

**DEPARTMENT OF GEOGRAPHY AND ENVIRONMENTAL MANAGEMENT
FACULTY OF PHYSICAL SCIENCES
AHMADU BELLO UNIVERSITY, ZARIA**

**POSTGRADUATE DIPLOMA IN CLIMATE CHANGE ECONOMICS, POLICY
AND INNOVATION**

1.0 INTRODUCTION

In the last three decades that Climate Change has become an issue of concern, the concentration of several Greenhouse Gases (GHGs) have been increasing since the Industrial Revolution. Several of these GHGs have long atmospheric lifespan of decades to centuries. The programme is aimed at responding to the need for research, training and understanding of Climate Change impacts, mitigation and adaptation. It will lead to a creation of knowledge based evidence, as well as inculcating trans-disciplinary research methods and approaches on climate issues /challenges.

2.0 JUSTIFICATION

Climate Change affects the poor, developing countries, rural areas, the women and children mostly. While developing countries contribute the least to Climate Change they are, however, the most seriously affected, destroying homes, basis of people's livelihoods and set in motion a stream of migration and refugees with a number of consequences. This led to the Intergovernmental Panel on Climate Change (IPCC) to raise an alarm in 1990, since then, conferences and workshops have been held, books written and Climate Change courses introduced in the programmes of schools. This document is an effort at setting standards and procedures in the design, teaching and evaluation of Climate Change programmes in Nigerian Universities. Mainstreaming the programme Climate

Change Economics, Policy and Innovation as a programme of study in Nigeria University System has become mandatory as a viable response by tertiary education institutions.

3.0 OBJECTIVES

The objectives of the programme are to:

- Build Climate Change Economics, Policy and Innovation (CCEPI) awareness at all levels within schools, ministries, parastatals, organizations and communities.
- Equip students with a higher level of thinking towards understanding of climate science, climate impacts, climate politics, climate economics, climate policies and laws, climate ethics and equity;
- Explore the relationship between Climate Change Economics, Policy and Innovation (CCEPI) and sustainable development processes and its challenges.
- Sensitize the society to effectively weigh the evidence regarding global Climate Change as it confronts the challenges.

4.0 Admission Requirements

The criteria for admission into the Postgraduate Diploma (PGD) Programme in Climate Change Economics, Policy and Innovation (CCEPI) are as follows:

- Candidates must have at least five “O” level credits including English and Mathematics;
- Candidates with third class degree from a recognized institution in any discipline;
- Candidates with Higher National Diploma (HND) from a recognized institution with at least lower credit;

- Any other relevant requirement binding the PG programme in Ahmadu Bello University, Zaria.

5.0 Duration of the Programme

The Postgraduate Diploma (PGD) programme in Climate Change Economics, Policy and Innovation (CCEPI) shall run for a minimum of 12 months and maximum of 18 months.

6.0 Requirements for Graduation

A candidate must have fulfilled the following conditions to be awarded the Postgraduate Diploma in Climate Change Economics, Policy and Innovation:

Registered and passed a minimum of 30 credit units of both core and elective courses as follows:

- Core courses — (24 Credit Units)
- Electives – (6 Credit Units)
- Seminar - (3 Credit Units)
- Project – (6 Credit Units)
- **Total – (39 Credit Units)**

7.0 LIST OF COURSES FOR THE PROGRAMME IN FORM OF FIRST AND SECOND SEMESTERS

First Semester Courses (Core)		
Course Code	Course Title	Credit Units
PGDCC 701	Philosophy and Methodology of Climate Change Economics, Policy and Innovation (CCEPI)	3

PGDCC 703	Basic Quantitative Techniques in Geography	3
PGDCC 705	Introductory Climate and Biogeography	3
PGDCC 709	Fundamentals of Geographic Information System	3
PGDCC 723	Seminar	3
First Semester Courses (Electives)		
PGDCC 719	Climate Change and Gender development	3
PGDCC 721	Climate Change Innovations in Arts and Humanities	3

Second Semester Courses (Core)		
Course Code	Course Title	Credit Units
PGDCC 702	Economics of Climate Change	3
PGDCC 704	Climate Change Law and Policy	3
PGDCC 706	Basic Computer Appreciation	3
PGDCC 700	Project	6
Second Semester Courses (Electives)		
PGDCC 708	Ecosystem Management and Sustainability	3
PGDCC 712	Climate Change, Animal Biodiversity and Wildlife Management	3

8.0 Course Descriptions for Postgraduate Diploma (PGD) in Climate Change Economics, Policy and Innovation (CCEPI)

PGDCC 701: Philosophy and Methodology of Climate Change Economics, Policy and Innovation (CCEPI) (3 Credit Units)

Definitions, scope, theories, concepts and techniques in CCEPI; analysis of Climate Change data from local, national, regional, and global scale. Methods of compilation and analysis of weather and climate data; analytical techniques of climate data such as analysis of variance and covariance, correlation and regression, and time series analysis. Origin, composition, structure and dynamics of the atmosphere: gas and radiation; the global climate system.

PGDCC 702: Economics of Climate Change (3 Credit Units)

Economic impact of Climate Change. Cost of Climate Change mitigation. Costs of adaptation to Climate Change impacts on the various sectors such as water supply, crop and animal production, forestry and fisheries; natural ecosystems, transportation and health. Theory and practice of economic analysis of environmental problems (efficiency, externalities, and public goods). Environmental policy instruments (carbon trading, tax incentives; revenue recycling). Management of depletable and nonrenewable resources. Rational decision making techniques. Analysis of risk and uncertainty. Cost benefit analysis. Discounting of future and distant effects choices on climate.

PGDCC 703: Basic Quantitative Techniques in Geography- (3 Credit Units)

Geographical use and applications of statistical techniques, Probability and Sampling Distributions, Hypothesis testing. Parametric methods: analysis of variance, correlation

analysis, regression analysis, Non-parametric tests of association and measures of correlation. Time series analysis.

PGDCC 704: Climate Change Law and Policy (3 Credit Units)

Introduction to Climate Change law and policy. Applicable International Environmental Law Principles on Climate Change, precautionary principle, principle of prevention, inter-generational principle, sustainable development etc. Establishment of the Intergovernmental Panel on Climate Change (IPCC); Critical theories in Climate Change law, policy. Policies aimed at reducing the impact of Climate Change. The legal framework for Climate Change mitigation and control: UNFCCC (1992) and the Kyoto protocol (1997). The United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, particularly in Africa, 1994; the National Environmental Impact Assessment Act, 1994; the National Environmental Standards, Regulations and Enforcement Agency (Establishment) Act 2007; Nigeria-Gas Flaring/Economic Development and Climate Change: National Response...Statutory Options, Policy Options, and approved Industry Options; Public Private Partnership (PPP) for 'Alternative Climate Change Preventive Plan'.

PGDCC 705: Introductory Climate and Biogeography- (3 Credit Units)

The energy balance of the earth's atmosphere. General circulation of the atmosphere and hydrosphere. Atmospheric thermodynamics; Basic structure and dynamics of plant communities; Factors influencing plant growth; Survey of characteristics, distribution and controlling factors of principal or zonal vegetation types.

PGDCC 706: Basic Computer Appreciation- (3 Credit Units)

Introduction to Computer, Introduction to windows, Basic DOS Commands, Elements of Word Processing; Spread Sheet. Computer Communication and Internet; WWW and Web Browsers, Email. Power Point Presentations.

PGDCC 708: Ecosystem Management and Sustainability- (3 Credit Units)

Concept of ecosystems management. Ecosystem structure and functional mechanisms. Ecosystem biodiversity goods and services and role in moderating Climate Change. Ecological knowledge, indicators, ecosystem and health. Climate Change and ecosystem degradation. Strategies for ecosystem management in Climate Change adaptation . Socio-economic and environmental benefits of adopting an ecosystems management approach. Adaptive management of ecosystem for sustainable development. Sustainability, principles, concepts and poverty. Consumption, population, technology and carrying capacity. Baseline audits: water, food, energy, waste and transportation. Concepts of carbon and ecological footprint. Ecology and nature, population and resources, carbon cycle, green house gases (GHGs) and biodiversity. Water: portable, shortage and conservation. Sustainable resources, forestry, fishing, agriculture, and mining. Social security, peace, justice. Human relation to nature and human settlements. Sustainable designs and transportation-building, urban planning, and waste management.

PGDCC 709: Fundamentals of Geographic Information System (3 Credit Units)

The nature and scope of GIS; definition and concepts in GIS; components of GIS; history of mapping and GIS and the relevance of GIS compared to other data gathering and analysis technique. Questions that GIS can answer. Application of GIS in other disciplines such as agriculture, economics, politics, engineering, health sciences, management and law. GIS as a technique in accessing environmental degradation such

as: flood, drought, desertification, deforestation, erosion, earthquakes and volcanic eruptions among others. GIS and remote sensing. Issues in and criticisms of GIS.

PGDCC 712: Climate Change and Animal Biodiversity (3 Credit Units)

Concepts and definitions in wildlife and animal biodiversity. Terrestrial and aquatic wildlife. Effect of Climate Change on wildlife diseases including history of species extinctions. Climate Change and ecological perturbations; flood, famine, hyperthermia, impacts on wildlife and biodiversity. Climate Change and ecological adaptation of species, breeding and general genetic resources. Climate Change, wildlife conservation and park management.

PGDCC 719: Climate Change and Gender Development (3 Credit Units)

Gender inequality in the context of Climate Change. Gender agriculture, health, food security and Climate Change. Gendered impacts of Climate Change on wage labour; migration; and conflict. Gendered perspective of Climate Change adaptation strategies; International Climate Change framework and policy; linking gender analysis with policy and framework in Climate Change adaptation:

Typology of policy and analytical approaches to address women's needs and interests in Climate Change adaptation; Typology of projects to address women's needs and interests in Climate Change adaptation.

PGDCC 721: Climate Change Innovations in the Arts and Humanities- (3 Credit Units)

Introduction to Climate Change and contemporary development in the Arts, Impacts of Climate Change in sound and creative resources. Environmental effects on Ensemble, theatre performance and arts exhibition. Innovative approaches to Climate Change

adaptation in the arts. Social, cultural approaches and enlightenment on Climate Change knowledge and adaptation in the arts. Dissemination of Climate Change issues in rural and urban centres in creative forms.

PGDCC 723: Seminar (3 Credit Units)

PGDCC 700: Project (6 Credit Units)

9.0 Facilities and Staffing

The Facilities required for running/teaching Postgraduate programme in Climate Change Economic, Policy and Innovation are available. They Include:

- i. A functional meteorological Station with up to date weather facilities in Institute for Agricultural Research (IAR).
- ii. A GIS Laboratory with computers and GIS software in Geography Department.
- iii. Faculty of Science Multi-User Laboratory.
- iv. Laboratories in Geography, Biological Sciences, Geology Departments and Institute for Agricultural Research (IAR)/ Faculty of Agric
- v. Classrooms include: Room 309,311, Theater AB/BC, Z1.1/1.2 and FSLT 1/2
- vi. Libraries in Geography, Biological Sciences, Geology Departments and Institute for Agricultural Research (IAR).
- vii. Ahmadu Bello University Botanical Garden and Research Fields in IAR.
- viii. Kashim Ibrahim Library (KIL).
- ix. ABU Dam
- x. National Animal Production Research Institute (NAPRI).