FORMULATING RESEARCH PROPOSALS ON CLIMATE CHANGE ISSUES – EXPERIENCES FROM UNICAL

BY

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WORKSHOP ON TEACHING, LEARNING AND RESEARCH ON CLIMATE CHANGE

HOSTS: University of Nigeria and Open Society Foundation
BACKGROUND

• A proposal for a research project on “Climate change and coastal ecosystem adaptation in Eastern Niger Delta”, is hereby submitted for funding by the National Universities Commission (NUC). The project is to be executed in the Institute of Oceanography (IOC), University of Calabar, within the framework of NUC-LEADS Visiting Fellowship awarded to Prof. A. Chidi Ibe, who is currently NUC-LEADS Scholar in our Institute.
RESEARCH STATEMENT

• Nigeria has been listed among the countries with the highest vulnerability to climate change with regard to the potential impact on the fishery sector. There is the need to understand the complex interactions between climate change and the coastal ecosystems and fisheries. This will enable the institution of policies for enhancing the adaptive capacity of our coastal and fishing communities. Hence, this research proposal.
SCOPE

• The work will be carried out through a multidisciplinary and inter-disciplinary research effort involving Oceanographers, Chemists, Geologists, Marine Ecologists, Microbiologists, Fishery Biologists and Socio-economists, among others. It will entail both field and laboratory studies and will last for 36 months, with the actual field and laboratory studies lasting for 24 months. The total financial requirement for this project is estimated at ₦233,150,456.00 only.
TARGET

• During this research, data and information will be collected that will allow the prediction of the impact of climate change on water quality, coastal aquaculture development, inshore fisheries, coastal geomorphology and pollution of the near shore Atlantic coastline of Nigeria. The results will help in the development of adaptation strategies to climate change in the region.
PROJECT OBJECTIVES

• The climate change project aims at supporting the mission of the Institute of Oceanography as an Organised Research Institute, in particular, to understand the mechanisms, agents, fate and impacts of climate change on the health of the aquatic ecosystems within the Gulf of Guinea; to develop strategic partnerships and collaborations in the climate change research and to provide scientific expertise, including capacity building of major stakeholders in relation to the sustainable use and management of the coastal and inshore waters of the Gulf of Guinea within Nigeria.
Fig. 1: Map of the Gulf of Guinea showing the Bight of Bonny
Specific objectives

• To study the annual and seasonal pattern of meteorological factors such as wind speed, humidity, insolation, precipitation, and air quality such as particulate matter, CO, N$_2$O, methane etc in relation to climate change.
To establish the current ecological conditions of the coastal waters adjoining the Bight of Bonny, through water quality monitoring (physicochemical, nutrient levels etc), hydrography (current velocity, tidal characteristics, bathymetry etc), biology (plankton, fisheries) and pollution (heavy metals, petroleum hydrocarbons, PAH, pesticides, radionuclides etc) as a basis for understanding climate change impacts on the ecosystem.
• To identify possible socioeconomic impacts of climate change on the livelihood of coastal dwellers especially artisanal and migrant fishers in the project area and to profer necessary adaptation strategies
• To assess the current status of natural and human impacts on the coast such as those related to flooding, dredging, coast protection (seawalls, breakwaters, groynes etc), coastal development (marinas, real estate, tourism) and any other infrastructures in the study area as a means of understanding the possible impacts of climate change and relevant adaptation strategies.
• To undertake pilot culture of some economically important marine fisheries species such as *Chrysichthys nigrodigitatus* in order to buffer the impact of climate change on the coastal fishery.
• To build capacity of existing and potential indigenous stakeholders and industrialists with regard to ecosystem services (utilization, exploitation and management) through public enlightenment programs, workshops and seminars on climate change.
• To develop strategic linkages with local and international agencies as well as collaborative research network in order to enhance the understanding of global climate environmental changes.
METHODOLOGY

• For effective monitoring and identification of impacts, the project shall involve many experts within and outside Institute of Oceanography, University of Calabar, such as oceanographers, socio-economists, meteorologists, remote sensing experts, hydrographers and environmental regulatory agencies
QUESTIONS AND ANSWERS

• The monitoring of impacts related to climate change shall involve answering some basic questions:
  
  • 1  Is climate change responsible for diminution of coastal marine and fresh water fishery resources in the outer and inner estuaries adjoining the Bight of Bonny?

  • 2  Is climate change already impacting Nigeria’s aquatic resources or will the effect be felt within the foreseeable future?

  • 3  Is there any relationship between climate change and ongoing habitat degradation (mangrove exploitation), destructive fishing practices (fishing of both juvenile and adults e.g. bonga) and increased demand for coastal marine products?

  • 4  Are there changes that are occurring in the productivity of coastal waters that can be attributed to climate change as opposed to other causes?
MONITORING AND SAMPLING TECHNIQUES

- To allow for effective coverage of the study areas, the estuaries will be divided into upper, middle and lower segments with one station in each segment. At each station, sampling will be conducted at the banks and middle of the river course making a total of nine stations per estuary.

- All sample collection within estuaries will be from outboard engine boats. Additional sampling will be carried out along the near-coast coastal waters using hydrographic vessel from Marine Police. Sample positioning will be by use of GPS.

- All sampling and field data collections shall be for 24 months (2 years) in the first instance.
GENERICS

IMPORTANT TO EMPHASIZE THE FOLLOWING:

• COMPLEXITY
• MULTI- AND INTER- DISCIPLINARITY
• RISK ASSESSMENT-ACTUAL AND PROJECTED
• MODELLING AND STATISTICS
• DEDUCTIONS
• POLICY OPTIONS
APPROACCHES

EVERY SCIENCE (SOCIAL N NATURAL) HAVE THEIR APPROACHES

IN OCEAN SCIENCES, THE LARGE MARINE ECOSYSTEM APPROACH AFFORDS A VANTAGE PLATFORM FOR FORMULATING RESEARCH PROPOSALS. IT OFFERS A PRACTICAL WAY TO INTEGRATE MARINE SCIENCE, OCEAN MANAGEMENT, & THE IMPROVEMENT OF ECONOMIC CONDITIONS AT THE ECOSYSTEM LEVEL
PARADIGM SHIFT

• FROM A SECTORAL APPROACH TO ECOSYSTEM BASED MANAGEMENT WITH EMPHASIS NOT ONLY ON ECOSYSTEM GOODS BUT ALSO ECOSYSTEM SERVICES
PARADIGM SHIFT FROM SECTORAL TO ECOSYSTEM APPROACH

<table>
<thead>
<tr>
<th>Individual species</th>
<th>Ecosystems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small spatial scale</td>
<td>Multiple scales</td>
</tr>
<tr>
<td>Short-term perspective</td>
<td>Long-term perspective</td>
</tr>
<tr>
<td>Humans: independent of ecosystems</td>
<td>Humans: integral part of ecosystems</td>
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<tr>
<td>Management divorced from research</td>
<td>Adaptive management</td>
</tr>
<tr>
<td>Managing commodities</td>
<td>Sustaining production potential for goods and services</td>
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LME MODULES AS SUITES OF ECOSYSTEM INDICATORS
MODULAR APPROACH

• THE MODULAR APPROACH THEREFORE OFFERS A CONVENIENT BUT TESTED TEMPLATE FOR THE EXAMINATION OF IMPACTS AND THE FORMULATION OF PREFERRED MANAGEMENT OPTIONS INCLUDING ADAPTATION TO CLIMATE CHANGE IN NIGERIA’S COASTAL AND MARINE ENVIRONMENT
RESTING MY CASE

• I SUBMIT THAT EVERY AREA OF SPECIALIZATION HAS ITS OWN MODULAR APPROACH.

• IF YOU AGREE---
•JUST DO IT!