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		Issue No.	01
		Effective Date	01.08.2022

SECTION A: QUALIFICATION DETAILS														
<b>QUALIFICATION DEVELOPER (S)</b>		UNIVERSITY OF BOTSWANA												
<b>TITLE</b>	Doctor of Philosophy in Natural Resource Management										<b>NCQF LEVEL</b>	10		
<b>STRANDS (where applicable)</b>	1. N/A													
<b>FIELD</b>	Natural, Mathematical and Life Sciences			<b>SUB-FIELD</b>	Social Sciences/Environment Management sciences					<b>CREDIT VALUE</b>	360			
New Qualification					✓		Legacy Qualification							
<b>SUB-FRAMEWORK</b>	General Education				TVET				Higher Education			✓		
<b>QUALIFICATION TYPE</b>	Certificate	I		II		III		IV		V		Diploma		Bachelor or
	Bachelor Honours				Post Graduate Certificate						Post Graduate Diploma			
	Masters						Doctorate/ PhD					✓		
<b>RATIONALE AND PURPOSE OF THE QUALIFICATION</b>														

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### ***RATIONALE:***

Training is an integral part of the roadmap to achieving and maintaining competency and sustainability in research work and is also key to generating knowledge. This fundamental importance of training and research sustenance is well captured in the Botswana National Research, Science and Technology Plan (BNRSTP) of 2005. The plan emphasizes that to maintain continuity in research, centres of excellence should have research fellows in the form of PhD level students and visiting researchers who will complement and enhance the international image of such centres. In 2008 the Okavango Research Institute introduced a research-based Master of Philosophy (MPhil)/Doctor of Philosophy (PhD) qualification so it could contribute to the achievement of the ORI's vision of being a centre of excellence and the implementation of the BNRSTP.

The development and delivery of the PhD in Natural Resource Management qualification is also a critical step towards fulfilment of Botswana's Vision 2036 which aspires, in the long term, to see Botswana as a knowledge-based economy. This economic strategy adopted by Botswana in its vision will facilitate the rapid attainment of the sustainable development and prosperity for all by 2036. In this vision, Botswana aims to promote the use of science, technology, and innovation across all its economic sectors, and further provides enabling environment for research, innovation, and economic development. The economy will be sustained by the research and innovation products developed by the researchers and students of this qualification. The aspirations of ORI are aligned to Botswana's Human Resource Development (HRD) objectives which also seek to transform Botswana from a factor-driven economy to a globally competitive and knowledge-based economy through its wing of the Research, Innovation, and Science & Technology (RIST). The RIST emphasizes on addressing national priorities and developing a critical areas of science, engineering and technology, to drive Botswana's research agenda.

The importance of the PhD qualification to Botswana's economy was first emphasised in 2006 during Vision 2016, which advocated for: (i) an educated and informed nation through accessible quality education that is able to adapt to the changing needs of the nation and by creating opportunity for continued education, (ii) the development of regional leaders in the production and dissemination of information, (iii) contributing to scientific and technological growth in the future, and (iv) promoting the use of renewable resources at a rate that is in balance with their regeneration capacity thereby enhancing sustainability.

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Botswana views sustainability of natural resource use, wildlife, and tourism as critical facets of economic and social development, in accordance with Vision 2036 and our commitment to the SDGs. In particular, the Ministry of Environment and Tourism (MET) strives to:

- Protect, conserve, and derive value out of natural and cultural resources.
- Promote a sustainable environment for the benefit of the nation.
- Formulate, implement, and monitor environmental conservation policies and strategies.
- Sustainable utilisation of natural and cultural resources.
- Derive benefit/value from natural and cultural resources.
- An empowered, adaptive, and environmentally conscious nation.
- Build resilience to climate change.

These objectives require highly qualified and motivated professional personnel, not only within Government but also in the private sector and in research institutions. The monitoring of a wide range of environmental indicators and interpretation of trends is required for sound management. This can only be achieved through a cadre of technical professionals trained to post-graduate level.

At the institute level, the introduction of the PhD qualification is part of the implementation of the University of Botswana's strategic plan of "Shaping our Future (2003)" which sets a roadmap along these priority areas: (1) "Expanding Access and Participation", while providing interactive (3) "Engagement and Entrepreneurship" and (4) "Extending Research, Scholarship and Graduate Studies" not only in the overall UB context but also regionally and internationally. In 2006, the University of Botswana revised its academic and research scope and moved to develop the "Academic Division Strategic Plan" whose focus was to (2) improve the University's research performance; (4) expand and strengthen graduate qualifications; and lastly (8) advance the internationalization of the University.

The Okavango Research Institute introduced a PhD qualification because of its potential to generate research-based knowledge and competency which can contribute to the national aspiration of having a "*knowledge-*

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*based economy*". The enrolment by many Botswana citizens and students from the region will speed up the attainment of this national aspiration.

The PhD qualification was recently re-endorsed by the ORI Advisory Board - the independent guiding body in a stakeholder workshop held in April 2022, as an essential component of the qualifications, courses and professional services offered by ORI.

The PhD qualification in Natural Resource Management is designed to provide students with the ability to conceive, design and implement research to answer societal questions and solve societal problems. It is also designed as the advanced and final stage of attaining professionalism in proposing and undertaking research in the field of natural resources management.

The Research Methods course is a core course in this qualification and is designed to impart the skills to assess situations, analyse problems, conceive, and develop research proposals designed to address the problems. The implementation of these proposals brings the student the competencies needed for carrying out further analysis and research: the depth of understanding that carrying out one's own design gives, and the flexibility to adjust research to different circumstances.

The PhD qualification is re-aligned with the Outcomes Based Education and Training (OBET) system and the Botswana National Credit and Qualifications Framework (NCQF) as required by the Botswana Qualification Authority to ensure an overall understanding of comparable levels of attainment at the Doctoral levels throughout the SADC region.

**Comparability:** In brief summary, the ORI PhD qualification is similar in some respects with regional and international qualifications, with a strong research weighting. It differs from most of those analysed in that it does not have a heavy course-work component (like those of the Indian Institute of Forest Management and the PhD qualification of the University of the West Indies).

***PURPOSE: (itemise exit level outcomes)***

The purpose of this qualification is to produce graduates with advanced knowledge, skills, and competences to:


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- Conduct independent research that informs policy on natural resource management.
- Demonstrate sound scholarship that contributes to the advancement of knowledge in various aspects of natural resources management field.
- Acquire competency in natural resource management for sustainable environmental protection
- Design and implement frameworks for natural resource management including monitoring and evaluation.
- Develop human capacity for knowledge transfer for employment and in-service training.


#### ***MINIMUM ENTRY REQUIREMENTS (including access and inclusion)***

Admission into the PhD qualification in Natural Resources Management (NCQF Level 10) shall be on:


- i. Candidate should have acquired a master's degree in a related field (NCQF Level 9) or equivalent.
- ii. Recognition of Prior Learning (RPL and Credit Accumulation (CAT) will be applicable and considered for access and inclusion in line with relevant ETP and national policies.

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<b>SECTION B</b>		<b>QUALIFICATION SPECIFICATION</b>	
<b>GRADUATE PROFILE (LEARNING OUTCOMES)</b>		<b>ASSESSMENT CRITERIA</b>	
At the end of education and training under this qualification, graduates will be able to:			
LO1. Identify and articulate research needs, aims and objectives for problem solving in natural resource management.		<ul style="list-style-type: none"> <li>i. Produce a concept note demonstrating knowledge of research type, structure, and processes.</li> <li>ii. Develop and defend a research proposal.</li> <li>iii. Produce one term paper on identified topic and publishable in a peer-reviewed journal.</li> </ul>	
LO2. Conduct original and independent research in natural resource management.		<ul style="list-style-type: none"> <li>i. Collect data following appropriate methods.</li> <li>ii. Analyse and interpret data using relevant tools.</li> <li>iii. Produce a thesis for review.</li> </ul>	
LO3. Demonstrate sound scholarship that contributes to the advancement of knowledge in various aspects of natural resources management field.		<ul style="list-style-type: none"> <li>i. Produce at least one peer-reviewed publication.</li> <li>ii. Complete and present a thesis for examination.</li> <li>iii. Participate in scientific presentations at both the national and international fora.</li> </ul>	

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<b>SECTION C</b>	<b>QUALIFICATION STRUCTURE</b>				
<b>COMPONENT</b>	<b>TITLE</b>	<b>Credits Per Relevant NCQF Level</b>		<b>Total Credits</b>	
		<b>Level (9)</b>	<b>Level</b>	<b>Level (10)</b>	<b>Level</b>
<b>FUNDAMENTAL COMPONENT</b>	N/A				
Subjects/ Courses/ Modules/Units					
<b>CORE COMPONENT</b> Subjects/Courses/ Modules/Units	Research Methods Course			10	10
	Term paper			10	10
	Research proposal development			40	40
	PhD Thesis			300	300
<b>STRANDS/ SPECIALIZATION</b>	<b>Subjects/ Courses/ Modules/Units</b>	<b>Credits Per Relevant NCQF Level</b>			<b>Total Credits</b>
		<b>Level [ ]</b>	<b>Level [ ]</b>	<b>Level [ ]</b>	
<b>1.</b>	N/A				

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<b>SUMMARY OF CREDIT DISTRIBUTION FOR EACH COMPONENT PER NCQF LEVEL</b>	
<b>TOTAL CREDITS PER NCQF LEVEL</b>	
<b>NCQF Level</b>	<b>Credit Value</b>
<b>10</b>	<b>360</b>
<b>TOTAL CREDITS</b>	<b>360</b>
<b>Rules of Combination:</b> <b>(Please Indicate combinations for the different constituent components of the qualification)</b>	
<ul style="list-style-type: none"> <li>Students will be required to take all components of the qualification indicated in Section C above as they are <u>mandatory</u> for students registering for the PhD qualification [NCQF 10].</li> <li>The Research Methods Course is <u>optional</u> for the Doctor of Philosophy qualification (NCQF 10) if the students have taken it at an MPhil level or equivalent qualification (NCQF 9).</li> <li>For the PhD qualification the student should have successfully completed 360 credits</li> </ul>	



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## ASSESSMENT ARRANGEMENTS

Assessment arrangements shall be as follows:

### **Formative assessment – 70%**

- Research Methods (Continuous Assessment: Tests, Assignments and Seminars) - Optional if it was taken at NCQF 9
- Term Paper (examined by the student's thesis supervisory board)
- Research Proposal Development (Internal review and oral examination)

### **Summative assessment – 30%**

- PhD Thesis (Examination of the written thesis, and oral defence)
- Assessment will be undertaken by BQA accredited and registered assessors

## MODERATION ARRANGEMENTS

### *Internal Moderation*

- Internal moderation will be conducted by an academic member of staff who is accredited by BQA as an assessor/moderator, and is experienced and competent in the area of the work to be examined, preferably an academic scholar with a PhD degree and has published widely in the subject area

### *External Moderation:*

- External moderation will be conducted by a senior academic at a level of a senior scholar or professor from another university or equivalent institute who is competent in the area of the work to be examined. The individual should have a PhD degree, and published widely in the subject area and is accredited by a nationally recognized qualification authority

Moderation will be undertaken by BQA accredited and registered assessors

## RECOGNITION OF PRIOR LEARNING

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Recognition of Prior Learning will be considered for admission to the qualification, and it will be evaluated on a case-by-case basis by the institution according to its policies. Currently, there is commitment and provision within the institution and national policies to award this qualification through RPL system.

### **CREDIT ACCUMULATION AND TRANSFER**

There is provision for an award through Credit Accumulation and Transfer (CAT) in line with institutional and national policies.

### **PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)**

#### **1. Education Pathways**

(i) *Horizontal Articulation* (related qualifications of similar level that graduates may consider)

- PhD in Environmental Science
- PhD in Development Studies

(ii) *Vertical Articulation* (qualifications to which the holder may progress to)

- This qualification has no vertical articulation.

#### **2. Employment Pathways**

The graduates can be employed as:

- Researchers in academic institutions, government, private organizations, and NGO's
- Natural resource managers (e.g., in game parks, nature reserves, biodiversity centres, botanical gardens, archaeological sites, museums, dams, water resources, etc.)
- Environment and development managers and consultants

### **QUALIFICATION AWARD AND CERTIFICATION**

- To be awarded a Doctor of Philosophy in Natural Resource Management qualification. A candidate must have attained a minimum of 360 credits.
- A certificate will be issued when all the requirements for the qualification have been met and the claim authenticated.

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## SUMMARY OF REGIONAL AND INTERNATIONAL COMPARABILITY

### Similarities

- All are research-based qualifications offered between 3-6 years, where production of a thesis and an oral defence are part of the examination process and an end-product of the training.
- Universities admit students with good grades in the undergraduate or master's degree qualifications, frequently through an MPhil entry point.
- Also admit applicants who have extensive research experience and have demonstrated engagement in research and management of natural resources (RPL)
- In some cases, limited course work is required to upgrade students' skills and knowledge in scientific methods and statistics (Some offer one course, some a full load of courses in Year 1 and one course in Year 2).
- Many are multidisciplinary/integrative qualifications which allow for specialization in any field within natural resources conservation and management, as determined by the availability of main supervisors who are experts in the field selected by the student.
- Students encouraged (or may be required) to publish their research papers
- Most qualifications have a provision for admission based on prior learning and experience.
- The PhD qualification at is similar in many ways to the MPhil/PhD qualification offered by University College of London (UCL) in terms of its multi-disciplinary approach to natural resource or environmental management, its multiple track specialisations, and its strong focus on guided self-driven research. The duration of the qualification at both institutions is 3-5 years, with the first year normally used for courses or proposal development.
- The UNISA PhD is similar in many respects, in particular the requirement for publications before the degree is granted. Like most of the comparable qualifications, the qualification recognises public officers with adequate experience in research and management for enrolment, hence helps in capacity building of in-service managers and policy makers. Most qualifications are designed to produce both practitioners and policy development leaders, as well as pushing forward research to improve sustainability.

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### ***Differences***

- Some universities (e.g., University of Nairobi, UWI,) require prospective students to first enrol and successfully complete a full year of course-work as a compulsory pre-requisite to the PhD qualification. Sometimes this requirement is less demanding (e.g., Australia National University). ORI requires very little coursework (Research Methodology, 3 credits, essentially a proposal development course).
- Some universities such as UCL do not require undertaking of any coursework for the PhD qualification. Proposal development is first done in year 1 and refined during the viva exam for upgrading to PhD.
- Submitting research papers emanating from the research work for publication is encouraged, but this is a requirement from some universities (e.g., Okavango Research Institute, University of Botswana and UNISA) and not a requirement for others for the award of the degree (e.g. University College London, University of Nairobi). Effective from 2018, proof of acceptance has been required for one manuscript and of submission for a second.
- Some Universities offer written exams (for courses) and group discussions, seminars, panel discussions, semester papers or oral presentation of a topic selected by supervisors which must be done and passed as part of the PhD qualification. These have not been required at ORI, with the exception of a requirement for a conference presentation.
- UCL differs in using the first year to assess the student's potential through an MPhil upgrade. The qualification offers a 3-credit Research Methods course (ORC600) in Year 1 to provide students with knowledge and skills in using applied statistics and research methods. Other than this, the qualification is purely research-based, and students are expected to produce a publication-type thesis which enhances student skills in producing publications, which subsequently increases publication production at the institute.

### ***Study and work opportunities***

- Graduate of this qualification have no vertical articulation. Horizontally there are opportunities on study in PhD in Environmental Science and PhD in Developmental Studies. Graduates can work as

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researchers in environmental protection endeavours, natural resource managers, policy developers, consultants etc.

### ***REVIEW PERIOD***

The qualification will be reviewed every 5 years

