

## **EVALUATION AND ACCREDITATION DOCUMENTS**

### **Graduate Study Programme on Climate Change and Water Resources (PhD)**

University of Abomey-Calavi (UAC)

Abomey-Calavi, Benin

**June 2024**

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International evaluation and accreditation

## EVALUATION REPORT

### **Graduate Study Programme on Climate Change and Water Resources (PhD)**

University of Abomey-Calavi (UAC)

Abomey-Calavi, Benin

**February 2024**

WASCAL network (WASCAL: West African Science Service Centre on Climate Change and Adapted Land Use) has mandated the Hcéres to perform the evaluation of the Graduate Study Programme “Climate Change and Water Resources” (GSP - CC&WR) delivered by the University of Abomey-Calavi (UAC). The evaluation is based on the “Evaluation Standards of Doctorate/PhD abroad”, adopted by the Hcéres Board on January 31<sup>st</sup>, 2022. These standards are available on the Hcéres website (hceres.fr).

In the name of the expert committee<sup>1</sup> :

Benoit Gabrielle, President of the committee

In the name of Hcéres<sup>1</sup> :

Stéphane Le Boulter, Acting President

The Higher Council for Evaluation of Research and Higher Education (Hcéres) is an independent public authority. It is responsible for evaluating higher education and research institutions, research organizations, research units, and training programmes.

<sup>1</sup>In accordance with articles R. 114-15 and R. 114-10 of the Research Code, evaluation reports are signed by the chairman of the expert committee and countersigned by the President of Hcéres.

## I. STUDY PROGRAMME IDENTITY SHEET

- Name of the Institution: University of Abomey-Calavi (UAC)
- Component, faculty or department concerned: National Water Institute (INE)
- Programme's title: Climate Change and Water Resources (CC&WR)
- Level and duration of studies: Graduate studies program (PhD) with a 3-year target duration
- Location(s) where the facility is located: Abomey-Calavi, Benin
- Campus(es): University of Abomey-Calavi main campus
- Year of creation and context: 2011

The inception of this study programme is rooted in the academic expertise of the University of Abomey-Calavi (UAC) in water-related sciences, testified by the presence of the National Water Institute (INE) and the recent recognition of an international Excellence Centre for water resources affiliated with it. This track-record lead UAC to offer a specific programme on water resources when the WASCAL (West African Science Centre on Climate Change and Adapted Land Use) network was established in 2011.

This study programme is being implemented in the framework of WASCAL, a large-scale research-focused service centre including 11 West African countries (Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, Ghana, Mali, Niger, Nigeria, Senegal, Gambia and Togo). The programme is funded by WASCAL and the German Federal Ministry of Education and Research (BMBF). Each batch of the programme selects and admits one student from each country.

### PERSON IN CHARGE OF THE PROGRAMME

- Name, first name: Prof. ADOUNKPE, Julien
- Position held: Director
- Discipline: Environmental Physical Chemistry and Aquatic Toxicology

### RESULTS OF PREVIOUS EVALUATIONS AND QUALITY SYSTEM IN PLACE

This is the first time this programme has undergone international evaluation. It has never been evaluated at the national level, as the National Education Council (CNE) is not yet active in quality control of higher education training programmes.

The quality assurance system of the Graduate Study Programme (GSP) has been set up by the Internal Quality Assurance Unit (CIAQ) of UAC. The recruitment of PhD candidates and the supervision of their theses comply with the standards of the WASCAL network.

### HUMAN AND MATERIAL RESOURCES DEDICATED TO THE PROGRAMME

- An administrative and technical staff of nine persons, including a programme director, a deputy director, a scientific coordinator, and several supporting staff members, namely a secretary, an accountant, an IT officer, a driver, a janitor and a watchman
- A pedagogical team comprising 26 professors from the host university, international lecturers, and supervisors from West Africa (other Beninese universities, Burkina Faso, Côte d'Ivoire, Nigeria, Senegal, Ghana, Niger), Europe (Germany and Sweden), and North America (USA)
- An equipped classroom for distance learning (with video projectors, video conferencing, high-speed internet connection), a computer room (with appropriate IT equipment), and a study room (with individual areas)
- A bus and a passenger car to transport students or GSP staff
- Access to the three research and study laboratories of the INE on the campus of Abomey Calavi: the Applied Hydrology Laboratory (LHA), the Water and Environment Sciences and Technology Laboratory (LSTEE), and the Hydraulics and Water Management Laboratory (LHME)
- Access to the libraries of UAC, including their electronic resources

## NUMBER OF STUDENTS OVER THE EXISTENCE OF THE STUDY PROGRAMME

		Batch 1 2012-2015	Batch 2 2013-2016	Batch 3 2015-2019	Batch 4 2020-2023	Batch 5 2022-2025
Year 1 to 4	Male	7	8	7	6	8
	Female	3	2	3	5	3
	Nationals	2	2	2	2	2
	Foreigners	8	8	8	9	9
	Total	10	10	10	11	11
Graduates	Male	7	8	6	-	-
	Female	3	2	3	-	-
	Nationals	2	2	1	-	-
	Foreigners	8	8	8	-	-
	Total	10	10	9	-	-

## II. COMPOSITION OF THE EXPERTS PANEL

- Benoit GABRIELLE, Professor, AgroParisTech, Paris-Saclay University, Chair of the panel
- Christophe CUDENNEC, Professor, Institut Agro Rennes-Angers, Expert
- Mathilde COLAS, PhD Student, University of Technology of Troyes, Student Expert

Hcéres was represented by Pierre COURTELLEMONT, Science Advisor, and Michelle HOUPE, Head of project (Europe and International Department). Benoit GABRIELLE could not take part in the on-site visit.

## III. EVALUATION PROCESS

### DESCRIPTION OF THE ON-SITE VISIT

- Date: April 4<sup>th</sup> and 5<sup>th</sup> 2023
- Summary of the proceedings: before the visit took place, the self-assessment report and many appendices had been received by the experts. The on-site visit took place over two days, according to a schedule mutually agreed upon by the WASCAL GSP management team and the panel of experts. Once drafted by the thematic expert of the panel, the report was submitted to all panel members for review.
- Organisation of the visit: the visit took place over two days on the UAC site. Meetings were held in the INE building housing WASCAL-CC&WR: face-to-face with the management team, employers and other professional partners, online with PhD teaching staff and supervisors, and in hybrid mode with PhD student, alumni. A visit to the UAC campus was also organised to see the facilities available to PhD students. The visit ended with a closing session with programme management and other UAC and WASCAL representatives.
- Cooperation of the students and institution to be accredited: perfect cooperation by all stakeholders
- Any problems: no problems identified

### PEOPLE MET

Day/Hour	People met
<b>April 4<sup>th</sup></b>	
09:30 am – 12:00 pm	Meeting with WASCAL-CC&WR management team: Presentation of the training programme & discussion
2:00 – 3:30 pm	Meeting with a panel of PhD professors and supervisors
03:30 – 05:00 pm	Meeting with a panel of PhD students
<b>April 5<sup>th</sup></b>	
09:00 – 10:30 am	Meeting with a panel of employers and other professional partners
10:30 am – 12:00 pm	Meeting with a panel of former students (alumni)
02:00 – 4:00 pm	Site visit: Tour of the campus tour, showing student workplaces such as laboratories with experiments in progress
04:00 – 05:30 pm	Closing session with programme director and management, WASCAL executive director, representatives from WASCAL Board and Scientific Council

Around 35 people were met during the visit, mostly on site.

## IV. OVERALL PRESENTATION

Since its inception in 2012, the WASCAL (West African Science Service Centre on Climate Change and Adapted Land Use) network aims to provide climate change solutions through capacity building. By educating future scientists, WASCAL strives to help West African countries to develop suitable management strategies.

Funded by the German Federal Ministry of Education and Research (BMBF), WASCAL aims at strengthening the research infrastructure and capacity in West Africa related to climate change by pooling the expertise of eleven West African countries and Germany. In this framework, each country hosts at least one programme. Typically, each batch of every programme trains 11 students representing the 11 partner countries.

The University of Abomey-Calavi (UAC) is Benin's main public university, enrolling over 70,000 students and employing approximately 1,000 faculty members. The university comprises six centres, coordinating 42 entities (faculties, schools or institutes), 140 bachelor's degree programmes, 165 master's degree programmes and 58 PhD degree programmes.

The Graduate Study Programme on Climate Change and Water Resources (GSP - CC&WR), which is part of the WASCAL network funded by the BMBF, is hosted by the UAC within the National Water Institute (INE). Apart from managing this programme, INE also oversees master's programmes in quantitative hydrology, hydrogeology, ecohydrology, integrated water resources management, and other water-related programmes. This solid expertise in the field of water resources makes it an ideal location to offer the WASCAL training on climate change and water resources. The GSP – CC&WR focuses on addressing water issues in the West Africa region within the context of climate change. The programme is designed to devise approaches and find locally adapted solutions to the water challenges faced by the region, including ensuring adequate water access for populations, supporting food production, improving sanitation, and more. It caters to various stakeholders such as scientists, governments, businesses, and farmers. The objectives of the doctoral programme include:

1. building the capacity of qualified scientists in water resources,
2. strengthening digital infrastructures for water education and training,
3. bridging the gap between climate and water research results and operational applications,
4. raising awareness of the value of climate and water information.

The postgraduate school delivering the PhD degrees is the Graduate School of Life and Earth Sciences (ED-SVT for "*Ecole doctorale des Sciences de la Vie et de la Terre*" in French), while a new school specially focused on water sciences is actually under consideration. However, the inception of this new school requires at least a second doctoral programme as per legal requirements.

### PRESENTATION OF THE TRAINING SELF-ASSESSMENT APPROACH

At the request of WASCAL management, the GSP - CC&WR at the UAC is undergoing an external evaluation by Hcéres with the prospect of applying for accreditation at international level. The self-evaluation report was drafted based on several preparatory meetings among the GSP administration and staff and the designation of a steering committee headed by the programme director. The committee identified necessary data sources for the report, prepared questionnaires to address the criteria established by the Hcéres reference framework, and circulated them to relevant stakeholders. After collecting responses, the committee compiled a report and appendices containing the required information to meet Hcéres standards.



## V. EVALUATION REPORT

### FIELD 1. DOCTORAL POLICY

The WASCAL GSP on Climate Change and Water Resources (CC&WR, <https://wascal-uac.org>) is operated under the National Water Institute (INE). The INE is currently being designated as the host of the African Centre of Excellence for Water and Sanitation (C2EA, <http://www.c2ea.ine-uac.net/>), with backing from the World Bank. This modernisation of the institute aligns with its strategic orientations, while also addressing actual societal research needs.

For the time being, the GSP CC&WR of the INE is housed by the Graduate School of Life and Earth Sciences (ED-SVT). Like the other UAC graduate schools, the ED-SVT operates under the oversight of the Scientific Council, which in turn, reports to the Vice-Rector in charge of University Research of the UAC. The role and structure of the ED-SVT in relation to the GSP are not explained in the self-evaluation report.

However, the institutional context of the CC&WR GSP has recently undergone changes with INE having leveraging a new legal framework (decrees of 2<sup>nd</sup> March 2022) to create a new postgraduate school focused on water sciences. This framework entails the establishment of three new chairs, with the WASCAL GSP being positioned within the chair of Climate Change and Water Control (also responsible for three master's programmes: Management of Crises and Catastrophes related to Water and Climate; Water Resources Management and Control; and Water Resources and Environmental Risks in African Metropolises). The two other chairs envisioned pertain to Hydrology (responsible for a GSP on Hydrology and Integrated Water Resources Management, and four master's curricula: Quantitative hydrology, Ecohydrology, Hydroinformatics and Geohydrology) and Water Engineering and Sanitation (responsible for a GSP on Water and Sanitation, and five master curricula: Water, Hygiene and Sanitation; Hydraulic and Sanitation; Water Management and Treatment; Hydromechanics; and a life-long one on Environmental Management and Water Quality).

Currently, INE is made up of four departments:

1. the Department of Hydrology and Water Resources Management (HGRE),
2. the Department of Water for Agriculture and Society Department (EAS),
3. the Water and Sanitation Engineering Department (GEA),
4. and another dedicated to Continuing Professional Development (DPC).

All the first and second cycle programmes offered by the INE are associated with these departments, such as master's programmes on quantitative hydrology, hydrogeology, ecohydrology, integrated water resources management, and other water-related programmes. This range of master's programmes provides an interesting basis on water-related topics for the pursuit of doctoral studies with the GSP – CC&WR. This array of master's programmes is expected to be further strengthened in the near future with the establishment of the Graduate School on Water Sciences, which will offer new masters programmes related to water and others linked to climate change and water management. The GSP – CC&WR, which fits in well with the INE's range of master's programmes, offers an additional advantage by focusing on climate change. As it is housed at the INE, the doctorate is coherently positioned within the UAC.

Some departments of UAC host programmes related to the GSP - CC&WR content: the Department of Geography in the Faculty of Letters, Arts and Humanities (FLASH), which hosts training curricula on climate, environment and watersheds across the country; the Department of Environment at the Polytechnic School of Abomey-Calavi (EPAC), which hosts programmes in environmental management; and the Faculty of Agronomic Sciences (FSA) which hosts programs in ecology, forestry, agriculture and the rationale use of lands. This co-existence is perceived as a threat in a SWOT analysis of the self-evaluation report. However, it could be beneficial by enabling synergies for teaching and research activities.

The WASCAL CC&WR programme has trained 30 PhDs in its first three batches (29 of whom graduated while one candidate passed away just before the defence). Currently, there are 22 students enrolled in the fourth and fifth batches. Eleven students from batch 4 are in the final stages of their PhD (the progression of the defences since the evaluation visit can be monitored at [https://wascal-uac.org/?page\\_id=13550](https://wascal-uac.org/?page_id=13550)). Meanwhile, the 11 candidates from batch 5 are conducting field research. Out of the total of 52 alumni and current students across five batches, 16 are female – according to the estimates which the Hcéres panel could draw from the various documents issued by the GSP management (see comment in Field #4 for more details).

26 academics from UAC (more than half) and other universities (most from Western Africa and a few from Germany, Netherlands and USA) are listed as contributors to the course semester. A socio-professional partner

is also involved in teaching a practical course within the programme. This external involvement could be further enhanced. While several sub-modules are expected to be taught by two academics, typically from different backgrounds, the Hcéres visit indicated that such dual coordination is rare in practice. This discrepancy is primarily attributed to scheduling challenges, highlighting the need to consolidate the list of effective teachers.

The self-assessment report cites national and foreign research laboratories (in Africa and Germany) as GSP partners. Such partnerships essentially take place through co-supervision by individual academics, on a case-by-case basis for the research part, depending on the topic at hand. Partnerships exist with operational public services in Benin, such as the National Meteorological Agency (Météo Benin), the General Directorate for Water (DGEau), and the National Civil Protection Agency (ANPC), aligning with the WASCAL's support for observation equipment. Yet, there is room to strengthen engagement with these partners through activities like visits, field campaigns, seminars, and thesis defences. This enhanced interaction would allow on the one hand students to better understand operational services needs for research outcomes, while also raising awareness among operational staff about doctoral research and its findings, thus fostering science-practice co-design and translation. Moreover, partnerships with private entities should be cultivated to broaden the programme's impact. Currently, partnerships in other countries within the WASCAL perimeter are informal, leading to challenges in data collection and societal integration of each PhD project. These PhD projects heavily depend on the national co-supervisor's network, resulting in significant transactional costs. The WASCAL framework, which includes a pool of co-supervisors across different countries, and drawing from the accumulated experience of the first five batches, should facilitate the establishment of a more regional portfolio of partnerships. This expanded network would play a crucial role in supporting students throughout their academic journey, aiding in the maturation, project running, and eventual valorisation of their findings.

Studying climate change through the prism of water resources encourages a multidisciplinary approach to the training on offer. The GSP – CC&WR includes a theoretical grounding in water sciences and climate change, as along with methodological and quantitative tools in mathematics, statistics and modelling. In addition to these foundational courses, there are sub-modules covering climate change and health, as well as climate change and the economy. Consequently, the training content offered is inherently multidisciplinary. This mobilisation of knowledge from several disciplines is also reflected in the theses of some doctoral students, their subjects being interdisciplinary. In addition, strong synergies exist with other universities involved in the GSP, contributing to the consolidation of this scientific network and advancing research in the field. Furthermore, by emphasising knowledge development on water resources, the GSP contributes to the WASCAL network's multidisciplinary approach to climate change in West Africa, enriching the common knowledge base with its thematic expertise. Thus, like other programmes within the network, the GSP – CC&WR integrates multidisciplinary into its objectives, aiming to address the challenges of sustainable development effectively.

The topical relevance of the WASCAL GSP - CC&WR is well-justified regarding the scientific and socio-economic challenges it addresses and its environment. Its institutional relevance is strong, given the expertise of INE and aligning with the broader spectrum of UAC. The ongoing establishment of a new graduate school at the INE level, with three chairs and corresponding GSPs, presents a timely opportunity to facilitate improvements identified through this evaluation process. This includes resource pooling and strengthening generic aspects, such as quality management, student recruitment procedures, knowledge management, and publication methodologies. Moreover, this is also an opportunity to explicitly position the WASCAL GSP relative to other GSPs, not only in terms of thematic coverage but also as an international programme compare to those with national mandates. This ongoing reorganisation, along with the imminent construction of a new building for the INE, presents opportunities to foster synergies between the GSPs, such as joint workshops or field exercises to facilitate mutual understanding and peer enrichment. The alignment between this restructuring of GSPs and the overhaul of the WASCAL CC&WR curriculum allows for leveraging the expertise of all current academic and technical staff within UAC. Many of them are pre-identified in the teams of the three future INE chairs but are sparsely mobilized in the GSP - CC&WR teaching and supervision team. However, proactive design is essential to ensure effective articulation and alignment within INE and with other identified departments to mitigate potential threats of detrimental competition.

**To conclude, the GSP - CC&WR is highly relevant given the societal and scientific challenges it addresses, and its hosting by UAC aligns well the university's thematic strengths. Links could be developed with other UAC training programmes similar to the GSP CC&WR by integrating teaching and research efforts. Developing more public/private and national/international partnerships for the programme would further enhance its ability to address challenges and generate positive impacts on water issues in the West African region within the context of climate change. The current developments with the National Water Institute (INE), including its designation as a Centre of Excellence, the construction of a new building, and the creation of a new post-graduate school under a new legal framework (2022) present an opportune moment to bolster support for this GSP. Within the framework of the new Graduate School on Water Sciences, alongside two other GSPs, collaborative synergies need to be co-designed. This context offers a timely opportunity to build upon the outcomes of the international evaluation and fully realign of this GSP with the new offerings of Master's and PhD curricula.**

## FIELD 2: TRAINING, HOSTING AND SUPERVISION ARRANGEMENTS FOR DOCTORAL STUDENTS

Students are recruited from various masters (hydrology, hydraulics, maths, physics, environmental sciences, soil sciences, agronomy, etc.), leading to some heterogeneity in student profiles. While this diversity enriches the PhD batches, it also poses challenges in terms of establishing common competencies and skills, and complicates the design of doctoral courses.

The programme begins with a four-month language course, a standard component for all WASCAL students. English courses are conducted in Ghana for French-speaking students, while French courses are held in Togo for English-speaking students. These language courses are intended to internationalise PhD students at the outset of their programme. However, several alumni and current students regret that all students, regardless of their initial linguistic skills, are grouped together for these courses. This approach may limit the effectiveness of the catch-up efforts. Then, a semester of specialised doctoral courses is offered at UAC, followed by approximately 24 months of fieldwork and contextualised research. Students have the option of conducting research and data processing at the WASCAL Competence Centre in Ouagadougou, in Burkina Faso, and embarking on a scientific trip lasting up to six months to Germany or elsewhere in Europe, America, Asia or Africa if sponsored. Finally, students return to UAC for six to ten months to draft their PhD dissertation.

Overall, the content of the curriculum aligns with the programme's objectives and intended learning outcomes. However, the initial semester of courses comprises seven modules, primarily delivered in French, with some in English. This curriculum definitely needs to be revised, as highlighted in the self-evaluation report, particularly regarding overlaps, misalignments, management of prerequisites, didactic progression, and addressing new needs in emerging topics and methods.

Modules I and II offer fundamentals that may not be relevant to all students depending on their respective master's profiles. Also, the mathematics update is very basic for a PhD programme in sciences, leading to frustration among some students due to the batch's heterogeneity. The essential updates could be reorganised with optional modules running in parallel, allowing each student to focus on their initial weaknesses. This restructuring could save time that could be allocated to emerging topics. Several modules claim to focus on climate change and related aspects, such as module II. However, Module II primarily focuses on meteorological basics, while the facts, challenges and mechanisms of climate change are scattered across Modules IV, V and VI. This leads to redundancy or divergence from the student's perspective. Course schedules are built based on the professors' constraints, which hampers a coherent sequencing of classes.

For some students in batches 4 and 5, some topics, such as hydrological modelling, are deemed too theoretical and inadequately covered, despite their centrality to many PhD projects. There is a need for reinforcement in several crucial areas where the state of the art evolves rapidly: modelling concepts, climate change scenario and downscaling, data-dependence, and uncertainty analysis across the chain.

Some emerging topics have been recently identified and gradually introduced but require further reinforcement and explicit inclusion in the curriculum (for instance, programming with the R software). New topics such as machine learning need to be addressed, while other topics like water-agriculture relationships and hydro-sedimentation are only touched upon briefly (despite strongly announced in the justification for a new chair in the workshop synthesis document dated from September 2022). It is recommended to expand the curriculum to delve into these important water and climate-related topics for students. Specifically, early warning and crisis management in the case of extreme events (such as floods, droughts, groundwater level fluctuations, and infrastructure operations) should be explicitly covered in the modular programme. This would align with the "Early warning for all" priority of the United Nations, especially considering that one of the masters organised by INE focuses on these aspects.

Most of the PhD research projects will rely on a study case and a short period of hydrometeorological field observations. Integrating such study cases and short observations into the context of climate change presents a significant challenge. Efforts shall be made to help students understand this epistemic challenge and bridge the perspectives of hydrometeorological and hydroclimate change. This includes collecting and managing data from the field and pre-existing databases, harmonising modelling and foresight approaches, and distinguishing between drivers of hydrological change attributable to climate change versus those stemming from geographic or catchment alterations.

Students have access to the three research and study laboratories of the INE at the campus of Abomey Calavi: the Applied Hydrology Laboratory (LHA: *Laboratoire d'Hydrologie Appliquée*, in French), the Water and Environment Sciences and Techniques Laboratory (LSTEE: *Laboratoire des Sciences et Techniques de l'Eau et de l'Environnement*, in French), and the Hydraulics and Water Management Laboratory (LHME: *Laboratoire Hydraulique et Maîtrise de l'Eau*, in French). The existence of these laboratories is an asset for the GSP, providing students opportunities to apply their knowledge and work in practical settings. However, feedback from alumni and current students met during the visit suggests that practical work, whether in the laboratories or in the field, is somewhat limited despite being announced in course descriptions. The programme has access to a bus and a driver, and the abundance of easily accessible hydrology-related systems around Cotonou should facilitate

more field practice during the semester. This hands-on experience would help students assimilate technical and organisational skills, which in turn would aid in the maturation of their research projects. Additionally, it would deepen their understanding of natural processes and assist in addressing data-related issues in their scientific approach. Organising visits and seminars with institutional and industrial partners would further enhance students' understanding of societal expectations from research. This exposure would help students contextualise their research project within a broader societal and professional framework.

The maturation of students' research projects and methodologies is facilitated by a series of seminars during the first semester, where alumni are also invited to contribute. At the end of the semester, just before students begin their fieldwork, a committee assesses the projects and methodologies. This committee also determines whether students are ready to proceed to the defence procedure after the first and second year of research. However, concerns have been raised by several alumni and students regarding the initial assessment of research projects. They believe that insufficient support during the maturation process often leads to delays in fieldwork. They further stated that research projects often need significant revisions shortly after fieldwork begins due to underestimated constraints related to field conditions and data collection.

According to the self-assessment report, the supervision of students' research is a collaborative effort involving UAC academics members of the GSP team, scientists from the student's home country or research field, and possibly a German scientist. This tripartite structure for supervising doctoral students corresponds to WASCAL standards, which are applicable to other programmes within the WASCAL network. An individual from the Competence Centre in Ouagadougou may be included, depending on student's data needs. The effectiveness of this co-supervision varies depending on factors such as the topic, partnership, country, and local conditions, including internet access and safety in the field. Despite these challenges, a monitoring process is implemented in accordance with WASCAL rules to ensure the smooth progress of students' thesis projects.

Academics within the programme are allowed to supervise up to four PhD students at a time, a relatively high number compared to European standards. Some professors oversee PhD projects outside from their primary areas of expertise, and there are several instances where professors are retired or nearing retirement, posing challenges in securing continuity. To address this, there is a potential tap into the pool of relevant colleagues at UAC and other public Universities in Benin to provide additional support and reinforce the WASCAL GSP - CC&WR programme, thereby enhancing continuity and ensuring effective supervision.

The co-supervision by a German scientist and a six-month stay in their laboratory are integral parts of the doctoral programme. However, starting from batch 4 onward, it appears that this practice is not consistently implemented. In case where it does occur, the duration of the stay is often shorter than six months, and the arrangements need to be negotiated by the PhD student himself, leading to some difficulty. It is essential to clarify whether this policy is still in effect and if so, to streamline the process to ensure that students can benefit from these visits with tangible outcomes. This would help reduce transactional and logistical costs and ensure that the GSP fully supports the announced student mobility initiatives.

Accessing or collecting data is a major challenge for the students. They typically collect experimental data over a maximum of two years, contingent upon the synchronisation of their arrival and operational conditions on the field. The seasonal and inter-annual variability in hydrometeorological conditions creates a narrow time window and limited representativeness of observations concerning climate change. To address this limitation, PhD candidates must rely on pre-existing data, which often requires lengthy negotiations with no guarantee of success. In both cases, the committee responsible for guiding and ultimately assessing the methodology plays a crucial role in mentoring and preparing students for a feasible project regarding data collection, including budget considerations such as payment for pre-existing data and invoicing for hydrochemical analysis.

The overall scientific productivity of the GSP is very good, evidenced by a significant number of international peer-reviewed articles and conference presentations. Analysis of publications from the initial three batches demonstrates that most PhDs have resulted in at least one journal article, with some students contributing to multiple publications. While this fulfils the doctoral requirement to publish in a scientific journal, it is worth noting that doctoral students are not always first authors. In the dynamic landscape of academic publishing, including the presence of predatory journals, the CC&WR programme should enhance its guidance and instructions to students regarding publication requirements and strategies, recognising that navigating this terrain is a skill in itself.

The roles of the committee and the rapporteurs in authorising the PhD defence need clarification and documentation. The ongoing establishment of a new post-graduate school, which will host three GSPs including the WASCAL CC&WR, presents an opportunity to consolidate and document this process.

**To conclude, the initial semester of courses at UAC serves as a valuable mechanism to prepare all students for their PhD research projects in their home countries, building upon the skills acquired during their Master's studies. However, a comprehensive revision of the curriculum and organisation of this semester is necessary to accommodate and leverage the heterogeneity of students' profiles, and to update and streamline the modular architecture. Improvements can be made in supporting to maturation of research projects alongside**

coursework, in collaboration with co-supervisors. The programme's strong output of scientific articles is very good and relevant to its scientific field. Increased involvement from alumni and socio-economic partners could further enrich both the societal and scientific perspectives of the GSP. The effectiveness of co-supervision involving a professor from the GSP team, a scientist from the home country, and possibly a scientist from Germany varies. Clarification of the defence procedure is warranted, which could be addressed through the establishment of the new postgraduate school on Water Sciences at UAC.

### FIELD 3: THE ATTRACTIVENESS, PERFORMANCE AND RELEVANCE OF THE DOCTORATE

The recruitment process for the programme is synchronised with other programmes within the WASCAL framework. Advertising efforts include social media, word-of-mouth, WASCAL communication channels, the GSP website, and partnerships. However, the WASCAL-UAC website requires updating (e.g. the application page - [https://wascal-uac.org/?page\\_id=13694](https://wascal-uac.org/?page_id=13694) - dates back to the 2014 campaign and contradicts the admission page - [https://wascal-uac.org/?page\\_id=13970](https://wascal-uac.org/?page_id=13970)). The selection process involves the International Scientific Advisory Board (ISAB) and the Local Scientific Advisory Board (LSAB). Shortlisted candidates from each origin country undergo interviews with the GSP governance, and a prioritised list is submitted to the WASCAL coordinator for final decision. The main selection criteria are outlined on the GSP website. The establishment of the new Post-Graduate School on Water Sciences, where the WASCAL CC&WR will be one of three GSPs, presents an opportunity to consolidate the recruitment process and document application statistics and criteria fulfilment.

The number of applications for the programme has increased steadily over the past decade, from 54 for the first batch to approximately 75 for the last two batches. This trend shows growing interest and awareness of the programme among potential applicants. From the pool of applicants, two or three top candidates per country are pre-selected before the final admission decisions are made. The WASCAL grant is then awarded to one of them by the GSP management. While this process aims to select the best students from West African Countries within the WASCAL network and provide them with optimal conditions for success, it does present challenges in achieving a balanced gender ratio.

The GSP has achieved a 100% success rate in graduating all PhD candidates from its first three batches (with the exception of a student who unfortunately passed away). However, it is worth noting that a fraction of these candidates experienced significant delays in completing their PhD beyond the standard duration of 3.5 years set by WASCAL.

The alumni from the three first batches primarily hold positions in the academic and scientific sectors, closely aligned with the field of their PhD. During the ad hoc panel meeting, the majority of them acknowledged the good quality of the CC&WR programme and confirmed its growing reputation within the academic community and among potential applicants. Alumni from the early batches have secured positions within the academic sector, reflecting the demand for research and capacity development in West Africa. However, this raises concerns about achieving the objective of having graduates assume roles across the broader science-society continuum, which has not fully realised to date. Implementing an ad hoc competency approach is necessary to facilitate the integration of graduates into the job market beyond academia.

An alumni association within the WASCAL network exists, functioning through social networks and e-mail to disseminate information, such as job opportunities and scholarship offers, and to organise activities, like a monthly presentation by an alumnus at programme seminars. Graduates met by the Hcéres panel confirmed that this association is dynamic and contributes to consolidate connections among current and former students. However, it does not play a structural role in the development of the GSP.

The GSP benefits from a good Beninese partnership with Météo Bénin, DGEau, and ANPC (*Agence Nationale de Protection civile*). Leveraging this collaboration could enrich the training programme with professional insights and enhance the societal relevance of the GSP. Similar partnerships with equivalent institutions in other WASCAL members countries, should be pursued to consolidate the regional social and hydrological perspective. This collaboration will facilitate a better understanding of social and biophysical interactions, thus enabling more effective solutions to water sustainability challenges in the region.

**To conclude, the GSP has earned a growing reputation in academia and among potential candidates. While the recruitment process benefits from this reputation, efforts should be made to encourage a more balanced gender ratio and to document the process more comprehensively. Enhancing the visibility of the GSP by ensuring that disseminated information is regularly updated would be beneficial. Alumni from the first three batches predominantly found employment in the academic sector and actively contribute to the academic training of doctoral students through monthly seminars. Their involvement could extend to the revision of the training programme itself. A skill-based approach should be developed in collaboration with socio-economic and operational partners to address the full science-society continuum related to water and climate change. This**

**approach would create more job opportunities to GSP alumni and enhance capacity-building in the WASCAL network countries.**

#### FIELD 4: MANAGEMENT AND CONTINUOUS IMPROVEMENT OF THE DOCTORATE

UAC has established a comprehensive policy for quality assurance, covering the recruitment of staff, external professors, and the selection of students. UAC also adheres to national decrees outlining research ethics and prohibiting scientific misconduct.

The management of the GSP is responsible for bridging the quality standards of UAC and WASCAL, while ensuring close support to the students for the successful completion of their doctorate. This includes overseeing programme staff such as secretary, accountant, and IT officer. Reporting lines extend to the Scientific Council of UAC and ED-SVT at UAC level, as well as to two bodies established for the GSP according to WASCAL standards:

1. the Local Scientific Advisory Board (LSAB)
2. the International Scientific Advisory Board (ISAB).

The LSAB consists of CC&WR management (the Director and Deputy Director of the programme), two representatives from the UAC (including one from the Scientific Council), and one representative from another Beninese university.

The ISAB comprises members of LSAB, a representative of the UAC Scientific Council, three representatives from West African institutions, and two German representatives.

All members of these advisory boards hold positions of either full professors or associate professors. The LSAB helps the programme management team in with various tasks, such as managing the call for applications, screening candidates' eligibility, and addressing challenges encountered during the PhD research phase. Meanwhile, the ISAB serves as the supervisory body, responsible for: 1) designing and adjusting the teaching programme, selecting candidates, and recommending professors of at least associate professor level, and 2) inspecting the quality of the teaching, research work, publication, and thesis defences. Overall, the WASCAL governance structure is suitable for ensuring the scientific monitoring of students from recruitment to graduation. Nevertheless, there is currently no explicit mechanism for mediation with students in case of problems, nor student representation in the GSP governance. It may be beneficial for students to have access to an external mediation body in case they encounter difficulties during their doctoral studies.

Similar to other WASCAL programmes, students enrolled in the GPS receive a research grant and a living allowance to support them throughout their doctorate. However, the total amount of student funding has varied from year to year, leading to inconsistencies in funding levels across different batches. This disparity in funding had posed challenges for students, particularly when faced with the financial demands of field research and laboratory analyses, which remain consistent regardless of fluctuations in funding. To ensure optimal conditions for student success, it is imperative to establish a minimum threshold for student funding to prevent funding levels from falling below adequate levels. It would be beneficial to adopt a flexible approach to funding allocation, taking into account the specific research requirements and the cost of living in each country where students are conducting their research.

With regard to course evaluation, some professors offer the possibility for students to provide feedback on their modules. However, it is essential to standardise and centralise this procedure at the GSP level, with guidance of the LSAB and ISAB (and possibly the School of Post-Graduate Studies). This approach ensures comprehensive monitoring of programme quality and facilitates continuous improvement. Existing mechanisms for monitoring overall programme quality can be improved, encompassing not only the evaluation of teaching but also the evaluation of programme content and student supervision. The exact composition of the various student batches differed across the documents issued by the GSP management, so that numbers and profiles were not entirely consistent. It is imperative to rectify this issue promptly through more rigorous monitoring procedures.

A competency portfolio approach could be developed with students throughout the programme and included as an annex to the PhD dissertation. This approach aims to foster a fully reflexive approach by students and facilitate their interactions with supervisors, data providers, and future employers.

The digital library of all PhD dissertations on the website could be expanded to include competency portfolios and related publications. This expansion would facilitate the tracking of research outcomes, enhance interactions between the management team and the students, enable corporate knowledge accumulation and management, and provide materials with new students to reference and learn from previous lessons.

The GSP team maintains contact with alumni primarily through social media, which has allowed for the establishment of a snapshot of alumni job placements in 2023. Consolidating annual snapshots would help in

understanding the wider professional trajectory of alumni and support ongoing steering of the competency approach.

**To conclude, the GSP - CC&WR benefits from the quality assurance system of its host university for the selection of PhD candidates and teaching staff. However, in practical terms, students are recruited and monitored throughout their training and research following WASCAL processes and standards. While WASCAL's funding of thesis projects supports students' success, it is essential to accurately assess their needs and ensure flexible funding during the course of their studies. The quality of the training programme is not systematically monitored, despite the involvement of two governance bodies. To address these gaps, it is important to develop mechanisms for the overall monitoring of the programme's quality (evaluation of teaching, curriculum content, monitoring of student supervision, etc.) and continuous improvement, potentially under the direction of the LSAB, ISAB, and possibly the School of Postgraduate Studies. External mediation mechanisms could also be introduced to the programme to resolve student difficulties impartially. Introducing a skill-based approach into the training would enhance graduates' job market integration. Close monitoring of alumni career paths through interactions with alumni would also help steer the doctoral programme and improve its relevance in terms of research agenda and capacity-building. To facilitate the centralisation of the research results of the GSP CC&WE, including publications and skills portfolios, on the WASCAL-UAC website would facilitate knowledge dissemination and access.**

## VI. CONCLUSION

The WASCAL GSP - CC&WR is highly relevant in addressing both societal and scientific challenges, particularly in the context of its hosting institution, the University of Abomey Calavi. Leveraging the thematic strengths of the University and the diverse hydroclimatic landscape of Benin, the programme offers a unique opportunity to study and understand various environmental scenarios. However, after five years of operation, there is a need to revisit the curriculum of the initial semester of courses at UAC. This revision should involve a collaborative effort with input from professors, partners, and alumni to develop a competency-driven set of modules that cater to the diverse profiles of students and align with current methodological approaches in the field. Furthermore, it's crucial to ensure that research projects are fully mature by the end of the initial semester, including comprehensive data collection plans and budgets, co-supervision arrangements, and international mobility considerations. That will help streamline field projects and ensure their immediate efficiency. By mobilising all available relevant stakeholders and capitalizing on the establishment of a new Graduate School on Water Sciences, the programme can facilitate the revision of the course modular architecture and enhance the maturation of research projects.

### STRENGTHS

#### *In general, for the WASCAL network*

- A well-structured international network of partner universities that ensures high-quality recruitment of PhD students on an international level, and a top-level opportunity for capacity-building across West Africa on climate change
- A thematic focus on a cross-cutting topic with high societal and scientific relevance to West Africa, in line with the region's needs for informed decision-making in both public and private sectors, as well as research and higher education
- An efficient foreign language and inter-cultural training
- An organisation with adequate support in terms of financial means, human resources, and infrastructure
- A well-formalised and documented framework for selecting, hosting and supervising PhD candidates
- The support of a regional Competence Centre, which centralises data collected by PhD candidates, and which allows WASCAL researchers to capitalize on.

#### *Specific points to GSP - CC&WR*

- A flagship programme aligned with a thematic strength of UCA, benefiting from the scientific expertise of the INE, its designation as host of the African Centre of Excellence for Water and Sanitation (C2EA) and the creation of a new school of postgraduate studies
- A strong and diverse teaching team encompassing a wealth of knowledge to approach climate change and water resources from a multidisciplinary perspective
- A programme with a good academic reputation, visibility and attractiveness
- An overall very good scientific productivity, with a significant record of international, peer-reviewed articles and conference papers
- An efficient job-market integration of graduates, primarily in the academic world

### WEAKNESSES

- Insufficient interactions with professionals and socio-economic stakeholders regarding the initial training programme or the design and transfer of research projects
- A six-month training programme which does not adequately address emerging priorities in water resources management, and should be updated

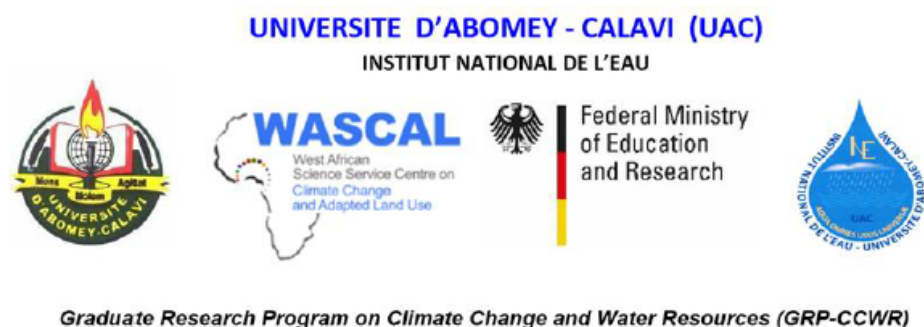


- Insufficient coordination within the teaching team, which could be expanded to accommodate a substantial revision of the training programme
- Lack of a structured partnership with German institutions, which impedes student mobility in this country (as for the other WASCAL programmes evaluated)
- A lack of students' support in designing research projects, leading to delays in the completion of their graduate programme

## RECOMMENDATIONS FOR THE INSTITUTION

- Align the GSP with the new organisational structure of INE and other GSPs to identify synergies and opportunities for joint activities
- Revise the six-month training programme to update and articulate emerging priorities and state-of-the-art approaches. Introduce elective courses and on online resources to allow students to catch up on pre-requisites
- Proceed with this revision relying on a consolidated team of professors for the sake of co-design the training programme, and increase the share of practical didactics in the laboratories of INE or other GSP partners
- Foster closer interactions with professionals and socio-economic stakeholders to ensure the relevance and the applicability of research projects. Establish partnerships with operational services to facilitate the transfer and strengthen the science-practice interface.
- Define a clear and consistent publication policy, and improve support to PhD candidates in the publication process
- Consolidate the policy regarding the mobility in Germany for a scientific stay, and the support mechanisms
- Emphasise the importance of maturing research proposals before starting the fieldwork, to ensure adequate budgeting, data collection procedures, and international mobility plan.

## VII. OBSERVATIONS OF THE INSTITUTION



ANSWERS TO Mr. Stéphane Le Boulter

### FIELD 1.

- 1- The Role and Structure of the ED-SVT in relation to the GSP not explained in Self Evaluation  
ANSWERS: Upon their recruitment, the WASCAL-CC and WR students are registered at UAC under the Graduate School (Ecole Doctorale) ED-SVT. The GSP gives the doctoral training, but the administrative part is handled by the ED-SVT basically (in addition to the ED-SVT role described in the Self Evaluation document) for their graduation. Once a student publishes a paper and wraps up his or her dissertation document, request to evaluate the student's PhD document (thesis) is sent to ED-SVT by the GSP that, along with the student's supervisors proposes three reviewers. The ED-SVT send the student PhD thesis to the 03 reviewers, one from the universities of Benin, and two from two different countries' universities. Once the 03 reports come out positive, the ED-SVT send them back to the GSP makes the paperwork to request, from the Scientific Council of UAC, through the ED-SVT, authorization to publicly defend PhD thesis. Once the authorization is granted, the GSP organizes the defense, sends the report to the ED-SVT to transmit to the Scientific Council with the request of diploma delivery.
- 2- Some departments of UAC host programmes related the GSP-CC WR. This can be a threat to the programme. It is recommended more collaboration with those programmes.

ANSWER: Collaboration exists already with those programmes to the point where fields trips, practicals and supervision position are held by academics of those departments.

- 3- Strengthen Partnership with DGEau, ANPC, Meteo Services and Privates sectors

ANSWERS: Partnership is already developed with DGEau, ANPC, and Meteo Services, but can be improved. We are already engaging with Private sectors as to bring them of board, and commit with them the socio-practical training of our students. This will become a reality for the 6<sup>th</sup> batch.

At the international level, beside the partnership with the universities, the Competence Center has developed close partnership with the major climate related centers across West Africa.

### FIELD 2

- 1- Courses taught in French.

ANSWER: The GSP programme is designed to have francophone students learn English and anglophone students learn French, and this for 3 to 4 months respectively at University of Cape Coast Ghana, and University of Lome Togo. The objective here to make students bilingual. But with this all courses are taught in English except for one or two for which the lecturers are not fluent at English. Basically, the anglophone students are the one that complain about teaching in French.

2- Lack of fields work

ANSWER: With COVID 19, fields work during the students of 4<sup>th</sup> batch residence time at UAC was impossible, but this was a conjunctural. Batch 5 has visited watershed, did some practicals over the Mono river , visits to sea level rise area, and measures underway to stop coastal erosion.

3- Overloaded supervisors.

ANSWER: To the best of my knowledge, a supervisor at GSP CC WR supervises a maximum of 2 students not 4. For batch 5 made of 11 students, we have 06 supervisors.

4- Retired academics as supervisors

ANSWER: No retired academic supervises students at our GSP. At least, supervision has to start prior to the retirement. In this case the retired academic has to take the student through graduation.

5- "While this diversity enriches the PhD batches, it also poses challenges in terms of establishing common competencies and skills, and complicates the design of doctoral courses."

ANSWER: Because of the diversity of recruited students from various masters (hydrology, hydraulics, maths, physics, environmental sciences, soil sciences, agronomy), 6 months of training are tanning at the beginning of the PhD to bring them nearly to the expected competence. This diversity enriches the topics on which PhD students work. But the possibility of parallel courses as to accommodate students can be envisioned depending on funding.

6- "The essential updates could be reorganized with optional modules running in parallel, allowing each student to focus on their initial weaknesses. This restructuring could save time that could be allocated to emerging topics."

ANSWER: The PhD students, while applying to the program were informed about the 6 months training and its content. They judged themselves able to undergo this before applying. Furthermore, the selection committee evaluates, based on the submitted application, the ability of the master's student before being selected as a PhD student. With 11 students and limited funds, running parallel training based on students' backgrounds is a good solution but may not be viable. However, students who fail to validate a specific module have the opportunity to go for a second round.

7- "Most of the PhD research projects will rely on a study case and a short period of hydrometeorological field observations. Integrating such study cases and short observations into the context of climate change presents a significant challenge"

ANSWER: In the context of the decline in hydro-meteorological observation instruments in Africa in general, students are, sometimes, constrained to use the available data. Within the three years of PhD work, students cannot collect more than 2 years of data by themselves. However, whenever possible, the PhD students use, in addition to the observed data, the reanalysis climate database available online such as GPCP, CHIRPS, ERA5, etc. after performing evaluation and correction of these datasets with observations.

We require, from our students, at least 30 years of data for studying the impacts of climate change. Through monthly lab seminars, student research outputs are exposed to the scientific committee (online and opened to everyone with a mailing list of more than 300 persons) for comments, questions, and suggestions to guarantee its contents.

8- "They believe that insufficient support during the maturation process often leads to delays in fieldwork. They further stated that research projects often need significant revisions shortly after fieldwork begins due to underestimated constraints related to field conditions and data collection. They further stated that research projects often need significant revisions shortly after fieldwork begins due to underestimated constraints related to field conditions and data collection."

ANSWER: About the insufficient support, the students should have provided more details on their expectations that were not met during the research project maturation. Currently, it looks like backbiting.

On the issue of research project revision, after the proposal defence indicated in the report, it may have been good to quantify the number of PhD students who raised this issue. If not, the reader may think that it is all the students who are facing the indicated issue. For instance, in the current batch 5, there is only one student over 11 who reoriented his topic due to data availability issues. During his proposal defence, he assured the jury that the data were available but once back to his home country, he realized that it was not the case and was obliged to change his topic. Anyhow, this kind of situation may happen, even in developed countries

- 9- " They typically collect experimental data over a maximum of two years, contingent upon the synchronization of their arrival and operational conditions on the field. The seasonal and inter-annual variability in hydrometeorological conditions creates a narrow time window and limited representativeness of observations concerning climate change."

ANSWER: The collected data for a maximum of two years by the students are not for climate change impact analysis since it is not enough to perform such a study. They complement existing secondary data that they purchase from their research budget. A database accessible to students is available at the competence centre of WASCAL in Ouagadougou, through cooperation with the meteorological agencies in West Africa.

- 10- " While this fulfils the doctoral requirement to publish in a scientific journal, it is worth noting that doctoral students are not always first authors."

ANSWER: For the PhD defence authorisation, each student must publish at least one paper as the first author. This is compulsory at the University of Abomey Calavi.

- 11- Publication as contributors

ANSWER: It is mandatory for PhD students to graduate from UAC to publish at least one paper in a reknown journal as FIRST AUTHOR.

A list of predatory journals is given out, and their supervisors take them through the process of submission to a journal.

- 12- Clarification of the PhD defense procedure

ANSWER: Once a student publishes a paper as first author, and wraps up his or her dissertation document, a request to evaluate the student's PhD document (thesis) is sent to ED-SVT by the GSP. The student's supervisors proposes three reviewers of the thesis. The ED-SVT send the student PhD thesis to the 03 proposed reviewers, one from the universities of Benin, and two from two different countries' universities. Once the 03 reports come out positive, the ED-SVT send them back to the GSP. This later makes the paperwork to request, from the Scientific Council of UAC, through the ED-SVT, authorization to publicly defend PhD thesis. Once the authorization is granted, the GSP organizes the defense. The authorization sets a panel of the defense, composed of a President, a full Professor of CAMES, two reviewers, an examiner, the major supervisor and a co-supervisor if possible. 45 minutes are issued to the candidate to deliver the results of his/her research. After that, questions and corrections from the panel followed. This can last up to two hours. Thereafter, the jury deliberates giving the grade if the work is accepted with or without major/minor corrections.

Reports of the defense is sent to the ED-SVT to transmit to the Scientific Council with the request of diploma delivery.

### FIELD3

- 1- Students selection procedure

ANSWER: Read " a prioritized list of 2 to 3 candidates per country is submitted to the WASCAL Executive Directorate for final decision and scholarship issuance.

- 2- Gender balance ratio.

ANSWER: At our GSP, we strived to have the gender balance. This is a strong requirement from the funder. Unfortunately, for some calls, no good female candidates at master level responded. Overall, the GSP is at 30 % female acceptance ratio.

3- Alumni do not play a structural role in the development of WASCAL GSP CC WR.

ANSWER: As much as we can, we have helped the Alumni set up, contributing to the GSP development as much as they can. As to play a structural role, this has to be changed in the overall WASCAL organogram. But for the GSP CC WR, we had recruited an Alumni to be the Scientific coordinator.

4- " However, this raises concerns about achieving the objective of having graduates assume roles across the broader science-society continuum, which has not fully realised to date. Implementing an ad hoc competency approach is necessary to facilitate the integration of graduates into the job market beyond academia."

ANSWER: Thank you for this recommendation. However, in the regional context of West Africa and beyond, the job market for the holders of PhD is mostly in the academia (university) since this diploma is not considered for recruitment in the administration. The industries could have been a good option but industries are embryonic in Africa. This justifies the fact that most of the graduates hold jobs at universities.

#### FIELD 4

1- No student representative at the GSP governance

ANSWER: We will work on this.

2- External mediation in case of problems with the GSP governance

ANSWER: We had never encountered problems with students beyond conciliation. However, venue will be explored for this.

3- Disparity in funding

ANSWER: This question has been addressed and correction made for the 5<sup>th</sup> batch onward.

4- Lecturer evaluation

ANSWER: At the end of each course, students are given opportunity to anonymously evaluate lecturer's performance. If needed, a lecturer is confronted with students' evaluation outcome as to request from him an adjustment. Two consecutive bad performance led to the lecturer replacement.

It happened already with the math lecturer.



Prof Julien ADOUNKPE  
Director of WASCAL GSP CC WR

The evaluation reports of Hcéres  
are available online : [www.hceres.com](http://www.hceres.com)

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## ACCREDITATION DECISION

### Graduate Study Programme (PhD) of WASCAL on Climate Change and Water Resources

University of Abomey-Calavi

Abomey-Calavi, Benin

**June 2024**

## SCOPE OF THE ACCREDITATION GRANTED BY HCÉRES

HCÉRES has based its evaluation process on a set of objectives that study programmes must pursue to ensure recognised quality within France and Europe. These objectives are divided up into four accreditation criteria.

The Accreditation Commission issues an opinion about the accreditation of the study programme after examining the file. The Hcéres President takes the decision based on the Commission's opinion and the final evaluation report of the programme. This accreditation decision, taken in plenary session, is the result of a collegial and reasoned process.

The decision issued by Hcéres regarding the accreditation of the study programme corresponds to the awarding of a label to the evaluated entity.

This decision is independent of the accreditations carried out by the French State and therefore does not entail recognition in France of the institution or the diplomas delivered by it.



**Decision No. EI-2024-24 on the accreditation of the WASCAL Graduate Study Programme on Climate Change and Water Resources issued by University of Abomey-Calavi, Benin**

**The President of the High Council for the Evaluation of Research and Higher Education,**

Considering the Research Code, in particular Articles L. 114-3-1 to L. 114-3-6;

Considering the Board's deliberation of 29<sup>th</sup> September 2022 on the accreditation criteria for international study programmes (except doctorates/PhDs);

Considering the Decision No. 2023-9 of 16<sup>th</sup> March 2023 on the international accreditation procedure of the High Council for the Evaluation of Research and Higher Education;

Considering the agreement DEI\_20220407 of 12<sup>th</sup> May 2022 - for the evaluation/accreditation of seven training courses, delivered by training and research centres affiliated to the WASCAL network in seven sub-Saharan African countries;

Considering the opinion issued by the Accreditation Commission on 25<sup>th</sup> April 2024;

**Decides:**

**Article 1**

Noting that the Graduate Study Programme on Climate Change and Water Resources delivered by University of Abomey-Calavi in Benin meets the four accreditation criteria, voted by the Board of the High Council on 29<sup>th</sup> September 2022, as follows:

**ACCREDITATION CRITERION 1: DOCTORAL POLICY**

The Graduate Study Programme on Climate Change and Water Resources (GSP - CC&WR) is highly relevant given the societal and scientific challenges it addresses, and its hosting by UAC aligns well the university's thematic strengths. Links could be developed with other UAC training programmes similar to the GSP CC&WR by integrating teaching and research efforts. Developing more public/private and national/international partnerships for the programme would further enhance its ability to address challenges and generate positive impacts on water issues in the West African region within the context of climate change. The current developments with the National Water Institute (INE), including its designation as a Centre of Excellence, the construction of a new building, and the creation of a new postgraduate school under a new legal framework (2022) present an opportune moment to bolster support for this GSP. Within the framework of the new Graduate School on Water Sciences, alongside two other GSPs, collaborative synergies need to be co-designed. This context offers a timely opportunity to build upon the outcomes of the international evaluation and fully realign of this GSP with the new offerings of Master's and PhD curricula.

**ACCREDITATION CRITERION 2: TRAINING, HOSTING AND SUPERVISION ARRANGEMENTS FOR DOCTORAL STUDENTS**

The initial semester of courses at UAC serves as valuable mechanism to prepare all students for their PhD research projects in their home countries, building upon the skills acquired during their Master's studies. However, a comprehensive revision of the curriculum and organisation of this semester is necessary to accommodate and leverage the heterogeneity of students' profiles, and to update and streamline the modular architecture. Improvements can be made in supporting to maturation of research projects alongside coursework, in collaboration with co-supervisors. The programme's strong output of scientific articles is very good and relevant to its scientific field. Increased involvement from alumni and socio-economic partners could further enrich both the societal and scientific perspectives of the GSP. The effectiveness of co-supervision involving a professor from the GSP team, a scientist from the home country, and possibly a scientist from Germany varies. Clarification of the defence procedure is warranted, which could be addressed through the establishment of the new postgraduate school on Water Sciences at UAC.

### ACCREDITATION CRITERION 3: ATTRACTIVENESS, PERFORMANCE AND RELEVANCE OF THE DOCTORAL PROGRAMME

The Graduate Study Programme on Climate Change and Water Resources has earned a growing reputation in academia and among potential candidates. While the recruitment process benefits from this reputation, efforts should be made to encourage a more balanced gender ratio and to document the process more comprehensively. Enhancing the visibility of the GSP by ensuring that disseminated information is regularly updated would be beneficial. Alumni from the first three batches predominantly found employment in the academic sector and actively contribute to the academic training of doctoral students through monthly seminars. Their involvement could extent to the revision of the training programme itself. A skill-based approach should be developed in collaboration with socio-economic and operational partners to address the full science-society continuum related to water and climate change. This approach would create more job opportunities to GSP alumni and enhance capacity-building in the WASCAL network countries.

### ACCREDITATION CRITERION 4: MANAGEMENT AND CONTINUOUS IMPROVEMENT OF THE DOCTORAL PROGRAMME

The Graduate Study Programme on Climate Change and Water Resources benefits from the quality assurance system of its host university for the selection of PhD candidates and teaching staff. However, in practical terms, students are recruited and monitored throughout their training and research following WASCAL processes and standards. While WASCAL's funding of thesis projects supports students' success, it is essential to accurately assess their needs and ensure flexible funding during the course of their studies. The quality of the training programme is not systematically monitored, despite the involvement of two governance bodies. To address these gaps, it is important to develop mechanisms for the overall monitoring of the programme's quality (evaluation of teaching, curriculum content, monitoring of student supervision, etc.) and continuous improvement, potentially under the direction of the LSAB, ISAB, and possibly the School of Postgraduate Studies. External mediation mechanisms could also be introduced to the programme to resolve student difficulties impartially. Introducing a skill-based approach into the training would enhance graduates' job market integration. Close monitoring of alumni career paths through interactions with alumni would also help steer the doctoral programme and improve its relevance in terms of research agenda and capacity-building. To facilitate the centralisation of the research results of the GSP CC&WE, including publications and skills portfolios, on the WASCAL-UAC website would facilitate knowledge dissemination and access.

#### Article 2

The Graduate Study Programme on Climate Change and Water Resources issued by University of Abomey-Calavi in Benin is accredited for a period of 5 years from the date of this decision.

#### Article 3

The decision is accompanied by the following recommendations and comments:

- Align the GSP with the new organisational structure of INE and other GSPs to identify synergies and opportunities for joint activities
- Revise the six-month training programme to update and articulate emerging priorities and state-of-the-art approaches. Introduce elective courses and on online resources to allow students to catch up on pre-requisites
- Proceed with this revision relying on a consolidated team of professors for the sake of co-design the training programme, and increase the share of practical didactics in the laboratories of INE or other GSP partners
- Foster closer interactions with professionals and socio-economic stakeholders to ensure the relevance and the applicability of research projects. Establish partnerships with operational services to facilitate the transfer and strengthen the science-practice interface.
- Define a clear and consistent publication policy, and improve support to PhD candidates in the publication process

Consolidate the policy regarding the mobility in Germany for a scientific stay, and the support mechanisms

Emphasise the importance of maturing research proposals before starting the fieldwork, to ensure adequate budgeting, data collection procedures, and international mobility plan.

**Article 4**

This decision will be published on the Hcéres website.

Paris, 14<sup>th</sup> June 2024.

The acting President  
signed

Stéphane Le Bouler

Les rapports d'évaluation du Hcéres  
sont consultables en ligne : [www.hceres.fr](http://www.hceres.fr)

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