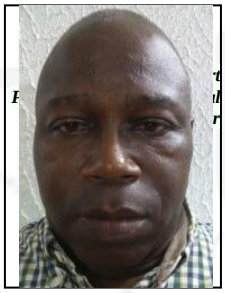
TETFUND NATIONAL RESEARCH FUND APPLICATION FORM

THEMATIC AREA

(Please tick as applicable)

- [X] **SCIENCE, TECHNOLOGY AND INNOVATION**
- [ ] **CROSS CUTTING**
- [ ] **HUMANITIES AND SOCIAL SCIENCES**



It is strongly recommended that applicant(s) should carefully read the accompanying guidelines before completing the TETFund NRF Application Form.

Project Title: Development of a world-class meteorological research station (OAU-Met) at Obafemi Awolowo University, Ile-Ife, Nigeria.

EXECUTIVE SUMMARY

With ever widening cross-disciplinary research interests in the environmental sciences such as, atmospheric physics, biology, geography, geology, architecture, agricultural and civil engineering, it is crucial that high-quality meteorological data be accessible in timely and efficient manner. This is against the backdrop that manually-operated weather observatories on Obafemi Awolowo University campus have become obsolete as current practice is the use of smart sensors and digital data acquisition systems. It is therefore imperative that the University should establish a world-class (automated) meteorological research station, OAU-Met, which will serve as a backbone by providing high-quality data to support teaching (human capacity building), scientific research and extension services (e.g., calibration of devices) in a multi-user environment in the University. This facility will help to drive collaboration and interdisciplinary research among scholars.

Keywords: Meteorological station, weather data, interdisciplinary research, extension services

Duration of Research: 24 _____ months (Phase I)

1.0 GENERAL BACKGROUND OF THE RESEARCH PROJECT

1.1 Introduction [Provide a general background of the problem and justification leading to the proposed research project]

Acquisition of diverse meteorological data is of vital importance for teaching and research in the environmental and engineering disciplines such as, atmospheric physics, agriculture, geography, botany, ecology, building, civil and mechanical engineering, architectural sciences, to mention a few. As such, high premium is placed on the development of research meteorological stations in educational and research institutions. At such facilities, multilevel and multi-temporal measurements of the wind speed (and direction), air temperature, humidity, solar radiation and soil temperature are made for investigating the atmospheric phenomena. Other important environmental indices such as, human comfort index, chill factor, plant stress, sunshine hour, evapotranspiration and surface albedo, are deduced as secondary variables from the basic meteorological measurements.

Due to transient nature of the weather elements at any particular location, measurements of the meteorological parameters should be efficient, accurate and promptly carried out, round the clock. Also, because of large volume of data which continuously is acquired, the data storage should be robust and fast to retrieve. Using a variety of data capture platforms, in-situ and remote systems, three-dimensional representation of near surface winds is needed for investigating wind energy conversion systems (WECS). Therefore, modern and reliable meteorological research facility should be multifaceted and encompass strict data acquisition protocols that meet to the internationally prescribed standards by the World Meteorological Organization (WMO). Presently, Nigeria Meteorological Agency (NIMET) does not have a purpose-built meteorological research facility which makes it even more imperative for research institutions to own and manage such facility due to demands for high data accuracy and consistency in capture.

Before the advent of the digital age, virtually all meteorological measurements at designated stations were manual. Such records often were fraught with a lot of human-prone errors. Moreover, operations of the manual systems were time consuming and the data retrieval cumbersome. To overcome these challenges, instrumentations at these stations have been changed from manual to electronic (smart sensors) systems with automated datalogging. This ensures that the meteorological measurements are accurate, reliable and most importantly, data retrievals can be done seamlessly.

For over three decades, the Atmospheric Physics Research Group (APRG) at Obafemi Awolowo University, Ile-Ife has acquired hands-on competency in

the design and installation of meteorological measuring complexes using state-of-the-art instrumentation through its involvement in international scientific projects (e.g., NIMEX, 2004; DACCIWA, 2016). With past experiences, the APRG is proposing to develop a modern meteorological research facility, OAU-Met station at Obafemi Awolowo University, Ile-Ife.

Ownership of a world-class meteorological research station, OAU-Met, will be of an advantage and great benefit to support research activities in the university, and enhance teaching and extension services particularly in agricultural sciences. Establishment of the facility will also encourage intra/inter university collaboration as a platform for intercomparison of sensors available in the markets, and calibration for prototypes. It is being envisaged that OAU-Met station will serve as a node (a data depository) for a network of automatic weather stations (AWS) which remotely can be downloadable in support of teaching in other Nigerian universities.

1.2 Aims, General and Specific Objectives of the Research Project:

The development of a world-class meteorological research station, OAU-Met at Obafemi Awolowo University is primarily aimed at providing highest quality data which will serve as backbone to support various research projects and particularly, to drive a multidisciplinary collaborative research efforts. Thus, the specific objectives are as follows:

(a) Design, construct and maintain a long-lasting world-class meteorological research facility based on expertise in the university;
(b) Provide a complex comprising of different measurement platforms (in-situ and remote systems);
(c) Configure the data acquisition system (DAS) for multilevel and multi-temporal operational modes;
(d) Provide a facility that can be used for intercomparison of sensors with prototypes designed at OAU and elsewhere;
(e) Establish a data resource for both short- and long-term investigations for atmospheric processes for research at OAU; and
(f) Training of young scientists and technologists in the area of meteorological measurements and instrumentation.

1.3 **Statement of the Problem** [Why does this research need to be conducted?]

Many researches on-going at Obafemi Awolowo University (OAU) for diverse fields such as, botany, zoology, geography, geology, architecture, ecology, agriculture and engineering, are limited by unavailability of high quality meteorological data due

to inadequate/unserviceable instrumentation or poor resolution of data capture.

High-quality meteorological datasets are required to complement studies in many environmental fields and non-availability could portend incomplete or inadequate interpretation of the findings. This unfortunate development is occasioned by dormancy of the main weather observatory located at the Teaching and Research farm in the University. Efforts to resuscitate this vital facility have not been successful due to obsolete and unserviceable equipment at the station, and the fact that virtually all of the systems are manually operated.

Several departments in the university (e.g. Architecture, Mechanical Engineering) have attempted to operate their individual mini-weather stations by introducing miniaturized electronic or compact weather recording systems. These initiatives failed in the long run due to component failures, improper maintenance, power-supply and related operational problems. The problem is exacerbated by improper siting of these ad-hoc meteorological stations by not observing the World Meteorological Organization (WMO) guidelines and lack of trained technologists to maintain the devices.

The Atmospheric Physics Research Group (APRG) at OAU in the past decade (since 2004) has deployed array meteorological sensors (digital systems) on the campus with participation of international collaborators from the European Union. The objective was to probe the depth of the atmospheric boundary layer and monitor soil conditions. This effort has adequately prepared the research group to acquire requisite skills and experience in meteorological instrumentation. It is this advantage that is yet to be fully exploited by the group for the development of a centralized and permanent facility as a research station for the university, which a wide group of researchers could benefit from. The major limitation towards realization of this goal is lack of funds to purchase meteorological devices for setting up of the research facility.

To set up a world-class meteorological research facility for inter-disciplinary studies in the university, it is necessary to co-locate measurement systems in atmospheric physics and environmental sciences and managing these resources efficiently. Hence, this proposal seeks to develop using local expertise, a multi-user meteorological research facility to generate veritable data which can be accessed online to address the problems enumerated above.

1.4 Conceptual framework of the Study [Clearly identify and define the central concepts or ideas of the study]

The central idea for the setting up of OAU-Met Station is to bring together a community of "different needs" users based in the University to operate a centralized meteorological research facility through the acquisition of state-of-the-art sensors for different applications, be it for research, teaching or extension services. The pool of expert community to use the facility will comprise of scientists, technologists and students at OAU, and possibly others from sister universities, research institutes and Nigeria Meteorological Agency (NIMET).

Funding required for initial take-off of the research facility, which largely is to procure the meteorological sensors, is expected to be borne by the TETFUND office. This will be complemented by instruments already acquired from other projects which are functional and available at OAU. Based on the expertise in meteorological instrumentation garnered over the decades by the Atmospheric Physics Research Group (APRG) at the Department of Physics and Engineering Physics, OAU, setting up of the station at the Teaching and Research farm can be competently handled. These tasks include the installation, programming and data acquisition from the devices. The research group will also be responsible for procurements, periodic calibration, maintenance of the facility and dissemination of datasets to the various end-users and for the data archiving.

The all-inclusiveness by the conceptualization of the project means that APRG jointly with identified groups will be engaged in the total running (installation, operation, data acquisition) of this facility. The aim is to ensure a broad-based participation, in-house capacity building and ownership. The ground staff at the Teaching and

Research farm at OAU will be responsible for the maintenance of the site and providing security for the facilities.

1.5 **Project Goals** [Provide a summary of the short and long term goals of the project. Indicate clearly the problems the project will help to address]

The proposed meteorological research station, OAU-Met (as a multi-user research facility) is being envisaged to realize the following goals:

a) The station will provide high-quality meteorological datasets on a continuous and long-term basis. This resource will be useful to support research in diverse study areas.

b) The station will be a practical laboratory used to teach students about protocols for electronic data acquisition in meteorology. The university students will be able to develop suite of programs customized for different measurement configurations.

c) Performances of newly developed instrumentations in the university will be tested at the station with standardized sensors for intercomparisons and calibration purposes.

d) The data collected at the station is to be shared with NIMET

and exchanged with regionally managed collaborative projects.

e) The station will be to promote OAU as hosting an internationally recognized meteorological research facility.

f) The data from the station can be marketed to other users.

1.6: Project Impact: [Provide information on the long term impact of the project within the context of social, economic and technological benefits.]

It is being envisaged that the development and operation of OAU-Met station will make the following impacts:

(a) Improvements in quality of research outputs and publications through access to high-quality and timely meteorological datasets.

(b) Students will have better understanding of the concepts taught in the class with the practical know how in the field.

(c) Meteorological information obtained from the station will assist agricultural production through better planning for planting and animal breeding on the University farm.

2.0 RESEARCH DETAILS

2.1 Literature Review

Establishment of the first weather station (observatory) at Obafemi Awolowo University (OAU) was in the 1970s and situated at the Teaching and Research farm of the Faculty of Agriculture. This station had served as backbone for teaching, research and extension services being undertaken in the faculty and by other researchers in the University before it went into dormancy. In the 1980s, the Department of Geography had a mini-weather station installed at Opa dam of the University. At various times, there were other minor weather stations set up and operated by the Departments of Architecture, Civil Engineering and Mechanical Engineering.

The limitation of the earlier established stations was in the sense that many of the meteorological recording devices were manually operated. Such systems often were fraught with a lot of human-prone errors when taking the measurements. The operations of the manual systems were time consuming and data retrieval was cumbersome. Many of the manual recording devices installed are now obsolete as they ceased to be in production or marketed as newer technologies have provided more accurate, portable and efficient systems, as replacements. Even to maintain and diligently keep manual records posed to be a serious challenge. With the passage of time, many of these stations have become moribund as trained observers retire in the university. Other operational challenges were non-reliability of the manual measurements made during weekends, holidays or late at nights, when the data recording could be compromised or doubtful.

To overcome these challenges, instrumentation at the meteorological station maintained by the Department of Architecture changed around 1993 such that compact electronic (smart sensors) systems with in-built

datalogging were introduced. This is in tune with the global practice that meteorological measurement systems increasingly are becoming automated.

In 1994, the atmospheric physics research group (APRG) acquired electronically-operated devices such as, pulse-output cup anemometers, potentiometer wind vane, platinum resistance wire (PT 100 Ω) air temperature sensors and digital datalogging equipment (measurement and control module). Using these devices, a complete year of meteorological observations of wind speed, wind direction, air temperature and relative humidity, and net radiation were made at various levels at a study site in Osu in 1995.

Beyond this initial effort, competency of APRG grew considerably to handle extensive designs and modifications for different meteorological measurement configurations. Moreover, parameters such as, atmospheric surface layer turbulence, solar and atmospheric radiation, soil temperature and heat flux have been acquired. Several key field experiments have been successfully executed at many sites on OAU campus spanning a period of nearly 20 years. In addition, a recent meteorological station is the one built besides the Department of Physics building in the year 2009.

The station measured basic meteorological parameters such as wind speed and direction, air temperature and relative humidity, atmospheric pressure, rainfall amount and atmospheric radiation including shortwave and longwave components on a continuous basis. This facility served the university academic community (a link to the station data is available on the homepage of OAU website) until it was decommissioned in 2014.

In 2010, the APRG set up another research facility on the rooftop of the Physics building for monitoring of PAR (photosynthetically active radiation) and global solar radiation, among other relevant atmospheric

parameters. This is a collaborative project executed in conjunction with staff of Electronic and Electrical Engineering department purposefully for studying solar-powered electricity conversion systems.

In the area of micrometeorology, the APRG has collaborated with colleagues from the Federal University of Technology, Akure (Professor E. O. Ogolo, Department of Physics) and University of Ibadan, Ibadan (Professor E. O. Oladiran, Department of Physics). We have concluded plans for setting up a brand new meteorological research station, OAU-Met (multi-user) to be situated within the Teaching and Research (T&R) farm.

2.2 Research Methodology [Give detail methodology of the proposed research project**]**

From field inspections and consultations with staff of the Faculty of Agriculture, OAU, the Teaching and Research Farm has been identified as a convenient, secure and undisturbed location for a world-class meteorological research station, OAU-Met. The site originally in 2004 was used for conduct of a multi-institutional collaborative research project between APRG/OAU and three other universities (University of Ibadan, Federal University of Technology, Akure and University of Bayreuth, Germany); the Nigeria Micrometeorological Experiment (NIMEX).

At the same location, a 15-m mast is already erected for the profile measurements in the atmospheric surface layer of wind, temperature and humidity (at 8 levels; 0.5 m, 1.0 m, 2.0 m, 3.0 m. 4.0 m. 6.0 m, 10.0m and 15.0 m). Additionally, a 2-m meteorological mast will be co-located to support eddy covariance instrumentation (3-D ultrasonic anemometer and infrared gas analyzer). A radiation stand will also be positioned within the measurement area to acquire components (shortwave and longwave) of solar and atmospheric radiation. For probing of

atmospheric boundary layer winds, a METEK PCS 2000 acoustic sodar will be deployed together with HATPRO microwave radar to acquire temperature and humidity profiles simultaneously. A VAISALA ceilometer (model CL51) will be installed at the site to measure and characterize cloud base heights.

To ensure that the research facilities and instruments are properly housed, there is need to construct a field laboratory at the site. This will be where the instrument calibration and configurations will be undertaken near the measurement location. The basic shelter will ensure long-term occupation of the project site.

The building will be connected to the nearby mains supply for electricity and wiring to provide power for computers, printers and other mains-operated equipment. To ensure an uninterrupted power supply to the instrumentation on the measurement field, electric cables from the facility building will be connected to a 3.5 kVA inverter/uninterruptible power supply (UPS) placed inside the facility building. Further, arrangements for electricity backups will be made by installing a 6.5 kW gasoline powered generator.

An area of about 50 m by 60 m, has been demarcated for the siting of the meteorological station. The measurement surface (18 m by 18 m), will be cordoned off by stainless steel open netting wire mesh to secure the instruments. The measurement surface will be planted with carpet grass in readiness for deployment of instruments at the site.

The data acquisition will be by use of a number (3) Campbell Scientific dataloggers (model CR1000, measurement and control module). These are programmable electronic data acquisition systems whereby various signal cables from the sensors are hard-wired into designated ports on the wiring panel. Each measurement sequence is made flexible and put together to accommodate a number of analog voltage and pulse outputs. The sampled data (10 secs or longer) are reduced to period averages (1 min, 2 min or 10 min). The stored data are routinely downloaded to field

computers by direct cable connections and/or over the GSM network using modems. The data so collected can be reduced further to produce weather summaries of key meteorological parameters at the site which can be given to end-users of this information.

2.3 Project Activities and Output [Give details of expectedoutput from the research grant i.e. results to be obtained/produced within the proposed time frame of the project]

Activity	Expected Outcome
Identification of OAU-Met site	Appropriate siting for OAU-Met station using WMO guidelines
Build-up of facilities at the station	Acquisition of facilities and resources as permanent fixtures (installation of meteorological masts, construction of a field laboratory, purchase of project vehicle, provision of electrical power for computers and sensors)
Configuration of measurement protocol	Circuit diagrams, software programming and harmonisation of measurement complexes (slow and fast response sensors)
Installation of meteorological devices	Design, construction and test running of OAU-Met station

2.4 Time Frame: [Provide a timeline for the major activities of the project.]

S/N	Description Of Activity	Duration	Year	Quarter			
				1st	2nd	3rd	4th
1	**Site identification**	Concluded	2015				X
2	**Site preparation**	2-3 months	2016			X	
3	**Construction of a field laboratory**	3 months	2016				X
4	**Provision of electricity supply to the**	2 months	2017	X			
5	**Procurement of sensors, recruitment &**	6 months	2017		X	X	
6	**Installation of meteorological devices**	4 months	2017				X
7	**Configuration of measurement**	2 months	2017				X
	Test operation and commissioning	2 months	2017				X
8	**Full operation of the station**	3 months	2018	X			

2.5. Activity Indicators [Clearly state the indicator(s) of each major activity of the project]

1. Identification of OAU-Met site – Expert location of the chosen site
2. Build-up of facilities at the site – Erection of meteorological masts, fully furnished field laboratory, purchase of project vehicle and sensors, recruitment of station personnel
3. Installation of meteorological devices – Mounting and wiring of various sensors, and positioning of data acquisition systems.
4. Configuration of measurement protocol – Communication between the different measurement complexes (in-situ and remote sensors).

2.6 The Study Location

The choice of a suitable site for the setting up a meteorological research station at Obafemi Awolowo University, OAU-Met, is to be based on a set of given criteria following strictly the guidelines by WMO. Among these criteria are general considerations such as: the station must be at appreciable distance away from buildings, traffic, human activities, noise and tall trees to prevent shading and wind blocking barriers. Also the surface must be covered by natural vegetation (e.g. grass) and not too close to a water body. Security is another important consideration to prevent pilferages and vandalisation. Particularly, the measurement area needs to be enclosed by wire nettings to prevent stray animals from tampering with the sensors and signal cables. Also there must be provision for uninterrupted electricity supply and steady communication between the station sensors and the field laboratory,

Taking these issues into consideration, and to set about the task of selecting a suitable site for OAU-Met station, a topographical map of Obafemi Awolowo University campus (7.5 ^{o}N; 4.5 ^{o}E) was acquired

and used to delineate possible choice of locations for the station. The university campus is flanked by a range of hills (about 600 m) in the northerly part which serves as a boundary of core academic area. The university farm which covers about 1400 hectares is partly cultivated. It is being managed by the staff of Faculty of Agriculture. The farm is located northeast of the main campus.

The choice of Teaching and Research farm for situating the meteorological station is quite attractive in the sense that the land is owned by the university and only a distance of about 7 km from the main campus. The terrain is relatively flat and the land cover is the remnants of original tropical forest. There are several planting sites and animal husbandry spread around the farm. The staff from the Faculty of Agriculture undertake several research projects in the farm.

The attractiveness in choosing the Teaching and Research farm to locate the station is because there is little human activities around its vicinity. Another important consideration is that between 1970s and 1980s, a weather observatory was functional at the farm, the records of which will be useful for climatological analysis. Apart from proximity to the campus, other practical factors to be considered here are access to technical services, motorable roads at the farm for ease of movement of personnel and equipment to the location, electricity and water supply, and ready communication facilities.

Another major requirement for siting a station is that distance of obstruction to the measurement height should be at least a ratio 100:1. This was ensured in the positioning of OAU-Met station at the Teaching and Research farm. The area finally selected as site for the meteorological station is close to the project farmland in use by staff and students of the Department of Crop Production and Protection. The land area for OAU-Met station has the dimensions

approximating 50 m by 60 m and surrounded by fallow bush.

2.7 Data Management and Analysis

The meteorological data obtainable from the proposed OAU-Met station, which is of high quality and high-temporal resolution (≤ 10 secs) and continuously measured will be processed by applying standardized quality assurance and quality control (QA/QC) protocols, in line with the World Meteorological Organization (WMO) guidelines. These datasets will be archived over a long time (e.g., 5 years, 10 years).

All the meteorological station data acquired will periodically be compared with the climatological records obtainable from synoptic stations operated by Nigeria Meteorological Agency (NIMET) and in WMO and World Data Centres (WDC) gazettes (such as temperature normals). The station data to be acquired, observations ranging from seconds to daily, will be further reduced to different time scales (hourly, daily, month and annual) and statistically analysed to obtain period means (averages), maximum and minimum, standard deviation, etc. The reduced data will be stored on common storage devices (external hard disks, flash drives, CD-ROMs, etc.). The weather summaries from the station will be sent to nationally and internationally designated meteorological data depository.

To directly support scientific activities linked to teaching, research and extension services, the datasets will be made available for members of the academic community in the university on a need established basis. Outside community of users in the university, requests for data can be acceded online by form-filling through the OAU-Met station website: http://meteorology.oauife.edu.ng. The

request can come from any research group in the country and collaborating institutions across the world.

2.8 Ethical and Environmental Considerations

The rationale for locating OAU-Met station at the Teaching and Research farm of Obafemi Awolowo University, in this case, is strategic. This is particularly so that the meteorological research station serves as a vital resource for modern farming practices (planting and animal husbandry). Co-location of the station with the farming activities is complementary since the farmland is vast occupying several hectares within the University campus. Therefore there is an ample space to site the meteorological station without disturbing other farming operations. Easily, the major consideration for establishing a station which is adequate distance away from experimental plots is met. More importantly, there is value added benefit of the station to their activities. Therefore for the farming community, locating a meteorological station within the premises of the Teaching and Research farm is very much welcomed. Proper siting of a meteorological station is done to ensure that there is minimal disturbance to both the flora and fauna at the location. Further, it should be positioned in an unobstructive manner thereby minimally affecting farming activities.

Environmentally, meteorological stations usually are well-integrated in the operation of modern farms. Power requirements for most devices are of low voltages (12 V DC) and as a matter of

fact, can easily be powered by rechargeable car batteries. Most stations are designed to allow free air flow and that the positioning of sensors do not constitute any hazard to animals. The meteorological station is protected by open netting wire fence and can be accessed easily. The field laboratory where the sensors are to be calibrated and stored is usually a dwarf building and innocuous in size so that it does not block out the farm. Most of the facilities are silent in operation and do not produce any harmful radiative emissions. There is no need for special protection to contain both the personnel and visitors to the station. This facility does not in any way disrupt the natural ambience at the location.

2.9: Monitoring and Evaluation Mechanism [State clearly the monitoring and evaluation mechanisms you will adopt in achieving the stated objectives.]

The operation of a meteorological station can easily be monitored for data consistency, accuracy and instrument failures which may be due to power outages and anomalous currents (e.g. lightning strikes). The monitoring system is usually graphical displays of the measured parameters which routinely are screened for out-of-range values or spurious data values. There are standardized procedures for data treatment (QA/QC) and suite of programmes to interpolate for missing values. Moreover, diligent monitoring by visual inspection of the daily records can be ensured to spot and remove such erroneous data values.

A reference sensor can be used for data intercomparison with field devices to benchmark and periodically check the records for calibration inconsistencies. This is a standard practice world-wide especially when new sensors are introduced. As a matter of routine, it is necessary to do adjustments of old calibration to

ensure there is consistency in the record series.

2.10: Dissemination Strategies [Indicate the steps you will take to ensure the project outcomes are brought to the attention of stakeholders.]

This project is aimed mainly at providing quality meteorological data as research support to diverse academic fields in the University and similarly as extension services for agricultural practices. The meteorological data acquired will be stored in a dedicated databank which will be accessible through a query-based form filling available online at http://meteorology.oauife.edu.ng.

In partnership with other relevant governmental agencies, such as Nigeria Meteorological Agency (NIMET) and water resources, there will be an arrangement for data sharing which OAU-Met station data can be put to use for researchers elsewhere in the country to benefit. In addition, OAU-Met station data will provide opportunities for collaboration with the international scientific community.

3.0 THE RESEARCH TEAM

3.1. Composition of the Research Team

A. Principal Researcher

Name and Position of the Principal Researcher: Oluwagbemiga Olawale JEGEDE - Professor.....

Date of Birth: 23/11/1959 ..... Gender:Male..... E-mail Address: oojegede@yahoo.com.....

Highest Qualification and Area of Specialization: Ph.D (Atmospheric Physics/Meteorology)……

Rank: Professor…….....

Name of Organization: Obafemi Awolowo University, Ile-Ife, Nigeria ……..

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A.2 Co-Principal Researcher

Name and Position of the Principal Researcher: Olayinka Olatokunbo OGUNKOYA - Professor.....

Date of Birth: 09/04/1951 ..... Gender: Male E-mail Address: olyinkaogunkoya@gmail.com.....

Highest Qualification and Area of Specialization: Ph.D (Hydrology – Fluvial Geomorphology)……

Rank: Professor…….....

Name of Organization: Obafemi Awolowo University, Ile-Ife, Nigeria ……..

Faculty/Department: Social Sciences/Geography……..

Postal Address: Department of Geography, Obafemi Awolowo University, Ile-Ife.....

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:

B.1 Research Partner:

Name and Position of the Researcher: Muritala Ajayi AYOOLA Lecturer

Date of Birth: 04/09/1962 .....Gender: Male..... E-mail Address: rayola40@yahoo.com .....

Highest Qualification and Area of Specialization: Ph.D (Atmospheric Physics/Meteorology) .....

Rank: Lecturer I……

Name of Organization: Obafemi Awolowo University, Ile-Ife, Nigeria

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Postal Address: Department of Physics & Engineering Physics, Obafemi Awolowo University, Ile-Ife .....

B.2 Research Partner:

Name and Position of the Researcher: Lukman Ayanniyi SUNMONU Lecturer

Date of Birth: 30/04/1976 .....Gender: Male..... E-mail Address: sunmonula@yahoo.co.uk.....

Highest Qualification and Area of Specialization: Ph.D (Earth System Science/Atmospheric Physics) .....

Rank: Lecturer I……

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Faculty/Department: Science/Physics & Engineering Physics

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B.3 Research Partner:

Name and Position of the Researcher: Adewale Iyiola AJAO Lecturer.....

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B.4 Research Partner:

Name and Position of the Researcher: Emmanuel Omonigho OGOLO Professor.....

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Highest Qualification and Area of Specialization: Ph.D. (Atmospheric Physics).....

Rank: Professor……

Name of Organization: Federal University of Technology, Akure.

Faculty/Department: School of Sciences/Physics Electronics

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B.5 Research Partner:

Name and Position of the Researcher: Abraham Awolola ASERE Professor .....

Date of Birth: 03/03/1949 .....Gender: Male..... E-mail Address: aaasere77@yahoo.co.uk .....

Highest Qualification and Area of Specialization: Ph.D (Thermofluid).....

Rank: Professor ……

Name of Organization: Obafemi Awolowo University, Ile-Ife …….

Faculty/Department: Technology/Mechanical Engineering

Postal Address: Department of Mechanical Engineering, Obafemi Awolowo University, Ile-Ife.

B.6 Research Partner:

Name and Position of the Researcher: Adeagbo Alani AMUSAN Professor.....

Date of Birth: 13/5/1954 .....Gender: Male..... E-mail Address: aamusan_135@yahoo.com ..

Highest Qualification and Area of Specialization: Ph.D (Soil Science) .....

Rank: Professor (Current Dean, Faculty of Agriculture, OAU)……

Name of Organization: Obafemi Awolowo University, Ile-Ife …….

Faculty/Department: Agriculture/Soil Science and Land Resources Management.

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B.7 Research Partner:

Name and Position of the Researcher: Bamidele Julius AMUJOYEGBE - Reader.....

Date of Birth: 28/09/1964 .....Gender: Male..... E-mail Address: beAmujoyegbe@gmail.com

Highest Qualification and Area of Specialization: Ph.D (Farming system/Agronomy) .....

Rank: Reader ……

Name of Organization: Obafemi Awolowo University, Ile-Ife …….

Faculty/Department: Agriculture/Crop Production and Protection.

Postal Address: Department of Crop Production and Protection, Obafemi Awolowo University, Ile-Ife.

B.8 Research Partner:

Name and Position of the Researcher: Olawale Emmanuel ABIYE - Lecturer.....

Date of Birth: 26/6/1979 .....Gender: Male..... E-mail Address: waleabiye@gmail.com.....

Highest Qualification and Area of Specialization: Ph.D (Atmospheric Physics/Pollution Meteorology).....

Rank: Junior Research Fellow……

Name of Organization: Centre for Energy Research and Development …….

Faculty/Department: Science/Energy Management and Technology

Postal Address: Centre for Energy Research and Development, Obafemi Awolowo University, Ile-Ife.

B.9 Research Partner:

Name and Position of the Researcher: Olufisayo Stephen BABALOLA - Lecturer.....

Date of Birth: 23/11/1958 .....Gender: Male..... E-mail Address: babfisayo@oauife.edu.ng ....

Highest Qualification and Area of Specialization: M.Sc (Smart Microgrid Application for Energy Resources).....

Rank: Lecturer I ……

Name of Organization: Obafemi Awolowo University, Ile-Ife …….

Faculty/Department: Technology/Electronic & Electrical Engineering

Postal Address: Department of Electronic & Electrical Engineering, Obafemi Awolowo University, Ile-Ife.

B.10 Research Partner:

Name and Position of the Researcher: Omotayo Babawande ADEBOYE Lecturer .....

Date of Birth: 27/12/1976 .....Gender: Male..... E-mail Address: adeboyeomotayo@yahoo.com

Highest Qualification and Area of Specialization: Ph.D (Soil and Water Resources Engineering) .....

Rank: Lecturer I ……

Name of Organization: Obafemi Awolowo University, Ile-Ife …….

Faculty/Department: Technology/Agricultural and Environmental Engineering

B.11 Research Partner:

Name and Position of the Researcher: Isaac Olutayo BOBOYE - Technologist .....

Date of Birth: 03/06/1961 .....Gender: Male..... E-mail Address: iboboye@oauife.edu.ng .....

Highest Qualification and Area of Specialization: HND, PGD (Physics Electronics).....

Rank: Chief Technologist ……

Name of Organization: Obafemi Awolowo University, Ile-Ife …….

Faculty/Department: Science/Physics & Engineering Physics

Postal Address: Department of Physics & Engineering Physics, Obafemi Awolowo University, Ile-Ife.

B.12 Research Partner:

Name and Position of the Researcher: Boluwaji Israel AKINBAYO - Technologist.....

Date of Birth: 26/04/1963 .....Gender: Male..... E-mail Address: boltecsup@yahoo.com.....

Highest Qualification and Area of Specialization: HND (Electronic Instrumentation).....

Rank: Technologist II ……

Name of Organization: Obafemi Awolowo University, Ile-Ife …….

Faculty/Department: Science/Physics & Engineering Physics

Postal Address: Department of Physics & Engineering Physics, Obafemi Awolowo University, Ile-Ife.

C.1 Research Mentees / Young Academics:

Name and Position of the Researcher: Olayinka Ayodeji OGUNWALE .....

Date of Birth: 20/01/1983 .....Gender: Male..... E-mail Address: onileolaayo@gmail.com .....

Highest Qualification and Area of Specialization: M.Sc (Atmospheric Physics) .....

Rank: Research Assistant……

Name of Organization: Department of Physics, Obafemi Awolowo University, Ile-Ife

Faculty/Department: Science/Physics & Engineering Physics

Postal Address: Department of Physics & Engr. Physics, Obafemi Awolowo University, Ile-Ife.....

C.2 Research Mentees / Young Academics:

Name and Position of the Researcher: Davidson AKPOOTU .....

Date of Birth: 27/01/1981 .....Gender: Male..... E-mail Address: profdon03@yahoo.com .....

Highest Qualification and Area of Specialization: M.Sc. (Atmospheric Physics) .....

Rank: Research Assistant.....

Name of Organization: Obafemi Awolowo University, Ile-Ife. .....

Faculty/Department: Science/Physics & Engineering Physics.....

Postal Address: Department of Physics & Engr. Physics, Obafemi Awolowo University, Ile-Ife.....

C.3 Research Mentees / Young Academics:

Name and Position of the Researcher: Olanrewaju Olukemi SONEYE.....

Date of Birth: 20/05/1989 .....Gender: Female..... E-mail Address: olarenwaju.soneye@gmail.com

Highest Qualification and Area of Specialization: M.Sc. (Atmospheric Physics) .....

Rank: Research Assistant.....

Name of Organization: Obafemi Awolowo University, Ile-Ife. .....

Faculty/Department: Science/Physics & Engineering Physics.....

Postal Address: Department of Physics & Engr. Physics, Obafemi Awolowo University, Ile-Ife.....

C.4 Research Mentees / Young Academics:

Name and Position of the Researcher: Oladimeji Adedoyin BABATUNDE .....

Date of Birth: 03/08/1986 .....Gender: Male..... E-mail Address: oae.babatunde@gmail.com....

Highest Qualification and Area of Specialization: M.Sc. (Atmospheric Physics) .....

Rank: Research Assistant.....

Name of Organization: Obafemi Awolowo University, Ile-Ife. .....

Faculty/Department: Science/Physics & Engineering Physics.....

Postal Address: Department of Physics & Engr. Physics, Obafemi Awolowo University, Ile-Ife.....

C.5 Research Mentees / Young Academics:

Name and Position of the Researcher: Omodara Eunice OBISESAN.....

Date of Birth: 15/06/1990 .....Gender: Female..... E-mail Address: obisesanomodara@gmail.com

Highest Qualification and Area of Specialization: B.Sc. (Physics) .....

Rank: Research Assistant……

Name of Organization: Obafemi Awolowo University, Ile-Ife. .....

Faculty/Department: Science/Physics & Engineering Physics.....

Postal Address: Department of Physics & Engr. Physics, Obafemi Awolowo University, Ile-Ife.....

C.5 Research Mentees / Young Academics:

Name and Position of the Researcher: Opeyemi Rotimi OMOKUNGBE .....

Date of Birth: 02/10/1982 .....Gender: Male..... E-mail Address: omokungbeopeyemi@yahoo.com

Highest Qualification and Area of Specialization: M.Sc. (Atmospheric Physics) .....

Rank: Research Assistant……

Name of Organization: Obafemi Awolowo University, Ile-Ife. .....

Faculty/Department: Science/Physics & Engineering Physics.....

Postal Address: Department of Physics & Engr. Physics, Obafemi Awolowo University, Ile-Ife.....

3.2. Research Work to Date

List the relevant team publications. Also list not more than 3 relevant on-going research works

The atmospheric physics research group (ARG) is a vibrant and visible research team resident in the Department of Physics and Engineering Physics at Obafemi Awolowo University, Ile-Ife. It is one of the oldest specialty research areas by the department and judging by the on-going research activities, there is a track record which can be measured by the number of postgraduate students and the research output.

The group engages actively in research collaboration with colleagues

from sister institutions (namely, University of Ibadan and Federal University of Technology, Akure) in Nigeria, as well as overseas institutions (Karlsruhe Institute of Technology, Germany).

Some recent publications by the group are listed below:

(i) Ayoola, M. A., L. A. Sunmonu, M. I. Bashiru and O. O. Jegede, (2014), Measurements of net all-wave radiation at a tropical location, Ile-Ife, Nigeria. Atmosfera. doi: 10.1016/S0187-6236(14)71118-X.

(ii) Owoade, Kayode O, Philip K Hopke, Felix S Olise, Lasun T Ogundele, Olusegun G Fawole, Bamidele H Olaniyi, Olugbemiga O Jegede, Muritala A Ayoola, Muniru I Bashiru, 2015, Chemical compositions and source identification of particulate matter (PM 2.5 and PM 2.5–10) from a scrap iron and steel smelting industry along the Ife–Ibadan highway, Nigeria, Atmospheric Pollution Research,

(iii) Peter Knippertz, Hugh Coe, Christine Chiu, Mat J Evans, Andreas H Fink, Norbert Kalthoff, Catherine Liousse, Celine Mari, Richard Allan, Barbara Brooks, Sylvester Danour, Cyrille Flamant, Oluwagbemiga O Jegede, Fabienne Lohou, John H Marsham, 2015. The DACCIWA project: dynamics-aerosol-chemistry-cloud interactions in West Africa, Bulletin of the American Meteorological Society. doi:10.1175/BAMS-D-14-00108.1

(iv) Sunmonu Lukman A., Adewale I. Ajao, Muritala A. Ayoola, Emmanuel O. Ogolo, Oladimeji A. Babatunde and **Oluwagbemiga O. Jegede,** Evaluation of the performances for two REBS net radiometer designs

during NIMEX at a tropical site in Ile-Ife, Nigeria (submitted).

3:3. Previous Research Grant [Provide short summary of grants won and managed in the last five years]

Members of the research group have been supported through various staff development fellowships to Sweden, Denmark (through the International Programs for Physical Sciences, (IPPS) of Uppsala University) and Germany (Alexander von Humboldt Foundation (AvH), Germany and Deutscher Akademischer Austaundiest (DAAD), Germany). Such opportunities have opened doors for wider participation at other Centres of Excellence in Europe particularly, International Centre for Theoretical Physics in Trieste, Italy, National Environmental Research Institute in Roskilde, Denmark as well as Department of Micrometeorology, University of Bayreuth in Germany. There are many of the research equipment owned by the group which were donations from international agencies like the Alexander von Humboldt foundation of Germany. It is to the credit of the Atmospheric Research group that it is being recognised for participation in ongoing EU-funded project: Dynamics-Aerosols-Chemistry-Cloud Interactions in West Africa (DACCIWA), 2013-2018.

The research group has three (3) research/teaching laboratories and research facilities like acoustic sounder, ultrasonic anemometer, infrared gas analyzer, Krypton hygrometer, etc. Altogether, external funding worth about USD 60,000 have been granted to conduct research within the group.

3:4. Group Research

Previous working relationship as a group [For group research, applicants are encouraged to consider gender, age and discipline. They should also provide details about roles and responsibilities of each member.]

The all-inclusiveness nature of the operation of OAU-Met Station project (which is being proposed) is that the facility should serve as a centralized research facility within a multi-user environment for diverse areas, such as, the physical and biological sciences - meteorology, climatology, ecology, atmospheric physics, engineering, technology, botany, zoology, agriculture, architecture, building technology, etc. Specifically, participation of the following identified interest groups in the University is necessary for successful take-off of the project.

The members of Atmospheric Physics Research Group (APRG) from the Department of Physics & Engineering Physics at OAU will undertake full responsibility for the setting up of the meteorological station at the Teaching and Research farm, OAU. The ground staff at the Teaching & Research farm, OAU will be responsible for maintenance of the measurement site and security of the facilities.

The following under-listed faculties/departments/units from OAU have been identified as potential end-users for the meteorological data collected from the OAU-Met Station: Faculty of Science (Departments of Physics and Engineering Physics, Botany, Zoology & Geology), Faculty of Social Sciences (Department of Geography), Faculty of Agriculture (Departments of Crop Production & Protection, Animal Science and Soil Science and Land Resources Management), Faculty of Environmental Design & Management (Departments of Architecture and Building & Environmental Science), Faculty of Technology (Departments of Mechanical Eng., Civil Eng., Agricultural and Environmental Engineering, and

Electrical and Electronic Engineering), Faculty of Clinical Sciences (Community and Environmental Health), Institute of Ecology and Environmental Studies and Teaching & Research Farm.

It should be noted that the listing above is not exhaustive as it is understood that new end users will be incorporated into the project.

4.0 FINANCIAL ASPECTS OF THE RESEARCH PROJECT IMPLEMENTATION

4.1 Project Budget: [Provide detailed budget requirement (in Naira) for the implementationof the research project. Indicate the amount to be allocated to each component/aspect of the project as provided in the template below.]

DESCRIPTION OF ITEM	EXPECTED FROM			TOTAL
	TETFund NRF	INSTITUTION	OTHER	
1.0 Personnel Costs/Allowances				
1.1 Principal Researcher - Prof O O Jegede	**1,700,000.00**	-	-	**1,700,000.00**
1.2 Co-Principal Researcher - Prof O O Ogunkoya	**1,000,000.00**	-	-	**1,000,000.00**
1.3 Team Members - Dr. M. A. Ayoola	**1,000,000.00**	-	-	**1,000,000.00**
1.4 Team Member - Dr L A Sunmonu	**750,000.00**	-	-	**750,000.00**
1.5 Team Member - Mr A I Ajao	**550,000.00**	-	-	**550,000.00**
1.6 Team Member - Prof E O Ogolo	**500,000.00**	-	-	**500,000.00**
1.7 Team Member – Prof A A Asere	**500,000.00**	-	-	**500,000.00**
1.8 Team member - Prof A. A. Amusan	**500,000.00**			**500,000.00**
1.9 Team Member - Dr B J Amujoyegbe	**500,000.00**	-	-	**500,000.00**
1.10 Team Member - Dr O E. Abiye	**500,000.00**	-	-	**500,000.00**
1.11 Team Member - Engr, O Babalola	**500,000.00**	-	-	**500,000.00**
1.12 Team Member - Dr. O. B. Adeboye	**500,000.00**	-	-	**500,000.00**
1.13 Technical Support – Mr. I. O. Boboye	**300,000.00**	-	-	**300,000.00**
1.14 Technical Support – Mr. B. LAkinbayo	**200,000.00**			**200,000.00**
1.15 Others (Please specify)	-	-	-	-
Sub-Total (Not >20% of budget)	**9,000,000.00**	-	-	**9,000,000.00**
2.0 Equipment (List & Specify)				
2.1 Radiometer Physics GmbH HATPRO Microwave radar (temperature and humidity profiler) ** Externally	-	-	**2,500,000.00**	**2,500,000.00**
2.2 Vector Instruments cup anemometers (3 nos.)	**800,000.00**	-	-	**800,000.00**
2.3 Vaisala Temp/RH Sensor - HMP60 (3 nos)	**400,000.00**	-	-	**400,000.00**
2.4 Texas Instrument Rainguage TE525 (1 no)	**200,000.00**	-	-	**200,000.00**
2.5 Campbell Instruments Pyranometer - CS300 (2 nos)	**125,000.00**	-	-	**125,000.00**
2.6 Campbell Instruments Soil Thermometer T108 (6 nos)	**75,000.00**	-	-	**75,000.00**
2,7 Campbell Instruments Soil Moisture Sensor CS616 - (2 nos)	**50,000.00**	-	-	**50,000.00**
2.8 Hukseflux Soil heat flux plate - HFP01 (3 nos)	**90,000.00**	-	-	**90,000.00**
2.9 Kip & Zonen net radiometer NR01 (1 no.)	**1,300,000.00**	-	-	**1,300,000.00**
2.10 Campbell Instruments Soil water potential matrix block (4 nos)	**110,000.00**	-	-	**110,000.00**
2.11 Vaisala Ceilometer	**6,600,000.00**			**6,600,000.00**
2.12 Campbell Scientific Datalogger CR1000 (3 nos)	**1,500,000.00**			**1,500,000.00**
Sub-Total (Not > 25% of budget)	**11,250,000.00**		**2,500,000.00**	**13,750,000.00**
3.0 Supplies/Consumables				
3.1 Construction of a field laboratory	**1,750,000.00**	-	-	**1,750,000.00**

3.2 Site preparation for meteorological station	**250,000.00**	-	-	**250,000.00**
3.3 Inverter/UPS system (3.5kVA)	**450,000.00**	-	-	**450,000.00**
3.4 Split Unit Air Conditioners (2 nos of 2HP)	**400,000.00**	-	-	**400,000.00**
3.7 Fuelling/maintenace of project vehicle	**250,000.00**	-	-	**250,000.00**
Sub-Total	**3,100,000.00**			**3,100,000.00**
4.0 Data Collection & Analysis				
4.1 Research Assistant (1 graduate)	**1,200,000.00**	-	-	**1,200,000.00**
4.3 Technical Assistants (2 persons)	**1,920,000.00**	-	-	**1,920,000.00**
4.4 Instrment design, wiring and programming	**500,000.00**	-	-	**500,000.00**
4.4 Data processing/analysis software	**1,000,000.00**	-	-	**1,000,000.00**
4.5 Data Analysis/Presentation/Dissemination	**1,500,000.00**	-	-	**1,500,000.00**
Sub-Total	**6,120,000.00**			**6,120,000.00**
5.0 Travels				
5.1 Purchase of Project Vehicle - Toyota Hilux	**12,000,000.00**	-	-	**11,580,000.00**
5.2 Air Travels - Local & International (2 years)	**1,000,000.00**	-		**1,000,000.00**
5.3 Project driver (2 years)	**1,200,000.00**	-	-	**1,200,000.00**
Sub-Total	**13,780,000.00**			**13,780,000.00**
6.0 Dissemination				
6.1 Production of weather summaries at OAU-Met station	**350,000.00**	-	-	**350,000.00**
6.2 Journal page charges	**400,000.00**	-	-	**400,000.00**
6.3 Internet hosting and maintainance of online website	**600,000.00**	-	-	**600,000.00**
Sub-Total (Not >3%)	**1,350,000.00**			**1,350,000.00**
7.0 Others/Miscellaneous (Specify)				
7.1 Security details for the station	**150,000.00**	-	-	**150,000.00**
7.2 GSM Modem and Communication	**250,000.00**	-	-	**250,000.00**
Sub-Total	**400,000.00**	-	-	**400,000.00**
TOTAL DIRECT COST	**45,000,000.00**	-	**2,500,000.00**	**47,500,000.00**
INDIRECT COST (5% of TETFund Component of Direct Cost) to Institution	-	**2,250,000.00**	-	**2,250,000.00**
GRAND TOTAL	**45,000,000.00**	**2,250,000.00**	**2,500,000**	**49,750,000.00**

4.2 Budget Justification [To be as specific as possible]

The total amount requested from TETFUND for execution of this meteorological station project is forty seven million, five hundred thousand Naira only (N47,500,000.00). This amount essentially covers provision of built infrastructure and part equipment to drive the project over a period of two years (2016-2018) including the operational expenses. This amount from TETFUND represents roughly about 50% of the total capital outlay of the whole for the project. A counterpart funding (50%) is to be provided from collaborating overseas research groups as equipment donations. This arrangement between the APRG and overseas collaborating partners has been sustaining for over a 20-year period. Particularly, the condition attached is that the counterpart funding hangs on securing local funding from TETFUND. The group expects TETFUND to provide funds to undertake civil construction and procurement of basic meteorological sensors.

4.3. Additional Source(s) of Funding [Provide full details of other source(s) of support and the amount.]

The EU-funded DACCIWA project that APRG is participating has endowed an additional grant for the procurement of research-specific sensors to the tune of 40,000.00 Euros (approximately N12,000,000.00). This money is available to access on the condition that the construction of the meteorological research station is funded locally and ready for a take-off. Presently, the DACCIWA project has given the group N2,500,000.00 which will be used to augment purchase of a HATPRO microwave radar as part of the instruments to be deployed at the station. Much earlier (between 2004 and 2010), the International Programs in the Physical Sciences (IPPS), Sweden had procured research

equipment worth about USD 40,000.00. These equipment are part of the resources to be deployed to the meteorological research station.

5.0 COMMITMENTS

The Principal Researcher, the other Researchers and the Institutions involved must commit themselves to the successful completion of the project.

5.1. Researcher(s) Declaration

I/we declare that information given in this application form is to the best of my/our knowledge complete and correct.
*I/we confirm my/our commitment to the successful implementation of the project.

Name and Signature of Principal Researcher	Prof. O. O. Jegede
Name and Signature of Co-Principal Researcher	Prof. O. O. Ogunkoya
Name and Signature of Partner Researcher	Dr. M. A. Ayoola
Name and Signature of Partner Researcher	Dr. L. A. Sunmonu
Name and Signature of Partner Researcher	Mr. A. I. Ajao
Name and Signature of Partner Researcher	Prof. E. O. Ogolo
Name and Signature of Partner Researcher	Prof. A. A. Asere
Name and Signature of Partner Researcher	Prof A A Amusan
Name and Signature of Partner Researcher	Dr B J Amujoyegbe
Name and Signature of Partner Researcher	Dr O E. Abiye
Name and Signature of Partner Researcher	Engr. O. Babalola
Name and Signature of Partner Researcher	Dr. O. B. Adeboye
Name and Signature of Partner Technologist	Mr. I. O. Boboye
Name and Signature of Partner Technologist	Mr. B. I. Akinbayo

5.2. Declaration of Head of Institution

I declare that the applicant(s) is/are staff member(s) of my institution and that my institution will support and provide space for the successful conduct of the research. I endorse the project and confirm my institutional commitment to the successful implementation of the TETFund NRF grant.

Name, Title/Official Position, Signature, Date and Stamp of Head of Institution

5.0 COMMITMENTS

The Principal Researcher, the other Researchers and the Institutions involved must commit themselves to the successful completion of the project.

5.1. Researcher(s) Declaration

I/we declare that information given in this application form is to the best of my/our knowledge complete and correct. I/we confirm my/our commitment to the successful implementation of the project.

Name and Signature of Principal Researcher	Prof. O. O. Jegede 22/02/2016
Name and Signature of Co-Principal Researcher	Prof. O. O. Ogunkoya 22.02.16
Name and Signature of Partner Researcher	Dr. M. A. Ayoola 22-02-2016
Name and Signature of Partner Researcher	Dr. L. A. Sunmonu 22nd/Feb/2016
Name and Signature of Partner Researcher	Mr. A. I. Ajao 22-02-2016
Name and Signature of Partner Researcher	Prof. E. O. Ogolo 22/02/2016
Name and Signature of Partner Researcher	Prof. A. A. Asere 22.02.16
Name and Signature of Partner Researcher	Prof A A Amusan 22/2/2016
Name and Signature of Partner Researcher	Dr B J Amujoyegbe 22/2/16
Name and Signature of Partner Researcher	Dr O E. Abiye 22FEB2016
Name and Signature of Partner Researcher	Engr. O. Babalola 22/02/2016
Name and Signature of Partner Researcher	Dr. O. B. Adeboye 22/02/2016
Name and Signature of Partner Technologist	Mr. I. O. Boboye 22/2/2016
Name and Signature of Partner Technologist	Mr. B. I. Akinbayo 22/02/16

5.2. Declaration of Head of Institution

I declare that the applicant(s) is/are staff member(s) of my institution and that my institution will support and provide space for the successful conduct of the research. I endorse the project and confirm my institutional commitment to the successful implementation of the TETFund NRF grant.

Name, Title/Official Position, Signature, Date and Stamp of Head of Institution

OBAFEMI AWOLOWO UNIVERSITY, ILE-IFE, NIGERIA

CURRICULUM VITAE FOR PROF. O. O. JEGEDE (PRINCIPAL RESEARCHER)

A. PERSONAL DATA

1. Name:	JEGEDE Oluwagbemiga Olawale
2. Date and Place of birth:	23rd Nov. 1959. Ibadan.
3. Nationality:	Nigerian
4. State of Origin:	Osun
5. Senatorial District:	Osun West
6. Local Government Area:	Ilesa West
7. Marital Status:	Married
8. No. of Children and their ages:	3 (30 years; 27 years; 25 years)
9. Next of Kin:	Dr (Mrs) O. A. Jegede
10. Address of Next of Kin:	Hse 20, Road 2, OAU Staff Quarters
11. Date of Assumption of Duty:	2nd August, 1982
12. Status at First Appointment:	Graduate Assistant
13. Present Position:	Professor
14. Date of Last Promotion:	1st October 2003
15. Date of Confirmation of Appt.:	27th February 1995
16. If Not Confirmed, Why:	Not Applicable
17. Present Salary: Scale and Step	CONUASS 7 Step 10
18. Faculty:	Science
19. Department:	Physics & Eng. Physics

B. EDUCATIONAL BACKGROUND

1. Educational Institutions attended with dates:

University of Ife, Ile-Ife, Nigeria (Sept. 1977 – Jun. 1981)
University of Ife, Ile-Ife, Nigeria (Sept. 1982 – Apr. 1985)
Obafemi Awolowo University, Ile-Ife, Nigeria (Mar. 1986 - May 1990)

2. Academic and Professional Qualifications:

B.Sc (Hons) Physics, 2nd Class Upper Division (Ife), 1981.
M.Sc Physics (Ife), 1985.
Ph.D Physics (Ife), 1990.

3. Other Distinctions and Awards (with dates)

(a) Scholarships –
Dept. of Meteorology, Uppsala University, Sweden (Sept. 1989 – Sep. 1990)

(b) Fellowships
- (i) International Science Programs, Sweden (Oct. 91 – Apr. 92)
- (ii) International Science Programs, Denmark (Sep.93 – Dec. 93)
- (iii) International Science Programs, Denmark (Sep.94 – Nov.94)
- (iv) Alexander von Humboldt Foundation, Germany (May 96 – Jan. 98)

(v) Alexander von Humboldt Foundation, Germany (Oct. 2000 – Feb. 2001)
(vi) Regular Associate, International Centre for Theoretical Physics (2002-2007).

(c) Research Grants
(i) International Science Programs, 1990/91 - $15,000
(ii) International Science Programs, 1994 - $15,000
(iii) International Science Programs, 1997 - $4,000
(iv) Alexander von Humboldt Foundation, 1997 - $15,000
(v) Obafemi Awolowo University – 1996-98 (URC 1425TF) - ₦125,000:00
(vi) Alexander von Humboldt Foundation, 2001 - $2,500
(vii) International Science Programs, 2001 - $2,000
(viii) University of Bayreuth, 2003 – Euro 500 (Travel grant)
(ix) EU-Funded funded FP7 project, DACCIWA,2014-2018, 80,000:00 Euros.

(d) National Awards – None

(e) International Awards – None

C. WORK EXPERIENCE

1. Work Experience outside the University System with dates:

(i) Examiner in Physics,West African Examination Council (WAEC), 1987-88.
(ii) Guest Scientist, National Env. Research Institute, Roskilde, Denmark (1993 & 1994)
(iii) Guest Scientist, German Weather Service (DWD) –
(a). Meteorological Observatory, Lindenberg (May 96 - Dec. 96);
(b). Research and Development Division, Offenbach (March 97 – May 1997).
(c). Meteorological Observatory, Lindenberg (June 97- July 97).
(iv) External Moderator, Osun State College of Education, Ilesa. (1999 - 2001)
(v) Executive Director, African Regional Centre for Space Science and Technology Education (June 2005 – Feb. 2009)

2. Work Experience in other Universities with dates:

(i) Lecturer, Dept. of Physics, Ondo State University, Ado-Ekiti. (1986/87 & 1987/88).
(ii) Postdoctoral, Dept. of Meteorology, Uppsala University, Sweden (Sep. l989 – Sep. 1990).
(iii) Postdoctoral, Dept. of Meteorology, Uppsala University, Sweden (Nov. l991 – Mar. 1992).
(iv) Researcher, Dept. of Micrometeorology University of Bayreuth, Germany (Aug. 1997 – Jan. 1998).
(v) Researcher, Dept. of Micrometeorology University of Bayreuth, Germany (Oct. 2000 – Feb. 2001).

3. Work Experience in the Obafemi Awolowo University (formerly University of Ife):

(i) Demonstrator, Part I Laboratory, Dept. of Physics. 1980/81 session.
(ii) Graduate Assistant (National Youth Service), Department of Physics. 1981/82

Session.
(iii) Graduate Assistant, Department of Physics, (August 1982 - August 1985).
(iv) Part-Time Lecturer, Technologist Training Scheme (1987 - 1988).
(v) Lecturer, Faculty of Education Sandwich Degree Programme (1992/93 session).
(vi) Assistant Lecturer, Department of Physics, (August 1985 - April 1990).
(vii) Lecturer I, Department of Physics, (May 1990 - September 1993).
(viii) Senior Lecturer, Department of Physics (October 1993 - September 1998).
(ix) Reader, Department of Physics (October 1998 – September 2003).
(x) Professor, Department of Physics (October 2003 to date).
(xi) Director, African Institute for Science Policy & Innovation, OAU, (2012 to date).

4. Courses being taught in the current session:

Undergraduate Courses

(i) PHY 105 – Physics for Biological Sciences I (4 unit, co-teaching)
(ii) PHY 106 – Physics for Biological Sciences II (4 unit, co-teaching)
(iii) PHY 431 – Atmospheric Physics I (3 units)
(iv) PHY 436 – Remote Sensing (3 units, co-teaching).

Postgraduate Courses

(i) PHY 657 – Atmospheric Diffusion (3 unit)
(ii) PHY 658 – Air Pollution Meteorology (3 unit)

5. Graduate Study Supervision:

(a) by research

MSc

(i) O. R. Oladosu
(ii) L. A. Sunmonu
(iii) O. J. Matthew
(iv) E. O. Elemo
(v) M. I. Bashiru
(vi) O. A. Ogunwale
(vii) O. Ezechikwelu
(viii) O. E. Akinola
(ix) A. Saliu
(x) O. Oguntuase
(xi) O. Sokoya
(xii) O. Soneye
(xiii) O. Babatunde
(xiv) A. Alabi
(xv) O. Owoeye
(xvi) O. Fadele

MPhil/PhD

(i) T. O. Aregbesola (M.Phil)
(ii) A. A. Balogun (FUTA)
(iii) O. R. Oladosu
(iv) T. O. Bello
(v) M. A. Olajire (M.Phil)

(vi) O. Ajileye
(vii) E. O. Abiye
(viii) M. I. Bashiru (on-going)
(ix) O. A. Ogunwale (on-going)
(x) O. Soneye (on-going)
(xi) O. Babatunde (on-going)

(b) by long essay – O. Arimoro

6. Current undergraduate supervision – 01

D. MEMBERSHIP OF PROFESSIONAL BODIES (with dates):

(i) Member, American Physical Society (defunct)
(ii) Member, American Meteorological Society (defunct)
(iii) Member, Nigerian Meteorological Society
(iv) Member, European Geophysical Society (defunct)
(v) Member, Nigerian Institute of Physics

E. PUBLICATIONS

1. Theses and Dissertations:

Jegede, O.O., 1981. The Neutrino. B.Sc (Physics) Project. University of Ife, Ile-Ife, Nigeria. 47 pp.

Jegede, O.O., 1985. Generation of the basis states to calculate the effects of core excitations in ^{90}Zr. M.Sc (Physics) Project. University of Ife, Ile-Ife, Nigeria. 69 pp.

Jegede, O.O., 1990. The dynamics and thermodynamics of the atmosphere over West Africa during the West African Monsoon Experiment (WAMEX) of 1979. Ph.D (Physics) thesis project. Obafemi Awolowo University, Ile-Ife, Nigeria. 187 pp.

2. Book/Monographs

(a) Foken, Th., **O.O. Jegede**, U. Weisensee, S.H. Richter, D. Handorf, U. Görsdorf, G. Vogel, U. Schubert, H-J. Kirtzel and V. Thiermann, 1997: The results of LINEX-96/2 Experiment. Geschäftsbereich Forschung und Entwicklung, Deutscher Wetterdienst. Arbeitsergebnisse (1997), Nr. 48, 75 pp. ISSN 1430-0281.

(b) **Jegede, O.O.** and Th. Foken, 1998: Determination of internal boundary layers. In Ergebnisbericht LINEX-97/1 (Th. Foken, ed.), Deutscher Wetterdienst, Forschung und Entwicklung, Arbeitsergebnisse (1998) Nr. 53, pp. 13-18, 38pp, ISSN 1430-0281.

3. Published Articles

(a) Journal Articles

(i). **Jegede, O. O.** and E.E. Balogun, 1991a. A contribution on the thermodynamic structure of the atmosphere over continental West Africa: Static stability measure. *Atmospheric Research*, **26**, 75-90.

(ii). **Jegede, O. O**. and E.E. Balogun, 199lb. A kinematic estimate of the large-scale motion fields over West Africa during the special observation period of WAMEX. *TELLUS*, **43**A, 145- 152.

(iii). **Jegede, O. O**. and E.E. Balogun, 1991c. Kinetic energy budget over the West African area during the special observation period of WAMEX. *Zeitschrift fur Meteorologie*, **41,** 42-47.
(iv). **Jegede, O. O.**, 1991. A kinematic method of computing large-scale motion fields in West Africa., *Zeitschrift fur Meteorologie*, **41**, 48-50.
(v). Balogun, E.E. and **O. O. Jegede**, 1991. Thermodynamic structure over the West African area during the special observation period of WAMEX. *Atmospheric Research*, **26**, 229-244.
(vi). **Jegede, O. O.**, 1992. A study of large-scale vertical motion over West Africa. *MAUSAM*, **43**, 175-182.
(vii). **Jegede, O. O.**, 1993. Some aspects of the West African monsoon circulation as deduced from a geostationary satellite. *MAUSAM*, **44,** October 1993, 359-364.
(viii). **Jegede. O. O.**, 1994. On the variations of the mean mixed layer depths over West Africa, *Meteorologische Zeitschrift*, **3**, 307-311.
(ix) **Jegede, 0. 0**., 1997a, Estimating net radiation from air temperature for diffusion modelling applications in a tropical area. *Boundary Layer Meteorology*, **85**, 161-173.
(x) **Jegede, O. O.**, 1997b. Daily averages of net radiation measured at Osu, Nigeria in 1995. *International Journal of Climatology*, **17**, 1357-1367.
(xi) **Jegede, O. O.**, 1997c. Diurnal variations of the net radiation at a tropical station - Osu; Nigeria. *Theoretical and Applied Climatology*, **58**, 161-168.
(xii) **Jegede, O. O**., T.A. Fasheun, Z.A. Adeyefa and A.A. Balogun, 1997. The effect of atmospheric stability on the surface layer characteristics in a low-wind area of tropical West Africa. *Boundary Layer Meteorology*, **85**, 309-323.
(xiii) **Jegede, O. O.** and P. Lofstrom, 1997: Fluxes of sensible heat and momentum in the surface layer estimated from the profile measurements of wind and temperature at a tropical station. *ATMOSFERA*, **10**, 213-223.
(xiv) **Jegede, O. O**., 1998. A field study of the mean surface layer structure in Sub-Saharan West Africa: The pre-monsoon (Dry) season. *MAUSAM*, **48**, 361-370.
(xv) **Jegede, O. O**. and Th. Foken, 1999. A Study of the internal boundary layer due to a roughness change in neutral conditions during the LINEX field campaigns. *Theoretical and Appied Climatology*, **62**, 31-41
(xvi) Balogun, A. A., **O. O. Jegede** and J. O. Olaleye, 2000, Bowen ratio estimation of the surface energy budget over bare soil at Ile-Ife, Nigeria, *Bulletin of the Science Association of Nigeria*, vol. **23**, 51-57.
(xvii) **Jegede, O. O**., Th. Foken, A. A. Balogun and O. J. Abimbola, 2001. Bowen ratio determination of sensible and latent heat fluxes in a humid tropical environment at Ile-Ife, Nigeria, *MAUSAM*, **52**, No. 4, 669-678.
(xviii). Balogun, A. A., **O. O. Jegede**, Th. Foken and J. O. Olaleye, 2002, Estimation of sensible and latent heat fluxes over bare soil using Bowen ratio energy balance method at a humid tropical site, *Journal of the African Meteorological Society*, vol. **5** (1), 63-71.
(xix). Balogun, A. A., **O. O. Jegede**, Th. Foken and J. O. Olaleye, 2002, Comparison of two Bowen ratio methods for the estimation of sensible and latent heat fluxes at Ile-Ife, Nigeria, *Journal of the African Meteorological Society*, vol. **5** (2), 63-69.
(xx). **Jegede, O.O**., 2002: Observations of daytime surface energy balance in cloudy tropical conditions at Ile-Ife, Nigeria. *MAUSAM*, vol **53**, No. 3, 359-366.
(xxi). Okogbue, E. C., J. A. Adedokun and **O. O. Jegede**, 2002, Fourier series analysis of global and diffuse irradiation for Ile-Ife, *Journal of Applied Sciences (Nig.)*, **5**(3), 3034-3045.

(xxii). **Jegede, O. O**., 2003, A note on net radiation at Osu, Nigeria, *Meteorologische Zeitschrift*, vol. 12, No. 5, October 2003.

(xxiii). Balogun, A. A., **O. O. Jegede** and J. O. Olaleye, 2003, Surface radiation budget over bare soil at Ile-Ife, Nigeria. *Nigerian Journal of Solar Energy*, vol. **14**, 6-13.

(xxiv). **Jegede, O. O**., *M Maunder, EC Okogbue, T Foken, EE Balogun, JA Adedokun, EO Oladiran, JA Omotosho, AA Balogun, OR Oladosu, LA Sunmonu, MA Ayoola, TO Aregbesola, EO Ogolo, EF Nymphas, MO Adeniyi, GI Olatona, KO Ladipo, SI Ohamobi, EO Gbobaniyi and GO Akinlade,* 2004. The Nigerian Micrometeorological Experiment (NIMEX-1): an overview. *Ife Journal of Science*, **6(2)**, 191-202.

(xxv). Oladosu, O. R. and **O. O. Jegede**, 2005, Variation of thermal properties in relation to the moisture content in a fine sandy-clay-loam soil at Ile-Ife, Nigeria. *Mausam*, 56, 883-892.

(xxvi). **Jegede, O. O.** and O. R. Oladosu, 2006, Heat Conduction in a Fine Sandy-Clay-Loam Soil. *Journal of Pure and Applied Physics (Nigeria)*, 4, 71-74.

(xxvii). **Jegede, O. O**., E. O. Ogolo and T. O. Aregbesola, 2006. Estimating net radiation using routine meteorological data at a tropical location in Nigeria. *International Journal of Sustainable Energy*, **25**, 107 -115.

(xxviii). Mauder, M., **Jegede, O. O**., Okogbue, E. U., Wimmer, F. and Foken, T., 2007: Surface energy balance measurements at a tropical site in West Africa during the transition from dry to wet season. *Theoretical and Applied Climatology*, **89**(3-4), 171-183.

(xxix). Oladosu, R., **Jegede, O. O.**, Sunmonu, L. A. and Adediji, A. T., 2007. Bowen ratio estimation of surface energy fluxes in a humid tropical agricultural site, Ile-Ife, Nigeria. *Indian Journal of Radio and Space Physics*, 36, 219-227.

(xxx). Omokungbe, OR, MA Ayoola, **O Jegede**, 2012, Diurnal characteristics of the surface energy fluxes at a tropical site in Ile-Ife, Nigeria. Ife Journal of Science, 14,

(xxxi). Owoade, OK, **OO Jegede**, MA Ayoola, OG Fawole, MI Bashiru, FS Olise, LT Ogundele, 2013. Concentrations of particulate matter from an iron-smelting plant located along a busy highway in Southwestern Nigeria. Ife Journal of Science, 15,

(xxxii). Ayoola, M. A., L. A. Sunmonu, M. I. Bashiru and **O. O. Jegede**, (2014), Measurements of net all-wave radiation at a tropical location, Ile-Ife, Nigeria. Atmosfera. doi: 10.1016/S0187-6236(14)71118-X.

(xxxiii). Owoade, Kayode O, Philip K Hopke, Felix S Olise, Lasun T Ogundele, Olusegun G Fawole, Bamidele H Olaniyi, **Olugbemiga O Jegede**, Muritala A Ayoola, Muniru I Bashiru, 2015, Chemical compositions and source identification of particulate matter (PM 2.5 and PM 2.5–10) from a scrap iron and steel smelting industry along the Ife–Ibadan highway, Nigeria, Atmospheric Pollution Research,

(xxxiv). Peter Knippertz, Hugh Coe, Christine Chiu, Mat J Evans, Andreas H Fink, Norbert Kalthoff, Catherine Liousse, Celine Mari, Richard Allan, Barbara Brooks, Sylvester Danour, Cyrille Flamant, **Oluwagbemiga O Jegede**, Fabienne Lohou, John H Marsham, 2015. The DACCIWA project: dynamics-aerosol-chemistry-cloud interactions in West Africa, Bulletin of the American Meteorological Society. doi:10.1175/BAMS-D-14-00108.1

(b) Published Refereed Conference Proceedings

(i) **Jegede, O. O.**, 1993a. Estimation and regulation of the concentrations of hazardous urban/industrial atmospheric emissions in Nigeria: A case for the use of air-pollution prediction models. *Proceedings of the International Workshop on Natural and Man-made Hazards in Africa,* eds. Onuoha, K.M. and Offodile, M.E. The Nigerian Mining and Geosciences Society, FAB Education Books, Jos, Nigeria. ISBN 978-30956-1-7. 30th January - 4th February, 1993, Awka, Nigeria. pp. 258-267.

(ii) **Jegede, O. O.**, l993b. Consequences of some atmospheric emissions on the air quality and the physical environment in Nigeria. *Ibid*., pp. 268-276.

(iii) **Jegede, O. O.**, 1994b. Some aspects of the West African monsoon circulation as deduced from a stationary satellite. *Proceedings of the International Conference on Monsoon Variability and Prediction,* International Centre for Theoretical Physics, Trieste, 9^{th} – 13^{th} May. WRCP-84, WMO/TD-No. 619, vol. I, pp 64-70.

(iv) Foken, Th. and **O. O. Jegede** 1997. Investigations of internal boundary layers. *12^{th} Symposium on Boundary Layers and Turbulence.* Vancouver, Canada. July, 1997, pp. 565-*566.*

(v) **Jegede, O. O**. and Th. Foken, 1997. Internal boundary layers during the LINEX-96/2 field study. *Annales Geophysicae,* Part II, vol. **15**, C438.

(vi) **Jegede, O. O**. and Th. Foken, 1998. Influence of roughness change on the profiles of mean wind and momentum flux observed in the neutral flux layer. *Annales Geophysicae,* Part II, vol. **16**, C613.

(vii) Jegede, O. O., 2001. The surface energy balance of a humid tropical environment at Ile-Ife, Nigeria. 4^{th} International Scientific Conference on Global Energy and Water Cycle, 10-14 September 2001. Paris, France.

(viii) Balogun, A. A., **Jegede, O. O**. and J. O. Olaleye, 2002, Estimation of sensible heat flux from radiometric surface temperature and air temperature – Application to the determination of evaporation, 4^{th} International Conference on African Association of Remote sensing of the Environment on Geoinformation Technology for Sustainable Development in Africa, Abuja, Nigeria, 14^{th} – 18^{th} October 2002.

(ix) Jegede, O. O., 2002, Scintillometric measurement of atmospheric boundary-layer turbulence, *6^{th} International Workshop on Laser Physics and Its Applications*, Tunis, 11^{th} -17^{th} December, 2002, page C5.

(x) Aregbesola, T. O. and **O. O. Jegede**, 2003, The surface energy budget of a tropical area in a cloudy condition at Ile-Ife, Nigeria. International Women's Conference on BIEN-Technology (The converging of Bio, Information, Environment, Energy, Space and Nano Technology), PaiChai University, Daejon, Korea, November 13 – 16, 2003.

(xi) Balogun, A. A., **O.O. Jegede**, T.O. Aregbesola, M. Mauder and T. Foken, 2004. The influence of stability on the turbulent transfer of heat, moisture and momentum fluxes in the surface layer over an agricultural farmland at a tropical location. 28^{th} AMS Conference, British Coloumbia, Canada. Paper J3.8.

(xii) Balogun, A. A., Mcfadden, J.P., Jegede, O. O., Mauder, M. And T. Foken, 2008, A note on the flux-variance relationships for heat, water vapour and momentum over a sub-urban tuf grass field and an agricultural site. Geophysical Research Abstracts, EGU General Assembly, vol. 10, EGU2008-A-10862.

(c). Manuscript accepted for publication: -

4. Published Non-refereed Conference Proceedings

(i) **Jegede, O. O.**, 1994a. A meteorological preprocessor for the next-generation Gaussian models usable at the low latitudes. *Second International Conference on Air Pollution,* Barcelona, September 26-27.

(ii) **Jegede, O. O.,** 1994b. A diagnostic study of the West African Monsoon circulation based on satellite derived windsets. (Abstract only). *7th Conference on Satellite*

Meteorology and Oceanography, American Meteorological Society, June 6-10.

(iii) Balogun, A. A., **Jegede, O. O**., Foken, Th., Olaleye, J. O., 1999. A comparative study of Bowen ratio methods for the estimation of sensible and latent heat fluxes: Preliminary results. *Nigerian National Conference on Climate and Sustainable Development in the Next Millennium*, Nigerian Meteorological Society, 24th – 26th Nov., 8 pp.

(iv) **Jegede, O. O**., 2001a, Observations of the surface energy balance under cloudy tropical conditions at Ile-Ife, Nigeria, *Conference on Climate Variability and Land-Surface Processes*, Trieste, Italy, 11 - 15 June.

(v) **Jegede, O. O.**, 2001b. The Surface Water and Energy Budgets and the Consequences on the West African (Tropical) Climate, Climate Conference 2001. Uthrecht, Netherlands, 10-13 July (abstract only).

(vi) **Jegede, O. O**., 2001c, The surface energy balance of a humid tropical environment at Ile-Ife; Nigeria, 8th IAMAS Symposium, Innsbruck, Austria, 10-18 July.

5. Manuscripts submitted for publication:

(i) **Jegede, O. O.,** An observational study of ground heat flux and net radiation at a tropical site. Submitted to Theoretical and Applied Climatology.

(ii) **Jegede, O. O.**, O. R. Oladosu, and G. N. Flerchinger, Simulating soil temperature and surface fluxes at a tropical site using SHAW model. Submitted to Journal of Applied Meteorology.

(iii). Sunmonu Lukman A., Adewale I. Ajao, Muritala A. Ayoola, Emmanuel O. Ogolo, Oladimeji A. Babatunde and **Oluwagbemiga O. Jegede,** Evaluation of the performances for two REBS net radiometer designs during NIMEX at a tropical site in Ile-Ife, Nigeria

6. Creative Work.

Design and implementation of the Nigerian Micrometeorological Experiment (NIMEX). This is a multi-institutional project (OAU, University of Ibadan, Federal University of Technology, and the University of Bayreuth, Germany) for which I had the sole responsibility of formulating the project goals, siting of experimental location (at the Teaching and Research farm, OAU), instrument designs and support, and overall organization. It is a major effort (both in terms of facility and personnel) and everything from the project concepts to the field installations, had to be taken from the scratch.

7. Technical Reports

(i) Eng, V., P. Soderberg and **O.O. Jegede**, 1990: The internal boundary layer at the beach of lake Tornetrask: case studies, May 27th to 31st, 1990. Abisko Scientific Research Station Abisko, Sweden. 12pp.

(ii) **Jegede, O.O.**, 1994; Determination of surface layer fluxes at some selected locations in Nigeria by the profile method for air pollution modelling applications: preparatory phase.

(iii) **Jegede, O.O**., 1995a; A Micrometeorological Field Study of the Mean Surface Layer Structure in Sub-Saharan West Africa: Part I - The Pre-Monsoon (Dry) Season, Boundary Layer Modelling Studies Report , BLMS 95:01

(iv) **Jegede, O.O**., 1995b; Fluxes of sensible heat and momentum estimated from mast-profile measurements of wind and temperature at Osu, Nigeria, Boundary Layer Modelling Studies Report BLMS 95:02.

(v) **Jegede, O.O**., 1995c: Executive summary of the IPPS supported project on surface layer studies in Nigeria, Boundary Layer Modelling Studies Report BLMS 95:03, Dec. 1995. 7pp.

(vi) **Jegede, O.O.** and Th. Foken, 1998: Determination of internal boundary layers. In Ergebnisbericht LINEX-97/1 (Th. Foken, ed.), Deutscher Wetterdienst, Forschung und Entwicklung, Arbeitsergebnisse (1998) Nr. 53, 13-18.

(vii) **Jegede, O.O**., 1997. Net radiation at Osu, Nigeria. Boundary Layer Modelling Studies Report BLMS 97:01, Nov. 1997. 14pp.

(xii) **Jegede, O. O.** and A. A. Balogun, 1999. A micrometeorological study of the environmental conditions around the disused NEPA facility at Ijora, Lagos, Nigeria: 28-29 October 1999. BLMS99:01, 15pp.

(xiii) **Jegede, O. O.** and E. E. Balogun, 2003. Field study of the energy exchange between the surface and atmosphere at a tropical location: Ile-Ife micrometeorological experimnent (NIMEX-1). December 2003, 7pp.

(xiv) **Jegede, O. O.,** 2004. The Nigerian Micrometeorological Experiment – Technical Details. January 2004, 12pp.

8. Papers and works in preparation:

(i) The surface mass, momentum and energy exchanges.

(ii) Estimation of the Net radiation from routine meteorological data.

F. CURRENT RESEARCH ACTIVITIES:

(i) Dynamics of the atmospheric boundary layer

(ii) Air pollution meteorology and development of applied air pollution models

(iii) Eddy covariance measurement of surface energy fluxes

G.ANY OTHER RELEVANT INFORMATION:

Service within the Department

i. Academic staff secretary (1992-94)
ii. Secretary, Departmental Council (1992-95)
iii. Staff Adviser, Physics and Engineering Physics Students' Society
iv. Supervisor, Part I laboratory (1982 – 1989)
v. Co-ordinator, Part II laboratory (1998/99 session)
vi. Supervisor, Part II laboratory
vii. Supervisor, Part III laboratory
viii. Departmental seminar co-ordinator
ix. Member, Departmental Postgraduate Committee
x. Secretary, Departmental Postgraduate Committee (1991 – 1995)
xi. Chairman, Departmental Postgraduate Committee (2011 – 2013)
xii. Chairman, B.Sc (Physics) curriculum review committee
xiii. Head, Atmospheric Physics/Meteorology Research Group, OAU.

Service within the Faculty

i. Member, Faculty Board
ii. Member, Committee on Relationship with Overseas Institutions
iii. Managing Editor, Ife Journal of Science (IJS) 2003-2007.

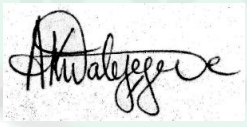
iv. Member, Faculty of Science Journal Accreditation Committee (2009)
v. Representative of Dean of Science, Faculty of Technology Review Panel (2012)
vi. Representative of Dean of Science, Faculty of Technology Board (2012)
vii. Representative of Dean of Science, Faculty of Technology Selection Panel (2012)

Service within the University

i. Member, Faculty Board of Agriculture (representing, Head of Physics) - 2002
ii. Setting up of an automatic weather station at the Teaching and Research Farm, OAU.
iii. Team Leader, Project on the Surface Energy Balance Studies (1998 – 2002)
iv. Principal Investigator, Nigerian Micrometeorological Experiments (NIMEX, from 2004)
v. Principal Investigator, OAU-Node for Dynamics-aerosol-chemistry-cloud interactions in West Africa (DACCIWA) EU-funded project (from 2014)
vi. Director, African Institute for Science Policy and Innovation (AISPI), 2012 to Date

Service outside the University

i. External Examiner, Federal University of Technology, Akure.
   - Department of Meteorology and Climate Science
   - Department of Physics
ii. Consultant for environmental companies on meteorological measurement systems.
iii. External Assessor for a readership appointment at University of Gaborone, Botswana.
iv. External Assessor for several readership and professorial appointments at the Federal University of Technology, Akure.
v. External Assessor for professorial appointment at University of Lagos.
vi. External Assessor for readership appointment at University of Ilorin, Ilorin.
vii. Director, African Regional Centre for Space Science and Technology Education (ARCSSTEE), 2005 – 2009
viii. Reviewer, The Nigerian Journal of Pure and Applied Physics (Federal Univ. Tech., Akure).
ix. Reviewer, Journal of Research in Science and Management (Federal Univ. Tech., Akure).
x. Reviewer, Theoretical and Applied Climatology (Springer Verlag, Vienna, Austria).

Signature:  Date: 22/2/2016