AQAS

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STUDIENGÄNGEN E.V.

FINAL REPORT

UNIVERSITY OF DEVELOPMENT STUDIES

CLUSTER WACWISA

IRRIGATION AND DRAINAGE ENGINEERING (MASTER OF PHILOSOPHY)

ENVIRONMENTAL MANAGEMENT AND SUSTAINABILITY (MASTER OF PHILOSOPHY)

ENVIRONMENTAL MANAGEMENT AND SUTAINABILITY (DOCTOR OF PHILOSOPHY)

September 2023

Content

DECISION OF THE AQAS STANDING COMMISSION

ON THE STUDY PROGRAMMES

- **"IRRIGATION AND DRAINAGE ENGINEERING" (MASTER OF PHILOSOPHY)**
- **"ENVIRONMENTAL MANAGEMENT AND SUSTAINABILITY" (MASTER OF PHILOSOPHY)**
- **"ENVIRONMENTAL MANAGEMENT AND SUSTAINABILITY" (DOCTOR OF PHILOSOPHY)**

OFFERED BY UNIVERSITY OF DEVELOPMENT STUDIES, GHANA

Based on the report of the expert panel, the comments by the university and the discussions of the AQAS Standing Commission in its 18th meeting on 21 August 2023, the AQAS Standing Commission decides:

1. The study programmes "**Irrigation and Drainage Engineering**" (Master of Philosophy), "**Environmental Management and Sustainability**" (Master of Philosophy), and "**Environmental Management and Sustainability**" (Doctor of Philosophy) offered by **University for Development Studies (Ghana)** are accredited according to the AQAS Criteria for Programme Accreditation (Bachelor/Master) and the AQAS Criteria for Doctoral Programme Accreditation (PhD).

   The accreditations are conditional.

   The study programmes essentially comply with the requirements defined by the criteria and thus the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) and the European Qualifications Framework (EQF) in their current version. The required adjustments can be implemented within a time period of twelve months.

2. The conditions have to be fulfilled. The fulfilment of the conditions has to be documented and reported to AQAS no later than **30 September 2024.** The confirmation of the conditions might include a physical site visit within the time period of twelve months.

3. The accreditation is given for the period of **six years** and is valid until **30 September 2029**.

Conditions:

<u>All programmes</u>

1. It is required to draft a course description with intended learning outcomes on the course level for the internship that outlines the programme's core competencies to clarify the knowledge, skills and competencies which are to be acquired in the internship.
2. To ensure effective quality assurance and continuous improvement, UDS has to prioritise the analysis phase of the PDCA (Plan-Do-Check-Act) cycle for WACWISA programmes to close the gap between the check and act component of the cycle by fostering a data-driven decision-making culture, and sharing results with internal and external stakeholders to enhance the visibility and relevance of quality assurance actions.

3. Being crucial for identifying areas of difficulty or delays, and implementing targeted support measures, UDS and the WACWISA programmes have to elicit data on the average study lengths of students to ensure accurate assessment of student progression.
4. WACWISA has to establish clear and well-defined internship guidelines to promote transparency, accountability, and effective communication, ensuring a positive and mutually beneficial experience for students and industry partners.
5. It is essential for UDS to publish accurate and up-to-date public information on its main homepage and departmental websites, as well as the WACWISA homepage.

Master's programmes

6. It is necessary to reformulate the intended learning outcomes (ILOs) of the master's programme in "Irrigation and Drainage Engineering" to align with the European Qualifications Framework (EQF), emphasizing discipline-specific knowledge and skills, while integrating multidisciplinary aspects and seeking input from faculty, industry professionals, and stakeholders to meet industry needs and expectations.
7. The intended learning outcomes on the programme level for the master's programme "Environmental Management and Sustainability" must be reformulated, aligning them with the European Qualifications Framework (EQF) Level 7 and placing stronger emphasis on discipline-specific ILOs, focusing on specialized knowledge, skills, and competencies in environmental management principles.
8. The curricula for the master's programme "Irrigation and Drainage Engineering" and the master's programme "Environmental Management and Sustainability" have to address specifically climate change, which is crucial for the programme's scope and the diverse backgrounds of students.

PhD programme "Environmental Management and Sustainability"

9. The intended learning outcomes on the programme level for the PhD programme "Environmental Management and Sustainability" must be drafted, ensuring comprehensive knowledge, advanced skills, and competencies in environmental management and sustainability, and emphasise the ability to address complex environmental challenges.
10. An advanced course in climate change for the PhD programme "Environmental Management and Sustainability" is required to address the programme's scope.

The following **recommendations** are given for further improvement of the programmes:

All programmes

1. UDS should use WACWISA as a pilot project to align UDS' credit transfer system with ECTS to improve international recognition, the facilitation of credit transfer, and the enhancement of student mobility.
2. A clear communication of the UDS regulations for PhD students should be carried out with the aim to clarify responsibilities of supervision to create a more effective research environment.
3. It is recommended to prioritise the implementation of transparent documentation for audited courses which are not part of the curriculum, e.g in the Transcript of Records.
4. It is strongly recommended that UDS considers re-activating its e-learning platform to ensure flexibility, accommodate diverse learner's needs, and strengthen institutional resilience and continuity.
5. It is recommended that WACWISA strategically involves PhD students in teaching undergraduate programmes at UDS to enhance their teaching skills, contribute to the undergraduate learning experience, and further their professional development.

Master's programmes

6. The course on "Advanced Statistics and research methods" in the master's programmes "Irrigation and Drainage Engineering" and "Environmental Management and Sustainability" should be separated into distinct courses on research design and research methodologies to develop strong skills in research design, and gain a deeper understanding of various research methods.

"Irrigation and Drainage Engineering" (Master of Philosophy)

7. The importance of incorporating a deeper understanding of irrigation and drainage should be reflected in the master's curriculum "Irrigation and Drainage Engineering".

With regard to the reasons for this decision the Standing Commission refers to the attached experts' report.

EXPERTS' REPORT

ON THE STUDY PROGRAMMES

- **"IRRIGATION AND DRAINAGE ENGINEERING" (MASTER OF PHILOSOPHY)**
- **"ENVIRONMENTAL MANAGEMENT AND SUSTAINABILITY" (MASTER OF PHILOSOPHY)**
- **"ENVIRONMENTAL MANAGEMENT AND SUSTAINABILITY" (DOCTOR OF PHILOSOPHY))**

OFFERED BY UNIVERSITY FOR DEVELOPMENT STUDIES (GHANA)

Visit to the university: 23 – 26 May 2023

Panel of experts:

Prof. Dr. Bancy M. Mati	Jomo Kenyatta University of Agriculture and Technology (Kenya), Soil, Water and Environmental Engineering Department (SWEED)
Prof. Dr. Klaus Greve	University of Bonn (Germany), Faculty of Mathematics and Natural Sciences, Department of Geography
Dr. Bob Manteaw	Founder Foresight Planners Africa (Ghana) and Senior Research Fellow at University of Ghana (Centre for Climate Change and Sustainability Studies) (Labour market representative)
Johann Bredner	Student at Otto-von-Guericke Universität Magdeburg (Germany) (Student representative)

Coordinator:

Patrick Heinzer	AQAS, Cologne, Germany

Preamble

AQAS – Agency for Quality Assurance through Accreditation of Study Programmes – is an independent non-profit organisation supported by more than 90 universities, universities of applied sciences and academic associations. Since 2002, the agency has been recognised by the German Accreditation Council (GAC). It is, therefore, a notified body for the accreditation of higher education institutions and programmes in Germany.

AQAS is a full member of ENQA and also listed in the European Quality Assurance Register for Higher Education (EQAR) which confirms that our procedures comply with the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG), on which all Bologna countries agreed as a basis for internal and external quality assurance.

AQAS is an institution founded by and working for higher education institutions and academic associations. The agency is devoted to quality assurance and quality development of academic studies and higher education institutions' teaching. In line with AQAS' mission statement, the official bodies in Germany and Europe (GAC and EQAR) approved that the activities of AQAS in accreditation are neither limited to specific academic disciplines or degrees nor a particular type of higher education institution.

Accreditation procedure

This report results from the external review of the master's programme "Irrigation and Drainage Engineering" (Master of Philosophy) and "Environmental Management and Sustainability" (Master of Philosophy and Doctor of Philosophy) offered by University for Development Studies.

1. Criteria

Each programme is assessed against a set of criteria for accreditation developed by AQAS: the AQAS Criteria for Programme Accreditation (Bachelor/Master) and the AQAS Criteria for Doctoral Programme Accreditation (PhD), respectively. The criteria are based on the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) 2015. To facilitate the review each criterion features a set of indicators that can be used to demonstrate the fulfilment of the criteria. However, if single indicators are not fulfilled this does not automatically mean that a criterion is not met. The indicators need to be discussed in the context of each programme since not all indicators necessarily can be applied to every programme.

2. Approach and methodology

Initialisation

The university mandated AQAS to perform the accreditation procedure in February 2022. The university produced a Self-Evaluation Report (SER). In November 2022, the institution handed in a draft of the SER together with the relevant documentation on the programmes and an appendix and statistical data on the programmes. The appendix included e.g.:

- an overview over statistical data of the student body (e.g. number of applications, beginners, students, graduates, student dropouts),
- the CVs of the teaching staff/supervisors,
- information on student services,
- core information on the main library,
- as well as academic regulations.

AQAS checked the SER regarding completeness, comprehensibility, and transparency. The accreditation procedure was officially initialised by a decision of the AQAS Standing Commission on 5 December 2023. The final version of the SER was handed in March 2023.

Nomination of the expert panel

The composition of the panel of experts follows the stakeholder principle. Consequently, representatives from the respective disciplines, the labour market, and students are involved. Furthermore, AQAS follows the principles for the selection of experts defined by the European Consortium for Accreditation (ECA). The Standing Commission nominated the aforementioned expert panel in April 2023. AQAS informed the university about the members of the expert panel and the university did not raise any concerns against the composition of the panel.

Preparation of the site visit

Prior to the site visit, the experts reviewed the SER and submitted a short preliminary statement including open questions and potential needs for additional information. AQAS forwarded these preliminary statements to the university and to all panel members in order to increase transparency in the process and the upcoming discussions during the site visit.

Site visit

After a review of the SER, a site visit to the university took place on 23 – 26 May 2023. On site, the experts interviewed different stakeholders, e.g. the management of the higher education institution, the programme management, teaching and other staff, as well as students and graduates, in separate discussion rounds and consulted additional documentation as well as student work. The visit concluded by the presentation of the preliminary findings of the group of experts to the university's representatives.

Reporting

After the site visit had taken place, the expert group drafted the following report, assessing the fulfilment of the AQAS Criteria. The report included a recommendation to the AQAS Standing Commission. The report was sent to the university for comments.

Decision

The report, together with the comments of the university, forms the basis for the AQAS Standing Commission to take a decision regarding the accreditation of the programmes. Based on these two documents, the AQAS Standing Commission took its decision on the accreditation on 21 August 2023. AQAS forwarded the decision to the university. The university had the right to appeal against the decision or any of the imposed conditions.

In October 2023, AQAS published the report and the result of the accreditation as well as the names of the panel of experts.

General information on the university

The University for Development Studies (UDS) is a public university located in Tamale, in the northern part of Ghana, and was established in 1992 following a Ghanaian law to connect and strengthen academia and the northern community in Ghana. Starting in September 1993 with the Faculty of Agriculture, the SER states that, as of 2022, UDS has around 20,000 students and approximately 2,000 permanent staff (including academic, administrative, technical and support staff). The University states to have a practically-oriented pedagogy, research, and field-based training approach. Originally, UDS was a multi-campus university. However, according to the SER, a restructuration process was established and led to the creation of four campuses: Two campuses in the northern region (Tamale and Nyankpala Campus), one in Gbayamni (North campus), and another in Yendi (Eastern campus).

The Tamale Campus entails the School of Medicine, the School of Pharmacy and Pharmacology, the School of Nursing and Midwifery, the School of Allied Health Sciences, the School of Public Health, the Graduate School, the Faculty of Education, the Faculty of Sustainable Development Studies, the Institute for Interdisciplinary Research, the Institute of Distance and Continuing Learning, Dryland Research Institute and the Central Administration. The Nyankpala Campus currently comprises the Faculty of Natural Resources and Environment (FNRE), Faculty of Agriculture, Food and Consumer Sciences (FoACS), School of Applied Economics and Management Sciences (FAEMS), Faculty of Communication and Cultural Studies (FCCS), Faculty of Biosciences, School of Veterinary Medicine and School of Engineering (SoE) as well as the West African Centre for Water, Irrigation Drainage and Sustainable Agriculture (WACWISA).

The programmes are located at the West African Centre for Water, Irrigation Drainage and Sustainable Agriculture (WACWISA), established in 2019 under Ghanaian government funding in cooperation with the World Bank. The Centre aims to provide research, teaching and technical development in sustainability, water resource management, irrigation, agriculture and climate change mitigation. The programmes under accreditation have a staff capacity of 21 (Irrigation and Drainage Engineering) and 24 (Environmental Management and Sustainability). The Irrigation and Drainage Engineering programme includes three professors, three associate professors, two senior lecturers, two lecturers, and eleven support staff. The Environmental Management and Sustainability programmes have two professors, four associate professors, six senior lecturers, two lecturers, and ten support staff.

The SER states that the programmes which are subject to the accreditation procedure fit the UDS strategic plan regarding the innovation of new academic programmes in line with the current demands (Strategic goal 2), the improvement of research output for the community and the development of Ghana (Strategic goal 7), and the further development of the UDS quality management system (Strategic goal 8).

The funding of the programmes is determined by the Budget Committee of UDS, a board made up of deans and directors of UDS. The SER outlines that the budgets are planned and submitted to the Director of Finance at UDS at the beginning of each academic year for approval. According to the self-evaluation report, the leading indicators for budgeting are revenues generated, the type of educational programme, the faculties and the number of enrolled students. In addition, the programmes under WACWISA are funded by external funding sources.

According to the SER, WACWISA has a similar structure as schools and faculties at the UDS. WACWISA is governed by a director, assisted by a deputy, thematic area coordinators, and research team leads. In addition, the Centre is supported by an International Scientific Advisory Board (ISAB) and a Sectoral Advisory Board (SAB). It is stated that ISAB comprises international researchers with advisory services in the programme's design, and SAB consists of industry practitioners and WACWISA partners who contribute to WACWISA's Annual Implementation Plan.

The Master's programme "Irrigation and Drainage Engineering" has been introduced by the Department of Agricultural Engineering within the School of Engineering (established in 2016) and implemented the Master's programme in 2019 under the support of the WACWISA Centre. The Department offers ten additional programmes (some introduced in the academic year 2022/23).

The Master's and PhD programmes "Environmental Management and Sustainability" have been introduced by the Department of Environment and Sustainability Sciences, which is one of five departments at the Faculty of Natural Resources and Environment. The Department also runs a Bachelor's programme in "Renewable Natural Resources".

The SER states that UDS has four thematic research areas, namely Engineering and ICT (I), Natural and basic sciences (II), Social sciences and humanities (III), and health laboratory sciences (IV). Given that as a baseline, the WACWISA programmes focus on research six themes: Irrigation and Drainage Systems (1), Water Resources Management (2), Environmental Sustainability (3), Sustainable Agriculture (4), Climate Change (5), and Food and Nutrition Security (6).

Assessment of the study programmes

1. Quality of the curriculum / Aims and structure of the doctoral programme

Bachelor's/Master's degree

The intended learning outcomes of the programme are defined and available in published form. They reflect both academic and labour-market requirements and are up-to-date with relation to the relevant field. The design of the programme supports achievement of the intended learning outcomes.

The academic level of graduates corresponds to the requirements of the appropriate level of the European Qualifications Framework.

The curriculum's design is readily available and transparently formulated.

[ESG 1.2]

Doctoral degree

The intended learning outcomes of the programme are defined and available in published form. They reflect both academic and labour-market requirements and are up-to-date with relation to the relevant field. The design of the programme supports the achievement of the intended learning outcomes.

The academic level of graduates corresponds to with the requirements of the appropriate level of the national qualifications framework or the European Qualifications Framework.

The curriculum's design is readily available and transparently formulated.

[ESG 1.2]

1.1 General structure of the African Centre of Excellence WACWISA

The SER states that the composition of the intended learning outcomes (ILO) on the programme level is based on three main elements, namely theory (of the respective discipline), practice (through internships with the industry), and research (through the thesis writing).

It is explained that the programmes follow the regulations of the Ghana Tertiary Education Committee (GTEC), which state that the curricula have to build on existing knowledge and skills of students and have to broaden their knowledge and skills from their prior education. The Master's and PhD programmes under the WACWISA umbrella are designed to be practically oriented, research-focused and problem-relevant. In general, the Master's programmes are designed for first degree holders and practitioners from the respective industry and discipline. PhD students are required to take two trimesters with the Master's students in case they have not the sufficient requirements for the PhD programme. UDS is using the credit system recommended by the GTEC. UDS runs a trimester system, whereby the third trimester includes only practical training outside the

university. The SER states that practical trimester comprise eight weeks, whereas teaching trimester comprise 14 weeks. Consequently, one academic year consists of 40 weeks.

The data sheet provided with the SER provides information on the enrolment of students (differentiated in gender and in Ghanaian and international students).

This data sheet shows that the Master's programme "Irrigation and Drainage Engineering" has enrolled students since the academic year 2019/2020. Currently, there 53 students enrolled (17 Ghanaian and 36 international students with a female-male ratio of 18:35) in the Master's programme "Irrigation and Drainage Engineering".

The Master's and PhD programmes "Environmental Management and Sustainability" enrol students in the programme since the academic year 2020/21 with first graduates in April 2023. As of 2022, there are 24 students enrolled in the Master's programme (11 Ghanaian and 13 international students with a female-male ratio of 9:14) and 29 in the PhD programme (11 Ghanaian and 18 international students with a female-male ratio of 8:21).

1.2 Irrigation and Drainage Engineering (MPhil)

Description

The master's programme "Irrigation and Drainage Engineering" is a two-year programme that includes three trimesters of coursework and an internship, and five trimesters of research work. The programme is conceptualised as a 47 credit points (CP) programme. The rationale for the programme is based on a shortage of experts in the field in the sub-region. Graduates of this programme can be employed in the private sector, national and international NGOs, the Ghanaian Ministries and authorities or at teaching and research institutions.

The programme strives to provide students with skills and knowledge related to the availability of water resources and various technologies and innovations for irrigation and drainage in the African sub-region. Graduates of the programme will understand water management, irrigation and drainage problems and the ability to localise knowledge and resources. In addition, the programme strives to impart competencies for using IT technologies for the discipline.

The documentation of the programme includes a graphic overview of the master's programme that indicates the following courses:

- First trimester: "Water Resources Engineering", "Advanced Agricultural Drainage and Flood Control", "Advanced Soil Physics", "Agricultural Machinery and Land Development", "Pumps and Pumping Plants, "Irrigation Structure Construction and Civil Works", "Advanced Statistics and Research methods", and "Research seminar I".
- Second trimester: "Irrigation project planning and feasibility studies", "Crop water requirements and irrigation scheduling", "Irrigation facility management, monitoring and evaluation", "GIS modelling of irrigation and drainage systems", "Agronomy of irrigated crops", "Design of sprinkler and drip irrigation systems", and "Research seminar II".
- Third trimester: "Integrated assignment and field practical".
- Trimester 4-8: Student research work and thesis plus the research seminars III-VII plus another integrated assignment and field practical in trimester six.

The additional documentation provided with the self-evaluation report includes course descriptions. The course descriptions include information on the student workload, credits, contact hours, independent study hours, the intended learning outcomes on the course level, the course content, the teaching methods, the assessment methods, course responsibilities, and the literature used in the courses.

Experts' evaluation

The master's programme "Irrigation and Drainage Engineering" is designed to provide students with advanced knowledge and skills in water management for agriculture especially in dry environments. As the world's population grows and climate change calls for adaption, food and water resources demand has become increasingly pressing. Consequently, the efficient and sustainable use of water in agricultural practices has become a paramount concern for researchers, policymakers, and professionals working in the field.

Based on the discussions during the site visit and the self-evaluation report, the experts evaluate the effectiveness and relevance of the programme in addressing the key challenges and problems associated with irrigation and drainage engineering. It became clear that one of the significant challenges irrigation and drainage engineers face is the management of scarce water resources. With climate change exacerbating drought conditions in many regions, water availability for agriculture is increasingly limited. In addition, intensive water use in agriculture can have adverse environmental impacts, including water pollution, salinity build up or water and soil degradation. The assessment evaluates how the programme addresses these concerns by promoting sustainable irrigation and drainage practices. This includes assessing the curriculum's emphasis on water quality management, soil conservation, and integrating ecological principles into engineering solutions. The experts believe the considerations will provide insights into the strengths and areas for improvement of the master's programme "Irrigation and Drainage Engineering." The findings will serve as a basis for enhancing the curriculum, ensuring that graduates are equipped with the necessary skills and knowledge to address the challenges faced by the field and contribute to sustainable water management practices.

Based on the documentation available and the discussion during the site visit, it is evident that reforming the intended learning outcomes (ILOs) on the programme level is necessary to match the curriculum's content (**Finding 1**). This reformulation should consider the European Qualifications Framework (EQF) while emphasising the need for more discipline-specific ILOs. The experts point out that this matter refers rather to a documentation matter than a content-related matter as specified further below.

The EQF provides a comprehensive framework for comparing qualifications. It aims to promote transparency, comparability, and recognition of qualifications. As such, aligning the ILOs of the master's programme in "Irrigation and Drainage Engineering" with the EQF is essential for documenting that graduates possess the necessary skills and knowledge expected at level 7.

To initiate the reformulation process, evaluating the existing ILOs in the programme is crucial. This evaluation will help identify gaps or misalignments with the programme's scope, as stated below. It is essential to recognise that while generic skills, competencies and job perspective are valuable, there is a need to enhance the discipline-specific aspects of the ILOs to meet the unique demands of the discipline in light of the scope of the Centre.

Discipline-specific ILOs should focus on the specialised knowledge, skills, and competencies vital to success in the field. This includes a deep understanding of irrigation and drainage systems, water management principles, hydrological modelling, environmental impact assessment, and sustainable practices specific to the discipline. Graduates should also be proficient in utilising relevant software, tools, and technologies commonly employed in irrigation and drainage engineering. Furthermore, the reformulation should emphasise the development of critical thinking and problem-solving abilities within the context of the discipline. Graduates should be equipped to analyse complex issues related to irrigation and drainage engineering, propose innovative solutions, and evaluate their potential impact on the environment, society, and agriculture.

Additionally, it is vital to consider integrating multidisciplinary knowledge within the context of "Irrigation and Drainage Engineering." While discipline-specific outcomes are essential, graduates should also demonstrate an understanding of the broader aspects that intersect with the field, such as environmental sustainability,

agricultural practices, socio-economic and socio-cultural considerations. This integration will enable graduates to approach challenges holistically and make informed decisions. Engaging with faculty members, industry professionals, and stakeholders in the field throughout the reformulation process is crucial. The interactions showed that these discussions had already taken initial steps. Their expertise and input can contribute to the identification of discipline-specific ILOs that align with industry needs and expectations.

While it became evident that the programme includes these discipline-specific components in the courses, the curriculum aligns with EQF level 7; the documentation needs more clarity. The panel of experts conclude this based on discussions with the teaching staff, follow-up discussions with students and external stakeholders relevant to the programme, and examples of the final theses.

An in-depth analysis of the study programme under accreditation reveals that it possesses a solid foundation and provides a reasonable basis for course content. The curriculum has been meticulously designed, encompassing a comprehensive range of subjects essential to the field of study. Students can expect to develop a theoretical understanding and acquire practical skills relevant to their future careers. The sequence of the curriculum allows students a clear progression in terms of knowledge and competencies. The experts have also learned that students can audit additional courses without getting credits from any faculty to specialise according to their preferences. Despite the strengths of the study programme, there are areas where curriculum improvements can be made.

The field of irrigation and drainage plays a pivotal role in ensuring sustainable agriculture, efficient water management, and environmental conservation. The practice of irrigation and drainage has witnessed significant advancements and complexities in recent years. Technological innovations, changing climatic patterns, and evolving ecological concerns have necessitated a deeper understanding of these domains. The MPhil programme must adapt to this changing landscape to produce graduates who can effectively tackle emerging challenges. As the challenges in this domain continue to evolve, it becomes increasingly crucial for educational institutions to provide comprehensive and specialised programmes to equip future professionals with the necessary expertise. The experts believe that a comprehensive learning unit on climate change must be made mandatory for the MPhil programme because it plays a crucial role in the programme's scope and supports the levelling of diverse students' backgrounds (**Finding 2**).

The core objective of the master's programme "Irrigation and Drainage Engineering" is to develop professionals who can contribute meaningfully to the field (e.g. to the extent of differentiating between "Irrigation with drainage" in which irrigation inherently has drainage components, as compared to "Drainage" in which problems of waterlogging and poorly drained lands are tackled more specifically and at advanced levels). By expanding their expertise in irrigation and drainage, students can gain a more comprehensive understanding of the subject matter, enabling them to devise innovative solutions and contribute to sustainable water management practices. Introducing specialised elective courses within the master's programme can allow students to delve deeper into specific areas of irrigation and drainage that align with their interests and career aspirations. These electives will give students a broader skill set, enhancing their career adaptability and employability. Consequently, the experts highlight the significance of incorporating a deeper understanding of irrigation and drainage within the master's programme's "Irrigation and Drainage Engineering" curriculum and advocate for including elective courses to enrich the curriculum (**Finding 3**).

One way to address this might be, as being practised at some universities in Europe, where universities provide a curriculum structure known as the "Y-model". Firstly, this model implies that the initial semesters of a degree programme focus on building foundational knowledge, allowing students to make informed decisions regarding their specialisation later in the programme. During the initial stages, students undergo collective training, with the field occurring in the later stages of the programme.

The curriculum submitted to the panel of experts shows that research competencies are taught within one course in the first trimester, namely “Advanced Statistics and research methods”. It has been discussed that the content of this course focuses on research design. The experts believe that the division of that research course into separate courses on research design and research methodologies can bring numerous benefits to students because, while research design and research methodologies are closely related, they represent distinct areas of study that require particular attention and focus. Separating these courses will enable students to delve deeper into both areas. Research design primarily focuses on a research study’s overall structure, framework, and planning. It involves determining research questions, hypotheses, variables, sampling techniques, data collection methods, and ethical considerations. By dedicating a course solely to research design, students can develop strong conceptual foundations and gain the necessary skills to design robust research studies, while research methodologies, on the other hand, deal with the specific techniques, tools, and procedures employed to collect and analyse data. This includes quantitative and qualitative methods, statistical analysis, data interpretation, and data presentation. By separating research methodologies into their course, students can develop a deeper understanding of various research methods, learn how to select the most appropriate method for their research questions and develop proficiency in applying these methods. Therefore, the experts recommend a separation of the course further develop research and equip students with solid skills on this matter (**Finding 4**).

The programme documentation provided to the experts includes course descriptions with intended learning outcomes on the course level, the workload according to the Ghanaian credit system, literature suggestions, and course responsibilities. This creates reliability and transparency for students.

The University for Development Studies (UDS) deserves commendation for its unique trimester system, which sets it apart from traditional academic models in Ghana. This innovative approach not only offers students a comprehensive educational experience but also provides them with exceptional internship opportunities with regional and international industry partners. UDS stands out as an institution that balances theoretical and practical learning and equips its students with the skills needed for success in the real world. This promotes grounding the students in realities of the regional catchment of UDS and especially rural livelihoods, and enables students to explore various courses, facilitating academic and professional growth. The general structure allows 14 weeks for the first two trimesters and eight weeks for the third trimester. One of the most notable advantages of UDS’s trimester system is the range of internship opportunities it offers to students. These internships provide invaluable practical skill development, allowing students to apply their theoretical knowledge and acquire essential problem-solving abilities, critical thinking skills, and professional competencies. This industry exposure nurtures a well-rounded educational experience and equips WACWISA graduates with a competitive edge in the job market. Through strong partnerships with regional industry partners, UDS students can gain hands-on experience in real-world settings. In addition, international students have done internships and research projects in their home countries.

On the one hand, the regional contacts support UDS’s mission to be a valuable asset for northern Ghana. On the other hand, international industry partners strengthen WACWISA’s visibility and raise the centre’s importance beyond the Ghanaian borders. The external partners opined that it would be opportune for UDS to develop a programme for the students to join the farms or companies when meaningful activities were ongoing as sometimes, the arrival of the students coincided with the wrong season in the crop/ activity calendar. Consequently, it is necessary to draft a course description with intended learning outcomes on the courses level for the internship that outlines the programme’s core competencies (**Finding 5**). In addition, internship guidelines should be drafted as outlined below (**see Chapter IV.3**).

Conclusion

The criterion is partially fulfilled.

1.3 Environmental Management and Sustainability (MPhil)

Description

The Master's programme "Environmental Management and Sustainability" is a two-year programme with compulsory courses in the first year of the programme. The programme leads to a Master of Philosophy degree. The programme's structure includes compulsory courses in trimester one and trimester two and an internship in trimester three. After that students have to take the research proposal seminar 1 and 2 in trimester one and two of the second year, and the MPhil thesis in the last trimester of the programme.

The programme's rationale is based on Africa's Agenda 2063 that includes the sustainable use of its resources. The programme strives to equip students with knowledge, skills and competencies in the transdisciplinary field of environmental management and sustainability. It is explained that the curriculum is also aligned with Ghana's long-term development plan (2018-2057) focusing on further developing of the society whilst protecting the environment. Graduates of the programme are likely to work in governmental ministries, NGOs, community-based organisations, and nature conservation projects.

An overview of the courses of the Master's programme reads as follows:

- First trimester: "Air, Soil and Water Pollution", "Spatial Data Capture and Analysis", "Environmental Assessment and Analysis", "Application of Sustainability Science", Advanced Research Design and Instrumentation", "Ecosystem-based management of natural resources", "Environmental Entrepreneurship", "The Urban Environment", "Climate Change and Sustainability", and "Population dynamics and environment"
- Second trimester: "Advanced environment and resource economics", "Advanced statistical analysis", "Sustainability, environmental law and policy", "Ethics for environment and sustainability studies", "Environmental modelling", "Integrated water resources management", "Integrated waste management", "Sustainable Forest resource management", "Environmental governance", and "Environmental health and safety".
- Third trimester: "Industrial attachment".
- Trimester 4-6: "Seminar I (Research proposal)", "Seminar II (Results seminar)", and Master's thesis.

Course descriptions of the master's programme "Environmental Management and Sustainability" have been submitted to the experts as annexes. The course descriptions include information on the student workload, credits, contact hours, independent study hours, the intended learning outcomes on the course level, the course content, the teaching methods, the assessment methods, course responsibilities, and the literature used in the courses.

Experts' evaluation

The urgent need to address environmental challenges and foster sustainable development has become increasingly apparent in today's rapidly changing world. Sub-Saharan Africa, a region rich in natural resources and diverse ecosystems, faces numerous environmental issues that demand effective management strategies and sustainable practices. The regional environment of UDS, characterised by its ecological diversity and environmental vulnerability, requires a curriculum that reflects the region's unique challenges and opportunities. Deforestation, climate change, biodiversity loss, water scarcity, and land degradation demand tailored approaches and locally relevant solutions are included in the programme's scope. In response to this pressing demand, WACWISA has developed a master's programme, "Environmental Management and Sustainability", to equip students with the knowledge and skills necessary to tackle these complex environmental issues. From the expert's perspective, this robust curriculum is fundamental to the programme's success. It balances theoretical knowledge and practical application, enabling students to develop a deep understanding of environmental concepts while equipping them with the skills necessary to address real-world challenges. Moreover,

the curriculum is responsive to emerging trends and innovations in the field, ensuring that graduates remain at the forefront of sustainable practices and policy developments.

Similar to the master's programme "Irrigation and Drainage Engineering", and after reviewing the available documentation and conducting discussions during the site visit, it is clear that a re-evaluation of the intended learning outcomes (ILOs) on the programme level is necessary (**Finding 6**). This re-evaluation should consider the European Qualifications Framework (EQF) on level 7 while placing a stronger emphasis on discipline-specific ILOs. The experts have seen that the current ILOs provide a solid basis for learning outcomes on which the department may build on the reformulation. However, it is essential to identify misalignments with the programme's scope. While generic skills, competencies, and job prospects are valuable, there is a need to enhance the discipline-specific aspects of the ILOs to meet the unique demands of "Environmental Management and Sustainability." Discipline-specific ILOs must concentrate on specialised knowledge, skills, and competencies crucial for success in the field. This includes a comprehensive understanding of environmental management principles, sustainable practices, ecosystem conservation, climate change mitigation and adaptation, policy analysis, and impact assessment. Graduates should also be proficient in utilising relevant tools, methodologies, and technologies commonly employed in environmental management and sustainability. However, it is currently unclear from the documentation how these discipline-specific components are explicitly incorporated into the programme.

Despite that fact, the analysis of the documentation submitted to the experts and the follow-up discussion showed that the curriculum composition is meaningful and addresses regional issues to a reasonable amount. This is based on the fact that the department, the centre, and the industry are aligned so that the curriculum addresses the needs of the discipline. The experts have verified the academic level of the programme through examinations of the final theses and examination projects during the site visit. The follow-up discussion with teaching staff and students as a double check has confirmed this impression. However, some minor adjustments should be considered in the curriculum's composition.

The experts have understood that the current curriculum tackles the topicality of climate change in many cases on a smaller scale in the courses. However, the experts believe that in recent years, climate change has emerged as one of the most significant global challenges of our time. Its far-reaching impacts extend across various sectors, including the environment, economy, public health, and social well-being. As such, it is imperative that WACWISA incorporates climate change as a distinct and explicit course within the curriculum rather than dispersing the topic across multiple courses because it is a complex and multifaceted subject that requires in-depth exploration to comprehend its causes, consequences, and potential solutions fully. By offering a dedicated course, students can learn about the intricacies of climate science, climate policy, mitigation strategies, adaptation measures, and the ethical and social dimensions of this global challenge. The experts also believe organisational synergies are possible when establishing the course (**see Finding 2**).

As outlined above, the experts have detected similarities concerning the research course. The master's curriculum "Environmental Management and Sustainability" includes a "Advanced Research Design and Instrumentation" course as presented in the documentation submitted to the panel. The discussion showed the opportunity of dividing the research course into two separate courses focusing on research design and methodologies. This conclusion does not assume that current research practices are carried out insufficiently. Still, the experts believe that the Centre can focus stronger on establishing those competencies to use the centre's full potential (**see Finding 4**).

Overall, the programme documentation includes course descriptions with intended learning outcomes on the course level, the credits assigned to the courses, the teaching and assessment methods, course coordinators, and literature suggestions for the course. These descriptions serve as a valuable source of information which creates reliability and transparency.

The system of UDS foresees a trimester system, which can be seen as an USP of the university. While undergraduate students use the third trimester as community outreach project, the master's programme "Environmental Management and Sustainability" expands from that and allows students to either take internship with partners in the region or beyond. This is a valuable transition in the curriculum's sequence that combines theory and practice. However, a clear description will shift the ownership to the department/centre, and will consequently strengthen the position of the centre in the region (**see Finding 5**).

Conclusion

The criterion is partially fulfilled.

1.4 Environmental Management and Sustainability (PhD)

Description

The PhD programme "Environmental Management and Sustainability" is a three-year programme that is based on two trimesters of coursework, one trimester of an industrial attachment, and six trimesters of research work. The programme is conceptualised to build on the master's programme "Environmental Management and Sustainability" knowledge, skills and competencies. However, the current version does not specify on the intended learning outcomes on the programme level.

An overview of the courses of the PhD programme reads as follows:

- First trimester: "Advanced pollution control", "Advanced remote sensing and GIS", "Socio-ecological systems analysis", "Sustainable energy", "Environmental sustainability and the extractive industry", "Governance for environmental sustainability", and "Management and evaluation for environmental sustainability".
- Second trimester: "Current issues in environmental management and sustainability", "Advanced research methods", "Advanced environmental economics", "Disaster preparedness and risk management", "Gender dimensions and environmental sustainability", "Restoration of degraded ecosystems", and "Advanced environmental modelling".
- Third trimester: Industry attachment.
- Trimester IV-IX: Seminar I-IV, and PhD thesis.

The current version of the SER includes the course descriptions for all courses of the PhD programme. The course descriptions include the course title, course code, the student workload, credits, an indication of the type of course, the intended learning outcomes on the course level, the course content, the teaching methods, the assessment methods, and reading suggestions.

Experts' evaluation

The PhD programme "Environmental Management and Sustainability" is an academic endeavour that provides students with a comprehensive and rigorous education in the field. With its diverse and interdisciplinary approach, dedicated faculty, and research opportunities relevant to the Sub-Saharan region, this programme stands out as a good choice for aspiring scholars and researchers in environmental management and sustainability.

Curriculum establishment is a crucial factor in evaluating the quality and effectiveness of educational programmes. The experts have jointly discussed with the programme's head and responsible teaching staff how the programme will be more robust for the upcoming challenges. It became evident that the PhD curriculum "Environmental Management and Sustainability" demonstrates a more elaborated curriculum with specialised PhD courses is already established in the curriculum. These courses are designed to equip doctoral students

with the necessary knowledge and skills for advanced research and scholarly pursuits. They often cover advanced topics of the curriculum of the master's programme, such as advanced environmental economics, advanced remote sensing and GIS, or advanced environmental modelling. The presence of such courses indicates a solid curriculum that caters to the unique needs of PhD students.

Consequently, based on the on-site assessment, it became clear that the PhD programme "Environmental Management and Sustainability" offers a sound curriculum encompassing various topics crucial to the field. From environmental policy and governance to sustainable resource management and climate change adaptation, students are equipped with a holistic understanding of our complex environmental challenges. The curriculum balances theoretical knowledge and practical application, preparing students to contribute meaningfully to the field upon graduation. However, this came to light only when discussing the curriculum with the relevant stakeholders. Similar to the other programmes and to ensure the effectiveness and relevance of the PhD programme "Environmental Management and Sustainability", it is crucial to reformulate the intended learning outcomes at the programme level to align with level 8 of the European Qualifications Framework (EQF) (**Finding 7**). This alignment will provide the programme's leadership with a comprehensive framework that enables them to manoeuvre the programme in a highly effective and informed manner.

By adopting level 8 of the EQF, the PhD programme can establish a clear set of learning outcomes that reflect the advanced skills, knowledge, and competencies expected at the doctoral level. By doing so, it will provide a standardised and internationally recognised benchmark. This will enhance the credibility and reputation of the PhD programme, making it more attractive to prospective students, researchers, and potential collaborators. Additionally, aligning with level 8 of the EQF will enable the programme's leadership to effectively navigate the complex landscape of environmental management and sustainability research and practice. Level 8 represents the highest level of academic achievement, characterised by the ability to generate new knowledge, contribute to the advancement of the field, and demonstrate a high level of autonomy and critical thinking. By reformulating the intended learning outcomes to reflect level 8, the programme's leadership can ensure that the programme provides students with the necessary skills and competencies to conduct independent and original research, engage in interdisciplinary collaboration, critically analyse complex environmental challenges, and develop innovative solutions. This alignment will also facilitate the integration of relevant ethical, social, and sustainability considerations into students' research and practice, promoting responsible environmental stewardship.

The PhD programme includes rigorous research and dissertation requirements, and the "Environmental Management and Sustainability" programme emphasises the importance of original research and scholarly contributions by requiring students to undertake a substantial doctoral dissertation. This process enables students to delve deeply into a specific research area, contribute to the existing knowledge base, and demonstrate their expertise in the field. These research requirements signify a curriculum that values scholarly pursuits and academic excellence. The experts confirm that the programme's content aligns with level 8 of the European Qualifications Framework, although the documentation issue is outlined above.

Concerning the curriculum, one of the programme's strengths lies in its interdisciplinary approach. Recognising the inherently interconnected nature of environmental issues, the programme encourages collaboration across various disciplines, such as ecology, economics, sociology, and public policy. This interdisciplinary perspective fosters a more holistic understanding of environmental management and sustainability, allowing students to develop innovative solutions considering social, economic, and ecological factors in the sub-Saharan region. Furthermore, the programme adheres to the trimester structure, which is unique at UDS. Consequently, the programme provides abundant research opportunities that enable students to delve deeply into their areas of interest. In addition to rigorous academic training, the programme emphasises developing professional skills necessary for environmental management and sustainability success. Students have access to various professional development opportunities, including workshops, seminars, and conferences, where they can

enhance their presentation, communication, and leadership skills. Moreover, the programme facilitates networking with professionals and organisations in the environmental sector, providing valuable connections and potential career opportunities.

The programme focuses explicitly on sustainability and climate change factors. This has been pointed out during the site visit as the driving factor for the centre and the programme. Currently, the topicality of climate change is implicit in many courses. Including a standalone course on climate change within the PhD programme "Environmental Management and Sustainability" offers several distinct benefits that may not be fully achieved by incorporating the topic implicitly into all courses to a lower extent, e.g., allowing for a concentrated and in-depth exploration of the subject matter. As discussed jointly during the site visit, climate change is inherently interdisciplinary, encompassing aspects of environmental science, policy, economics, sociology, and more. By offering a dedicated course, the PhD programme can bring together experts from various disciplines to provide a comprehensive and integrated understanding of climate change. Students can benefit from diverse perspectives, methodologies, and research findings, fostering a holistic approach to addressing climate change challenges in their research. Therefore, the experts believe that it is important to implement an advanced PhD course on climate change as a standalone course (**Finding 8**).

During the site visit, it became evident that the PhD programme aligns with the labour market requirements. The programme keeps pace with current developments by regularly incorporating the latest advancements and trends in the respective field. This adaptability ensures graduates possess the necessary skills and knowledge to thrive in academia and the labour market. The experts analysed the appropriateness of the programme's identity, supported by various forms of evidence, including evaluations, graduate surveys, and feedback from the labour market. These feedback mechanisms provide valuable insights into the programme's effectiveness, allowing for continuous improvement and enhancement of its curriculum.

The curricular structure of the PhD programme provides comprehensive support for achieving the intended learning outcomes and facilitates learners' progression. The programme offers a well-defined time plan with key milestones, allowing students to navigate their doctoral research with orientation and guidance throughout their studies. The curriculum's structure as such includes subject-specific and cross-subject knowledge. The discussion on the curriculum and the evidence shown during the site visit showed, for instance, that the curriculum encompasses aspects of environmental policy and governance or sustainable resource management on the side of subject-specific knowledge and encourages PhD students for systematic thinking, sustainable development application or the application of environmental ethics as cross-subject knowledge.

However, the experts' panel has detected some points that need to be addressed effectively to improve the programme's quality:

Similar to the outlined points raised concerning the programmes assessed in this cluster, the course description of the internship is crucial for the programme (**see Finding 5**). The fact that the UDS is recognised as an African Centre of Excellence further reinforces the relevance of a well-described internship course for the PhD programme. The WACWISA's reputation suggests that it has the expertise, resources, and commitment to provide high-quality education and training in environmental management and sustainability. The internship course can be viewed as a reflection of the institution's dedication to practical learning and preparing students for real-world challenges, which aligns with the goals of a PhD programme. The experts do not doubt that, currently, internships are of the highest relevance for the programme. However, the discussion showed that the scope of the internship shifted lately and became more international (instead of regional). Therefore, the experts argue that a well-described scope of the internship with clear intended learning outcomes which are to be gained will ensure that the internship will be in the future an aspect of utmost importance for the students.

In conclusion, the PhD programme "Environmental Management and Sustainability" curriculum exhibits good quality, offering a comprehensive range of interdisciplinary courses and research opportunities. It equips

students with the necessary knowledge, skills, and practical experiences to address complex environmental challenges. The programme's commitment to staying updated and relevant ensures that students receive a robust environmental management and sustainability education.

Conclusion

The criterion is partially fulfilled.

2. Procedures for quality assurance

Bachelor's/Master's degree

The programme is subject to the higher education institution's policy and associated procedures for quality assurance, including procedures for the design, approval, monitoring, and revision of the programmes.

A quality-oriented culture, focusing on continuous quality enhancement, is in place. This includes regular feedback mechanisms involving both internal and external stakeholders.

The strategy, policies, and procedures have a formal status and are made available in published form to all those concerned. They also include roles for students and other stakeholders.

Data is collected from relevant sources and stakeholders, analysed, and used for the effective management and continuous enhancement of the programme.

[ESG 1.1, 1.7 & 1.9]

Doctoral degree

The programme is subject to the higher education institution's policy and associated procedures for quality assurance, including procedures for the design, approval, monitoring, and revision of the programmes.

A quality-oriented culture, focusing on continuous quality enhancement, is in place. This includes regular feedback mechanisms involving both internal and external stakeholders.

The strategy, policies, and procedures have a formal status and are made available in published form to all those concerned. They also include roles for students and other stakeholders.

Data is collected from relevant sources and stakeholders, analysed, and used for the effective management and continuous enhancement of the programme.

[ESG 1.1, 1.7 & 1.9]

Description

UDS' quality assurance system is based on a quality assurance policy that defines the processes and tasks of the Directorate of Academic Planning and Quality Assurance (DAPQA). The current version of the SER includes the current version of the policy. It states that the core objectives of DAPQA include the quality of graduates of UDS programmes aligned with the stakeholders' expectations, a high staff output, the facilitation of a conductive teaching and learning environment, and safeguarding mechanisms for the UDS governance.

The quality assurance policy states that the quality assurance unit (QAU) was established in 2008 under the Vice Chancellor's office. Their task is to fulfil the requirements outlined by the National Accreditation Board (NAB). In 2011, the QAU was changed to the Academic Quality Assurance Unit (AQAU) and further developed into the Directorate of Academic Quality Assurance (DAQA) in February 2014, later than DAPQA.

The quality assurance policy regulates compliance with the National Council for Tertiary Education (NCTE) and the NAB accreditation requirements, the formal admission conditions and requirements, recruitment procedures, stipulations concerning the quality course contents, structure and assessment, and the examination regulations. The quality assurance policy also includes:

- student feedback,
- instruments for staff performance appraisal (academic and non-academic),

- compliance instruments with the Code of Conduct of staff and students,
- curriculum updating mechanisms, and
- the alignment of teaching methods with the courses.

The UDS policy defines the scope of the QA system on four levels (Teaching and learning, research, community service, and support services). Regarding the teaching and learning level, the QA policy specifies that a periodic review of the teaching should be carried out to ensure the alignment of the ILOs on the course level and the teaching process, the availability of human, material and financial resources, and the involvement of external stakeholders. This review should be run at least every five years. The focus on research activities includes monitoring the relevance of research priorities, the adequacy of financial allocations to activities, the proper structuring of research projects, the adequacy of research outputs, the effectiveness of the dissemination of research outputs, and the integration of research outputs into teaching and learning. The community outreach activities are monitored and evaluated by the UDS staff and students with a particular focus on the relevance of the projects, the quality of the outputs, and the assessment of the overall impact of UDS' community outreach projects. The support services at UDS are monitored and evaluated within the QA instruments by focusing on the academic and social counselling services, the teaching and learning infrastructure, health and recreational facilities, the career advisory services, and the alike. To focus on the current working conditions at UDS, the DAPQA carries out staff satisfaction surveys. These aim to detect necessary interventions and are discussed at the units' level and the university level. The implementation of improvement strategies is monitored by the DAPQA and reported to the Vice-rectorate at UDS. Being one of the pillars of the QA scope of UDS, community outreach surveys are administered by DAPQA to determine UDS' social acceptability.

The institutional audits focus on the administrative and governance organs of UDS, while programme reviews focus on the relevance and effectiveness of the programmes. DAPQA organises internal audits every five years with three team members (two people within UDS but outside the respective programme and one from a comparable programme). The results (including observations) are then discussed between DAPQA and the Vice-rectorate. DAPQA follows up on the implementation of agreed steps. The external institutional and programme reviews are arranged every five years. This includes a five-person team of external reviewers (at least three from outside Ghana).

The implementation strategies include a student satisfaction survey, an employer satisfaction survey, an alumni satisfaction survey, a staff satisfaction survey, a community perception survey, internal institutional audit and programme reviews, external institutional audits and programme reviews, improvement plans, and programme accreditation procedures. Institutional key performance indicators are composed based on this information, focusing on student progression and success rates, graduates' employability, satisfaction, teachers' effectiveness, student profiles, and improvement on learning resources.

According to the QA policy, the student satisfaction surveys strive to allow students' feedback on the individual courses and the study programme. The policy includes that DAPQA collects, analyses, and disseminates the results to teaching units and staff. As a result, strategies for specific problem areas are formulated and implemented into the programmes. On the university level, UDS collects employer satisfaction surveys every five years. However, the specific programme units may collect that more frequently. The alumni satisfaction survey is seen as valuable information for curricula enhancements and reviews. The policy states that alumni should be contacted three years after graduation. Usually, the alumni satisfaction and the employer satisfaction survey are carried out jointly every five years. However, the programme's units may carry out this activity more frequently.

All information is collected and summarised for stakeholders for the programme enhancements. This information includes year-on-year data on application, data on drop-out rates, retentions and graduates, industry feedback, student and alumni feedback.

Experts' evaluation

The West African Centre for Water, Irrigation and Sustainable Agriculture (WACWISA) demonstrates a commitment to quality assurance, ensuring adherence to the university's policies and associated procedures. These evaluation tools provide, in general, valuable insights into the effectiveness of the programmes, enabling continuous improvement and refinement. During the site visit, the experts discussed with the relevant stakeholders at UDS the effectiveness of the quality assurance instruments at UDS and their application to the programmes at WACWISA.

The responsibilities and targets set within the WACWISA programmes are defined and appropriate for monitoring and revising the programmes. The availability of clear responsibilities for the administration and quality assurance of the doctoral programme, such as the doctoral board, doctoral commission, examination board, coordination, advisory board, and executive board, establishes a solid framework for the successful completion of postgraduate studies. It became evident that UDS' quality assurance system is based on a quality assurance policy that outlines the processes and tasks of the Directorate of Academic Planning and Quality Assurance (DAPQA). The approach emphasises the core objectives of DAPQA, such as ensuring the quality of graduates, maintaining a conducive teaching and learning environment, and implementing governance mechanisms. The policy also regulates compliance with accreditation requirements and admission conditions, recruitment procedures, course contents, structure and assessment, and examination regulations.

Additionally, it includes provisions for student feedback, staff performance appraisal, code of conduct compliance, curriculum updating, and alignment of teaching methods. The QA system at UDS is designed to cover various aspects, including teaching and learning, research, community service, and support services. It specifies the need for periodic reviews to align intended learning outcomes with teaching processes, involves external stakeholders, and ensure resource availability. The system also monitors research relevance, funding allocation, output dissemination, and integration into teaching and learning. Community outreach projects and support services are evaluated based on relevance, quality, and impact. To address working conditions, staff satisfaction surveys are conducted by DAPQA to identify necessary interventions. Improvement strategies are monitored and reported to the Vice-rectorate. Community outreach surveys are administered to assess UDS' social acceptability.

Even though UDS' QA policy addresses most of the relevant points of a quality assurance instrument, which is to be expected, some points still need to be improved to connect the WACWISA centre (a hallmark project in the region) and the QA instruments. In quality management, the PDCA (Plan-Do-Check-Act) cycle stands as a fundamental tool for continuous improvement. Its cyclical nature suggests a closed loop, where higher education institutions analyse their processes, identify areas of improvement, and implement changes. It became evident that the PDCA cycle remains incomplete for the programmes under accreditation, with a significant oversight in the analysis of quality assurance results. This crucial step, which holds the key to refining operations and achieving excellence, is underrepresented. The discussions showed that UDS and, consequently, WACWISA programmes prioritise the initial three stages of the PDCA cycle. Unfortunately, neglecting this crucial step prevents higher education institutions from reaping the full benefits of the PDCA cycle and inhibits their ability to achieve sustainable improvements. To address the incomplete loop of the PDCA cycle, UDS must prioritise the analysis phase. This involves allocating dedicated resources (time and people) for WACWISA and fostering a culture that values data-driven decision-making. By integrating comprehensive analysis, organisations can close the loop and create an accurate continuous improvement framework, amplifying their ability to adapt, innovate, and deliver exceptional quality. Consequently, the results have to be shared with internal and external stakeholders to increase the visible relevance of QA actions (**Finding 9**).

As stated above, the documentation submitted to the experts showed several relevant instruments that collect data for the student's progression, and monitoring and tracking the academic progression of students is crucial

for educational institutions and programmes in general and UDS in particular. The statistical data on students' progression is systematically collected. This data provides valuable insights into student composition and exam performance. However, in the context of the West African Centre for Water, Irrigation and Sustainable Agriculture (WACWISA) project, it is essential to obtain accurate information about the average study lengths of students (**Finding 10**). Eliciting average study lengths will allow the WACWISA team to gather comprehensive data regarding the duration of students' academic programmes. This information clearly explains the time students typically spend on their studies, including potential variations. Without this data, it becomes challenging to assess student progression accurately, set realistic expectations, and design appropriate interventions or support mechanisms. In addition, eliciting average study lengths enables the WACWISA team to identify programme stages where students encounter difficulties or experience delays. This knowledge empowers the team to implement proactive measures, such as targeted support programs, mentoring initiatives, or curriculum adjustments, to address the identified issues and enhance student progression. Without this data, the team's ability to identify and intervene promptly is compromised.

The programmes demonstrate commitment to continuous improvement by actively incorporating feedback from internal and external stakeholders. These stakeholders, including students, student advisory bodies/groups, labour market representatives, and alumni, play an integral role in the quality assurance process. Their feedback is collected through well-structured mechanisms, and evaluation results are efficiently shared with teaching staff and students, fostering a transparent and collaborative environment. WACWISA recognises the importance of understanding labour market requirements and collects information from various sources. By doing so, the programmes ensure that its graduates are equipped with the necessary skills and knowledge the industry demands. The programme's commitment to monitoring graduates' employment sectors and tracking their further studies demonstrates a proactive approach to staying abreast of labour market trends and the needs of future graduates.

Academic integrity and preventing academic fraud are of utmost importance within WACWISA. UDS has established robust procedures to safeguard academic integrity, and the university has passed a code of good scientific conduct. These quality assurance policies effectively support the prevention of academic misconduct, intolerance, and discrimination, fostering an inclusive and respectful educational environment. The most common tool is the TurnIt software provided by the UDS library. In addition, the discussion showed that it might be beneficial to consider different instruments as artificial intelligence tools arise.

UDS uses the Ghanaian credit transfer system, which is logical. However, as the landscape of higher education continues to globalise, it becomes increasingly essential for Ghana to align and compare its credit transfer system with internationally recognised frameworks. Considering a comparing matrix to the European Credit Transfer and Accumulation System (ECTS) holds significant merit. By aligning the Ghanaian credit transfer system with the ECTS, UDS can enhance their international recognition and appeal to domestic and international students. ECTS, widely adopted across European countries, is a trusted credit transfer and accumulation standard. Embracing this system would ensure that Ghanaian qualifications are better understood and accepted worldwide, fostering academic mobility and promoting collaboration with international institutions. In addition, comparability to ECTS would greatly facilitate student mobility easier access to European Master's programmes. It would enable seamless transfer of credits between institutions, allowing students to pursue educational opportunities at different universities without losing progress or repeating coursework. Ghanaian students would also find it easier to participate in exchange programmes and pursue study abroad opportunities, making their educational journeys more diverse and enriching, which leads to stronger cooperation with European higher education institutions. This alignment encompasses not only credit transfer but also quality assurance mechanisms. Aligning the Ghanaian credit transfer system with ECTS would necessitate the further development and implementation of additional quality assurance practices, such as learning outcomes, workload measurement, and assessment criteria (**Finding 11**).

Conclusion

The criterion is partially fulfilled.

3. Learning, teaching and assessment of students / Learning and assessment of students

Bachelor's/Master's degree

The delivery of material encourages students to take an active role in the learning process.

Students are assessed using accessible criteria, regulations, and procedures, which are made readily available to all participants and which are applied consistently.

Assessment procedures are designed to measure the achievement of the intended learning outcomes.

[ESG 1.3]

Doctoral degree

The form of supervision and/or course structure is adequate and corresponds with the intended learning outcomes.

Students are assessed using accessible criteria, regulations, and procedures, which are made readily available to all participants and which are applied consistently.

Assessment procedures are designed to measure the achievement of the intended learning outcomes.

[ESG 1.3]

Description

According to the SER the teaching and learning methods used in the programmes include classroom -face to face- learning, assignments, seminars, online teaching, assignments and seminars.

The mode of assessment of students are said to be captured in students' handbooks and other prescribed guidelines of the University and GTEC. Entry requirements, part time etc., sandwich programmes and online systems shall help students with special needs, nursing mothers, pregnant students, etc.`

The assessment methods are written and oral exams, quizzes, assignments, and presentations. Online exams are said to be carried out since the start of COVID epidemics to allow students to work off campus where possible.

PhD programme: The dissertation/thesis of the PhD candidate is submitted to Graduate School by the Head of Department. Each PhD thesis is assessed by one internal and two external examiners. The external examiners are recommended by the Department and appointed by the Registrar on the advice of the Board of Graduate School. All the examiners (i.e., the internal and external) must pass the thesis, to enable the candidate to do the oral defence of the thesis (viva voce). The candidate is made to present his/her work in 45 minutes, after which he/she responds to questions from the examination panel. Each panel member scores the presentation on the scale 0 - 100%. Based on consensus, the candidate is given some time to work on corrections and get these approved by the internal examiner before the final binding and submission of the thesis to the department. The grading system is as follows: A+ = 80-100 %; A = 70-79 %; B+ = 65-69 %; B = 60-64; F = below 60 % (NB: F is Fail).

A timetable for the examination periods is available at the beginning of the academic year. Particular examination dates are scheduled at least two weeks to the date of the exam and displayed on notice boards; retakes and resits of exams are possible. Examination procedures are spelt out in the examination rules and handouts. Thesis defence or *viva voce* are organised at least twice a year to enable students who have passed their thesis assessment by external and internal assessors to do their oral examination for final scoring and preparing them to graduate.

The formal procedure for student appeals is outlined in the University's Junior Members Regulation and Handbook which is available to every student. According to the SER there is also a sexual harassment policy, with provisions for reporting cases of sexual harassment in the University. An online grievance complaint and feedback system shall also offer students the opportunity to obtain guidance, counselling and other information support. The General Examination Rules and Regulations handbook provide to students the right to query how their scripts are marked.

Experts' evaluation

The learning and teaching methods implemented in the master's and PhD programmes contribute significantly to a student-centred learning environment. The programmes emphasise practical application and experiential learning, allowing students to engage actively in their education. Hands-on exercises complement lectures, case studies that will enable students to apply theoretical knowledge to real-world situations, and fieldwork (in the third trimester). This approach considers the diverse needs of students and enables flexible learning paths.

The programmes prioritise the transfer of knowledge to situations outside the university context. Learning and teaching methods are designed to integrate theoretical and practical aspects. Students are exposed to real-world challenges and encouraged to apply their knowledge through fieldwork, internships, and collaborative projects. Assessment formats, such as case studies and project-based assignments, facilitate interlacing theoretical concepts with practical applications.

The experts have understood that due to the different backgrounds of WACWISA students and prior experiences from various higher education systems, there is an increasing need to establish transparent regulations that provide students with a higher level of transparency in their studies. Transparent regulations empower students and foster a culture of trust, accountability, and fairness within educational institutions. By ensuring clear guidelines, accessible information, and open communication channels, transparent regulations can significantly enhance the educational experience and support students in achieving their academic goals. After having analysed several regulations of UDS, the panel of experts confirms that many regulations are in place. However, the whole picture revealed that some regulations have to be adjusted to fully exploit the potential of the WACWISA programmes, while others are fit for purpose as they are.

The assessment regulations and procedures are generally defined and accessible to students. Examination requirements, including grading scales, are transparently communicated to ensure students understand the expectations. The responsibilities for organising exams are clearly outlined and made available to students. Timelines for exams are communicated in advance, allowing students to prepare adequately. Beyond that, the experts have learned that there is room for flexibility to cater for the specific needs of WACWISA students, e.g. because international students need more flexible examination timetables.

PhD candidates are provided with transparent information regarding examination procedures and the different modes of completing the programme. Students have the choice between monographs or cumulative dissertations. However, it was stated that the trend is towards cumulative dissertations. The timescale for publications and status are also communicated transparently to ensure clarity throughout the doctoral journey. When choosing the cumulative dissertation, the rule for PhD programmes states that at least two articles must be published in SCOPUS-indexed journals before allowing PhD students to defend their PhD thesis. The experts acknowledge that but want to express that the acceptance of an article might be sufficient in practice because it may cause delays when waiting for the publication of the article.

In this regard, clear and transparent supervision of PhD students is crucial for the success and effectiveness of PhD programmes. The role of supervisors in guiding, supporting, and mentoring doctoral candidates is pivotal in ensuring that students receive the necessary guidance, resources, and feedback to complete their research and achieve academic excellence. The experts have learned during the site visit that the theoretical

framework of master's and PhD supervision is set, but occasionally the practice might be different, especially for PhD students. In general, PhD programmes are long and intensive journeys that require students to navigate complex research processes. Clear and transparent supervision provides students with guidance and direction, sets goals, and allows them to progress in their research. Supervisors play a vital role in helping students define research questions, develop research plans, and establish milestones, ensuring they remain focused and motivated throughout their doctoral studies. Also, from a QA perspective, apparent supervision helps maintain high-quality standards in research. Supervisors provide valuable insights, expertise, and critical feedback that ensure students' work's rigour, relevance, and originality. Supervisors help students refine their research methodologies, enhance their analytical skills, and produce high-quality research outcomes through regular discussions, review of research outputs, and constructive criticism. The discussion showed that in the past, the communication between PhD students and first and second supervisors was nurtured by the close contact that WACWISA offers to its students. This caused at instances confusions between students and staff, which was solved by intensified communication on an informal basis. However, the experts believe that clear regulations on the responsibilities or the explanation thereof might be an additional adjustment to create a well-established research environment (**Finding 12**).

Furthermore, the site visit has demonstrated that the chosen assessment methods align with the learning outcomes of individual courses in both the master's and PhD programmes. Various examination formats are used, including written exams, oral presentations, research papers, and practical assessments. Students are familiarised with this variety of formats, preparing them for diverse assessment scenarios in their future careers.

The programmes have documented and accessible procedures for student appeals. Students are provided with appropriate channels to voice their concerns or appeal examination results. Furthermore, opportunities to retake exams are offered, allowing students to improve their performance.

In addition, regulations are in place to compensate for possible disadvantages, illness, or absence during exams. These regulations are clearly documented, accessible, and designed to ensure fairness and equal opportunities for all students. Students are informed about the provisions available, allowing them to seek appropriate accommodations when necessary.

As stated above, the internship component is decisive in all UDS programmes. Those internships bridge academia and the professional world, providing students with valuable hands-on experience and industry exposure. To ensure a successful internship programme, implementing clear and well-defined internship guidelines that adhere to the scope of WACWISA is crucial (**Finding 13**). These guidelines facilitate a structured learning experience and promote transparency and accountability for universities, students, and industry partners. Internship guidelines outline students' and industry partners' expectations and intended learning outcomes (**see Finding 5**). By clearly defining the scope of work, responsibilities, and deliverables, these guidelines set a foundation for a mutually beneficial experience. Students gain a clear understanding of their role and the skills they are expected to develop, while industry partners can align their expectations with the intern's capabilities. Clear guidelines foster transparency and ensure that all parties agree regarding the internship's goals and outcomes. The experts have reviewed the evidence of how internships are assessed and believe that the outcomes are fit for purpose and foster the learner's progression. However, the experts believe that establishing internship guidelines will put the ownership more towards WACWISA, which in the light of the experts, will be necessary for the future with more (international) industry partners for the programmes. Also, internship guidelines facilitate effective communication channels and conflict-resolution mechanisms. Guidelines outline the reporting structure, communication protocols, and procedures for addressing any conflicts or issues during the internship. By establishing clear lines of communication, universities, students, and industry partners can promptly address concerns, clarify expectations, and resolve conflicts transparently and professionally. This promotes accountability and ensures a positive and constructive internship experience for all stakeholders.

One of the key aspects of the publication culture at WACWISA is the emphasis on interdisciplinary research and collaboration. Recognising the complex and interconnected nature of water and agriculture issues, WACWISA encourages collaboration among experts from various disciplines, including hydrology, agronomy, engineering, economics, and others. This multidisciplinary approach leads to publications that offer comprehensive insights and practical solutions to the complex challenges faced in the region.

WACWISA also promotes the publication of research that aligns with sustainable development goals and supports evidence-based decision-making. Publications from WACWISA researchers often focus on innovative techniques, technologies, and management practices that enhance water efficiency, improve agricultural productivity, and foster sustainable development in the region. The centre actively seeks partnerships with local stakeholders, policymakers, and international organisations to ensure the translation of research findings into impactful actions.

Additionally, WACWISA acknowledges the importance of open-access publishing to reach a wider audience and maximise the impact of research outputs. The centre encourages researchers to publish their work in open-access journals or make their publications accessible through repositories. This approach ensures that knowledge generated by WACWISA and its collaborators can be readily accessed and utilised by stakeholders, policymakers, and fellow researchers in the region and beyond.

Overall, the publication culture at WACWISA reflects a commitment to high academic standards, collaboration, and sustainability. Through its publications, the centre continues to contribute valuable insights and solutions to the water, irrigation, and agricultural challenges faced by West Africa, playing a crucial role in shaping the future of the region's water and farming systems.

In conclusion, the teaching, learning and assessment modalities for the programmes under WACWISA adhere to a clear structure which depends on the UDS. It provides guidance, fosters academic and professional development, gives accountability and includes ethical considerations. The experts believe that these structures benefit the learner's progression, which contributes to the overall success and well-being of master's and PhD students, enabling them to excel in their research and make meaningful contributions to their respective fields of study.

Conclusion

The criterion is partially fulfilled.

4. Student admission, progression, recognition and certification / Legal status, admission and certification

Bachelor's/Master's degree

Consistently applied, pre-defined, and published regulations are in place which cover student admission, progression, recognition, and certification.

[ESG 1.4]

Doctoral degree

The institution is entitled to award a doctorate.

Consistently applied, pre-defined, and published regulations are in place which cover student admission, progression, recognition, and certification.

[ESG 1.4]

Description

Admission

In advertising for students, the requisite qualifications are listed in addition to relevant documents required. Applicants who wish to apply for the programmes purchase the University Application Form online fill and submit to the School of Graduate Studies. The Graduate School sorts all applications and send them to the relevant departments. Candidates who meet the admission requirements are invited for an interview. A panel is set up with the Heads of Departments for the programmes, the Dean, Vice-Dean or both, the subject specialists and the Administrative Officer. Candidates who score 60 % and above and who prove worthy of admission are recommended and the list presented to the School of Graduate Studies for their admission letters to be written to them by the Administrative Officer of the Graduate School.

Progression

Students are assigned to supervisors who have expertise in the areas of students' research. Mostly students are assigned to supervisors within the university but in some cases external supervisors are assigned where necessary, for instance, international students have the opportunity to have home supervisors if they are conducting the research in their home country. The minimum requirement or qualification to be supervisor of a graduate student is a Senior Lecturer/Senior Research Fellow. In addition to subject-specific supervisory staff, there are Graduate Studies Coordinators at the School/Faculty levels that coordinate and organise graduate programmes. In the specific case of WACWISA, besides the Graduate Studies Coordinators, there are the Scientific and Academic Coordinator, Industrial Liaison Coordinator and Administrative Coordinators who support the coordination and organisation of graduate studies in the Centre.

There are Continuous Professional Development (CPD) opportunities for supervisors of graduate students. These include regular capacity building workshops on supervisory techniques, mentorship, coaching and methodologies. These workshops are mostly facilitated by accomplished senior academics and industry players. Besides, administrative and technical staff are supported to develop their competences through internal seminars at departmental, faculty and university levels and tailor-made professional courses organised by relevant bodies such as GTEC and AAU.

Recognition

The graduate handbook of UDS outlines how students from different universities can transfer to UDS. To apply for admission, applicants must follow the admission procedure. Students need to complete the required forms and submit them, along with their academic transcript and a confidential report from the Registrar of their previous university to the Registrar of UDS. It is important to submit these documents within the specified timeframe before the admission exercise begins. It is stated that applicants may be conditionally admitted to UDS at a level that is not higher than the level they achieved in their graduate degree program at their previous university. Additionally, they may be required to take lower-level courses as remedial courses, which must be successfully completed before graduation. According to the graduate handbook, all academic records from their previous universities will be considered when calculating the results for the degrees awarded by UDS.

Certification

The self-evaluation report includes examples of the certificates for all programmes under accreditation. The UDS statutes allocated the responsibility of issuing the certificates and transcript of records at the registrar.

Experts' evaluation

Admission

The experts have analysed the admission requirements for the programmes under accreditation, and it can be testified that the formal requirements for admission and the specific prerequisites for the individual study programmes are clearly defined and readily available to prospective students. The university ensures transparency by making this information accessible, allowing students to make informed decisions about their academic pursuits.

According to the graduation handbook, the UDS stipulates specific criteria for admission, although the minimum requirements are a graduate diploma or a master's degree. The specific criteria vary depending on the departments and disciplines within the university. Generally, candidates are expected to have obtained a commendable undergraduate degree, attaining at least a Second-Class Lower classification, in a relevant field of study from an accredited university. Nevertheless, applicants who possess a first degree below the Second-Class Lower Division may still be considered for admission, subject to the recommendation of the respective Department. Additionally, individuals holding a non-research-based master's degree may be eligible for a 12-month top-up program within the same program or a related field, leading to the conferment of an MPhil. To proceed with their application, these applicants must furnish an official transcript of academic records and secure two recommendation letters from referees who comprehensively understand their academic accomplishments.

Furthermore, candidates must submit a 3–5-page research proposal delineating their intended area of research. Lastly, the candidates must fulfil any additional prerequisites the Faculties/Schools prescribes. These other requirements might encompass relevant professional experience, a written entrance examination, or an interview.

Regarding admission into the PhD programme, prospective candidates must either possess an M.Phil./M.Sc. by research degree in an appropriate field from a recognised university or hold an MA/MEd/MSc/MBA degree in a relevant area with a cumulative grade point average (CGPA) of 3.5 or higher, with no more than one grade of C+. Additionally, a score of B+ or higher in a research methods course is obligatory. Those individuals holding a non-research-based master's degree but having accumulated practical field experience exceeding 24 months may be admitted to those mentioned above 12-month top-up programme within the same or a related field.

The selection procedure follows well-defined criteria and steps made available to prospective students, ensuring a fair and consistent process. It became evident that WACWISA has a wide variety of different backgrounds in their student cohorts. Many of the students come from neighbouring francophone countries, which could be a struggle for some students due to transition to expressing themselves in English. However, the site visit has effectively demonstrated clear progress in language acquisition during studies. The experts commend the efforts of WACWISA in this regard. The selection requirements have been carefully designed to ensure students possess the essential skills and knowledge to excel in their chosen field of study. The university periodically reviews and updates these prerequisites to align with emerging industry trends and demands, keeping the curricula relevant and up-to-date.

The experts have been supplied with data on the admission procedures, which have been analysed to identify trends and provide comprehensive information on the cohorts. This data-driven approach allows the university to continuously refine its practices and ensure fairness in the selection of students.

Progression

Although the institutional follow-up on average lengths of studies will require improvement (**see Finding 10**), the experts believe that the general progression monitoring of students is sufficiently addressed on the course level. Based on very tight monitoring based on examinations, coursework, or progress reports, students' success can be measured on the course level and consequently for the programmes.

Recognition

Based on information provided during the site visit, the experts learned that recognition is a smaller factor for UDS, which is typical for the region. The same applies to the transfer of credits from other higher education institutions. Consequently, there was not much experience for that, and until now, the applicants were relatively linear students from similar disciplines and with fewer differences. However, UDS' graduate handbook includes regulations and information on the procedure. The information is outlined on the UDS main homepage and consequently accessible to externals and students. However, since the higher education systems on the African continent are further developing, the experts want to point out that UDS should closely follow these developments and the further implementation of continental recognitions conventions, which might be implemented in Ghana in the future, e.g. the Revised Convention on the Recognition of Studies, Certificates, Diplomas, Degrees and Other Academic Qualifications in Higher Education in the African States.

Certification

The experts have analysed and discussed the certification procedure that UDS provides its graduates. It became clear that the university issues up-to-date documentation that aligns with the national requirements. However, the experts believe that employers are increasingly seeking candidates with a solid educational background and diverse skill sets in today's competitive job market. The documentation of courses plays a pivotal role in showcasing a candidate's academic achievements and expertise that go beyond the programme's framework. The experts have seen that the current practice is that students may take additional courses outside their curricula. It has been stated that these courses however are not depicted in the transcript of records. The experts believe that, when there is a lack of transparent documentation for audited courses outside the curriculum, it can significantly diminish an individual's employment prospects. In addressing this issue, it is crucial to balance transparency and the consideration of national regulations (**Finding 14**) because transparent documentation of audited courses enables potential employers to accurately assess an individual's knowledge base and expertise. A comprehensive record of audited courses showcases candidates' commitment to continuous learning and highlights their mastery of relevant subjects. Employers value individuals with a broad skill set, and the documentation of audited courses serves as tangible evidence of their versatility.

The University for Development Studies is one of the recognised Ghanaian public universities. As such, they are entitled to award PhD degrees. This is fostered by the national regulatory framework.

Conclusion

The criterion is fulfilled.

5. Teaching staff / Academic level of supervisory staff

Bachelor's/Master's degree

The composition (quantity, qualifications, professional and international experience, etc.) of the staff is appropriate for the achievement of the intended learning outcomes.

Staff involved with teaching is qualified and competent to do so.

Transparent procedures are in place for the recruitment and development of staff.

[ESG 1.5]

Doctoral degree

The composition (quantity, qualifications, professional and international experience, etc.) of the staff is appropriate for the achievement of the intended learning outcomes.

Staff involved with teaching is qualified and competent to do so.

Transparent procedures are in place for the recruitment and development of staff.

[ESG 1.5]

Description

5.1 Common structure for all programmes

The SER states that the supervision of Master's and PhD theses is according to the expertise of the teaching staff at UDS, which is aligned with the research focuses of WACWISA. Students may have external supervisors if deemed necessary, but the common way is that UDS staff members are involved. The minimum supervisor requirement is a senior lecturer or senior research fellow position. The organisation of the supervision framework is administered by the graduate studies coordinators, the scientific and academic coordinators, the industrial liaison coordinator, and the administrative coordinators.

Following the SER, UDS incorporates opportunities for the continuous professional development of staff. This includes capacity-building workshops on supervisory techniques, mentorship, coaching, and methodologies. Senior academic or industry partners mostly facilitate the workshops. In addition, UDS offers internal seminars on the department, the faculty or the university level or tailor-made professional courses organised by the Ghana Tertiary Education Commission (GTEC) or the Association of African Universities (AAU).

The SER annexe includes the CVs of teaching staff members in the programmes.

5.2 Irrigation and Drainage Engineering (MPhil)

The SER provides an overview of academic staff for the programme. This information shows that six people are responsible for imparting the programme for the Master's programmes "Irrigation and Drainage Engineering". This includes three full professors, two associate professors, and one senior lecturer. All of them are full-time employees, are responsible for teaching and student theses supervision, and have between four and six teaching hours responsibilities.

5.3 Environmental Management and Sustainability (MPhil/PhD)

The information shows that for the Master's and PhD programmes "Environmental Management and Sustainability", 18 staff members are responsible for the programmes. This includes two full professors, four associate professors, ten senior lecturers, and two lecturers. All are full-time employees of UDS and have either three or six teaching hours responsibilities.

Experts' evaluation

The teaching staff involved in WACWISA demonstrates remarkable resilience in challenging circumstances, e.g., UDS being in a more remote area in Ghana. Despite their rugged surroundings, the teaching staff and responsible persons exhibit a solid commitment to their profession and a determination to provide quality education to their students. UDS may be located in an area in strong competition in Ghana's south, but the teaching staff finds innovative ways to overcome these obstacles. They often go above and beyond their responsibilities to ensure students receive the education they deserve. This might lead to a higher workload of staff. The teaching staff at UDS also demonstrate resilience through their unwavering dedication to their students. They recognise the potential impact of education on the lives of their students and the broader community, and this understanding drives them to persevere despite the challenges they face. They believe in the

transformative power of education and are committed to nurturing their students' intellectual and personal growth.

The teaching staff for the master's and PhD programmes in "Irrigation and Drainage Engineering" and "Environmental Management and Sustainability" demonstrates an adequate level of competence and commitment, effectively contributing to the overall success of the programmes. In the documentation, the university has provided a list of all teaching staff involved in the programmes, including their academic qualifications, research experience, and other relevant qualifications, which the experts have analysed. It became evident that the human resources at WACWISA allow for personalised attention and effective mentoring. The workload for staff members, including teaching, research, and administrative duties, is high due to the extra efforts by implementing the trimester system, but manageable.

The supervisory staff for the PhD programme demonstrates methodological expertise and is well-qualified to support and advise the candidates. The UDS has regulations in place regarding the involvement of external examiners. Their roles are defined, and the university ensures they possess the necessary qualifications and are familiar with the programme's requirements. The university has defined and transparent recruitment procedures for teaching staff, ensuring that qualified individuals are selected. This is outlined in the UDS statutes, which represent the minimum requirements for each position.

However, the experts want to encourage the University for Development Studies (UDS) to reconsider its recruitment strategy by including new expertise with people with a variety of educational backgrounds can bring numerous benefits to the institution and its students. By diversifying the background within the faculty, UDS can enhance its academic offerings, improve research capabilities, and better serve the community's needs. The experts have learned that WACWISA is currently applying for an inter-African funding scheme to support staff exchange. The experts believe that this would be a good change towards broadening the expertise at UDS. UDS can promote knowledge sharing, collaboration, and exposure to diverse perspectives by facilitating exchange programmes with other universities or institutions across Africa. Staff exchange programmes can provide opportunities for faculty members to gain regional expertise and bring back valuable insights and experiences to enhance teaching and research at UDS. Therefore, this initiative is strongly supported by the experts. The university is firmly rooted in the community of the Tamale region. The efforts to connect to the local and regional needs are clearly visible and meaningful. The outcome of these projects is of good quality and commendable. These efforts demonstrate the institution's commitment to addressing local needs and producing graduates with practical skills and knowledge. This can attract students, researchers, and partnerships, both regionally and internationally, contributing to UDS's recognition as a leading institution in development studies. However, the recruitment strategy could be expanded by finding industrial partners who could be involved in teaching and co-hosting research. The experts believe recruiting faculty members with industrial expertise fosters more vital collaboration between the university and the industry. These practitioners can bring first-hand knowledge of industry trends, practices, and challenges, bridging the gap between academia and the professional world.

The university has implemented a defined concept for staff development, providing opportunities for both teaching and administrative/support staff to enhance their skills. Teaching staff have access to further training in their respective subjects and teaching and assessment methods. This commitment to ongoing professional development ensures that the teaching staff remains up-to-date with the latest advancements in their fields and can deliver quality education.

Conclusion

The criterion is fulfilled.

6. Learning resources and student support / Support and research environment

Bachelor's/Master's degree

Appropriate facilities and resources are available for learning and teaching activities.

Guidance and support is available for students which includes advice on achieving a successful completion of their studies.

[ESG 1.6]

Doctoral degree

Guidance and support are available for students which include advice on achieving a successful completion of their studies.

Appropriate facilities and resources are available for learning and research activities.

[ESG 1.6]

Description

Learning resources

The general learning resources for students in the programmes entail an office complex with study rooms, a library, laboratories (including lab and field equipment), and transport equipment for field trips. It is stated that theoretically, UDS and the Centre consider the needs of students with special needs. This includes laboratories on the ground floors and buildings equipped with disability ramps and elevators. However, as of 2022, no special-needs students enrolled in the programmes. UDS states that a maintenance and replacement policy is in place. The procurement procedures focus on the material resources according to the intended learning outcomes for the programmes. The process starts with a request (either by students or lecturers), which is approved by the academic advisor and forwarded to the procurement committee for final approval.

The general UDS library provides students access to subscriptions to journal databases and e-books for the discipline. Students can request to procure the material if specific literature is needed. The current SER version does not specify the amount of programme-specific literature available as hard copies or in digital form.

Student support

According to the SER, the study programmes are financed by tuition fees and government subsidies. It is said that the tuition fees are lower than tuition fees at other public universities in Ghana. In addition, WACWISA provides scholarship opportunities for students. The student handbook indicates that WACWISA programmes may offer scholarships under the Scholarship Award Scheme (SAS), which is supported by the Government of Ghana and the World Bank. In general, all students enrolled in WACWISA programme are eligible for scholarships. However, the target group is students under 30 years (Master's programme) and under 35 years (PhD programme), and an African nationality and residency. The student handbook outlines that several scholarships can be offered to students. This includes:

- Full tuition fee for regional students for the whole programme,
- Stipend (starting in the first year for regional and in the second year for national students),
- Support of relevant equipment (hardware and software),
- Research funding,
- Publication fees in Scopus journals,
- Sponsorship for national and international conferences,
- Housing for international students,
- English courses for students coming from Non-English speaking countries.

Research environment

The SER states that the baseline for the research environment is set out to provide the necessary framework for the future research careers of WACWISA students. This includes the necessary reading materials, equipment and capacity-building opportunities through conferences, seminars, webinars and workshops. It is stated that students are familiarised with the UDS Research Ethics Policy that strives to ensure good academic practice and conduct. Also, the SER includes that some PhD students may be granted teaching assistants positions. According to the SER, students at WACWISA have the opportunity to follow already established research paths and ongoing projects. If the research outputs are relevant to specific courses in the curricula, these specific research outputs may serve as a case study in the respective course. The student's handbook shows a typical PhD student study timeline with clear indications of when to undertake industry attachments, internship reports, the submission of progress reports, or data collection.

Experts' evaluation

Learning resources

The University for Development Studies (UDS) has made significant strides in establishing laboratories that support basic research aligned with its practical approach. These state-of-the-art facilities provide researchers and students with the necessary infrastructure and equipment to conduct impactful studies across the disciplines under accreditation. While some laboratories are still under procurement, UDS remains committed to providing cutting-edge infrastructure and resources to support practical research across disciplines. These facilities contribute to the university's mission of promoting sustainable development and finding practical solutions to real-world problems.

The UDS Experimental Farm catalyses research advancement, which is commendable. This facility accelerates agricultural research by providing a dedicated space for experiments and collaboration. Equipped with relevant technology and diverse agricultural landscapes, UDS researchers can test innovative farming practices and optimise crop yields. The farm pushes the boundaries of knowledge through interdisciplinary collaboration and partnerships and drives scientific progress. Additionally, by leveraging its resources and expertise, the UDS Experimental Farm has the potential to generate income through entrepreneurial initiatives and industry partnerships.

As a direct reaction to the pandemic, UDS implemented a broader e-learning platform for students and staff. During the site visit, the experts learned that this platform is no longer active. However, given the increasing need for flexibility in learning approaches, the experts believe that UDS should consider re-activating its e-learning platform even after the pandemic for several compelling reasons. While the pandemic forced many educational institutions to transition to online learning as a temporary measure in general, the discussion showed that there are numerous benefits to maintaining and leveraging e-learning platforms in the long term, in particular for WACWISA, e.g. flexibility in terms of when and where learning takes place, and accommodating diverse learner's needs. The experts believe that a blended learning approach that combines both online and in-person teaching will be supported by re-activating the e-platform. The experts have seen that currently, WACWISA has several informal communication instruments available that are fit for purpose in the short term but less in the long run. However, the experts also acknowledge that UDS is currently struggling with a consistent provision of its ICT system, making it necessary to switch to informal communication. Despite that, the experts state that the re-activation of an e-learning platform positions WACWISA to better respond to future challenges and disruptions that may arise. By maintaining an established digital infrastructure, institutions can quickly pivot to online learning modes during unforeseen circumstances, ensuring minimal disruption to the educational process. This adaptability strengthens institutional resilience and continuity. Therefore, the re-activation should be envisaged promptly (**Finding 15**).

The experts have understood that the Ghanaian government primarily pays teaching staff salaries while facilities have to be covered by the universities themselves in Ghana. Therefore, alternative sources have to be found by UDS. From the expert's perspective, establishing entrepreneurship and innovation hubs clearly located at UDS could be a possibility to provide support services to students, faculty members, and researchers. These hubs can attract funding from investors and donors interested in supporting innovative ideas and startups. Such initiatives can promote entrepreneurship, technology transfer, and economic development, generating additional university revenue. In addition, UDS could seek international collaborations and secure grants from global funding agencies and foundations. Collaborative research projects and capacity-building initiatives with international partners can provide access to funding, expertise, and resources supporting various university activities. As outlined above, the importance of the e-learning platform might play an important role here because embracing digital technologies and e-learning platforms can provide cost-effective solutions for expanding access to education and generating revenue. This might lead to a somewhat blended approach to learning, including distance learning or massive open online courses (MOOCs), which can develop income reinvestment into university development. In total, sustainable financial management is vital here, but the experts have no doubts that effective financial management practices are implemented at UDS and WACWISA.

Student support

The University for Development Studies (UDS) deserves commendation for its commitment to student support and establishing a robust institutional framework that prioritises the well-being and success of its students once enrolled at UDS and, respectively, at WACWISA. Through its comprehensive range of support services, UDS has consistently demonstrated its dedication to nurturing a conducive environment for academic growth, personal development, and overall student satisfaction.

One of the notable aspects of UDS's student support system is its emphasis on academic guidance, especially at the beginning of the studies. The university recognises that every student is unique, with diverse needs and aspirations. To address this, UDS offers personalised academic counselling, ensuring students receive tailored guidance throughout their educational journey. This approach enables students to make informed decisions about their course selection, engage in research opportunities, and maximise their academic potential.

UDS also excels in providing a nurturing environment for holistic development. Recognising that student success extends beyond the classroom. The university offers various extracurricular activities, clubs, and societies that cater to diverse interests and passions. These platforms enable students to explore their talents, develop leadership skills, and foster social connections. UDS promotes a well-rounded student experience and prepares individuals for life beyond graduation by encouraging active participation in non-academic pursuits.

Furthermore, UDS places significant importance on the well-being and welfare of its students. The university maintains a comprehensive health and counselling centre that provides medical care, psychological support, and counselling services. This commitment to student welfare ensures students access the necessary resources to maintain their physical and mental well-being, promoting a thriving student community.

The institutional framework at UDS is designed to promote effective communication and student engagement. The university organises regular forums, town hall meetings, and student-led initiatives to encourage dialogue between students, faculty, and administrators. This open and inclusive approach allows students to express their concerns, contribute to decision-making processes, and actively shape the policies and programs that affect their lives. UDS values the voice of its student body, making them integral partners in the institution's continuous improvement and development. The experts have learned that the WACWISA programmes currently do not include exchange opportunities for students in the programmes, but institutionally the framework allows for recognition mechanisms, as outlined above.

In summary, the University for Development Studies has created a commendable student support system and institutional framework that prioritises the needs and success of its students. By providing academic guidance, fostering holistic development, prioritising student well-being, and promoting student engagement, UDS has established an environment that enables students to thrive academically, personally, and professionally. The university's commitment to student support sets an exemplary standard for higher education institutions. It reinforces UDS's reputation as a leading institution in nurturing the next generation of leaders and change-makers. In consequence, students have confidence in the system of UDS.

Research environment

The PhD programme "Environmental Management and Sustainability" provides PhD students with comprehensive and familiar guidance and support arrangements, ensuring a conducive research environment. PhD students are offered personalised supervision and mentoring to assist them throughout their research journey. This support extends to aiding students in publishing their work and providing valuable insights on effective publication strategies.

Regarding practical placements and internships, students receive substantial support from the programmes, while others have contacts in their home countries. Thus, assistance is given to help students identify and secure practical placements that align with their research interests and career goals. The programme facilitates connections with relevant organisations and institutions, enabling students to gain hands-on experience and apply their theoretical knowledge in real-world settings.

The programmes emphasise student diversity and consider it a vital aspect of the learning environment. Resources and support services are allocated and planned in a manner that considers the students' diverse backgrounds and needs. The programmes foster an inclusive and supportive atmosphere where all students can thrive and excel.

To promote national and international academic exchange, PhD students are provided with sufficient and appropriate opportunities. They are encouraged to attend workshops and participate in conferences, both nationally and internationally when funding is available. This enables students to broaden their horizons, establish connections with scholars in their field, and gain exposure to diverse perspectives and research methodologies. The site visit has shown that WACWISA recognises the importance of equipping doctoral students with the necessary skills for a future research career, and the programmes actively support their skill development. However, the experts believe that a precious instrument could strategically include the PhD students in teaching undergraduate programmes at UDS (**Finding 16**).

The experts believe that allowing PhD students to teach in undergraduate programmes brings numerous benefits for both the university and the students involved. PhD students possess deep knowledge and expertise in their respective fields, making them valuable resources for high-quality instruction. Moreover, PhD students bring fresh perspectives and cutting-edge research insights to the classroom, enhancing the learning experience for undergraduates. Being up-to-date with the latest developments in their fields, they contribute to a more dynamic and engaging educational environment. PhD students also may serve as mentors and guides to undergraduates, sharing their experiences and offering valuable advice on research, graduate studies, and career paths. This mentorship fosters a supportive academic community and inspires and motivates undergraduate students to pursue their educational and professional goals. The proximity of PhD students to their undergraduate education and their current advanced research makes it easier for them to connect with undergraduates. This connection allows them to better understand the challenges undergraduates face and provide relatable guidance and support.

Allowing PhD students to teach undergraduate courses benefits the students and provides valuable teaching experience for the PhD students themselves. Teaching is a crucial skill for academic and research careers,

and this opportunity enables PhD students to develop their teaching abilities, communication skills, and pedagogical techniques. Lastly, involving PhD students in teaching also helps reduce the teaching workload for faculty members, allowing them to focus on their research, mentoring graduate students, and other academic responsibilities. This redistribution of teaching responsibilities ensures that high-quality instruction is maintained while providing faculty members more time to excel in their areas of expertise.

Overall, the reality of the research environment for the programmes is characterised by guidance and support arrangements. The programmes strive to create an inclusive and enriching research environment that nurtures students' academic and professional growth.

Conclusion

The criterion is fulfilled.

7. Public information

Bachelor's/Master's degree

Impartial and objective, up-to-date information regarding the programme and its qualifications is published regularly. This published information is appropriate for and available to relevant stakeholders.

[ESG 1.8]

Doctoral degree

Impartial and objective, up-to-date information regarding the programme and its qualifications is published regularly. This published information is appropriate for and available to relevant stakeholders.

[ESG 1.8]

Description

The dissemination of relevant information on the study programmes is located at the UDS Public Relations unit at the university level. The SER states that the primary source of information for the advertisement of the programmes is the university's homepage, social media, and newspaper publications. It is stated that on the relevant homepages for the programme, information on the intended learning outcomes can be accessed via the student handbooks. WACWISA also has a communications officer, mainly in charge of the programmes within the centre. The admission requirements and selection procedures are accessible in the relevant calls for applications.

Experts' evaluation

Public information plays a crucial role in the functioning and growth of African universities. It serves as a vital means of communication and engagement with various stakeholders, including prospective students, parents, researchers, funding agencies, government bodies, and the general public. Accessible and up-to-date information helps build trust, transparency, and accountability within the academic community and fosters an environment conducive to academic excellence and development.

The experts observed that in the case of the University for Development Studies (UDS), ownership of public information is currently an issue, and the representation of up-to-date information available to externals underscores the significance of accurate and accessible information. The ownership issue, specifically regarding the UDS main homepage/departments and its association with the West Africa Centre for Water, Irrigation, and Sustainable Agriculture (WACWISA) homepage, poses challenges in providing up-to-date information to external stakeholders. Although the experts learned that students inform themselves instead via social media, the experts still believe that the UDS main homepage is currently under further development, hindering the

dissemination of accurate and timely information to prospective students, researchers, and other interested parties.

First and foremost, accurate and up-to-date public information is crucial for student recruitment. Prospective students rely on accessible information to make informed decisions about their education. UDS can attract and enrol qualified students by providing comprehensive details about programmes, faculty profiles, admission requirements, and campus facilities. However, in the case of WACWISA, the need for up-to-date information poses challenges in effectively communicating with potential applicants. Currently, the homepage does not offer any information on the application requirements. This can lead to confusion and missed opportunities for the university to showcase its offerings and attract suitable candidates.

In addition to student recruitment, public information is vital for fostering collaboration and research partnerships. External researchers, institutions, and funding agencies rely on accurate and current information to identify potential collaborations with UDS faculty and researchers. UDS can attract external researchers and institutions interested in collaborative ventures by providing detailed information about ongoing research projects, areas of expertise, and available resources. However, the presence of outdated information on the WACWISA homepage can hinder these partnerships, as it may create uncertainties about UDS's research capabilities and hinder the university's growth in development studies.

Furthermore, public information plays a crucial role in accessing funding opportunities. Universities rely on public information to showcase their achievements, research breakthroughs, and potential for impact. Accurate and up-to-date information is vital in attracting funding from governmental and non-governmental organizations, philanthropists, and private sector entities. Funding agencies and donors often rely on this information to assess the credibility and potential impact of the university's projects and initiatives. However, suppose UDS fails to provide accurate and timely updates regarding its ownership issue. In that case, it may miss out on valuable funding opportunities that can support its growth and contribute to its mission of promoting sustainable development. Therefore, this matter has to be addressed soon (**Finding 17**).

Conclusion

The criterion is not fulfilled.

Recommendation of the panel of experts

The panel of experts recommends accrediting the study programmes "**Irrigation and Drainage Engineering" (Master)**, **"Environmental Management and Sustainability" (Master)**, and **"Environmental Management and Sustainability" (PhD)** offered by University for Development Studies (Ghana) with conditions.

Commendation:

- The University for Development Studies (UDS) overcomes recruitment challenges in a remote region to establish itself as a centre offering quality study programmes, successfully attracting diverse students through strategic initiatives and targeted outreach efforts.
- UDS's unique trimester system sets it apart from traditional academic models, offering students an accelerated learning experience and providing exceptional internship opportunities with regional and international industry partners, emphasizing practical learning and preparing students for success in the real world.
- WACWISA's publication culture emphasises interdisciplinary research and collaboration, focusing on comprehensive insights and practical solutions to water and agriculture challenges in the region, aligned with sustainable development goals and promoting evidence-based decision-making through partnerships and open access publishing.

Findings:

1. It is necessary to reformulate the intended learning outcomes (ILOs) of the master's programme in "Irrigation and Drainage Engineering" to align with the European Qualifications Framework (EQF), emphasizing discipline-specific knowledge and skills, while integrating multidisciplinary aspects and seeking input from faculty, industry professionals, and stakeholders to meet industry needs and expectations.
2. The curricula for the master's programme "Irrigation and Drainage Engineering" and the master's programme "Environmental Management and Sustainability" have to address specifically climate change, which is crucial for the programme's scope and the diverse backgrounds of students.
3. The importance of incorporating a deeper understanding of irrigation and drainage should be reflected in the master's curriculum "Irrigation and Drainage Engineering".
4. The course on "Advanced Statistics and research methods" in the master's programmes "Irrigation and Drainage Engineering" and "Environmental Management and Sustainability" should be separated into distinct courses on research design and research methodologies to develop strong skills in research design, and gain a deeper understanding of various research methods.
5. It is required to draft a course description with intended learning outcomes on the course level for the internship that outlines the programme's core competencies to clarify the knowledge, skills and competencies which are to be acquired in the internship.
6. The intended learning outcomes on the programme level for the master's programme "Environmental Management and Sustainability" must be re-formulated, aligning them with the European Qualifications Framework (EQF) Level 7 and placing stronger emphasis on discipline-specific ILOs, focusing on specialized knowledge, skills, and competencies in environmental management principles.
7. The intended learning outcomes on the programme level for the PhD programme "Environmental Management and Sustainability" must be drafted, ensuring comprehensive knowledge, advanced skills, and

competencies in environmental management and sustainability, and emphasise the ability to address complex environmental challenges.

8. An advanced course in climate change for the PhD programme “Environmental Management and Sustainability” is required to address the programme's scope.
9. To ensure effective quality assurance and continuous improvement, UDS has to prioritise the analysis phase of the PDCA (Plan-Do-Check-Act) cycle for WACWISA programmes to close the gap between the check and act component of the cycle by fostering a data-driven decision-making culture, and sharing results with internal and external stakeholders to enhance the visibility and relevance of quality assurance actions.
10. Being crucial for identifying areas of difficulty or delays, and implementing targeted support measures, UDS and the WACWISA programmes have to elicit data on the average study lengths of students to ensure accurate assessment of student progression.
11. UDS should use WACWISA as a pilot project to align UDS' credit transfer system with ECTS to improve international recognition, the facilitation of credit transfer, and the enhancement of student mobility.
12. A clear communication of the UDS regulations for PhD students should be carried out with the aim to clarify responsibilities of supervision to create a more effective research environment.
13. WACWISA has to establish clear and well-defined internship guidelines to promote transparency, accountability, and effective communication, ensuring a positive and mutually beneficial experience for students and industry partners.
14. It is recommended to prioritise the implementation of transparent documentation for audited courses, as it plays a crucial role in effectively showcasing a candidate's academic achievements and expertise beyond the programme's requirements.
15. It is strongly recommended that UDS considers re-activating its e-learning platform to ensure flexibility, accommodate diverse learner's needs, and strengthen institutional resilience and continuity.
16. It is recommended that WACWISA strategically involves PhD students in teaching undergraduate programmes at UDS to enhance their teaching skills, contribute to the undergraduate learning experience, and further their professional development.
17. It is essential for UDS to publish accurate and up-to-date public information on its main homepage and departmental websites, as well as the WACWISA homepage.