

# KNOWING WASCAL

Facts and Figures behind  
the combating of Climate  
Change and improving  
livelihoods in West Africa



## OUR MEMBER COUNTRIES



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*Combating Climate Change,  
Improving Livelihoods*

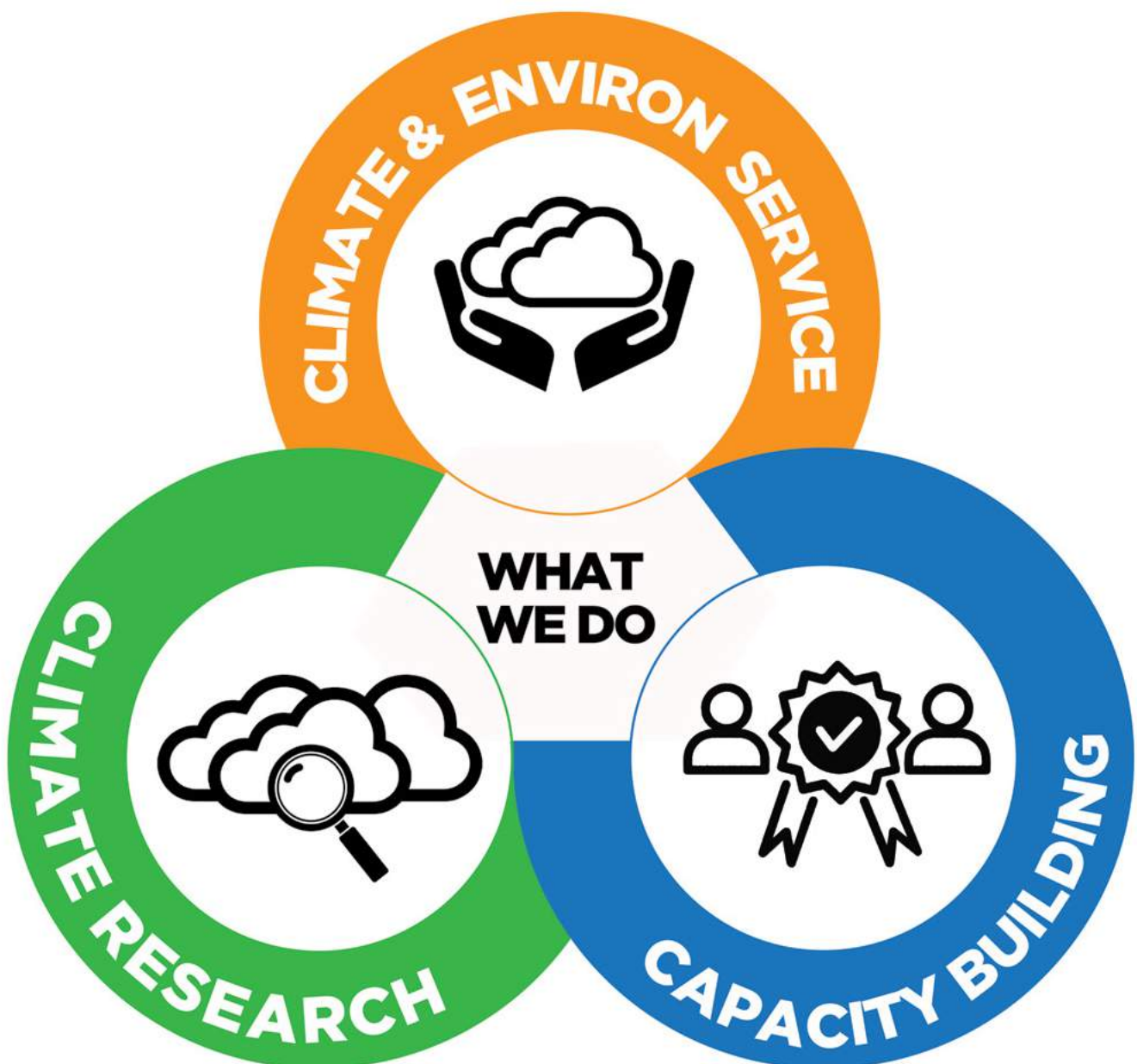
## OUR VISION

WASCAL seeks to become one of Africa's leading institutions in the provision of climate services in and for West Africa.

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## OUR MISSION

WASCAL seeks to provide information and knowledge at the local, national and regional levels to its West African member countries to cope with the adverse impacts of climate change. We do this through Capacity Building support to young West African Scholars in fields of natural and social sciences and by strengthening West African universities and climate service departments in WASCAL member countries.



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# I

## CREATION AND STATUS

Climate Change remains one of the most severe challenges to the tropics and particularly to West Africa in this century. WASCAL was established to respond to the challenges of climate change in West Africa by filling the scientific capacity gaps in climate services under the umbrella of ECOWAS.

It was created in 2012 by 10 west African countries (Benin, Burkina Faso, Cote d'Ivoire, Ghana, the Gambia, Mali, Niger, Nigeria, Togo and Senegal) in cooperation with the Federal Republic of Germany, through its Ministry of Education and Research (BMBF), and under the umbrella of ECOWAS with an international status since 2014. The admission of Cape Verde has been approved by the recent ministerial council meeting held in Accra on the 30th of July 2019. The remaining four (4) ECOWAS countries are being engaged in the process of adhering to the institution.

WASCAL is funded by the BMBF, partners and the member countries and has established a strong network of partners at national, regional and international levels. The institution has gained a scientific international recognition and membership to high-level institutional networks.

# II

## OUR MANDATE

WASCAL as a wholly West African international non-profit organization plays a front-line role in helping West Africa

achieve the United Nation's Sustainable Development Goal (SDG) 13 on climate change and thereby enhancing green economy and other SDGs.

**We are guided by  
the UN Sustainable  
Development Goal 13  
in our quest to Combat  
Climate Change and  
Improve Livelihoods**



The institution's mission is to provide information and knowledge at the local, national, and regional levels to the member countries to cope with the adverse impacts of climate change and devise integrated mid and long-term options to build up resilient and productive socio-ecological landscapes. We do this through capacity building and environmental services in West Africa.

WASCAL works with national, regional and international partners to promote scientific research at local, national and regional level, to serve as a basis for providing relevant information and advice that can guide land users and decision

makers toward appropriate policies and practices for sustainable development. As part of this initiative we pursue a capacity building program with the purpose of contributing to create a critical mass of the next generation of scientists and specialists in various fields related to climate change.



## GOVERNANCE AND STRUCTURE

WASCAL is governed by:

**01** a ministerial council

a governing board backed by a scientific advisory committee and ad hoc committees.

**02**

**03** an executive management team

### Our structure is composed of:

- the Headquarters in Accra (Ghana)
- the Competence Centre as a regional scientific Hub in Ouagadougou (Burkina Faso) hosting the data infrastructure, modelling and climate services facilities;
- The Graduate studies Programme stretches out across the region with regional graduate centres of excellence hosted by 12 host universities in the 11 member countries, covering 12 climate change topics. These programmes are made of 10 doctoral and two master's programmes.

### The current doctoral programmes are:

- West Africa Climate System: Federal University of Technology, Akure (FUTA), Nigeria
- Climate Change and Water Resources: Université d'Abomey-Calavi (UAC), Benin
- Climate Change Economics: Université Cheikh Anta Diop de Dakar (UCAD), Senegal
- Climate Change and Land Use: Kwame Nkrumah University of Science and Technology (KNUST), Ghana
- Climate Change and Agriculture: Institut Polytechnique Rural de Formation et de Recherche Appliquée (IPR-IFRA), Mali and University of Cape Coast (UCC), Ghana
- Climate Change and Biodiversity: Université Felix Houphouët Boigny (Formerly Université Cocody-Abidjan), Cote d'Ivoire
- Climate Change and Disaster Risks Management: Université de Lomé (UL), Togo
- Climate Change and Energy: Université Abdou Moumouni de Niamey (UAM), Niger
- Climate Change and Habitats: Federal University of Technology, Minna (FUT-Minna), Nigeria
- Climate Change and Education: University of the Gambia (UTG), The Gambia

### The current master's programmes are:

- Climate Change and Marine Science: University of Cabo Verde
- Informatics for Climate Change: Université Prof. Joseph Ki-Zerbo, Burkina Faso

### Among other direct benefits to member countries include:

- Accessibility to all facilities built up and assets acquired by WASCAL on an equitable basis subject to the provisions of the Cooperation Agreement;
- Establishment and operation of Graduate Centres of Excellence in lead universities where

### WASCAL operates;

Accessibility to climate change capacity building of future policy makers and scientists within the sub-region; Climate service and equipment provision;

National level programmes on climate change;

Assistance to national policy and decision makers in design and implementation of sustainable development strategies.

### OUR MEMBER COUNTRIES



**WASCAL**  
COMPETENCE CENTRE

**COMPETENCE  
CENTRE**



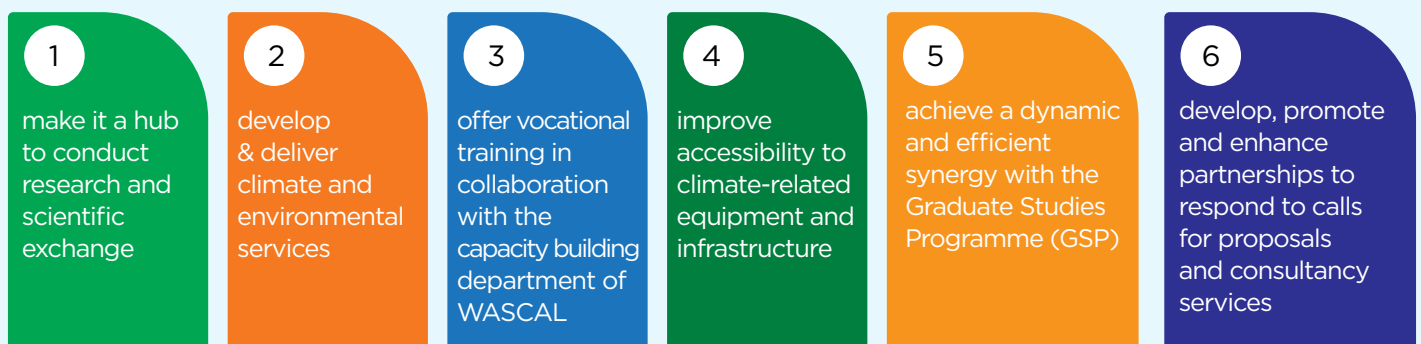


## ABOUT THE COMPETENCE CENTRE

The WASCAL Competence Centre (CoC) is a regional scientific hub for Africa, built for Research and Innovation, Data Management, and Climate & Environmental Services Provision.

As the research and services department of WASCAL, it conducts research and delivers scientific advisory, climate & environmental services to West African countries in various thematic areas. The delivery of these services require both spatial and non-spatial data because the centre is equipped with a data infrastructure and management system supporting research and innovation actions in the region.

**Pillars of the Competence Centre-** The operations of the centre are designed to:



## RESEARCH & INNOVATION

### WASCAL Research & Action Plan (WRAP2.0)

Research and Innovation activities are rolled out under the Strategic Mid-term Research and Action Plan (WRAP2.0), adopted at the third WASCAL Ministerial Council meeting 2019. WRAP2.0 is founded on five Priority Research Themes (PRT).

a. PRT 1 - Land use and Land Cover/Land Degradation / Climate Change Nexus (LDC). Research under this RPT aims at generating updated high-resolution West African time-variant Land Use/ Land Cover database along with their thermal and physical parameters. Under LDC, two Research-Innovation projects, CONCERT and LANDSURF, are executed. The results of this PRT

will improve the representation of surface conditions in climate models and ultimately contribute to the development of a tailored dynamical vegetation model for the region.

b. PRT 2 - Risks and Vulnerability to Climate Extremes (RiVEx). Harmonizing information on climate extreme events, vulnerability, and potential risks. It specifically develops tools and metrics to understand, quantify and mitigate present-day and future risks associated to multi-hazards and compound events induced by climate, climate variability and change. The FLURIFLOOD project is executed under RiVEx .

- c. PRT 3 - Rural-urban and Cross Border Migration in West Africa (RUM). This PRT aims at investigating the interlinkage between climate and environmental changes, population dynamics, gender, conflicts, livelihood opportunities and migration. Under RUM, two Research-Innovation projects, MIGRAWARE and MiTra-WA, are executed .
- d. PRT 4 - Sustainable Agriculture/ Climate Smart Landscapes Nexus (SA). Improving food and nutrition security and livelihoods through sustainable intensification of agriculture while contributing to Green-House-Gas mitigation efforts and carbon sequestration potential. The WRAP2.0 funded project GreenGaDe is executed under this PRT.
- e. PRT 5 - Renewable and clean Energy (REN). Providing a wide range of research and services portfolio in areas of energy efficiency, hydrogen energy, waste-to-energy, solar, wind, hydropower energy and their mixes. It provides science-based solutions to

## WRAP2.0 PROJECTS

increase the adoption of renewable energy and innovative technologies under a changing climate.

**CONCERT** (Greenhouse gas emissions and mitigation options under climate- and land use change in West Africa: A concerted regional modeling and observation assessment): (Lead: University of Augsburg, African partners: United Nations University Institute for Natural Resources in Africa, Kwame Nkrumah University of Science and Technology (KNUST), Centre for Atmospheric Research Agency NASRDA/ FUTA and AGRHYMET Regional Centre.

**LANDSURF** (Land surface processes as a determinant of climate change in Africa – scenarios, high-resolution modeling and development of a stakeholder data portal): (Lead: University Wuzburg, African partners: University Ouagadougou, Burkina Faso, United Nations University (UNU), Accra, Ghana, Federal University

of Technology Akure (FUTA), Akure, Nigeria, AGRHYMET, Niamey, Niger)

**FLUIRFLOOD:** Current and future risks of urban and rural flooding in West Africa – An integrated analysis and ecosystem-based solutions” (Lead: Karlsruhe Institute of Technology (KIT) Institute of Meteorology and Climate Research (IMK) 76128 Karlsruhe, Germany, African partners: United Nations University – Institute for Natural Resources in Africa (UNU-INRA), Accra, Kwame Nkrumah University of Science and Technology, Ghana, University of Abomey-Calavi, Benin, University of Lomé (Coordination), University Cheikh Anta Diop, Dakar, Senegal, Université Félix Houphouët-Boigny, Cote d’Ivoire)

**MIGRAWARE:** Rural-urban and cross-border MIGRAtion in West-Africa – an integrated assessment framework of drivers, processes and sustainable REsponses (Lead: KIT, African partners: Cape Coast University ,Savanna Agricultural Research Institute (SARI),

Hen Mpoano (NGO), Federal University of Technology Minna (FUT Minna) University Nazi Boni, Burkina Faso (UNB).

**MiTra-WA:** Migration and Translocality in West Africa (Lead: Universität Passau (UP), African partners: University of Ghana, Accra Centre for Migration Studies (CMS), Ghana, Université de Ouagadougou, Institut Supérieur des Science de la Population (ISSP) ,Burkina Faso Kwame Nkrumah University of Science and Technology, Kumasi Department of Planning (KNUST) , Ghana ,University of Ibadan (UI) Department of Agricultural Economics, Nigeria)

**GreenGaDe:** Greenhouse Gas Determination in West Africa's Agricultural Landscapes (Lead: University of Potsdam, African partners: Laboratory of Plant Biology and Ecology, University Joseph Ki-Zerbo, Ouagadougou/ Burkina Faso, Forestry Research Institute of Ghana, Kumasi /Ghana, Department of Nuclear Physics and Chemistry, University Abdou Moumouni Niamey/ Niger, Institut de l'Environnement et de Recherches Agricoles (INERA) / Burkina Faso).

## DATA MANAGEMENT DEPARTMENT

The Data Management Department (DMD) hosts WASCAL Data Infrastructure (WADI) which is a set of hardware, software, network resources and information technology services to enable the collection, storage, management, discovery, access, sharing, and dissemination of primary & secondary data.

The other components of DMD include the Observation Networks (ONs), the GIS/Remote Sensing Laboratory (GIS/RS-Lab), the High-Performance Computer (HPC) and the Web Repositories and Geoportals (REPs).

### Components of WADI

**Observation Networks (ONs):** The ONs provide a novel high-resolution observation data for the WASCAL member countries based on innovative measurement techniques and improved facilities for data collection. The observation networks and data products are needed to improve the capacities of the national services in meteorology, hydrology, agriculture and other disciplines, and forms the base for stakeholders for better decision-making through the establishment of multi-stakeholder innovation platforms in West Africa.

**High Performance Computer (HPC):** This unique computational facility within WADI provides scientists with the operational CPU time and other computational power in order to enable further developments of regional climate models and carry out numerous projection and simulation experiments.

**GIS/Remote Sensing Laboratory:** The GIS and Remote Sensing Laboratory is a fully functional laboratory that provides scientists and students with the necessary infrastructure for carrying out mapping activities associated with their research projects. The lab also provides value-added GIS and remotely sensed data to projects and offers short training courses in collaboration with the Capacity Building Department of WASCAL.

## CLIMATE AND ENVIRONMENTAL SERVICES

Climate and Environmental Services (CES) at WASCAL are designed, demonstrated, and disseminated from the Competence Centre. They are defined to provide information, engineering solutions, policy guidance and knowledge to support resilience, sustainable development and improve livelihoods. These are “customized” and “integrated” services responding to user needs, to the new challenges posed by global warming and climate change, and bringing together

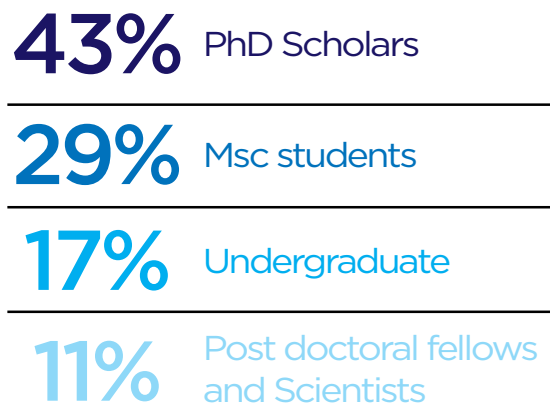
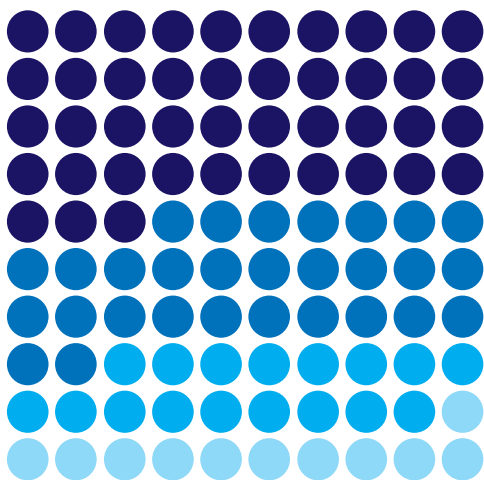
human skills, financial investments, information resources, tools, and training to improve the adaptive capacity of nations and the resilience of different sectors.

The majority of the 3D-Services are embedded in the CICLES project and derived from WRAP2.0 projects, Data Management Services and other consortia projects/consultancies jobs of WASCAL.


## THE COMPETENCE CENTRE BY THE NUMBERS



## Annual Rates of Visiting Scientists Received at the Competence Centre







**WASCAL  
RESEARCH  
ACTION PLAN  
(WRAP 2.0)  
2021-2024**

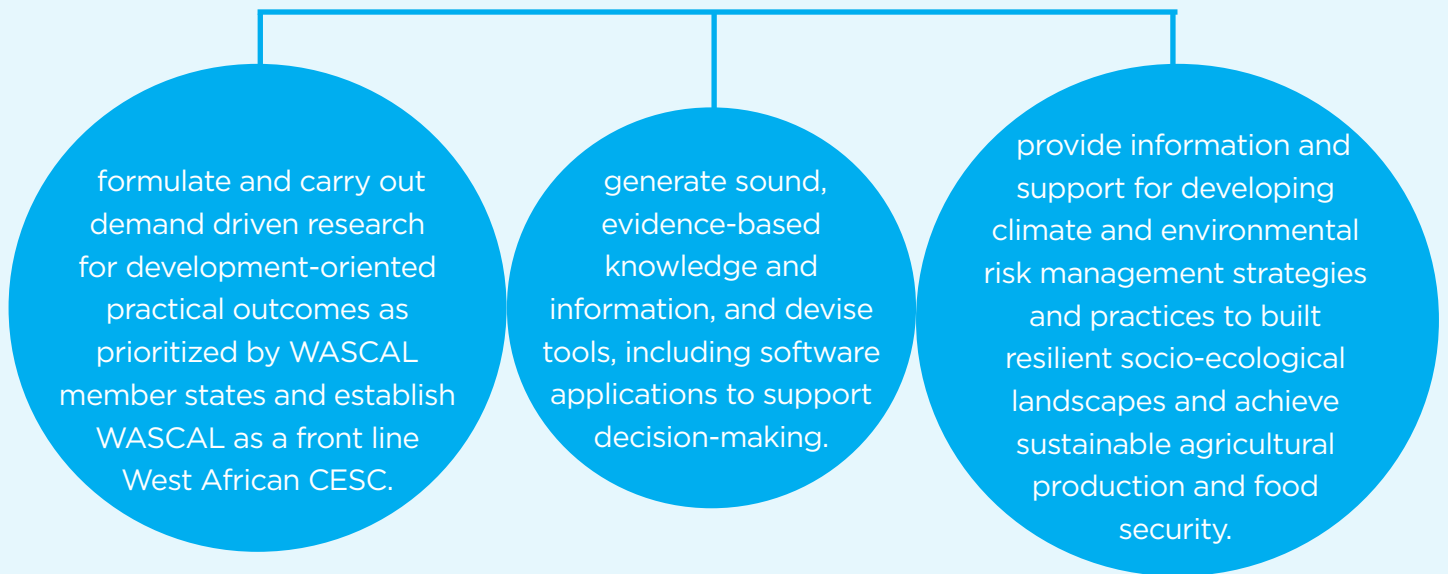


## ABOUT WRAP 2.0

The WASCAL Research Action Plan 2021-2024 (WRAP 2) is a roadmap to a Climate and Environmental Services Centre (CESC) to deliver, by 2024, key-demand

driven climate and environmental services for use by policymakers and other key stakeholders, including smallholders. Working objectives for 2021 are:

### Working objectives for 2021 are:



### To implement WRAP 2.0, WASCAL frames its research strategy on:



II.

## OBJECTIVES AND ACTIVITIES

The main objective assigned to WASCAL is to coordinate high quality or evidence-based and impact-oriented research for development and support climate and

environmental services delivery in the context of Climate Change and Climate Variability in West Africa.

**To achieve this objective, the key activities to be undertaken in the implementation of WRAP 2.0 are:**

**O1 .** Ensure that there is a coherence and complementarity between the projects selected for funding under WRAP 2.0 call,

**O3 .** Monitor and evaluate the projects selected for funding under WRAP.2 call based on their respective annual workplan and performance goals.

**O2 .** Contribute to the planning of activities and setting of performance goals of the projects selected for funding under WRAP 2.0.

**O4 .** Capitalize and document the outputs and outcomes of the projects selected for funding under WRAP 2 call that can be used for the development and delivery of climate and environmental services by WASCAL

III.

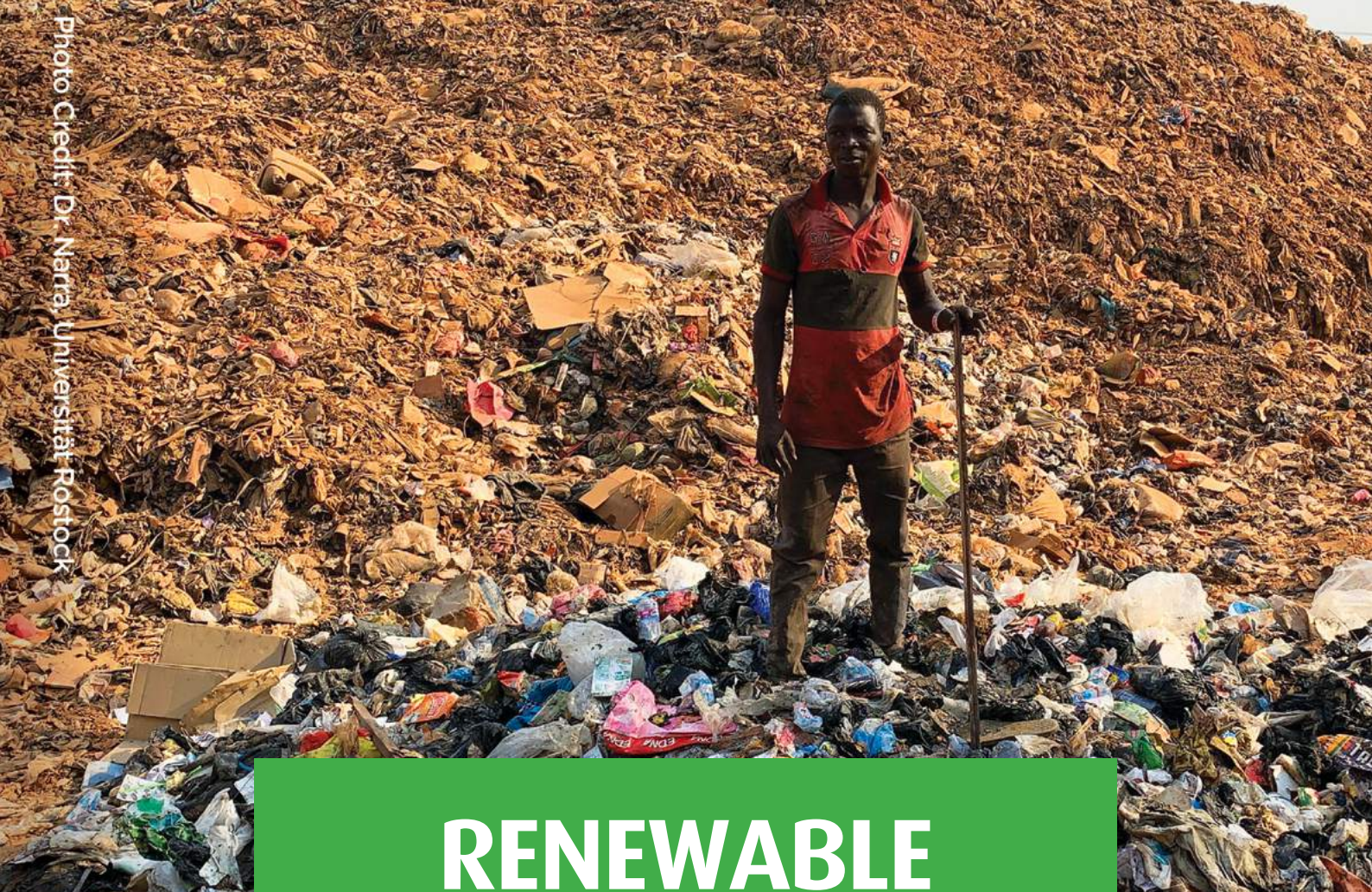
## PRIORITY RESEARCH THEMES

To operationalise its strategic goals for the next three years, WASCAL builds of 4 Priority Research Themes:

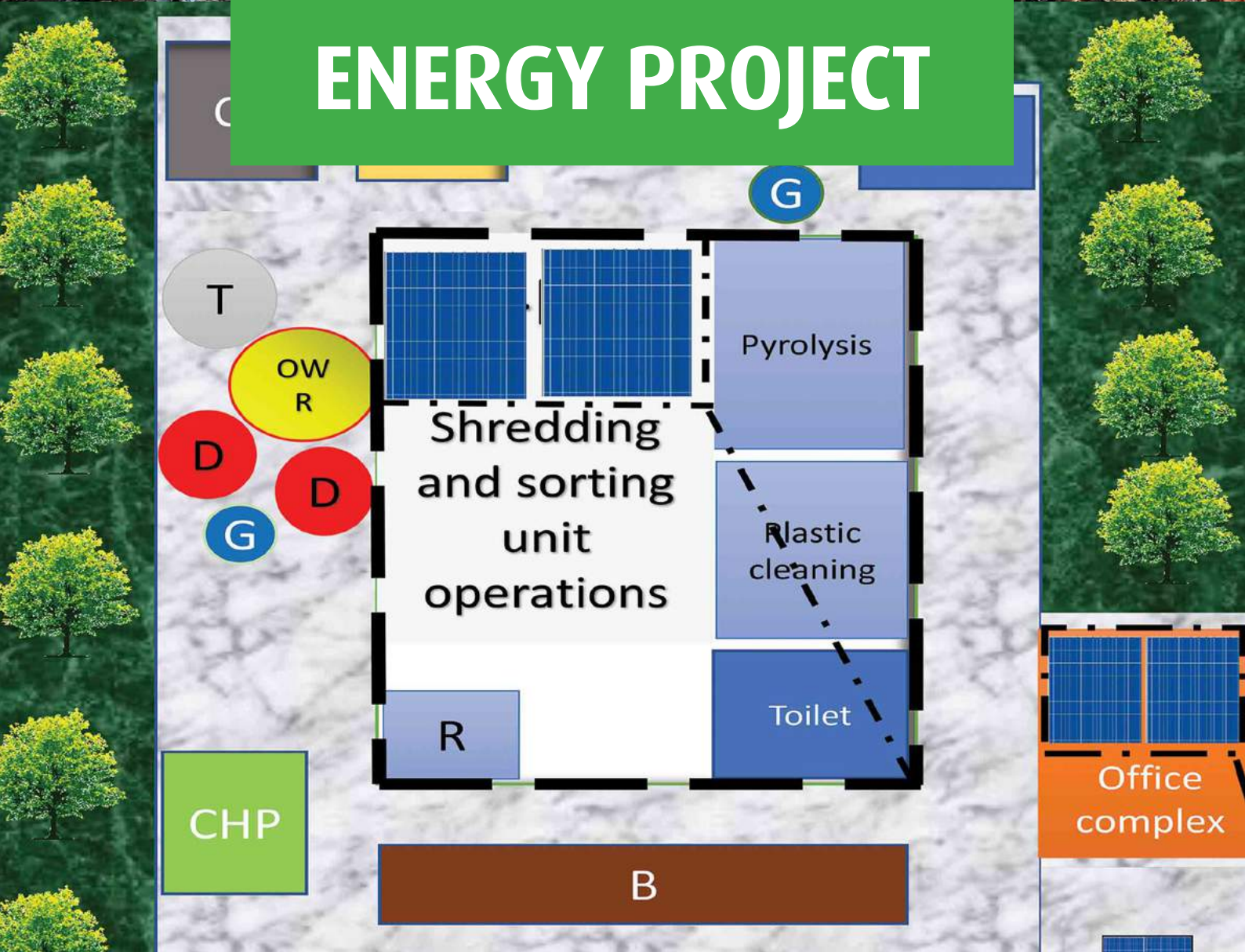








# RENEWABLE ENERGY PROJECT





## NAME OF COUNTRY: GHANA

**Name of Project: Hybrid Waste-to-Energy (W2E) Pilot Project in the Ashanti Region, Ghana.**

### Key goal of the project:

To develop concepts for waste segregation and conversion into energy by using biogas, pyrolysis, and solar PV plants, build capacity and transfer proven waste treatment technologies in use in Germany to Ghana.

### General facts/ findings behind the project:

- The management of municipal waste has served as a challenge for cities due to population growth and ever-changing lifestyles.
- Two feasibility studies were conducted by CSIR to find the best solution which gave rise to this project.

### Partners within the country:

- WASCAL
- Council for Scientific and Industrial research (CSIR-Ghana)
- University of Energy and Natural Resources (UENR)
- Kumasi Technical university (KsTU)
- FV Construction Limited
- Centre for Energy Environment and Sustainable Development
- KNUST- The Brew Hammond Energy Centre
- Twerebo Process Industries Limited

### Success story:



Building the capacity of 17 masters students by giving scholarship to those interested in waste conversion, pyrolysis, biogas, and solar PV systems in KsTU, KNUST, UENR.



1 PhD and two post docs.



Communities and Stakeholders engaged on the project's impact.

### Anticipated impacts

- Build a waste to energy treatment facility in Gyankobaa to produce 400 kW energy.
- Improve environmental sanitation.
- Provide organic fertilizers to farmers in the communities.
- Build capacity of local experts to design, construct, and maintain a hybrid waste to energy facility.
- Provide a blueprint for the propagation of 10 additional waste to energy facilities.
- Contribute to the inclusion of renewable energy in Ghana's electricity generation mix.



## NAME OF COUNTRY: TOGO

### Name of Project: Technologies for the Use of Biomass Potentials in Togo: Biogas Laboratory and Pyrolysis Cookers.

#### Key goal of the project:

To construct a high Technology Laboratory for Biogas Production and develop Pyrolysis Cookers for usage in rural communities.

#### Partners within the country

- University of Lomé Togo
- Jeunes Volontaires pour l'Environnement.

#### Anticipated impacts

- Equip Togolese academics (Students and other stakeholders and populations with practical information on renewable energy.
- Train local experts in the field of renewable energy from biogas

- Help the government's objective to achieve a 100% access rate to electricity, with 50% produced from renewable sources by 2030.
- Master the process of storing and distributing this clean energy.
- women in rural communities will find efficient Pyrolysis Cookers to replace the usage of wood to improve their health.

#### General facts/ findings behind the project:

- Togo has enormous biomass potential which remains untapped over the years and there is the need to tap these by having a biogas laboratory for the development of research capacity and demonstrate innovative biogas production technologies.
- Women in rural communities have used wood for cooking where the smoke affects their health. There is the need to develop and adopt improved stoves.





## INSTITUTION: ECOWAS

### Partners within the country:

KNUST

### Name of Project: H2-Power-Africa- Atlas of green hydrogen generation potential in Africa

#### Key goal of the project:

To support sustainable and economic development through a viable hydrogen economy with a high potential to make Africa an exporter of green hydrogen, hence gaining more relevance in international energy markets.

#### General facts/ findings behind the project:

- Africa has a growing population of nearly 1.3 billion, increasing at an average annual rate of 2.5% for the last 10 years. The growing population directly implies growing demand for energy.
- The overall sustainable development of Africa and indeed the global effort to reduce climate degradation will stem from a holistic energy system driven by renewable energy.
- This challenge of reaching 100% renewable based energy systems will require joint effort and partnership across borders to find feasible climate-friendly solutions.

In a new initiative, Germany is collaborating with African countries to explore the utilization of green hydrogen and hydrogen derivatives as an energy option in a joint effort.

#### Anticipated impacts

- Produce an interactive atlas, to show the “locations of interest”, serving as a decision support tool for the concept and design of pilot hydrogen plants.
- Contribute towards a clear roadmap for enabling a green hydrogen-based economy in sub-Saharan Africa thus of great relevance for policy makers, investors, researchers and indeed all stakeholders in Germany and Africa.
- Provide relevant information which German and African businesses/ industries can leverage in partnership to provide the appropriate technology for sustainable development.
- Build the capacity of 15 post docs within ECOWAS in the field of green hydrogen technology through exchange visits of German and African students/ researchers,
- joint workshops and establish hydrogen graduate programs in partnership with WASCAL, Forschungszentrum Jülich GmbH and RWTH Aachen.

# DATA MANAGEMENT DEPARTMENT (DMD)





## **ABOUT WASCAL DATA INFRASTRUCTURE (WADI)**

The WASCAL Data Infrastructure (WADI) is a multi-purpose infrastructure of hardware, software, network resources and information technology services to enable the collection, storage, management, discovery, access, sharing, and dissemination of primary and secondary data related to environment and Climate Change within the West African region. WADI includes the following: (i) The Observations Networks from which raw data are collected and processed; (ii) The WASCAL Data Repository and Portals (WASREP) with an online platform for harvesting, archiving, managing, publishing, sharing, and disseminating the data;

### **A: Observation Networks (ONs):**

The ONs provide a novel high-resolution observation data for the WASCAL member countries based on innovative measurement techniques and improved facilities for data collection.

The observation networks and data products are needed to improve the capacities of the national services in meteorology, hydrology, agriculture and other disciplines, and forms the base for stakeholders for better decision-

### **B: High Performance Computer (HPC)**

A unique computational facility within WADI which provides scientists with the operational CPU time and other computational power in order to enable further developments of regional climate

models and carry out numerous projection and simulation experiments

### **C: GIS/Remote Sensing Laboratory**

It is a fully functional laboratory that provides scientists and students with the necessary infrastructure for carrying out mapping activities associated with their research projects. The lab also provides value-added GIS and remotely sensed data to projects and offers short training courses in collaboration with the Capacity Building Department of WASCAL.



## **WASCAL DATA REPOSITORY AND PORTALS**

WASCAL has deployed a regional data repositories and portals, formally referred to as WASCAL Data Repositories and Portals (WASREP). This is designed to contribute to filling the data gaps in terms of online and long-term storage and accessibility of the data, as well as datasets description, licensing and sharing, WASREP being the online visible web face of WADI, is also often referred to as WADI portal.

The main interest of WASREP is twofold:

- facilitate the online provision, integration, management, and exchange of heterogeneous data resources mainly for the delivery and dissemination of climate services and
- develop a regional data hub connecting data providers (owners/distributors), data users (scientists/non-scientists) and data managers.

- To this main repository are linked specific data platforms and apps as follows:

wascal-hydromet-net.org: An interactive data platform for time-series hydrometeorological data. It provides a map-based discovery, request, and access to the data of WASCAL-donated meteorological stations and hydrological sensors installed in WASCAL watershed Basins and in member countries. An access to the countries synoptic weather stations is also provided.  
<http://wascal-hydromet-net.org/>

WASCAL Location-based mobile field data collection aggregate system: Customized deployment of server and mobile app for socio-eco surveys. Collected data from mobile devices are being sent and aggregated onto WASCAL server.  
[https://wascaldataportal.org/wascal\\_searchportal2/](https://wascaldataportal.org/wascal_searchportal2/)

cov-clichange app: WASCAL dashboard for monitoring COVID-19 daily statistics against air quality and climatic variables. The app is still being improved.  
<https://wascal-dataportal.org/cov-clichange-app/>

#### IV. DATA SERVICES

Through the WADI, the Competence Centre is increasingly providing the following data services to governments, academic institutions, development and implementation agencies, and any other end users interested in climate data, storage, and computing services:

Open data source access for partner organizations and institutions.

Raw and value-added/processed data on climate, agriculture (e.g., high

quality baseline data on soil organic carbon (SOC) and Green House Gases (GHG) emissions), health, renewable energy, education, environment, land use (land cover), water resources management, and migration.

Regional data storage facilities.

Data mirroring and backup.

HPC access for large-scale computations and modelling

#### V. AUTOMATIC HYDROLOGICAL SENSORS

WASCAL acquired sixty (60) automatic hydrological sensors (AHS) for member countries: 50 Automatic Water Level Sensors (AWLS) and 10 Automatic Water Quality Sensors. The objective sought by WASCAL is to strengthen member countries flood watch, Disaster Risk Reduction & early warning schemes and entry/exit water quality surveys at country borders.

WASCAL signed a Memorandum of Understanding (MoU) on data sharing policy with hydrology department of each country. The latter is also expected to provide tax waivers for the sensors entry into the country.

#### VI. WASCAL BASINS

WASCAL has established local hydro-climate observation networks in three watersheds- also known as basins - in the



<b>Distribution plan of hydrological sensors</b>			
Basins	AWLS	AWQS	Countries
Comoe	5	1	Burkina Faso, Cote d'Ivoire, Ghana
Niger	13	4	Mali, Burkina Faso, Niger, Benin, Nigeria
Volta	8	2	Burkina Faso, Cote d'Ivoire, Ghana, Benin, Togo
Senegal	8	1	Mali, Senegal
Ouémé	2	1	Benin
Mono	6	1	Benin, Togo
The Gambia	8	0	Gambia Senegal

semi-arid Sudanian zone of West Africa, specifically in the Dassari (Benin), Dano (Burkina Faso), and Vea/Sissilli (Ghana/Burkina Faso) watersheds. These basins represent the core research base (i.e., experimental catchment) for scientists involved in WASCAL-related research activities in West Africa, particularly those interested in studying the semi-arid Sudanian zone.

The basins which form the novel research observatory of WASCAL are equipped with several environmental monitoring (i.e., climate, soil-water, river gauging, river flow, turbidity, and piezometric) stations and is designed for long-term measuring of more than 30 hydrometeorological variables in sub-hourly temporal resolution and further variables such as carbon dioxide.

Past and ongoing research projects in these basins can be broadly categorized into the following thematic areas - climate, hydrology, agronomy, and land use.

### **1. Dassari Basin**

Located near Tanguiéta in Benin, the Dassari Basin is equipped with numerous

hydro-meteorological sensors which have been collecting data since 2013. The basin is a portion of land identified and characterized by WASCAL in 2012 for its research work.

### **2. Dano Basin**

The Dano Basin is one of WASCAL's core research catchments equipped with numerous hydro-meteorological sensors and is located near Dano in the Loba Province of Burkina Faso.

### **3. Vea/Sissilli Basin**

The Vea/Sissilli Basin collectively represents five (5) watersheds including the Vea, the Sissilli, the Tono, the Atankwedi and the Anayare river basins. The basin which covers parts of northern Ghana and southern Burkina Faso is one of the three focal experimental catchments of WASCAL with Vea watershed (about 300 km<sup>2</sup> in surface area) being its core research area. The basin comprises several wetlands, inland valleys, small dams (used for irrigation and animal watering) and wells/pumps resulting which makes it a complex ecosystem.

growing population of communities in the area.

# CAPACITY BUILDING PROGRAMME



# Doctoral Research Programme in Climate Change and Water Resources

## The University of Abomey-Calavi, Benin



Director in Charge of Programme: Dr. Julien Adoukpe

WASCAL Capacity Building Programme facilitates academic education amongst 12 West African universities in collaboration with German institutions through the Graduate Studies Programme (GSP). Each programme selects students from each of the WASCAL member countries through open calls for applications (scholarship and fee-paying students). WASCAL has since 2012, maintained its strong commitment, under the sponsorship of the German Federal Ministry of Education and Research (BMBF) to provide climate change solution through capacity building by helping educate the next generation of scientists attain an in-depth knowledge of different climate related issues in order to help the region develop suitable management strategies.

English language is used as the main language of instruction. Both Masters

and Doctoral students are expected to participate in four months language training in English (University of Cape Coast, Accra-Ghana) and French (University of Lomé - Togo) for Anglophone and Francophone students respectively.

### **PROGRAMME RELEVANCE TO CLIMATE CHANGE**

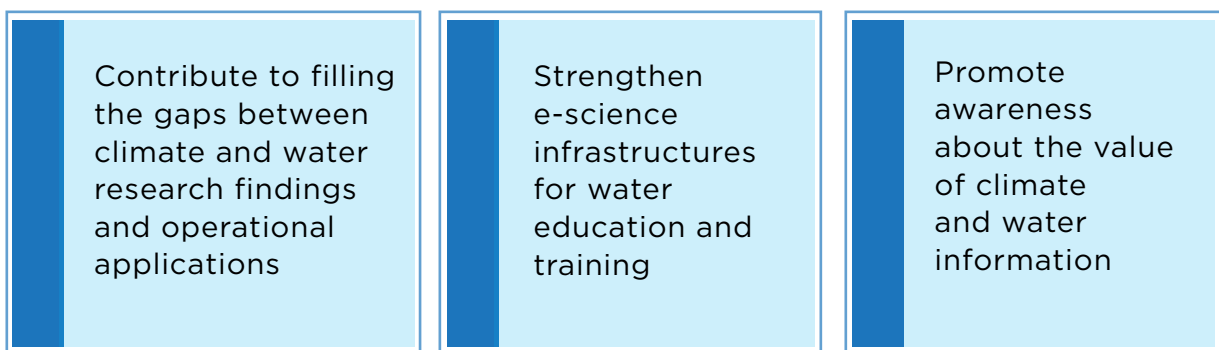
Climate extremes have led to various catastrophes, such as floods, droughts, and hydro-energy shortcuts, which negatively impact human well-being, economic development and the achievement of the Millennium Development Goals (MDGs). Mismanagement of water resources leads to underuse of economic potential and to an inability to adequately deal with climate risks and hydrological variability. The region's weak capacity to buffer and manage the effects of varying water

availability generates uncertainties and risks for economic activities. Sustainable economic and social development at national and regional levels require that hydrological forecasting systems for communities at risk are continuously developed, which in turn demands an optimal combination of data, forecasting tools and well-trained specialists.

The Doctoral Programme in Climate

Change and Water Resources is created at the University of Abomey-Calavi in the framework of the West African Science Service Centre on Climate Change and Adapted Land Use (WASCAL) to increase capacity building for qualified water resource scientists.

The programme is combating climate change through its training activities and research output that are geared towards specific objectives as follows:



## HOST UNIVERSITY

The University of Abomey-Calavi of Benin hosts the Doctoral Research Programme in the Faculty of Sciences and Technology (FAST). All senior staff in the faculty are well qualified and have good working relations at international level. Water-related education is also located within three other faculties: (1) Faculty of Agronomical Sciences (FSA) that offers degrees (BSc, MSc and doctoral) on land use and water management, irrigation techniques, analysis of small reservoirs and virtual water studies; (2) Abomey-Calavi Polytechnical School (EPAC) - Civil Engineering Department that offers degrees (BSc and MSc) in water

education; and(3) Faculty of Literature, Arts and Human Sciences (FLASH) - Department of Geography that offers degrees in climatology, water and society. These faculties are closely interlinked within a common coordinated training programme called PROfEAU (Programme de Formation en Eau) sponsored by Dutch cooperation.

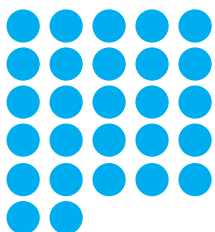


**Water-related education located within three faculties**

## BENEFICIARIES SO FAR

**38 West African students**

**Full scholarship scheme:** accommodation, tuition, travel, and cost of research.



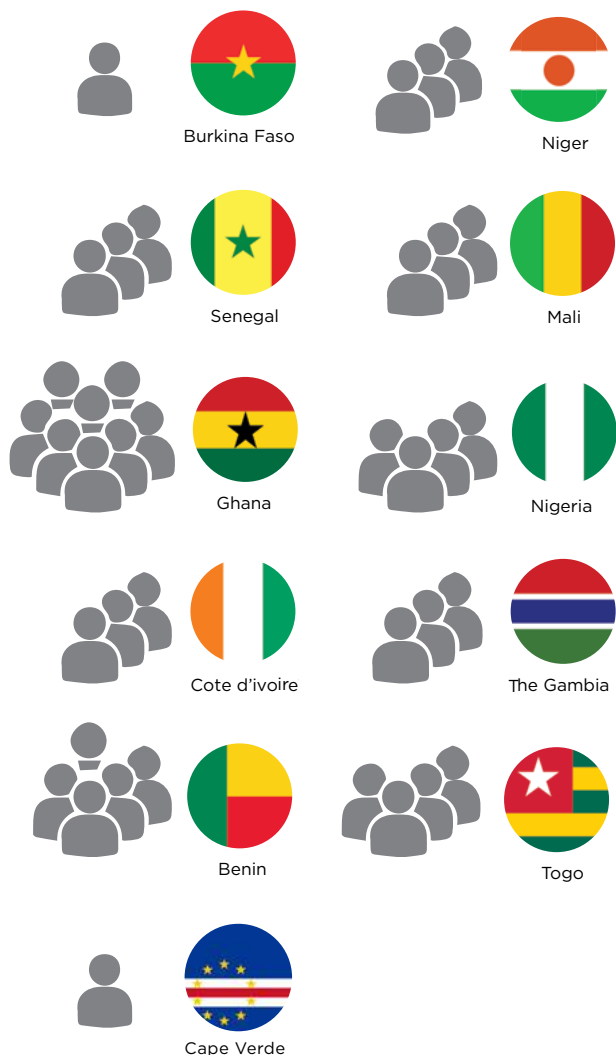
**27 graduated**  
2012-2019



**11 students in 4th batch**

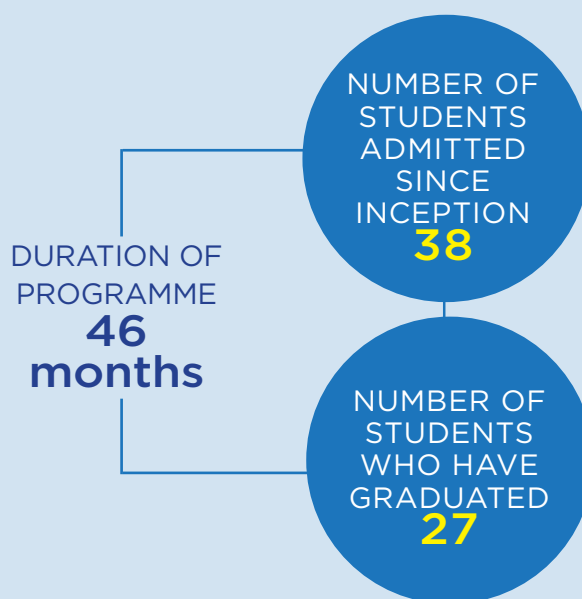
- admitted in 2019
- completion in 2022

## COUNTRY BREAKDOWN OF BENEFICIARIES SO FAR



## MODE OF ADMISSION

Call for application (through advert) for scholarship as well as for fee-paying students and then selection through the relevant committee with the involvement of the School of Postgraduate Studies (SPGS). Recommendations are then sent to the International Advisory Board.



## IMPACT

- The programme has successfully trained and empowered individuals across West Africa to increase capacity building for qualified water resource scientists;
- Strengthen e-science infrastructures for water education and training;
- Contribute to filling the gaps between climate and water research findings and operational applications;
- Promote awareness about the value of climate and water information.

## BENEFICIARIES BY GENDER

27



11



## NUMBER OF THESES WRITTEN SO FAR

27



## INVESTMENT BY BMBF SO FAR

**€3,074,133**

### Investment breakdown per each batch:

First and Second  
batches:  
(November 2011 to  
February 2016):  
€ 1,575,007

Third batch  
(March 2016 to  
September 2019):  
€ 735,880

Fourth batch:  
(September 2019  
to date )  
€ 763,246



# Master Research Programme in Informatics for Climate Change

**Université Joseph KI-ZERBO,  
Burkina Faso**



Director in Charge of Programme: Prof Tanga Pierre Zougrana

WASCAL Capacity Building Programme facilitates academic education amongst 12 West African universities in collaboration with German institutions through the Graduate Studies Programme (GSP). Each programme selects students from each of the WASCAL member countries through open calls for applications (scholarship and fee-paying students). WASCAL has since 2012, maintained its strong commitment, under the sponsorship of the German Federal Ministry of Education and Research (BMBF) to provide climate change solution through capacity building by helping educate the next generation of scientists attain an in-depth knowledge of different climate related issues in order to help the region develop suitable management strategies.

English language is used as the main language of instruction. Both Masters

and Doctoral students are expected to participate in four months language training in English (University of Cape Coast, Accra-Ghana) and French (University of Lomé - Togo) for Anglophone and Francophone students respectively.

## **PROGRAMME RELEVANCE TO CLIMATE CHANGE**

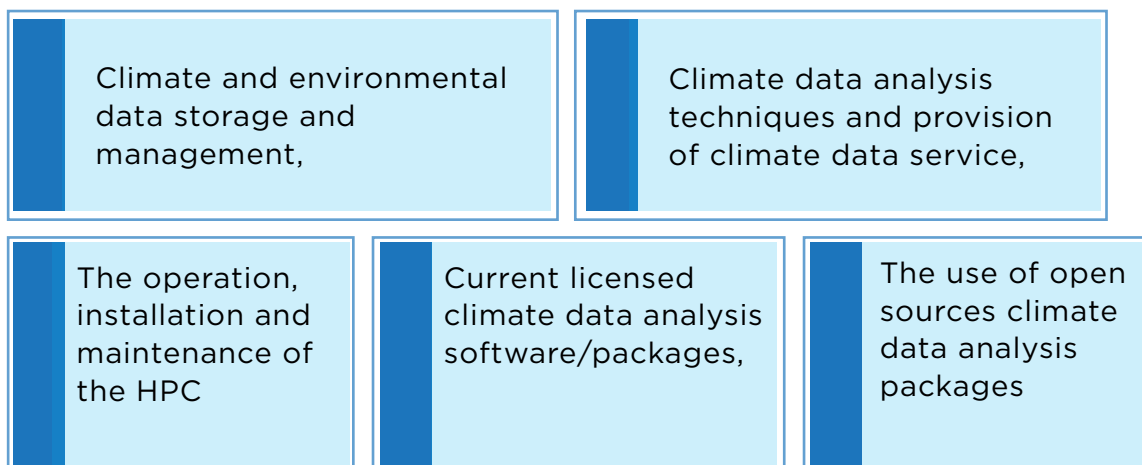
The Master Research Programme in Informatics for Climate Change (MRP-INFORMCC) is implemented at the Université Joseph KI-ZERBO (Burkina Faso) in partnership with the University of Würzburg (Germany) and the support of WASCAL and BMBF. MRP-INFORMCC is aimed at training a critical mass of experts with adequate scientific computation and climate data management skills in West Africa. This Master programme include all aspect of data management and administration of

high-performance computing facility that will be used to run regional climate models and its auxiliaries for operational and research institutions and universities in West Africa. Student will be exposed to interdisciplinary and trans-disciplinary approaches to climate data analysis and management skills as well as operations and maintenance of HPC systems.

Due to the projected high level of vulnerability to climate change of the ever increasing population in West Africa, the lack adequate ability for adaptation coupled with the poor capacity to effectively carry out reliable data and high

computing analysis, establish and manage needed climate data platform, there is an urgent need to develop strong human capacity in this areas. The programme will train a critical mass of experts with adequate scientific computation and climate data management skills. This will help for solving these issues and the uncertainties in key climate change concerns.

The programme is combating climate change through its training activities and research output that are geared towards specific objectives as follows:



These skills offer several opportunities for the graduates. They can pursue doctoral studies or undertake professional careers in meteorological agencies, research centers, universities, public administration, private sector, NGOs, International Institutions, etc.

### HOST UNIVERSITY

The Université Joseph KI-ZERBO, started running the WASCAL Master Research programme in 2019. The University was created in 1974 with only 374 students. In 2020, it involves more than 45,000 students



1136 lecturers



520 support staff



about 45,000+ students

with nearly 13,000 new baccalaureates graduated per year in the first year of Bachelor's degree. It is the first University of Burkina Faso.

It has five (05) Training and Research Units, six (06) Institutes and four (04) Doctoral



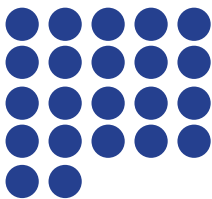
Schools with more than seventy-five (75) programmes and fifty-four (54) Laboratories. These programmes and laboratories cover various fields: Humanities, Arts, Communication, Science and Technology, Health, Environment, Climate Change, etc.

The Université Joseph KI-ZERBO is ranked in recent years among the best Universities in Francophone Africa. It ranks a good position at the international level in terms of scientific production, presence and participation in scientific forum, etc.

### BENEFICIARIES SO FAR (2019)

**22 West African students**

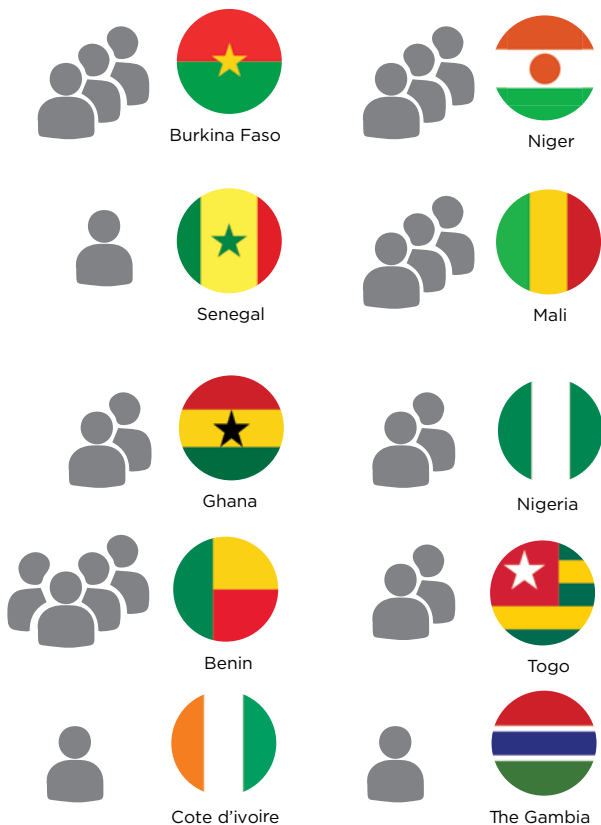
**Full scholarship scheme:** accommodation, tuition, travel, and cost of research.



**22 students in 1st and 2nd batch**

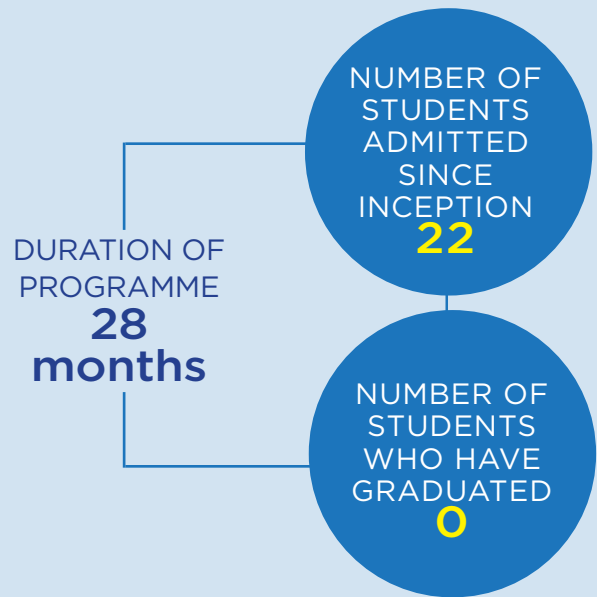
- admitted in 2019 and 2020
- completion in 2022

### COUNTRY BREAKDOWN OF BENEFICIARIES SO FAR



### MODE OF ADMISSION

Call for application (through advert) for scholarship as well as for fee-paying students and then selection through the relevant committee with the involvement of the School of Post-graduate Studies (SPGS). Recommendations are then sent to the International Advisory Board.



### IMPACT

- The programme will build a strong institutional anchorage for the school in the Université Joseph KI-ZERBO .
- It will also promote the programme on the national and international levels and involve all national and international partners who can contribute technically and/or financially to the development of our programme.
- International lecturers will be involved in the programme.
- Platform for online courses will be used as complementary tool to classroom courses
- The programme is estimated to increase the number of students (with fee paying students).

## BENEFICIARIES BY GENDER

17



5



## INVESTMENT BY BMBF SO FAR

**€956,282**

Investment  
breakdown  
per each batch:

First and second  
batch:  
(since 2019):  
€ 956,282



# Master Research Programme in Climate Change and Marine Sciences

## Atlantic Technical University, Cabo Verde



Director in Charge of Programme: Dr. Corrine Almeida (PhD)

WASCAL Capacity Building Programme facilitates academic education amongst 12 West African universities in collaboration with German institutions through the Graduate Studies Programme (GSP). Each programme selects students from each of the WASCAL member countries through open calls for applications (scholarship and fee-paying students). WASCAL has since 2012, maintained its strong commitment, under the sponsorship of the German Federal Ministry of Education and Research (BMBF) to provide climate change solution through capacity building by helping educate the next generation of scientists attain an in-depth knowledge of different climate related issues in order to help the region develop suitable management strategies.

English language is used as the main language of instruction. Both Masters

and Doctoral students are expected to participate in four months language training in English (University of Cape Coast, Accra-Ghana) and French (University of Lomé - Togo) for Anglophone and Francophone students respectively.

### **PROGRAMME RELEVANCE TO CLIMATE CHANGE**

The Master's Research Programme on Climate Change & Marine Sciences at the Atlantic Technical University of Cabo Verde is implemented in close cooperation with the GEOMAR Helmholtz Centre for Ocean Research Kiel, the University of Kiel and the Thünen Institute, as German partner institutions and with the National Institute of the Sea (IMAR) as the Cabo Verdean partner institution. This consortium is well suited to provide needed scientific and

academic skills in climate, marine sciences and management both on an international and on a regional level in West Africa, in a climate change context.

Equip students with the skills to understand, develop and monitor the influence of anthropogenic (human) factors on marine environments. This includes an investigation of issues such as coastal erosion, maritime transport, pollution, and climate change.

The programme is combating climate change through its training activities and research output that are geared towards specific objectives as follows;

The programme will adequately prepare West African students for subsequent post-graduate studies or professional careers as managers or experts in industry, consultancy, governmental agencies etc.

## HOST UNIVERSITY

The Atlantic Technical University (Cabo Verde) is a novel public university and its mission is to offer undergraduate and graduate education, research, and public services. UTA inherited the 35 years of experience of its precedent institutions and together with other two independent institutions, UTA forms the “Campus do Mar” established by the Government with the aim of preparing highly qualified professionals and promote applied research, and international scientific cooperation in key areas for the development of Cabo Verde. UTA will be composed by at least 4 Institutes, being the current Institute - ISECMAR responsible to realize the university mission on the various branches of engineering, maritime and marine sciences.

**ISECMAR** - offers different kind of facilities, such as laboratories (biology, chemistry, multi-purpose laboratories, seaweed bank of Cabo Verde), rooms for Administration, teaching and guest lecturers.

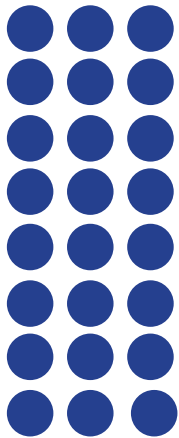
**GEOMAR** - our main scientific partner, is a world-wide leading institute of marine research. This institute investigate chemical, physical, biological and geological processes of the seafloor, oceans and ocean margins and their interactions with the atmosphere. And also bridge the gap between basic and applied science in several areas.

**OSCM** at **IMAR** is a multi-functional space, intended to significantly enhance opportunities to conduct marine research in the tropical Northeast Atlantic and the West African region. It functions as a drive-through hall in which large marine scientific equipment such as deep-sea robots and manned submersibles can be maintained. Connected to the two-story hall, the centre offers a mechanical and electronics workshops, two multi-purpose laboratories (a wet and a dry one) as well as storage rooms for equipment, samples and chemicals.

## BENEFICIARIES SO FAR

**23 West African students**

**Full scholarship scheme:** accommodation, tuition, travel, and cost of research.



**24 students in 1st and 2nd batch**

- admitted in 2019 and 2020
- completion in 2022

## COUNTRY BREAKDOWN OF BENEFICIARIES SO FAR



Senegal



Mali



Ghana



Nigeria



Benin



Togo



Cabo Verde



Burkina Faso



Cote d'Ivoire



The Gambia



Niger



Guinea

Sponsored by MAVAFoundation



DURATION OF PROGRAMME  
**24 months**

NUMBER OF STUDENTS ADMITTED SINCE INCEPTION  
**24**

1 STUDENT Sponsored by MAVAFoundation

NUMBER OF STUDENTS WHO HAVE GRADUATED  
**0**

## MODE OF ADMISSION

Call for application (through advert) for scholarship as well as for fee-paying students and then selection through the relevant committee with the involvement of the School of Postgraduate Studies (SPGS). Recommendations are then sent to the International Advisory Board.

## IMPACT

- The programme will help students gain a thorough understanding of the taxonomy, natural history, and ecology of a wide variety of marine organisms.
- It will enable them conduct hands-on research and have opportunities to focus your studies on a specific aspect of marine biology. As a graduate, they will not only walk away with a thorough comprehension of marine biota but will also know how to communicate their research and their knowledge to interested parties.
- Offer several opportunities for the graduates. They can pursue doctoral studies or undertake professional careers in meteorological agencies, research centers, universities, public administration, private sector, NGOs, International Institutions, etc.

## BENEFICIARIES BY GENDER

17



6



## INVESTMENT BY BMBF SO FAR

**€1,138,783**

Investment  
breakdown  
per each batch:

First and second  
batch:  
(2019):  
€ 1,138,783



# Doctoral Research Programme in Climate Change and Biodiversity

**Université Felix Houphouet  
Boigny, Côte d'Ivoire**



Director in Charge of Programme: Prof. Souleymane Konate

WASCAL Capacity Building Programme facilitates academic education amongst 12 West African universities in collaboration with German institutions through the Graduate Studies Programme (GSP). Each programme selects students from each of the WASCAL member countries through open calls for applications (scholarship and fee-paying students). WASCAL has since 2012, maintained its strong commitment, under the sponsorship of the German Federal Ministry of Education and Research (BMBF) to provide climate change solution through capacity building by helping educate the next generation of scientists attain an in-depth knowledge of different climate related issues in order to help the region develop suitable management strategies.

English language is used as the main language of instruction. Both Masters

and Doctoral students are expected to participate in four months language training in English (University of Cape Coast, Accra-Ghana) and French (University of Lomé - Togo) for Anglophone and Francophone students respectively.

## **PROGRAMME RELEVANCE TO CLIMATE CHANGE**

The curriculum of the Graduate Research Programme Climate Change and Biodiversity starts with six months of course work in the fields of ecology and climate change, statistics and modeling tools, biodiversity management, climate science and biodiversity, functional aspects of major organism units, and the human dimension in biodiversity. Following course work is a period of 24 months for field research, during which students will collect and

analyze data for their doctoral thesis.

The Doctoral Research Programme in Climate Change and Biodiversity is created at the Université Felix Houphouet Boigny in the framework of the West African Science Service Centre on Climate Change and Adapted Land Use (WASCAL) to train doctoral students as

experts to understand and protect species richness, genetic diversity, ecosystems and ecosystem services for the next generations.

The programme is combating climate change through its training activities and research output that are geared towards specific objectives as follows:

To understand strategies developed by living organisms and ecosystems in the face of climate change.

Make a substantial contribution towards the adaptation of humanity to these changes and towards the conservation of biodiversity under future conditions.

## HOST UNIVERSITY

The Université Felix Houphouet Boigny (formerly known as Université de Cocody-Abidjan Côte d'Ivoire), hosts the Doctoral Research Programme in Climate Change and Biodiversity. It was created in 1964. It is the oldest Ivorian University. In 2010, UCA had 1,355 Professors, Assistant-professors and Lecturers, 81 full time Researchers, 534 Administrative & Technical Personals and more than 53,700 Students in 2010. Université Felix Houphouet Boigny is structured in 13 Training and Research Units (UFR), 2 autonomous Research Centers (Mathematics and Socio-economics), 1 Specialized School and 13 Research Institutes and Centers. UCA has a long experience of training students both from Cote d'Ivoire and the region at Masters and Ph.D. level in the area of Biodiversity including Tropical Ecology (Animals & Plants), Entomology, Botany, Hydrobiology, Ornithology etc. It also has a strong collaboration with the Université d'Abobo-Adjamé (UAA), Abidjan, Côte d'Ivoire, also very active in the area of

biodiversity. The programme is hosted at the campus of Bingerville and equipped with offices, laboratories for plant diversity and animal diversity, a library and a classroom. Central to the practical training of students are field trips and excursions within Côte d'Ivoire and to the WASCAL study sites in Bénin, Burkina Faso and Ghana, to study the variety of plants and animals in different ecosystems.

# In 2010

## 1,355

Professors,  
Asst. professors  
& Lecturers

## 81

Full time  
Researchers

## 534

Administrative  
& Technical  
Personels



## 53,700+

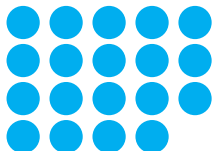
Students



## BENEFICIARIES SO FAR

**30 West African students**

**Full scholarship scheme:** accommodation, tuition, travel, and cost of research.



**19 graduated**  
2012 to 2019



**11 students in 4th batch**

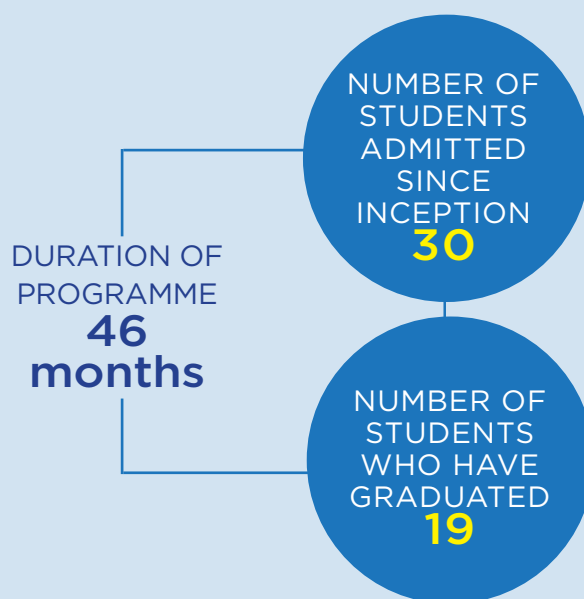
- admitted in 2019
- completion in 2022

## COUNTRY BREAKDOWN OF BENEFICIARIES SO FAR



## MODE OF ADMISSION

Call for application (through advert) for scholarship as well as for fee-paying students and then selection through the relevant committee with the involvement of the School of Postgraduate Studies (SPGS). Recommendations are then sent to the International Advisory Board.



## IMPACT

- The programme has successfully trained and empowered individuals across West Africa to understand strategies developed by living organisms and ecosystems in the face of climate change.
- Make a substantial contribution towards the adaptation of humanity to these changes and towards the conservation of biodiversity under future conditions.

## BENEFICIARIES BY GENDER

19



11



## NUMBER OF THESES WRITTEN SO FAR

19



## INVESTMENT BY BMBF SO FAR

€3,342,111

### Investment breakdown per each batch:

First and Second  
batches:  
(November 2011 to  
February 2016):  
€ 1,786,821

Third batch  
(March 2016 to  
September 2019):  
€ 735,880

Fourth batch:  
(September 2019  
to date )  
€ 819,410



# Doctoral Research Programme in Climate Change and Education

University of the Gambia,  
The Gambia



Director in Charge of Programme: Prof. Sidat Yaffa

WASCAL Capacity Building Programme facilitates academic education amongst 12 West African universities in collaboration with German institutions through the Graduate Studies Programme (GSP). Each programme selects students from each of the WASCAL member countries through open calls for applications (scholarship and fee-paying students). WASCAL has since 2012, maintained its strong commitment, under the sponsorship of the German Federal Ministry of Education and Research (BMBF) to provide climate change solution through capacity building by helping educate the next generation of scientists attain an in-depth knowledge of different climate related issues in order to help the region develop suitable management strategies.

English language is used as the main language of instruction. Both Masters

and Doctoral students are expected to participate in four months language training in English (University of Cape Coast, Accra-Ghana) and French (University of Lomé - Togo) for Anglophone and Francophone students respectively.

## PROGRAMME RELEVANCE TO CLIMATE CHANGE

Climate change is scientifically complex, and is accompanied by economic, social and political ramifications. Article 6 of the 1992 United Nations Framework Convention on Climate Change (UNFCCC) urges the development and implementation of educational and public awareness programmes on climate change and its effects; it further urges parties to the convention to develop and implement education and training programs. Also, UNFCCC advocates for capacity building

on climate change to be a priority in all regions of the world, especially in West Africa, through the facilitation of more national and regional activities to combat climate change adversities.

The Doctoral Research Programme in Climate Change and Education is created at the The University of the Gambia in the framework of the West African Science Service Centre on Climate Change and Adapted Land Use (WASCAL) to build

the climate change expertise of students from eleven West African countries in an inspiring, interdisciplinary and intercultural learning environment. Each year, ten to twenty students are admitted to the programme.

The programme is combating climate change through its training activities and research output that are geared towards specific objectives as follows:

A special focus is laid on the capacity development of skills in communication, education and public relations. These skills are highly relevant for policy-advice, public awareness building on climate change, for the development of climate services, as well as for the implementation of adaptation programmes.

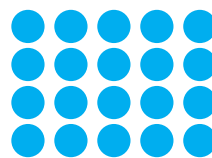
## HOST UNIVERSITY

The University of the Gambia hosts the Doctoral Research Programme in Climate Change and Education. It was established by an Act of the National Assembly of the Gambia in March 1999. The enactment, which was a bold step to fulfilling a long-standing desire of the people of the Gambia and to respond to severe years of advocacy both within and outside the Country for a university, ended years of indecision on the university question. The WASCAL Doctoral Programme resides on a beautiful and inviting campus in the market town Farafenni, in the North Bank Region of The Gambia. The campus aims to serve as a role model for sustainability and climate-friendliness, as well as a workplace for other WASCAL staff and students and knowledge pool for climate change related activities in The Gambia.

## BENEFICIARIES SO FAR

**31 West African students**

**Full scholarship scheme:** accommodation, tuition, travel, and cost of research.



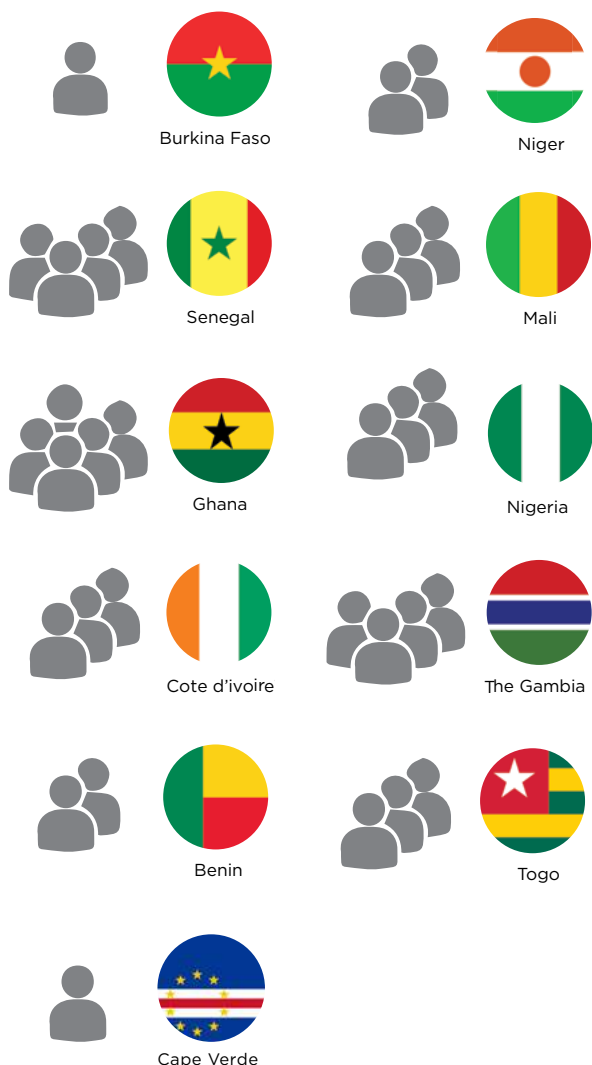
**20 graduated**  
2012 to 2019



**11 students in 4th batch**

- admitted in 2019
- completion in 2022

## COUNTRY BREAKDOWN OF BENEFICIARIES SO FAR



## MODE OF ADMISSION

Call for application (through advert) for scholarship as well as for fee-paying students and then selection through the relevant committee with the involvement of the School of Postgraduate Studies (SPGS). Recommendations are then sent to the International Advisory Board.

## IMPACT

- The programme has successfully trained and empowered individuals across West Africa to prepared to work as educational experts and communication officers for national and international agencies, the media, as well as for civil society and donor organizations.
- Some continue their academic career in Education or Communication Sciences.

DURATION OF PROGRAMME

**46 months**

NUMBER OF STUDENTS ADMITTED SINCE INCEPTION

**31**

NUMBER OF STUDENTS WHO HAVE GRADUATED

**20**

**BENEFICIARIES  
BY GENDER**

20



11



**NUMBER OF THESES  
WRITTEN SO FAR**

20



**INVESTMENT BY BMBF SO FAR**

**€2,198,717**

**Investment  
breakdown  
per each batch:**

First and Second  
batches:  
(November 2011 to  
February 2016):  
€ 1,000,000

Third batch  
(March 2016 to  
September 2019):  
€ 403,130

Fourth batch:  
(September 2019  
to date )  
€ 795,587



# Doctoral Research Programme in Climate Change and Land Use

**Kwame Nkrumah University of Science and Technology (KNUST), Ghana**



Director in Charge of Programme: Prof. Wilson A. Agyare

WASCAL Capacity Building Programme facilitates academic education amongst 12 West African universities in collaboration with German institutions through the Graduate Studies Programme (GSP). Each programme selects students from each of the WASCAL member countries through open calls for applications (scholarship and fee-paying students). WASCAL has since 2012, maintained its strong commitment, under the sponsorship of the German Federal Ministry of Education and Research (BMBF) to provide climate change solution through capacity building by helping educate the next generation of scientists attain an in-depth knowledge of different climate related issues in order to help the region develop suitable management strategies.

English language is used as the main language of instruction. Both Masters and Doctoral students are expected to participate in four months language training in English (University of Cape Coast, Accra-Ghana) and French (University of Lomé - Togo) for Anglophone and Francophone students respectively.

## **PROGRAMME RELEVANCE TO CLIMATE CHANGE**

In order to deal with the current and emerging issues of climate change through the use of interdisciplinary approaches, the Doctoral Programme in Climate Change and Land Use (DRP-CCLU) is created at the Kwame Nkrumah University of Science

and Technology, Kumasi Ghana, in the framework of the West African Science Service Centre on Climate Change and Adapted Land Use (WASCAL) to focus on capacity building at the PhD level to help develop the knowledge necessary for sustainable land use and management

in the face of climate change.

The programme is combating climate change through its training activities and research output that are geared towards specific modules as follows:

Train a critical mass of human resources to strengthen the research, educational and policy capacity and competency of West-African countries to deal with current and emerging issues of climate change through the use of interdisciplinary approaches.

## HOST UNIVERSITY

The Kwame Nkrumah University of Science and Technology (KNUST), runs this Doctoral Research Programme, which until 2019, was ran at the Master’s level. It was established since 1961. Its students’ population is over 55,000 with over 5,000 graduate students. The university is organized into a collegiate system with six (6) Colleges: Science, Engineering, Health Sciences, Agriculture and Natural Sciences, Architecture and Built Environment, Art and Social Sciences. The Doctoral Research Programme in Climate Change and Land is hosted at the Department of Civil Engineering as the academic department under the responsibility of the School of Graduate and Research Studies in collaboration with the Quality Assurance Department of KNUST .



over **5,000**  
graduate  
students

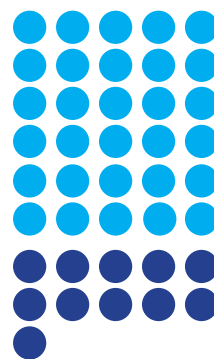


over **55,000**  
students

## BENEFICIARIES SO FAR (2012-2020)

**41 West African students**

**Full scholarship scheme:** accommodation, tuition, travel, and cost of research.



**30 graduated**  
• from 2012 to 2019

**11 students in 4th batch**

- 2 fee paying students
- admitted in 2019
- completion in 2022

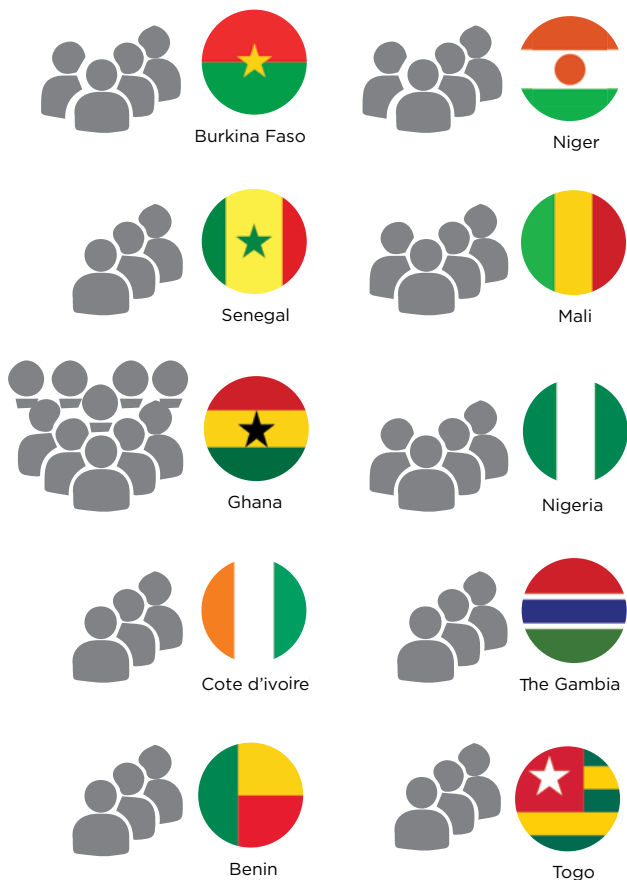
DURATION OF PROGRAMME  
**46**  
months

NUMBER OF STUDENTS ADMITTED SINCE INCEPTION  
**41**

NUMBER OF STUDENTS WHO HAVE GRADUATED  
**30**



## COUNTRY BREAKDOWN OF BENEFICIARIES SO FAR



## MODE OF ADMISSION

Call for application (through advert) for scholarship as well as for fee-paying students and then selection through the relevant committee with the involvement of the School of Postgraduate Studies (SPGS). Recommendations are then sent to the International Advisory Board.

## IMPACT

WASCAL KNUST continues to deliver on its mandate of training high quality graduates in the area of Climate Change and Land-use. The strength of the WASCAL programme is reflected in the employability of graduates. WASCAL KNUST graduates currently occupy high positions in both the private and public sectors and are making impact in society. Notable Alumni include Biola Kazeem Badmos (PhD), a graduate from Nigeria who is employed by the Islamic Development Bank, Saudi Arabia. He currently has six (6) papers published from his dissertation plus a book chapter. Mathieu Maurice Ahouansou (PhD), a graduate from Benin is currently an Assistant Professor at the School of Natural Resources Management, Faculty of Agronomic Sciences and University of Abomey-Calavi, Benin. He played a key role as a hydrologist and climate change expert, to analyse the hydrological long-term trends in past and present time and to investigate extreme drought and floods events and to develop an Early Warning System for Benin, a project funded by the United Nations Development Programme and the World Bank. Demba N. A. Trawally (PhD), a graduate from The Gambia is currently the Director of Research at the National Agricultural Research Institute, The Gambia. Mariama Nouhou Koutcha (PhD), a graduate from Niger, is currently a lecturer at the faculty of Agronomy at Niger Islamic University.

**BENEFICIARIES  
BY GENDER**

34



7



**NUMBER OF THESE  
WRITTEN SO FAR**

30



**INVESTMENT BY BMBF SO FAR  
€3,095,610**

**Investment  
breakdown  
per each batch:**

First and Second  
batches:  
(November 2011 to  
February 2015):  
€ 1,605,804

Third batch  
(March 2016 to  
September 2018):  
€ 735,880

Fourth batch:  
(September 2019  
to 2022 )  
€ 753,921



# Doctoral Research Programme in Climate Change and Agriculture

Institut Polytechnique Rural de Formation et  
de Recherche Appliquée (IPR-IFRA), Mali



Director in Charge of Programme: Dr. Yacouba Diallo

WASCAL Capacity Building Programme facilitates academic education amongst 12 West African universities in collaboration with German institutions through the Graduate Studies Programme (GSP). Each programme selects students from each of the WASCAL member countries through open calls for applications (scholarship and fee-paying students). WASCAL has since 2012, maintained its strong commitment, under the sponsorship of the German Federal Ministry of Education and Research (BMBF) to provide climate change solution through capacity building by helping educate the next generation of scientists attain an in-depth knowledge of different climate related issues in order to help the region develop suitable management strategies.

English language is used as the main language of instruction. Both Masters

and Doctoral students are expected to participate in four months language training in English (University of Cape Coast, Accra-Ghana) and French (University of Lomé - Togo) for Anglophone and Francophone students respectively.

## **PROGRAMME RELEVANCE TO CLIMATE CHANGE**

The Third World countries, particularly Africa are threatened by the predicted effects of climate change because of their economic dependence on climate for development whose backbone is Agriculture. There is strong evidence from the World Meteorological Organization (WMO), Intergovernmental Panel on Climate Change (IPCC) and United Nations Environmental Programme (UNEP) that, the observed increases in greenhouse gases particularly Carbon dioxide (CO<sub>2</sub>) may lead to global warming, sea level rise and space-time

changes in climatic zones and seasons on the globe.

Crops, livestock and fisheries are highly dependent on specific climate conditions. Trying to understand the overall effect of climate change on our food supply can be difficult. Increases in temperature and carbon dioxide (CO<sub>2</sub>) can be beneficial for some crops in some places. But to realize these benefits, nutrient levels, soil moisture, water availability, and other conditions must also be met. Changes in the frequency and severity of droughts and floods could pose challenges for farmers and ranchers. The economy of most of the sub-Saharan African countries is based on agriculture sector. This sector is the most affected by the seasonal and inter-annual variability of the climate. The warming, the change in rainfall quantity, the increase of CO<sub>2</sub> concentration in the atmosphere are some effects of the Climate Change that are likely to modify positively or negatively livestock, crop and forest productivities. Therefore, training of

highly qualified human resources (having relevant infrastructures and equipment) constitutes one of the major adaptation strategies to climate change.

The Doctoral Research Programme on Climate Change and Agriculture at the “Institut Polytechnique Rural de Formation et de Recherche Appliquée (IPR-IFRA)”, in the framework of the West African Science Service Centre on Climate Change and Adapted Land Use (WASCAL) is designed to train experts for West African countries in anticipating the effects of climate change, define and to implement strategies towards adaptation and mitigation to the negative effects of climate change in agriculture, strengthen the synergistic relationship between the West African Universities and the partnership with German Universities.

The programme is combating climate change through its training activities and research output that are geared towards specific objectives as follows:

Guided training: Theoretical inputs in seminar (Interest/importance, principles); observations and field works.

Individual self-training: The students learn main theoretical notions and practice from available pedagogic materials;

Supervision: There is a supervision team for each student to help correct their research works. The supervisor keeps in touch through internet contact at the beginning of the training and will follow up according to the needs of the student.

## HOST UNIVERSITY

The Institut Polytechnique Rural de Formation et de Recherche Appliquée (IPR-IFRA) of Katibougou runs this doctoral programme since 2012. It is the

host University of the PhD programme (infrastructures and equipments for lecturer, student, management board, teaching and supervision tasks). The programme is implemented in partnership with USTTB and UCC according to the Doctoral School regulations and WASCAL

rules and regulations. It is an institution that trains professionals in the area of agriculture since 1897. The institute has trained thousands of technicians and engineers in all areas of agricultural science including agriculture, forestry, animal sciences, and rural economics. It is the main institution of tertiary education in the area of agriculture in Mali. The institute has an annex in Bamako where training and research activities are coordinated within 4 teaching and research departments:

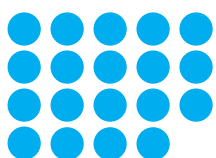
- Agricultural science techniques ;
- Livestock Science and techniques ;
- Rural engineering and water forestry;
- Social and economic science.

IPR/IFRA also conducts research in the areas of agro-physio-genetics and plant biotechnology, soil science, ethno-botany plant protection, animal production systems, forestry, agroforestry and environmental protection, economics and social sciences, innovation systems, and renewable energies (biogas, biofuel). IPR/IFRA will collaborate with the University of Sciences, Techniques and technologies of Bamako to implement the Doctoral Programme.

### BENEFICIARIES SO FAR

**30 West African students**

**Full scholarship scheme:** accommodation, tuition, travel, and cost of research.



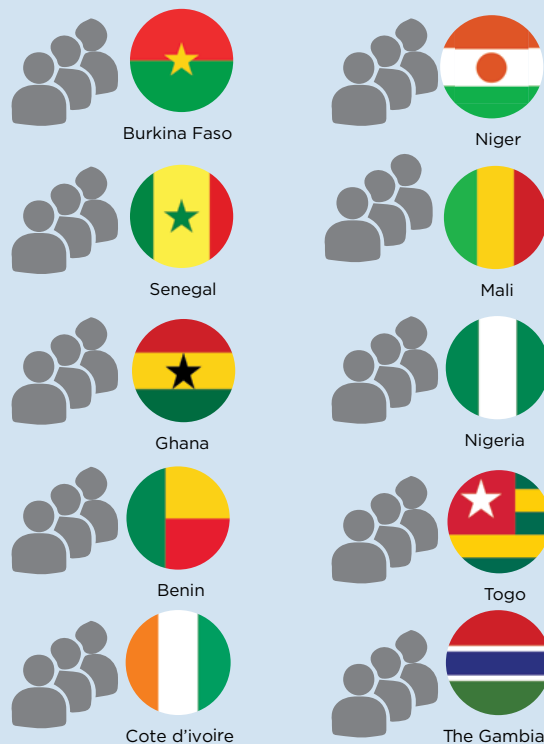
**19 graduated**  
2012-2019



**11 students in 4th batch**

- admitted in 2019
- completion in 2022

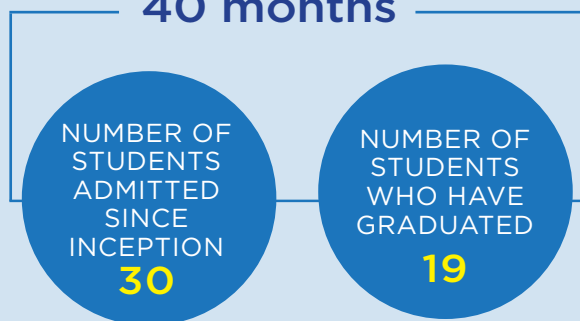
### COUNTRY BREAKDOWN OF BENEFICIARIES SO FAR



### MODE OF ADMISSION

Call for application (through advert) for scholarship as well as for fee-paying students and then selection through the relevant committee with the involvement of the School of Prost-graduate Studies (SPGS). Recommendations are then sent to the International Advisory Board.

DURATION OF PROGRAMME  
**40 months**

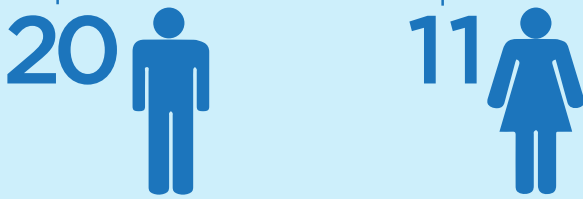


### IMPACT

To come up with climate change associated impacts on agriculture in Africa, a pedagogic approach of the graduate PhD programme was based on some strategic training methods:

- **Guided training:** theoretical inputs in seminar (Interest/importance, principles); observations and field works.
- **Individual self-training:** the student learns the main theoretical notions and practice from available pedagogic materials;
- **Supervision:** there is a supervision team for each student to help him and correct his work. The supervisor keeps in touch through internet contact at the beginning of the training and will follow up according to the needs of the student.

### BENEFICIARIES BY GENDER



## INVESTMENT BY BMBF SO FAR

# €3,363,226

### Investment breakdown per each batch:



NUMBER OF THESES  
WRITTEN SO FAR

19 



# Doctoral Research Programme in Climate Change and Energy

## University Abdou Moumouni (UAM), Niger



Director in Charge of Programme: Prof. Rabani ADAMOU

WASCAL Capacity Building Programme facilitates academic education amongst 12 West African universities in collaboration with German institutions through the Graduate Studies Programme (GSP). Each programme selects students from each of the WASCAL member countries through open calls for applications (scholarship and fee-paying students). WASCAL has since 2012, maintained its strong commitment, under the sponsorship of the German Federal Ministry of Education and Research (BMBF) to provide climate change solution through capacity building by helping educate the next generation of scientists attain an in-depth knowledge of different climate related issues in order to help the region develop suitable management strategies.

English language is used as the main language of instruction. Both Masters

and Doctoral students are expected to participate in four months language training in English (University of Cape Coast, Accra-Ghana) and French (University of Lomé - Togo) for Anglophone and Francophone students respectively.

### **PROGRAMME RELEVANCE TO CLIMATE CHANGE**

Even though Africa is the most vulnerable continent to the impacts of climate change, constraints exist in availability of skilled manpower, training and research facilities, institutional capacity to coordinate activities related to climate change and lack of appropriate policies. Given the fact that climate change management (adaptation and mitigation) strategies require an integrated, interdisciplinary and multi-sectorial approach, the Doctoral Programme in Climate Change and Energy

is created at Abdou Moumouni University of Niamey (Niger) in the framework of the West African Science Service Centre on Climate Change and Adapted Land Use (WASCAL) to prepare the next generation to address the energy challenges of adaptation and resilience to climate change in West Africa. The program interdisciplinary approach will allow a better understanding of present-day

energy infrastructures in the sub-region, their strength and weaknesses, energy policies, practices in a changing climate context and the search for sustainable solutions.

The programme is combating climate change through its training activities and research output that are geared towards specific modules as follows:



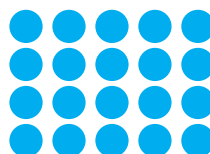
## HOST UNIVERSITY

The University Abdou Moumouni (UAM), runs this Doctoral Research Programme, which until 2019, was ran at the Master’s level. It is a non-profit public higher education institution located in Niamey that offers courses and programmes leading to officially recognized higher education degrees such as bachelor, master, and doctorate degrees in several areas of study. The University is named after former Professor Abdou Moumouni, first physicist of the region, pioneer in renewable energy (solar) since the 70’s. He was one of the first president of the university created in 1971. UAM employs more than 400 lecturers and professors, 419 Administrative and Technical Personnel and involves more than 27000 students. This makes it the largest and most acknowledged University in the country.

## BENEFICIARIES SO FAR

**31 West African students**

**Full scholarship scheme:** accommodation, tuition, travel, and cost of research.



**20 graduated**

• 2012 to 2019

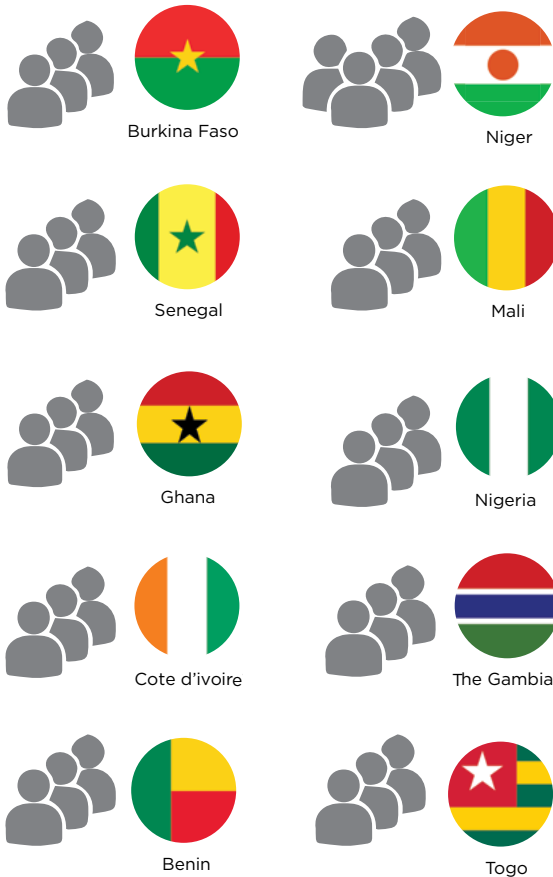


**11 students in 4th batch**

• admitted in 2019  
• completion in 2022



## COUNTRY BREAKDOWN OF BENEFICIARIES SO FAR



## MODE OF ADMISSION

Call for application (through advert) for scholarship as well as for fee-paying students and then selection through the relevant committee with the involvement of the School of Postgraduate Studies (SPGS). Recommendations are then sent to the International Advisory Board.

## IMPACT

- The programme has successfully trained and empowered individuals across West Africa to analyze the threats and risks to society or communities to the impact of climate change.
- Synthesize knowledge regarding integrated management strategies to climate change effects, specifically to improve human security.
- Prepared background document and policy notes that offer options to deal with climate change.
- Assisted communities in dealing with climate change by adaptation and mitigation.

DURATION OF PROGRAMME

**46 months**

NUMBER OF STUDENTS ADMITTED SINCE INCEPTION

**31**

NUMBER OF STUDENTS WHO HAVE GRADUATED

**20**

**BENEFICIARIES  
BY GENDER**

19



12



**NUMBER OF THESES  
WRITTEN SO FAR**

20



**INVESTMENT BY BMBF SO FAR**

**€2,138,414**

**Investment  
breakdown  
per each batch:**

First and Second  
batches:  
(November 2011 to  
February 2015):  
€ 1,000,000

Third batch  
(March 2016 to  
September 2018):  
€ 398,330

Fourth batch:  
(September 2019  
to 2022 )  
€ 740, 084



# Doctoral Research Programme in West African Climate Systems at Akure

**The Federal University of Tech.,  
Akure (FUTA), Nigeria.**



Director in Charge of Programme: Prof. Z. Debo Adeyewa

WASCAL Capacity Building Programme facilitates academic education amongst 12 West African universities in collaboration with German institutions through the Graduate Studies Programme (GSP). Each programme selects students from each of the WASCAL member countries through open calls for applications (scholarship and fee-paying students). WASCAL has since 2012, maintained its strong commitment, under the sponsorship of the German Federal Ministry of Education and Research (BMBF) to provide climate change solution through capacity building by helping educate the next generation of scientists attain an in-depth knowledge of different climate related issues in order to help the region develop suitable management strategies.

English language is used as the main language of instruction. Both Masters

and Doctoral students are expected to participate in four months language training in English (University of Cape Coast, Accra-Ghana) and French (University of Lomé - Togo) for Anglophone and Francophone students respectively.

## **PROGRAMME RELEVANCE TO CLIMATE CHANGE**

Changing climatic conditions as well as human activities such as agricultural intensification leads to changing land cover patterns such as deforestation and desertification. To better understand the impact of climate change on land cover and the social-ecological system, Doctor of Philosophy students pursuing this programme are trained in the use of state-of-the-art modeling tools for the analysis of environmental and socio-economic scenarios.

They produce quantitative results for scenarios development and the assessment of the impacts of climate change on land cover and the environment with the aim of proffering the most suitable adaptation measures to minimize

these impacts in the West African sub-region.

The programme is combating climate change through its training activities and research output that are geared towards:

<p>Manpower development and enhancement of skills for stakeholders to combat and manage the climate system</p>	<p>Predicting extreme weather and climate conditions; the impacts of climate change and variability on coastal urbanization, agroforestry, energy demand, hydrology and water resources and rainfall onset and cessation over West Africa.</p>	
<p>Development of climate services, as well as adaptation programs.</p>	<p>Provision of public awareness as well as policy advisory to governments and non-governmental agencies on climate change.</p>	<p>Improving the forecast and management of weather and climate system over west Africa</p>

## HOST UNIVERSITY

The WASCAL Doctoral Research Programme in West Africa Climate System is hosted by The Federal University of Technology, Akure (FUTA), Nigeria. The top ranking University of technology in Nigeria was established in 1981 in the southwestern region of Nigeria. The University has grown tremendously over the years, stretching its academic disciplines and research across eight different schools and over fifty academic departments. One of the key departments in the University is the Department of Meteorology and Climate Science. It is an accredited institution of the World Meteorological Organization (WMO) and has trained numerous personnel for WMO across Africa over the years.



over 800  
academic  
staff



about  
25,000  
students

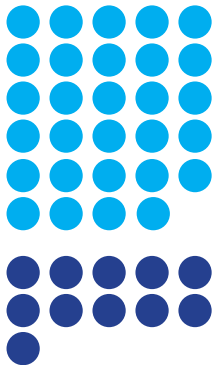
## Vision

To be a world class University of Technology and a centre of excellence in training, research and service delivery; to promote technological advancement by providing conducive environment for research, teaching and learning engenders development of products that are technologically oriented, self-reliant and relevant to society.

## BENEFICIARIES SO FAR (2012-2020)

**40 West African students**

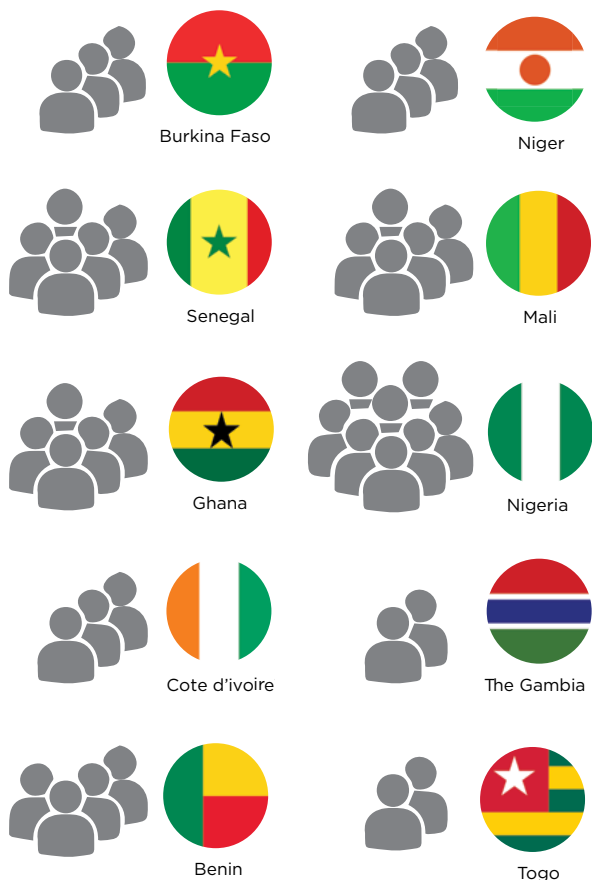
**Full scholarship scheme:** accommodation, tuition, travel, and cost of research.



**29 graduated**  
2012 to 2019

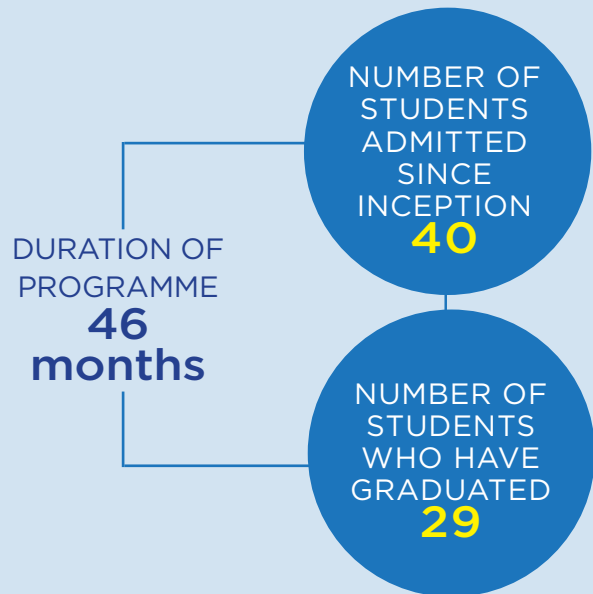
**11 students in 4th batch**  
admitted in 2019  
• completion in 2022

## COUNTRY BREAKDOWN OF BENEFICIARIES SO FAR



## MODE OF ADMISSION

Call for application (through advert) for scholarship as well as for fee-paying students and then selection through the relevant committee with the involvement of the School of Postgraduate Studies (SPGS). Recommendations are then sent to the International Advisory Board.



## IMPACT

- The Programme has successfully trained and empowered individuals across West Africa who are now consultants to organizations like the World Meteorological Organization, World Bank, and the Intergovernmental Panel on Climate Change
- Graduates have been quite productive, attracted grants to their individual organizations.
- Graduates have made significant contributions to the scientific and economic advancements of their institutions and countries.
- Beneficiaries of the scholarship schemes have become leaders in their respective domains, making their contributions, changing the world positively and bringing goodwill to WASCAL and visibility to BMBF.
- Providing improved prediction, adaptation and management of the climate system over West Africa.

## BENEFICIARIES BY GENDER

31



9



NUMBER OF THESE  
WRITTEN SO FAR

29



## INVESTMENT BY BMBF SO FAR

€3,242,379

Investment  
breakdown  
per each batch:

First and Second  
batches:  
(November 2011 to  
February 2016):  
€ 1,776,237

Third batch  
(March 2016 to  
September 2019):  
€735,880

Fourth batch:  
(September 2019  
to date )  
€730,262



# Doctoral Research Programme in Climate Change and Human Habitat

The Federal University of Tech.,  
Minna (FUT Minna), Nigeria



Director in Charge of Programme: Professor Appollonia A. Okhimamhe

WASCAL Capacity Building Programme facilitates academic education amongst 12 West African universities in collaboration with German institutions through the Graduate Studies Programme (GSP). Each programme selects students from each of the WASCAL member countries through open calls for applications (scholarship and fee-paying students). WASCAL has since 2012, maintained its strong commitment, under the sponsorship of the German Federal Ministry of Education and Research (BMBF) to provide climate change solution through capacity building by helping educate the next generation of scientists attain an in-depth knowledge of different climate related issues in order to help the region develop suitable management strategies.

English language is used as the main language of instruction. Both Masters

and Doctoral students are expected to participate in four months language training in English (University of Cape Coast, Accra-Ghana) and French (University of Lomé - Togo) for Anglophone and Francophone students respectively.

## **PROGRAMME RELEVANCE TO CLIMATE CHANGE**

Transforming settlements into sustainable and climate change resilient human habitats is on the front burner in this century. The World Bank's 2009 Urban Strategy highlighted Developing Countries as the locus of this transformation that could be regarded as a challenge and a huge opportunity. While cities are responsible for growing global energy consumption expected to rise above two-thirds, hence increasing GHG emission levels (IEA 2008; in rural areas, humans' livelihood and food security are impacted

by the consequence of increasing GHG that manifests as increase in temperature. In 2016, the United Nations Conference on Housing and Sustainable Urban Development (Habitat III) highlighted the critical challenges of planning and management of settlements (cities, towns and villages) as drivers of sustainable development, a guide to the implementation of Sustainable Development Goals (SDG) and the Paris Agreement on Climate Change. West Africa has highly populated capital cities along its vast coastland, a number of which are at risk as sea level rises and coastal erosion and flooding increase. Similarly, major highly populated cities are located in the hinterland and are at risk as less frequent rainfall events could lead to dry conditions, which make human comfort more expensive to maintain. The bleak picture does not end there. Due to the high population, the spread of pandemics and epidemics such as COVID 19 are a huge public health challenge. Cities in more habitable locations are a “magnet”

attracting a steady flow of humans in search of conducive environments to thrive in. How do we transform our overcrowded cities into sustainable cities that mainstream climate change adaptation and mitigation strategies into their operations? How do we improve on rural environments such that there is minimal push towards the overcrowded cities?

The WASCAL Doctoral Research Programme in Climate Change and Human Habitat, led by the Federal University of Technology, Minna (FUT Minna) in the framework of the West African Science Service Centre on Climate Change and Adapted Land Use (WASCAL), seeks to answer these questions and more, as it combines these two trending key foci of the research community.

The programme is combating climate change through its training activities and research output that are geared towards specific objectives as follows: to

Transport Planning and Sustainable Mobility and Rural and Urban migration issues.

Provide a platform for young West African researchers to participate in global cutting edge research through assessments and modeling of impacts of climate change in human habitat, and vice versa, with key foci being Settlement Dynamics and Modeling, Housing and Green Space Management (urban agriculture and forestry, recreational parks and gardens), Climate Change, Energy Systems and Settlements (urban and rural adaptation and mitigation strategies).

## HOST UNIVERSITY

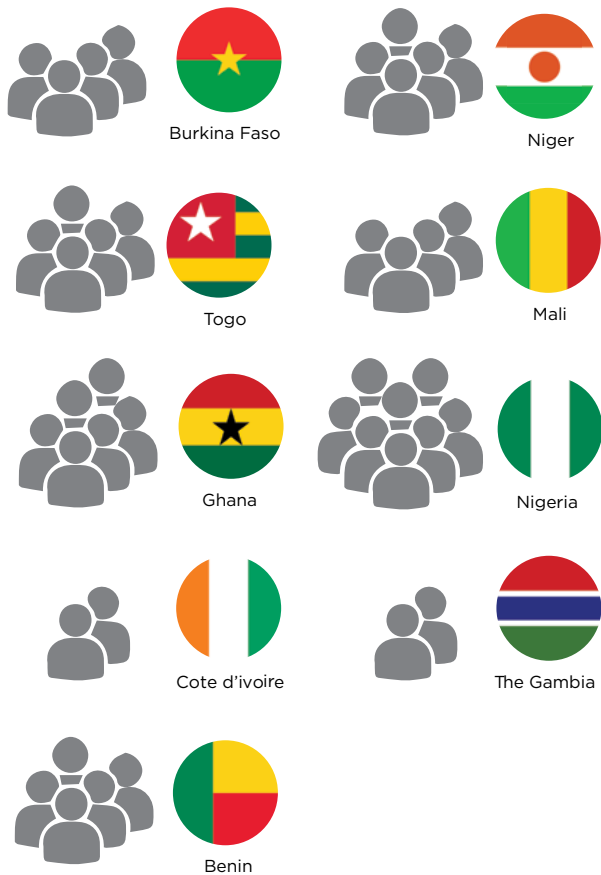
The Federal University of Technology, Minna (FUT Minna) is a Federal Government owned University in Nigeria and runs this Doctoral Research Programme since 2012. It was established in 1983 and specializes in Sciences, Engineering and especially Technology with an academic culture of excellence that 4th

best University in Nigeria based on graduate employability index. The University has secured approval to commence the Open and Distance Learning (ODL) programme to run a Bachelor of Technology (B.Tech) in Computer Science, whose online Learning Management Systems (LMS) facilitated the online lectures conducted for Batch 4 students of WASCAL CCHH during the Covid-19 restriction period.



Additionally, the University is a beneficiary of a Mini ICT Square for R&D, an ICT Hub and Digital and Malware Detection Laboratory funded by the Nigerian Communications Commission (NCC), National Information Technology Development Agency (NITDA), and National Intelligence Agency (NIA) respectively. In 2019, the University secured the World Bank funded African Centre of Excellence in Mycotoxin and Food Safety (ACEMFS) that would host PhD and Master of Technology (M.Tech) Degrees in Food Safety, Toxicology, Molecular Biology and Bioinformatics. Also, the University is one of the Consortium of 5 African Universities that secured the European Commission Intra Africa Academic Mobility Programme led by Rhodes University, South Africa The University is also collaborating with the Girne American University of Cyprus to run International Degree in selected disciplines. FUT Minna has an enviable record of graduating Postgraduate students on time and consistently, with 2020's PhD graduates being 94. WASCAL CCHH students will soon join these "crème de la crème" of their society in 2023.

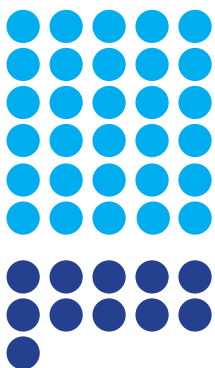
## COUNTRY BREAKDOWN OF BENEFICIARIES SO FAR



## BENEFICIARIES SO FAR (2012-2022)

**41 West African students**

**Full scholarship scheme:** accommodation, tuition, travel, and cost of research.



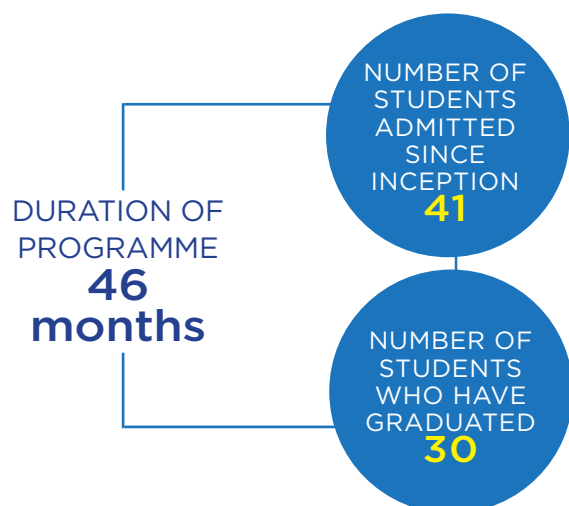
**30 graduated**  
2012 - 2019

**11 students in 4th batch**

- admitted in 2019
- completion in 2022

## MODE OF ADMISSION

Call for application (through advert) for scholarship as well as for fee-paying students and then selection through the relevant committee with the involvement of the School of Postgraduate Studies (SPGS). Recommendations are then sent to the International Advisory Board.



## IMPACT

- Settlement Dynamics and Modeling: the size, form, design, and expansion of settlements creates unique micro-climates that affect variables including temperature and wind and have implications on GHG emissions;
- Housing and Green Space Management: Urban Heat Island (UHI) and air quality effects are minimized by the presence of green space (urban parks, gardens, forestry, agriculture etc) in cities and around houses;
- Climate Change, Energy Systems and Settlements: growth, poverty reduction, air quality improvement and jobs creation can be boosted by sustainable infrastructure powered by renewable energy, thus building low-carbon, climate-resilient economies for the future;
- Transport Planning and Sustainable Mobility: innovative technologies, modal shift and other strategies aimed at decreasing the emissions from the transportation sector;
- Rural and Urban migration issues: novel, innovative and comprehensive solutions are required for the multidimensional challenges created by migration induced slow onset events such as sea-level rise, desertification, ocean acidification, and air pollution.



**30** NUMBER OF THESE WRITTEN SO FAR



**INVESTMENT BY BMBF SO FAR**

**€2,263,667**

**Investment breakdown per each batch:**

First and Second batches: (November 2011 to February 2016): € 1,058,163

Third batch (March 2016 to September 2019): € 403,130

Fourth batch: (September 2019 to date ) € 802,374



# Doctoral Research Programme in Climate Change Economics

## University Cheikh Anta Diop (UCAD), Senegal



Director in Charge of Programme: Professor Fatou Gueye

WASCAL Capacity Building Programme facilitates academic education amongst 12 West African universities in collaboration with German institutions through the Graduate Studies Programme (GSP). Each programme selects students from each of the WASCAL member countries through open calls for applications (scholarship and fee-paying students). WASCAL has since 2012, maintained its strong commitment, under the sponsorship of the German Federal Ministry of Education and Research (BMBF) to provide climate change solution through capacity building by helping educate the next generation of scientists attain an in-depth knowledge of different climate related issues in order to help the region develop suitable management strategies.

English language is used as the main language of instruction. Both Masters

and Doctoral students are expected to participate in four months language training in English (University of Cape Coast, Accra-Ghana) and French (University of Lomé - Togo) for Anglophone and Francophone students respectively.

### **PROGRAMME RELEVANCE TO CLIMATE CHANGE**

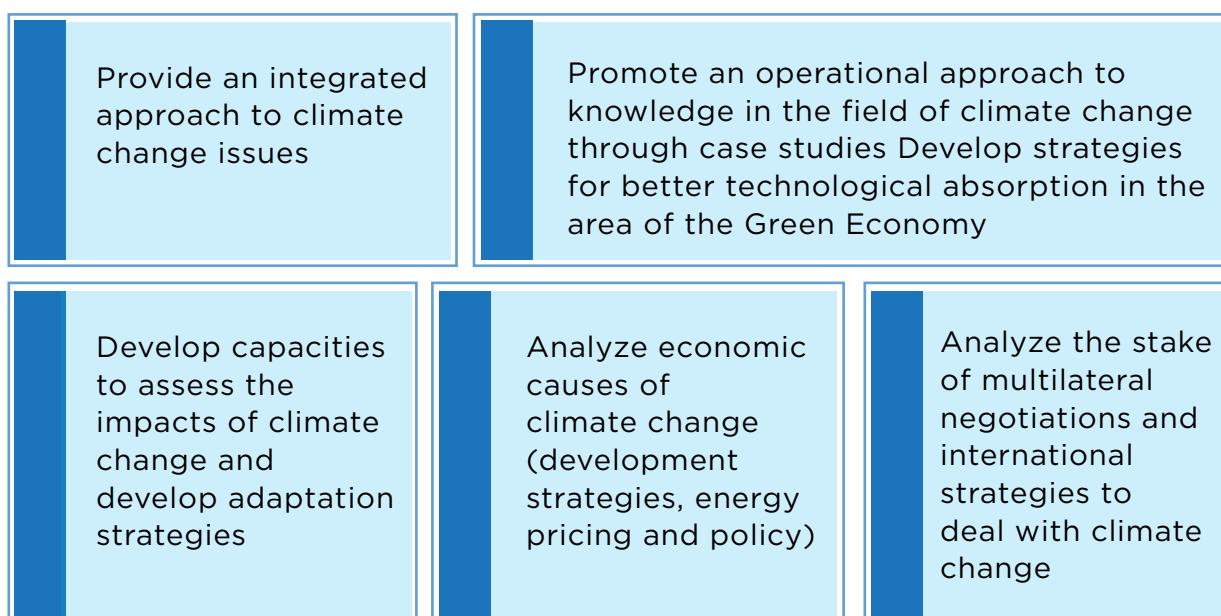
Scientific and anecdotal evidence of climate change in the recent history of West Africa has been one of increased desertification with the Sahara Desert gradually claiming the Sahel sub-region and continuing downwards towards the grass lands of West Africa. The great rivers of West Africa (the Senegal, the Niger, the Volta, and the Gambia) and Lake Chad, have lost 25% to 40% of their capacity due to evaporation and increased agriculture and domestic demands. On the opposite scale is increased flooding of West

Africa with its attendant destructive forces sweeping away valuable vegetation, habitats, ecosystems, soil, infrastructure and homes, and leaving death and destruction. The years 2008 and 2009 saw floods of epic proportions sweeping the region leaving destruction estimated in the billions of dollars. Most of the population of Africa already experiences a variety of stresses and shocks (the latter being COVID-19) on a regular basis. West Africa therefore faces an urgent need to develop effective adaptation and mitigation strategies related to climate change through the design of appropriate science-based policies.

The Doctoral Research Programme in Climate Change Economics (CCEcon),

led by the Cheikh Anta Diop University of Dakar (UCAD), in the framework of the West African Science Service Centre on Climate Change and Adapted Land Use (WASCAL), focuses on applying economic rationality to analyze adaptation and mitigation strategies related to climate change. To ensure an interdisciplinary and comprehensive approach to climate related analysis and policy. The programme also develops strong synergies with other universities involved in the WASCAL Graduate Studies Programme (GSP).

The programme is combating climate change through its training activities and research output that are geared towards specific objectives as follows: to



## HOST UNIVERSITY

The University Cheikh Anta Diop (UCAD) in Dakar, runs this doctoral programme since 2012. It is the oldest university in francophone African countries. It has students from 44 different nationalities from all parts of Africa. Alongside its six faculties, the University hosts

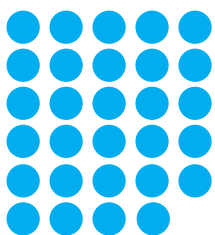
a variety of specialized schools, mainly in the area of journalism, environment, engineering, and public health. UCADs faculty of Economics and Management is considered a centre of excellence for sustainable economic development studies in Africa. UCAD is a focal point of the “Programme de troisième cycle inter-universitaire en Economie (PTCI)”, that

is a graduate programme in economics, a coordinated programme among Universities and research centers of 18 francophone African countries. It was implemented in 1994 and by now has significantly provided universities and governments with highly trained people.

### BENEFICIARIES SO FAR (2012-2020)

**40 West African students**

**Full scholarship scheme:** accommodation, tuition, travel, and cost of research.



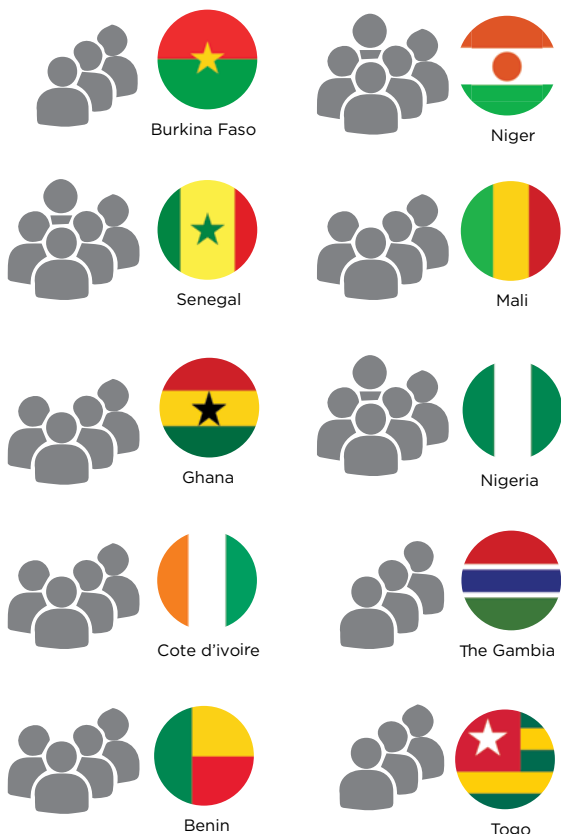
**29 graduated**  
2012 - 2019



**11 students in 4th batch**

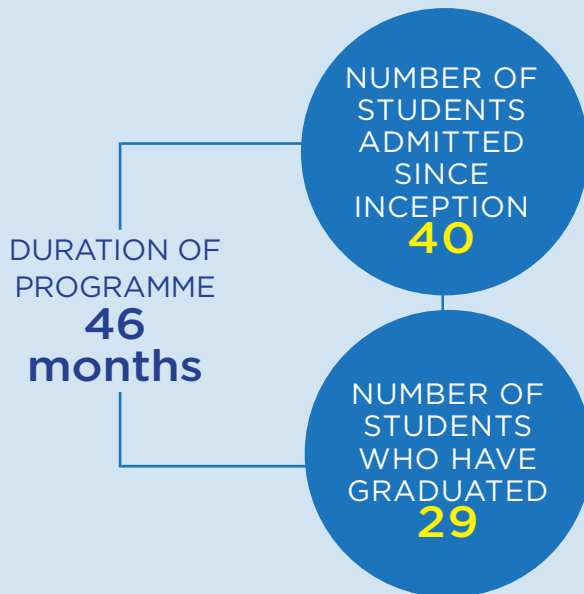
- admitted in 2019
- completion in 2022

### COUNTRY BREAKDOWN OF BENEFICIARIES SO FAR



### MODE OF ADMISSION

Call for application (through advert) for scholarship as well as for fee-paying students and then selection through the relevant committee with the involvement of the School of Postgraduate Studies (SPGS). Recommendations are then sent to the International Advisory Board.



### IMPACT

- The programme focuses on applying economic rationality to analyze adaptation and mitigation strategies related to climate change.
- To ensure an interdisciplinary and comprehensive approach to climate related analysis and policy the programme develops strong synergies with other universities involved in the WASCAL Graduate Studies Programme

**BENEFICIARIES  
BY GENDER**

29



11



**NUMBER OF THESES  
WRITTEN SO FAR**

29



**INVESTMENT BY BMBF SO FAR**

**€3,035,465**

**Investment  
breakdown  
per each batch:**

First and Second  
batches:  
(November 2011 to  
February 2016):  
€ 1,493,627

Third batch  
(March 2016 to  
September 2019):  
€ 712,880

Fourth batch:  
(September 2019  
to date )  
€ 828,958



# Doctoral Research Programme in Climate Change and Disaster Risks Management

Université de Lomé, Togo



Director in Charge of Programme: Prof. Komi Agboka

WASCAL Capacity Building Programme facilitates academic education amongst 12 West African universities in collaboration with German institutions through the Graduate Studies Programme (GSP). Each programme selects students from each of the WASCAL member countries through open calls for applications (scholarship and fee-paying students). WASCAL has since 2012, maintained its strong commitment, under the sponsorship of the German Federal Ministry of Education and Research (BMBF) to provide climate change solution through capacity building by helping educate the next generation of scientists attain an in-depth knowledge of different climate related issues in order to help the region develop suitable management strategies.

English language is used as the main language of instruction. Both Masters

and Doctoral students are expected to participate in four months language training in English (University of Cape Coast, Accra-Ghana) and French (University of Lomé - Togo) for Anglophone and Francophone students respectively.

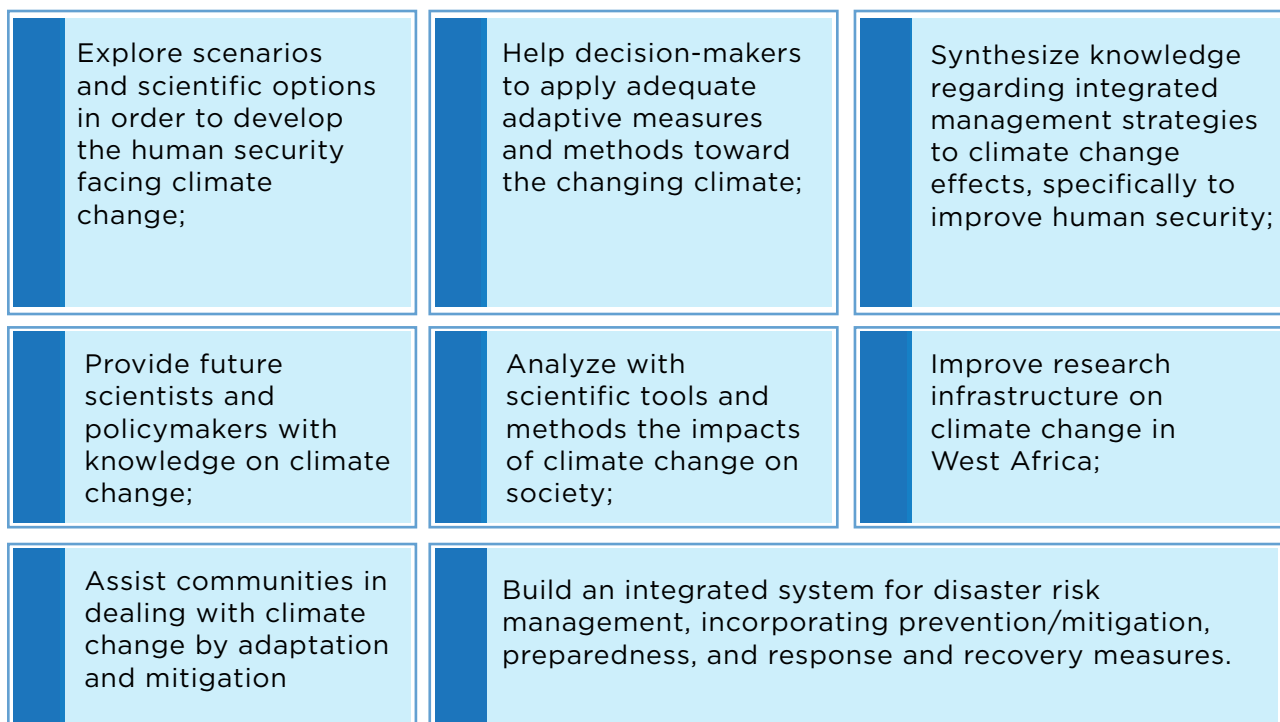
## **PROGRAMME RELEVANCE TO CLIMATE CHANGE**

Africa is highly vulnerable to natural hazards and disasters which cause loss of life, destruction of infrastructures and damage of ecosystems. The impacts of these phenomena are expected to escalate due to climate change. In addition, West Africa is one of the regions which are most in need of experts to provide solutions to disaster risk management problems and adaptation to climate change for a sustainable development of communities. Therefore, it is a major challenge for West African

countries to develop regional research and training programmes to assist in reducing the impacts of climate-induced disasters by investigating and managing risks rather than responding to disasters when they occur. In order to strengthen the efforts in reducing the impacts of natural disasters through training of trainers by experts. The Doctoral Programme in Climate Change and Disaster Risk Management is created at Université de Lomé (Togo) in the framework of the West African Science Service Centre on Climate Change and Adapted Land Use (WASCAL) to educate students to understand the threats and

risks associated with climate change, to get familiar with the design of early warning systems and to know means to improve the resilience and coping capacity of affected socio-ecological systems. Students are exposed to interdisciplinary and transdisciplinary approaches to assessing threats and to work in multidisciplinary teams with affected groups in harnessing their inherent resilience to hazards.

The programme is combating climate change through its training activities and research output that are geared towards specific objectives as follows:



## HOST UNIVERSITY

The Université de Lomé (UL) formerly known as “Village du Benin”, runs this Doctoral Research Programme, which until 2019, was ran at the Master’s level. It was created by Decree N° 70-156/PR in September 14, 1970. It is composed of six faculties, nine (9) schools and institutes, two centres of professional training and four Centres of Excellence namely Regional Centre of excellence on Poultry Science

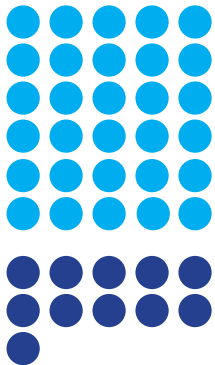
(CERSA), Regional Centre of excellence for Electricity management (CERME), Centre for sustainable towns (DOUNEDON) funded by World Bank, and WASCAL GRP on climate change and disaster risk management. Its areas of training include health sciences, science and technology, agriculture, law, policy and administration, economics and management, science of man and society, communications, literature, languages and arts and education.



## BENEFICIARIES SO FAR (2012-2020)

**41 West African students**

**Full scholarship scheme:** accommodation, tuition, travel, and cost of research.

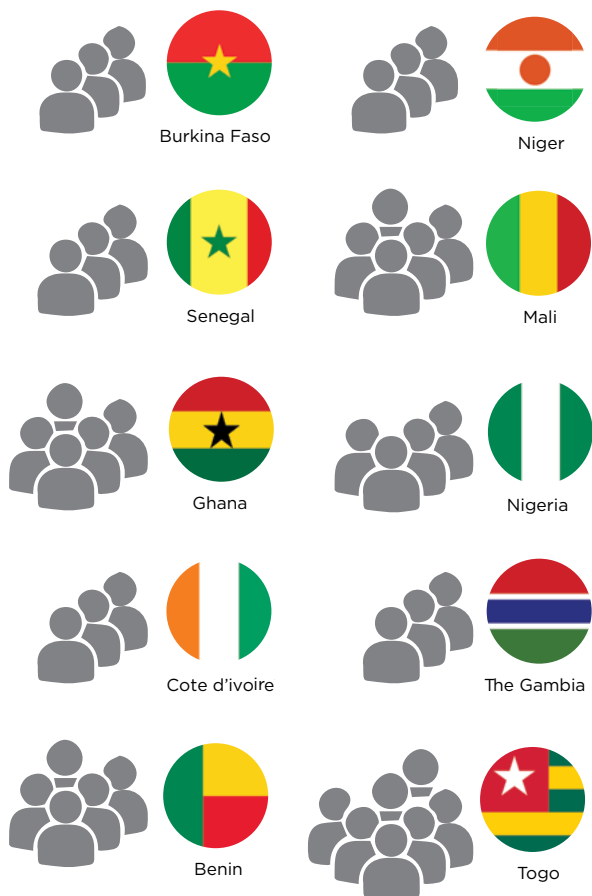


**MASTER STUDENTS**  
**30 graduated**  
2012 to 2019

**11 students in 4th batch**

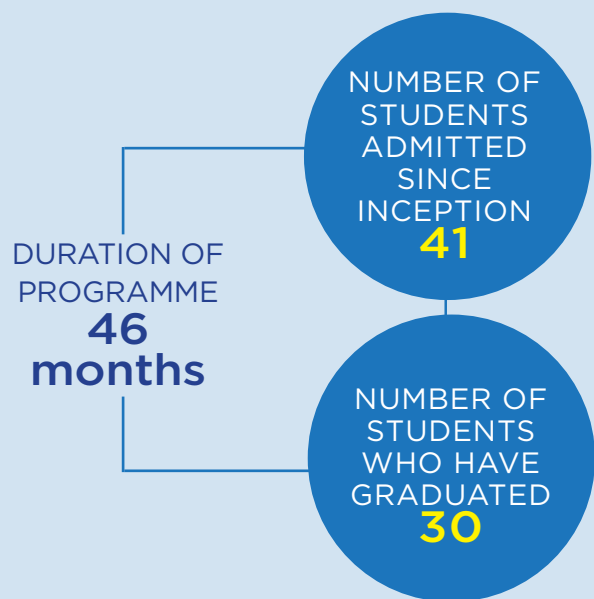
- admitted in 2019
- completion in 2022

## COUNTRY BREAKDOWN OF BENEFICIARIES SO FAR



## MODE OF ADMISSION

Call for application (through advert) for scholarship as well as for fee-paying students and then selection through the relevant committee with the involvement of the School of Postgraduate Studies (SPGS). Recommendations are then sent to the International Advisory Board.



## IMPACT

- The programme has successfully trained and empowered individuals across West Africa to analyze the threats and risks to society or communities to the impact of climate change.
- Synthesize knowledge regarding integrated management strategies to climate change effects, specifically to improve human security.
- Prepared background document and policy notes that offer options to deal with climate change.
- Assisted communities in dealing with climate change by adaptation and mitigation.

## BENEFICIARIES BY GENDER

33



8



NUMBER OF THESE  
WRITTEN SO FAR

30



## INVESTMENT BY BMBF SO FAR

€2,274,337

Investment  
breakdown  
per each batch:

First and Second  
batches:  
(November 2011 to  
February 2016):  
€1,124,708

Third batch  
(March 2016 to  
September 2019):  
€403,130

Fourth batch:  
(September 2019  
to date )  
€746,499





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