacity building through specialised training to sustain efforts in instrument fabrication, repairs, calibration, AWS assembly and more. To hasten sustainable development through fabrication of local instruments, reduce cost and dependence on imported instruments.

### **2.2 FUNCTIONS OF RICS:**

The regional instrument centers are designated to carry all functions as contained in the WMO instrument and method of observation programme, in addition to the following especially for the developing countries.

- Facilitate high level WMO sponsored train the trainer programme with organized/specialized WMO equipment/instrument manufacturers and institutions.
- Harness the regional local instrument development/calibration capabilities and make them functional for revenue generation.
- Hasten local development, self/collaborative fabrication of conventional and electronic instrument and AWS assembly (the current and future instrument).

- Provide grass root capacity building (training) for countries within the region on instrument/ equipment repairs and calibration.
- Regional instrument repair and calibration center for maintenance of regional and international standards .
- Offer sustainable assistance and recommendation to national workshops on the adoption and implementation of appropriate technology.
- Should embrace information and communication technology (ICT) as an opportunity for facilitating sustainable technological development in the region.

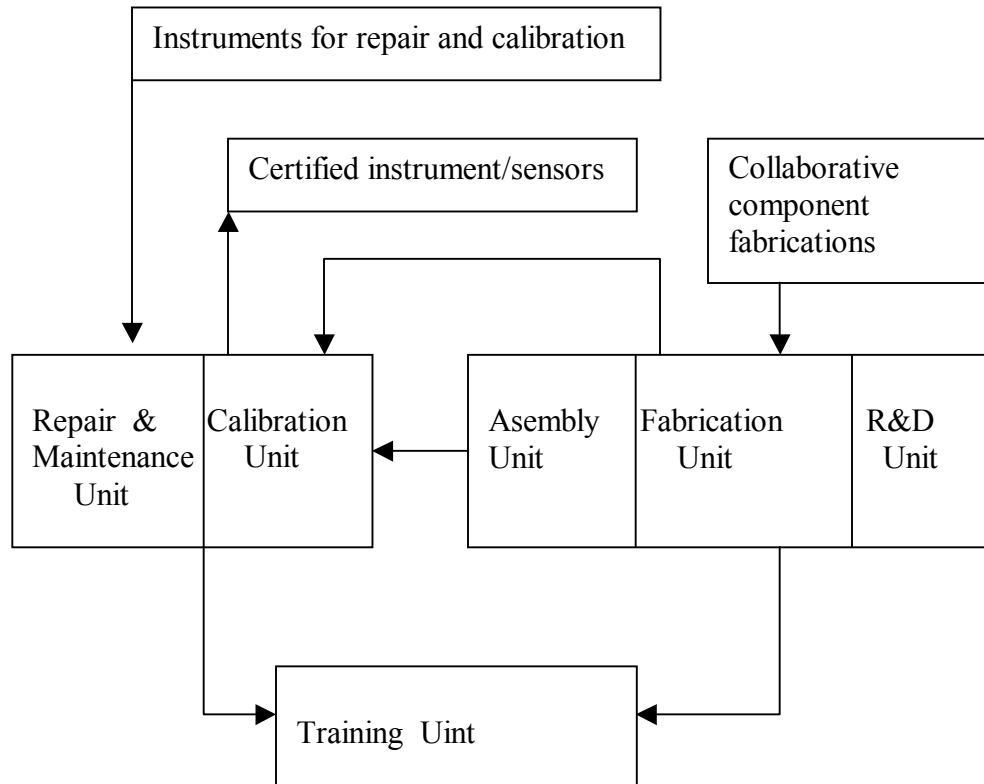
### 3.0 NIGERIAN MET. AGENCY WORKSHOP:

The Nigerian Meteorological Agency's Instrument Workshop in the drive for self-sufficiency in production, maintenance and calibration of meteorological instruments has in place

- **Fabrication workshop:** measuring 14.5 X 12.5 meters, housing the existing lathe machines, milling, drilling, cutting, bending, rolling, grinding, spraying machines etc.
- **Calibration and Repair workshop:** measuring 9 X 7 meters, housing the existing Pressure calibration chamber, Humidity chamber, Temperature chamber/ bath etc though obsolete
- **Human Resources:** the units has Engineers, Technologists, technicians and craftsmen in the fields Electrical/Electronics, Computer, Mechanical Engineering for full take of RIC.
- **Internet Access:** Vsat based internet connectivity for information and research base activities

### 4.0 Development Proposal

- Expansion of the fabrication/production capability to include the production of anemometers, tipping bucket rain gauge among other conventional instruments; by equipping the workshop with modern machine for boring, shaping, power press etc.
- Expansion and full commercialization of the calibration capability by replacing the obsolete equipment with modern ones.
- Capacity building; specialized training for all cadres in instrument design, fabrication, assembling, repairs and calibration.
- Offer quality and sustainable services in the areas of calibration, maintenance assembly of instruments and training to the member West African sub-region
- Collaborative arrangement (MoU) for instrument component production with local specialized scientific agencies or industries.



**Fig. 1: Proposed expansion of Nigerian Met. Workshop**

#### **4.0 CONCLUSION:**

The call for technology transfer or technological growth, capacity building and development of RICs in R A I is a call for help to harness technical capabilities to increase local development, production and maintenance of weather monitoring instruments/ equipment at reduced cost .

The situation can be linked to the man inside a deep pit, desiring to come out. He has to raise alarm for attention. He has to make effort, jump up or raise his hands to grab the lifeline lowered for him. These efforts have been made by existing RICs and NMHSs workshops.

The aim of this presentation is to emphasize that the purpose of this call can be realized faster through meaningful counterpart contribution of WMO-CIMO, WMO technologically advanced member countries, Established RICs and NMHSs. This is through training and provision of facilities for instrument fabrication, calibration, assembling of AWS and sensors etc.

The Nigerian Meteorological Agency (NIMET) have in pursuance of it's workshop expansion activity program wish to make it the WMO-RIC for the West African sub-region. This is in line with the WMO 2002 sponsored consultant mission for the establishment of manufacturing and calibration facilities for meteorological instrument in Nigeria.

The Nigerian MET. Agency needs your support and contribution to realize this for the sub-region, R A I and WMO.

**REFERENCES:**

- M. I. Refaie The use of new technologies to increase application capabilities of NMHSs Case study of Egyptian Meteorological Authority
- William Nyakwada Opportunities in Africa for the Development of Manufacturing, maintenance repairs and calibration facilities
- Geneva 2003 R A I Meeting on procurement, manufacturing, maintenance, repair and calibration facilities. Technical cooperation programme