SECTION A:	***QUALIFICATION DETAILS***				
QUALIFICATION DEVELOPER (S)	Botswana Open University BA ISAGO University				
TITLE	Master of Science in Climate Change and Sustainable Development			***NCQF LEVEL***	9
FIELD	Natural, Mathematical and Life Sciences	***SUB-FIELD***	Environment Management Sciences	***CREDIT VALUE***	*240*
New Qualification	✓	*Review of Existing Qualification*			
SUB-FRAMEWORK	*General Education*		*TVET*		*Higher Education* ✓
QUALIFICATION TYPE	*Certificate*	*I*	*II*	*III*	*IV*	*V*	*Diploma*	*Bachelor*
	Bachelor Honours	*Post Graduate Certificate*	*Post Graduate Diploma*					
	Masters ✓	*Doctorate/ PhD*						

RATIONALE AND PURPOSE OF THE QUALIFICATION

RATIONALE:

In response to the harsh climate realities facing Southern Africa, Southern African Regional Universities Association (SARUA) through its Programme for Climate Change Capacity Development (PCCCD) sought to revitalize higher education in the SADC (Southern African Development Community) region through collaborative research, teaching and community engagement which responds directly to southern Africa's vulnerability to climate change (SARUA, 2013). As noted, this Master of Science in Climate Change and Sustainable Development qualification was developed in response to gaps and needs identified in the 2014 SARUA Climate Change Counts Mapping Study for climate compatible development in southern Africa. This was done through SARUA's Curriculum Innovation Network (SCIN) where the mapping study identified a lack of relevant qualifications across much of the region, particularly at postgraduate level. The SCIN connected universities with

external stakeholders and contributing individuals to strengthen curriculum innovation across the SADC region through the development of an Open Access Master's curriculum and coursework in climate change and sustainable development. The Masters is open for use and adaptation by any university in the SADC region.

This qualification is a timely response to addressing Sustainable Development Goals 3, 6, 7, 11 and 13, which are:

- GOAL 3: Good Health and Well-being.
- GOAL 6: Clean Water and Sanitation.
- GOAL 7: Affordable and Clean Energy.
- GOAL 13: Climate Action.
- GOAL 11: Sustainable Cities and Communities.

The MSc in Climate Change and Sustainable Development is an interdisciplinary study intended to produce a well-rounded practitioner who is able to recognize the link between the physical environment, the social as well as the economic so as to execute strategies that are economically viable, environmentally sustainable and socially acceptable. Furthermore, this qualification intends to empower students with skills in climate change and sustainable development, inter/transdisciplinary research, policy and practice in order to produce a well-rounded, innovative and globally competitive graduate. As an inter/transdisciplinary qualification, it will attract prospects from a wide range of fields, such as the humanities, health sciences, natural sciences and the social sciences. The qualification was designed in response to national and global needs.

The rationale for this innovative Master's study lies in the global environmental and development challenges that have been articulated in the Sustainable Development Goals and also in Botswana's own Vision 2036, Pillar 3 on Sustainable Environment. This programme will address the gap that is also identified in the Human Resource Development Council (HRDC) top priority skills in demand as it will produce sustainability specialists and environmental protection professionals.

Pursuant to the Paris Agreement (2015) which predicted Africa to be the worst affected by Climate Change, and a recent UN report, which predicted that planet earth faces catastrophic warning by 2030 (IPCC Report, October 2018), there is therefore dire need for desert areas like Botswana to build national, regional and global capacity to

pursue resilient, low-carbon development pathways that sustainably address climate change challenges. In response, Botswana has since 2001 designed instruments and overarching policies dealing with mainstreaming climate change into planning and development. The Climate Change and Sustainable Development Programme (2009) was the first document to promote climate compatible development.

Additionally, in 2013, Botswana initiated the process to develop a National Climate Change Strategy and Action Plan, which is located within the umbrella of sustinable development. The country's National Development Plans since 2009 also affirm the importance of climate compatible development. Overall, the qualification will therefore address several needs, including: the need for capacity and skill to teach, research, disseminate information; advocacy on climate change; need for skilled managers and planners/ policy formulaters and practitioners on related issues such as food security, natural resources management, as well as environmental issues such as pollution, access to clean water and productive land.

Furthermore, the need for the qualification is supported by need assessment report based on the respondents who indicated that there is a need for qualified people in Climate Change and Sustainable Development for their organisations in the future and 84% of the respondents stated that they would be able to consider hosting the students for a work placement and 54% of the organizations said that they could consider employing graduates with this qualification upon completion. Therefore, Botswana being vulnerable to climate change does indeed need skills in its response systems at government and non-governmental levels.

PURPOSE:

It is evident that the solutions to the challenge of sustainable development require holistic, integrated and coordinated actions across a very wide range of sectors, therefore this qualification aims to equip learners with increasingly multidisciplinary approach in addressing climatic issues sustainably. From this qualification, the learners will acquire specialised knowledge, skills and competences to:

- Investigate on the conventional approaches to climate change and sustainable development.
- Assess key issues and factors influencing climate change impacts on the ecosystems.
- Develop key strategies towards mitigating and adaptating to climate change.
- Research and propose solutions to attain sustainable development.
- Apply appropriate environmental intervention strategies in line with the sustainable development goals.
- Build broad knowledge of climate change and development from academic and applied perspectives, and in

specific domains critical to development in Africa.

- Develop the skills and attitudes needed to engage inclusively with non-academic communities from different sectors relating to climate change and sustainable development in Africa.
- Develop expertise to respond to complex problems related to climate change and sustainable development in Africa and beyond.

ENTRY REQUIREMENTS (including access and inclusion)

Minimum Entry Requirements

Candidates with at least NCQF Level 8 (Bachelor's Degree Honours/Post Graduate Diploma in Environmental Management or Environmental Science, Social Sciences or Life Sciences) or any other related field will be eligible for admission into the qualification.

RPL and CATS

Candidates who do not meet the minimum academic qualifications stated above but working will be considered through a Recognition of Prior Learning (RPL) process which shall be administered according to the National RPL Policy. There will also be provision for Credit Accumulation Transfer to the learner in a case they are transfer in from another institution as per National Policy on CAT.

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SECTION B	***QUALIFICATION SPECIFICATION***
GRADUATE PROFILE (LEARNING OUTCOMES)	***ASSESSMENT CRITERIA***
1. Demonstrate advanced knowledge on the concept of Sustainable Development as it relates to different fields of study.	1.1 Identify opportunities and challenges for linking climate and development. 1.2 Assess the organization of Sustainable development in Botswana 1.3 Evaluate different methods, tools and approaches in relation to the knowledge areas. 1.4 Discuss the interlinked issues surrounding climate change in the context of sustainable development.
2. Interrogate conventional approaches to climate change and sustainable development.	2.1 Evaluate appropriate approaches, paradigms, theoretical frameworks and methods to undertake research and engagement around policy issues. 2.2 Assess the information related to the Anthropocene Transdisciplinary knowledge paradigms 2.3 Create solutions to complex real world problems related to climate change and sustainable development
3. Undertake an in-depth critical exploration of selected key issues in mitigation and vulnerability, impacts and adaptation (VIA).	3.1 Explain the systemic relationships between both mitigation and adaptation on development. 3.2 Investigate major impacts of climate change on development. 3.3 Critically investigate possible mitigation and adaptation measures to reduce people's vulnerability and impacts from climate issues. 3.4 Develop, analyze and implement climate compatible development policies.
4. Assess knowledge production processes for analysing climate change impacts on	4.1 Calculate the value of ecosystem services. 4.2 Select appropriate methods, tools, processes or

ecosystems..	technologies for ecosystem assessment. 4.3 Illustrate how ecosystems can contribute to climate change adaptation and mitigation.
5. Demonstrate advanced knowledge of approaches to estimate Green House Gas (GHG) emissions.	5.1 Evaluate the vulnerabilities of a given type of farming system using established indices and methodologies, 5.2 Evaluate the impacts of climate change on agricultural production and food supply. 5.3 Calculate GHG emissions of a given agro-system.
6. Assess critically the relationship between urban form and emissions and policies therein.	6.1. Assess climate-related risks, vulnerabilities, impacts, resilience, sustainability and climate compatible development. 6.2. Critically assess urban risk and vulnerability, quantitatively and qualitatively. 6.3. Review policies for climate change and development.
7. Conduct a research to contribute to the body of knowledge about the field.	7.1. Undertake new empirical research, using one or more qualitative and/or quantitative methodologies to deepen own understanding of a complex, localized problem relating to climate change and sustainable development. 7.2. Apply research to collaborate with people from different disciplines, sectors, cultures and/or backgrounds and to work in transdisciplinary environments.

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SECTION C	***QUALIFICATION STRUCTURE***		
COMPONENT	***TITLE***	***Credits Per Relevant NCQF Level***	***Total*** ***(Per** Subject/ Course/Module/ Units)*
		Level [9]	
FUNDAMENTAL COMPONENT *Subjects/ Courses/ Modules/Units*	Transdisciplinary Thinking and Skills	20	
	Research Methods	20	
CORE COMPONENT *Subjects/Courses/ Modules/Units*	Key Concepts in Climate Change and Sustainable Development	20	
	Mitigation and Adaptation in Theory and Practice	20	
	Agriculture, Food, Security and Climate Change	20	
	Climate Change and Ecosystem Services	15	
	Climate Change and Social Justice	15	
	Climate Change and Urban Development	15	
	Climate Financing	15	
	Research Project	80	
ELECTIVE/ OPTIONAL COMPONENT *Subjects/Courses/ Modules/Units*	***N/A***		

SUMMARY OF CREDIT DISTRIBUTION FOR EACH COMPONENT PER NCQF LEVEL	
TOTAL CREDITS PER NCQF LEVEL	
NCQF Level	***Credit Value***
Level 9	240
TOTAL CREDITS	***240***
Rules of Combination: (Please Indicate combinations for the different constituent components of the qualification)	
The credit distribution is made up of 40 credits from the fundamental component and 200 credits from the core component.	

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ASSESSMENT ARRANGEMENTS

All assessments which are leading to the award of the qualification should be based on learning outcomes and associated assessment criteria. Assessment will be conducted by Assessors who have been registered with Botswana Qualifications Authority (BQA) or anu other recognized Authority/Body. The assessments will be as follows:

i. **Formative Assessment**

The weighting of formative assessment is 60 % of the final assessment mark.

ii. **Summative Assessment**

The weighting of summative assessment is 40 % of the final assessment mark.

MODERATION ARRANGEMENTS

There will be provision for internal and external moderation, conducted by Moderators registered with the Botswana Qualifications Authority (BQA), or any other recognized entity.

RECOGNITION OF PRIOR LEARNING

Recognition of Prior Learning (RPL) will be applicable for consideration for award in this qualification.

CREDIT ACCUMULATION AND TRANSFER

Credit Accumulation Transfer (CAT) will be applicable for consideration for award in this qualification.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

Learning Pathways

Horizontal Articulation:

Graduates may progress horizontally, pursuing a different master's level qualification related to some of the specialist courses in this qualification on several qualifications but not limited to:

- Master's Degree in Eco-tourism and Environmental Conservation;
- Master's Degree in Wildlife Conservation and Management;

- Master's Degree in Natural Resource Management;
- Master's Degree in Environmental Management;
- Master's Degree in Environmental Science.

Vertical Articulation

Student's graduating with this degree can easily articulate into the following:

- Doctor of Philosophy in Climate Change and Sustainable Development
- Doctor of Philosophy in Environmental Policy
- Doctor of Philosophy in Eco-tourism and Environmental Conservation
- Doctor of Philosophy in Wildlife management and Conservation
- Doctor of Philosophy in Natural Resource Management
- Doctor of Philosophy in Environmental Management
- Doctor of Philosophy in Environmental Science; and
- Doctoral Degrees in relevant varying fields, ranging from the humanities to the social sciences, health sciences and environmental sciences.

Diagonal Articulation:

Some may progress diagonally, articulating to masters studies in areas related to some of the specialist areas in this qualification, including, but not limited to:

- Masters of Science in Public Policy and Health;
- Masters of Business Management in Project Management.

Employment Pathways

- Sustainability Consultants
- Sustainability Specialists
- Environmental Officers
- Risk Managers
- Climate Change and Development Policy Analyst
- National, Regional or International Development Programme Coordinators

- Green Jobs Analysts
- Academia/ Lecturers/
- Researchers
- Environmental Auditors
- Government Advisors
- Research and Analysis Programme Leader
- Banking Sector (both public and private) - Rural Development Managers for their agribusiness, rural entrepreneurship, micro-finance and rural infrastructure support programmes.

QUALIFICATION AWARD AND CERTIFICATION

Candidates meeting the prescribed requirements will be awarded the qualification in accordance with the qualification composition rules and applicable policies. To be eligible for the award of the Master of Science in Climate Change and Sustainable Development, candidates should have obtained a minimum of 240 credits**.** A certificate will be issued to learners who are awarded the qualification.

REGIONAL AND INTERNATIONAL COMPARABILITY

The proposed MSc in Climate Change and Sustainable Development was benchmarked against the following programmes offered by various institutions.

1. **University of Cape Town's Master of Science in Climate Change and Development** (http://www.egs.uct.ac.za/egs/degrees/masters/climate-change) is a one year graduate intensive qualification at NCQF Level 9, which produces candidates with a competence climate change assessment, mitigation and adaptation as well as sustainable development. This taught Master's qualification provides interdisciplinary training in climate change and sustainable development, with a focus on the issues of relevance to African development.

2. **University of Ghana's Master of Science in Climate Change and Sustainable Development** (http://ugbs.ug.edu.gh/department-public-administration-and-health-services-management/msc-climatechange-sustainable-developement) is a one year full time master's qualification worth 42 credits pegged at NCQF Level 9, which produces interdisciplinary graduates with competencies in

climate law, climate compatible development and adaptation and mitigation. The qualification strengthens research in climate change assessment, mitigation and adaptation and sustainable development which responds to the contemporary challenges emanating from climatic variability and change.

3. **University Of Mauritius offers an MSc Climate Change and Sustainable Development**, a one year programme worth 90 credits. (https://www.uom.ac.mu/Images/Files/programmes/FOA/YR2017/Postgraduate/ALC522A.pdf). It produces graduates who have abilities to explain the interlinked issues surrounding climate change in the context of sustainable development in the local and regional contexts. Graduates also have expertise to explore the diverse values and roles that pertain to the different sectors and stakeholders relevant to climate change and sustainable development in the local and regional contexts. It allows learners to apply interdisciplinary competencies that enable them to work with other disciplines. It exposes learners to skills to apply the knowledge areas and competencies outlined above to solve specifically defined problems in different African contexts.

4. **University of Sussex in the United Kingdom offers a Master of Science in Climate Change, Development and Policy** (https://www.sussex.ac.uk/study/masters/courses/climate-change-development-and-policy-msc) worth 270 credits pegged at NCQF Level 9 generally emphasize on the development of competencies in research on greening and inclusiveness as well as cultivating a low carbon economy and adapting to climate change, and how they influence global and regional development. This interdisciplinary qualification focuses on the policies and politics of transformations to the sustainability of the environment through translation of socio-ecological theories and technological innovation. The emphasis of this qualification is on understanding the implications of climate change and climate policies for equity between, and within, countries and how to achieve sustainable development.

5. **Asian Institute of Technology offers an MSc, Climate Change & Sustainable Development** worth 360 credits at Level 9.. (https://serd.ait.ac.th/climate-change-and-sustainable-development-2/).

The MSc, Climate Change & Sustainable Development aims to address key elements of maintaining sustainable livelihoods and economies in Asia. Due to the interdisciplinary character of CCSD, students with a wide variety of backgrounds including agriculture, biosciences, environmental sciences, energy, forestry, including social sciences will engage in research to promote and mitigate climatic issues. The course shall produce graduates from the Msc. CCSD are equipped with expertise to find excellent opportunities for employment in government ministries (e.g. forestry, power, energy industry, finance, and environment), non-profit organizations research institutions, and consulting companies focusing towards climate change and sustainable development.

Although the qualifications examined generally follow similar structures and standards, there are differences amongst them, though not significant in that they concentrate on understanding mitigation as well as adaptation and vulnerability mapping. As noted above, this qualification generally compares well with all the qualifications studies since the exit outcomes cover similar scope and depth and are aligned to exit level descriptors typically of this level and type of qualification as done within the region and beyond.

However, what sets it apart from the ones highlighted above is the fact that it incorporates broad cutting disciplines involved in climate change and sustainable development from an African and developing world perspective into one interdisciplinary qualification. It also brings to the fore, Climate Financing, climate compatible development as well as African climate variability. The nature of its intensity is to allow students to research critically around climate change issues affecting the country, and the university will use it to feed into the SARUA, PCCCD as a means of addressing African climate change issues that have been identified.

REVIEW PERIOD

This qualification will be reviewed after 5 years upon registration.

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