

BQA NCQF Qualification Template

DNCQF.FDMD.GD04

Issue No.: 01

QUALIFICATION SPECIFICATION										SECTION A	
QUALIFICATION DEVELOPER		Botswana University of Agriculture and Natural Resources									
TITLE		Diploma in Forestry and Range Ecology					NCQF LEVEL		06		
FIELD	Agriculture and Nature Conservation			SUB-FIELD		Forestry and Range Ecology					
New qualification		X		Review of existing qualification							
SUB-FRAMEWORK		General Education				TVET				Higher Education	
		Certificate				Diploma		X		Bachelor	
QUALIFICATION TYPE		Bachelor Honours				Master				Doctor	
CREDIT VALUE								360			
RATIONALE AND PURPOSE OF THE QUALIFICATION											
<p>Rationale</p> <p>According to vision 2016, Botswana anticipated to have an informed and enlightened citizen by 2016. Vision 2016 has been reasserted in vision 2036 to align the country's development ambitions with the global agenda on sustainable development goals. Realisation of the potential contribution of Forest and rangeland resources require trained manpower in Forestry and Range Ecology. Increased number of qualified graduates is believed to have a direct impact on the knowledge-based and fast-growing economy. Knowledge generation can also bring considerable impact in terms of socio-cultural development, improved lifestyle, food security and ecosystem health that aligns with the United Nations Sustainable Development Goals (SDGs: Goals 2, 6, 7, 8, 13 and 15), as foreseen in Vision 2036. All these require human, financial and physical resources, qualified expertise, up-to-date information, functioning markets, well-organized institutions, enabling policies and effective regulation.</p> <p>Botswana has aspired to become a high-income country, with an export-led economy reinforced by diversified, comprehensive and sustainable development driven by high levels of productivity. This, in turn, is planned to be achieved through a knowledge-based economy, involving the use of high-quality science, technology and innovation that can drive the economy to high levels of efficiency (Government of Botswana, 2016). Botswana has also aspired to develop a globally competitive workforce that is</p>											

productive, creative and has international exposure. This will lead the country towards sustainable growth endowed with skill set that are relevant, offering local, regional and international opportunities.

According to the Agricultural Sector Human Resource Development Plan (HRDC, 2015), compared with other sectors, the forest sector is largely underdeveloped with most producers located in the northern part of the country on a seasonal and subsistence basis. Therefore, the need to do more to develop forestry, Range, aquaculture and agroforestry has been emphasized. Hence, this qualification aims at producing qualified technicians with practical skills that will contribute to the achievement of Vision 2036 through the management, sustainable utilization and conservation of forest, woodland and range resources. The significance of this qualification was echoed by the respondents during stakeholder consultation needs assessment from the industry. The needs assessment survey was conducted to establish whether the qualification was required. The respondents during stakeholder consultation needs assessment conclusively recommended for the development of the qualification.

Purpose

The qualification is designed for both high school leavers as well as those who are in the industry without relevant qualification. The proposed qualification in Forestry and Range Ecology is intended to produce individuals with the skills and competence to identify plants, conduct forest and range resources assessments as well as promoting sustainable management, utilization and conservation of forest and rangeland resources. The qualification also introduces learners with technical thinking by providing them with practical skills. On successful completion of the learning programme, learners will be able to:

- Establish and manage plant nurseries, woodlots, and plantations.
- Develop and promote awareness programmes on sustainable management and utilization of forest and rangeland resources to the public and local communities.
- Effectively communicate both, orally and in writing technical reports in all aspects of forest and rangeland resources management activities.
- Design and conduct forest and range resources inventories/assessments.
- Develop and implement wildland fire management plans.

ENTRY REQUIREMENTS (including access and inclusion)

- The minimum entry requirement is NCQF Level 4, Certificate IV, (General Education) or other equivalent with passes in relevant subjects.
- Any relevant vocational qualification at NCQF Levels 5 or 6 in Forestry and related fields may render the candidate eligible for exemptions or credit transfer in accordance with applicable policies.
- Applicants that do not meet the above criteria but possess relevant industry experience will be considered through recognition of prior learning (RPL). In particular, attention is drawn to the mature age applicants and recognition of prior learning (RPL).
- Transfer candidate will be considered for entry the Credit Accumulation and Transfer (CAT) system.

**QUALIFICATION SPECIFICATION
B**

SECTION

GRADUATE PROFILE (LEARNING OUTCOMES)

ASSESSMENT CRITERIA

Holders of this qualification should be able to:

1. Apply advanced knowledge in woody and herbaceous plant species identification.

- Proficient in the use of vocabulary terms which relate to characteristics for woody and herbaceous plant identification.
- Apply taxonomic keys accurately to analyse specific characteristics (leaf, bark, flower, and fruit) form and habits of woody and herbaceous plants to identify species.
- Develop an understanding of utilizing a plant identification dichotomy guide.
- Prepare a portfolio of at least 20 local geographic-area woody and Herbaceous plants labeled with the common and scientific names.
- Compare plant samples to images to identify genus and species.

2. Apply advanced knowledge in conducting forest and range resources inventories/assessments

- Apply different forest and range sampling methods to collect data.
- Proficient in the use of different forest and range sampling tools.
- Establish sampling plots.
- Estimate population means, sampling errors and variances.
- Analyse and interpret forest and range inventory data.

3. Demonstrate the ability to establish and manage plant nurseries, woodlots and plantations	<ul style="list-style-type: none"> • Select and prepare nursery and planting sites. • Establish nursery and plantation in line with international standard. • Proficient in the use of different forest and range hand tools and equipment. • Propagate and manage seedlings in plant nurseries. • Plant tree seedlings and carryout tending operations.
4. Demonstrate competences in forest fire control and suppression activities	<ul style="list-style-type: none"> • Apply basic fire fighting techniques in line with established standards. • Plan and carry out fire prevention and suppression activities. • Develop and implement fire management plans
5. Demonstrate the ability to implement natural resources policies and legislation	<ul style="list-style-type: none"> • Demonstrate knowledge of natural resources policies and legislation. • Interpret and enforce natural resources legislation.
6. Demonstrate ability to use ICT and traditional tools to process information	<ul style="list-style-type: none"> • Demonstrate knowledge to use ICT and traditional tools in collection and processing data. • Apply the use of the use of ITC in forest and range resources management.
7. Demonstrate ability to manage forests and range resources as business enterprises	<ul style="list-style-type: none"> • Develop plans for managing indigenous forests, woodlands, rangelands and plantations. • Design, establish and manage community-based forest and range projects. • Establish and manage forest and range-based enterprises.
8. Demonstrate the ability to communicate effectively with peers, superiors, subordinates and farmers in oral and written form.	<ul style="list-style-type: none"> • Communicate relevant information effectively with accuracy using proper form, structure and style • Evaluate and synthesize information from various sources. • Organize and present relevant information clearly. • Prepare oral presentations for delivery and lead discussions.
9. Demonstrate the ability to work effectively in multidisciplinary and multi-cultural teams efficiently to come up with solutions to problems affecting forest and range resources	<ul style="list-style-type: none"> • Work effectively in multidisciplinary and multi-cultural teams. • Accept comments, criticism and feedback and learn from them.

	<ul style="list-style-type: none"> Explain the importance of forest and range resources non-experts. Organize, coordinate and supervise forest and range field teams. Work with other professionals in the forest, range resources and related sectors.
10. Engage in independent and life-long learning through well-developed learning skills.	<ul style="list-style-type: none"> Apply professional training and social life skills within the context of forest and range for the benefit of humankind. Provide solutions to forest and range resources problems based on solid evidence and theoretical arguments, using creative and critical thinking.

QUALIFICATION STRUCTURE			
			SECTION C
FUNDAMENTAL COMPONENT	Title	Level	Credits
Subjects / Units / Modules /Courses	Mathematics	05	12
	Biodiversity	05	12
	General and Inorganic Chemistry	05	12
	Communication and Academic Literacy Skills I	05	12
	Computer Skills Fundamentals I	05	8
CORE COMPONENT			
Courses	Introduction to Agricultural Economics	6	8
	Forest and Range Botany	6	12
	Plant Propagation	6	12
	Seed Technology and Tree Improvement	6	12
	Forest Mensuration	5	8
	Principles of Crop Production	6	12
	Nursery Practices, Tree Establishment and Tending Operations	5	16
	Agricultural Extension	6	12
	Soil Science	6	12
	Ecology of Forests and Rangelands	6	12
	Land Surveying and Evaluation	6	12
	Field Practical Training	5	12
	Forest Fire and other damaging factors	5	12
	Forest and Range Entomology	7	12
	Forest Pathology	6	8
	Forest and Range Inventory and Monitoring	6	12
	Beekeeping	6	8
	Wildlife Ecology and Management	6	12
	Natural Resources Policy and Legislation	6	12
	Community Forestry	6	12
	Timber Harvesting and Wood Processing	5	12

	Agroforestry	6	8
	Introduction to Biometry	7	12
	Range Development and Improvement	7	12
	Range Resource management	7	12
ELECTIVE COMPONENT Courses	Take one course from (8 credits each)		8
	Project Appraisal and evaluation	7	
	Farm business management	7	
	Take one course from (12 credits each)		12
	Financial Management in Agriculture	7	
	Development of Entrepreneurial Skills in Agribusiness	7	

Rules of combinations, Credit distribution (where applicable):

The structure of the qualification shall be as follows:

Level	Total Credits
Fundamental: 5	56
6	0
7	0
Core: 5	60
6	176
7	48
Electives:	0
6	0
7	20
TOTAL	360

ASSESSMENT MODERATION ARRANGEMENTS

ASSESSMENT ARRANGMENTS

Assessment strategies, requirements and weightings

Assessment arrangements

All assessments, formative and summative, leading/contributing to the award of credits or qualification will be based on learning outcomes and/or sub-outcomes.

Formative assessment

Formative assessment or continuous assessment contributing towards the award of credits will be based on qualification outcomes.

The assessment methods for this qualification are based on:

1. Practical reports, group work, quizzes, presentations and assignments.
2. Tests

The contribution of formative assessment to the final grade is 50%

Summative assessment

Candidates will undergo assessment including written final examination for each course which contribute 50% of the final mark.

MODERATION ARRANGEMENTS

The purpose of the moderation is to ensure that assessment and marking across all courses is fair, valid and reliable. It also ensures that the assessment tool is aligned to the learning outcomes, that it is set at appropriate level of study and, that the process of marking is consistent.

Internal Moderation

Moderation for all continuous assessment tools like tests and final examinations shall be carried out by internal moderators who are qualified and experienced academic staff in the university who have been trained as assessors and moderators.

Before Assessment

The question papers and marking keys will be submitted for internal moderation to the respective moderator before learners are given the assessment. The internal moderator will produce a question paper moderation report giving feedback on the paper. The assessor (assessment tool setter) will take the feedback from the internal moderator into consideration when finalizing the paper.

After Assessment

The question paper, marking key and scripts are shared with the moderator who will sample at least 10% or 20 scripts (whichever is larger) for moderation. The sampled scripts should be representative of all levels of performance by learners (A+, A, A-, B+, B, etc.). For terminal courses in the qualification, the internal moderator will produce a report which will be filed and shared with the external examiner.

External Moderation

The University Senate will appoint appropriate qualified experts from accredited institutions for external moderation purposes. External moderation shall be conducted on the final year qualification courses. The purpose of external moderation is to monitor standards of assessment, assessors' decisions, credibility of assessment methods and question papers, check the internal moderation processes and provide advice through the feedback report. The feedback reports from the internal moderators, question papers, marking keys and scripts will be shared with the external examiner. A sample of 10% or 20 scripts (whichever is larger) will be moderated by the external examiner. The decisions of external examiner are final and supersede those of internal moderator.

RECOGNITION OF PRIOR LEARNING (if applicable)

Learners with appropriate experience and informal or non-formal training who wish to be assessed, may arrange to be assessed without having to attend further education or training (RPL). The assessor will decide on the most appropriate assessment procedures after discussion with the learner.

A prospective learner may be considered for entry based on RPL, prior employment in the relevant field or the acquisition of a non-award qualification in a relevant field. Learners who wish to apply for RPL must provide evidence in terms of completed qualifications along with other relevant documentation.

Learners who possess skills acquired through life or work experience and non-formal education will be assessed and awarded credit or exemptions where applicable. Credit for previous learning may be obtained through the processes of articulation, credit transfer and RPL or a combination of these processes.

Learners may submit evidence of prior learning and current competences and or/undergo appropriate form of RPL assessment for the award for the credits towards the qualification. The RPL assessment will focus on ways of evaluating a learner's lifelong experiences (formal and non-formal) against a set of pre-determined criteria as detailed in the PRL Policy.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

Learning progression Pathways

The Diploma in Forestry and Range Ecology qualification will provide learners with both horizontal and vertical articulation possibilities.

Horizontal Articulation

- Diploma in Beekeeping at NCQF Level 6
- Diploma in Agriculture NCQF Level 6
- Diploma in Horticulture NCQF Level 6
- Diploma in Animal Health and Production at NCQF Level 6
- Diploma in Agriculture at NCQF Level 6
- Diploma in Wood Technology at NCQF Level 6
- Diploma in Forest management at NCQF Level 6
- Diploma in Wildlife Management at NCQF Level 6

Vertical Articulation

- BSc Forest Sciences at NCQF Level 7
- BSc in Range Science at NCQF Level 7
- BSc in Agriculture at NCQF Level 7
- BSc in Environmental Sciences at NCQF Level 7
- BSc in Wildlife Management at NCQF Level 7
- BSc in Forest and Nature Conservation at NCQF Level 7

Employment Pathways

Graduates can be employed as:

- Self-employed
- Forestry and Range Technicians
- Forestry and Range Managers
- Fire Rangers
- Urban Forestry Technicians
- Forestry and Range Advisors
- Forestry Rangers

- Project managers
- Environmental and natural resources managers
- Forestry and Range Consultants

QUALIFICATION AWARD AND CERTIFICATION

Minimum standard of achievement for the award of the qualification

A candidate is required to achieve total credits of 360 inclusive of fundamental, core and elective components to be awarded the Diploma in Forestry and Range Ecology qualification upon attaining a total of 360 credits. All the learning outcomes should be met for award of the qualification. The qualification does not have exit awards.

Certification

The learner meeting prescribed requirements will be awarded a certificate in accordance with standards prescribed for the award of the qualification and applicable policies.

REGIONAL AND INTERNATIONAL COMPARABILITY

This qualification was compared with similar or equivalent qualification from various institutions in the region and abroad. There is no institution locally, in the region and abroad offering a Diploma in Forestry and Range Ecology qualification. Most institutions used for comparison offers a Diploma in Forestry qualification.

Region

In the region, the following universities and their qualifications were taken for benchmarking.

1. **Forest Industries Training Centre and Zimbabwe College of Forestry** offer a two and half (2.5) year Diploma in Forestry qualification.

Similarities

The Diploma in Forestry qualification offered by Forest Industries Training Centre and Zimbabwe College of Forestry offers forestry courses that are also included in this qualification (Appendix 1). Both qualifications don't have exit awards and has a duration of two and half years.

Differences

The diploma in Forestry qualification offered by Forest Industries Training Centre and Zimbabwe College of Forestry does offer range ecology courses and hence titles of the two qualification differ.

2. Malawi College of Forestry and Wildlife offer of a three (3) years Diploma in Forestry qualification.

Similarities

The Diploma in Forestry qualification offered by Malawi College of Forestry and Wildlife offers forestry courses that are also included in this qualification (Appendix 1). Both qualifications don't have exit awards.

Differences

The diploma in Forestry qualification offered by Malawi College of Forestry and Wildlife does offer range ecology courses and hence titles of the two qualification differ. The two qualifications also differ in credit value; at Malawi College of Forestry and Wildlife the learner is expected to accomplish 103 credits to be awarded the diploma, while with this qualification, the learner should accomplish 360 credits to be awarded diploma.

Internationally

Internationally, the following Institutions and their qualifications were taken for benchmarking:

1. Kathmandu Forestry College (KAFCOL), Nepal, offers a three (3) years Diploma in Forestry Qualification.

Similarities

The Diploma in Forestry qualification offered by Kathmandu Forestry College offers forestry courses that are also included in this qualification (Appendix 1). Both qualifications don't have exit awards.

Differences

The diploma in Forestry qualification offered by Kathmandu Forestry College does not offer range ecology courses and hence the titles of the two qualification differ. The two qualifications also differ in credit value; at Kathmandu Forestry College the learner is expected to accomplish 118 credits to be awarded the diploma, while with this qualification, the learner should accomplish 360 credits to be awarded diploma.

2. Toi-Ohomai Institute of Technology, New Zealand offers two years (2) New Zealand Diploma in Forest Management with a total of 240 credits.

Similarities

The Diploma in Forestry qualification offered by Toi-Ohomai Institute of Technology offers some few forestry courses that are also included in this qualification (Appendix 1). Both qualifications don't have exit awards

Differences

The diploma in Forestry qualification offered by Toi-Ohomai Institute of Technology does not offer range ecology courses and hence the titles of the two qualification differ.

3. Eastern Caribbean Institute of Agriculture and Forestry (E.C.I.A.F), The University of Trinidad and Tobago offers a two (2) years Diploma in Forestry qualification.

Similarities

The Diploma in Forestry qualification offered by Eastern Caribbean Institute of Agriculture and Forestry offers forestry courses that are also included in this qualification (Appendix 1). Both qualifications don't have exit awards.

Differences

The diploma in Forestry qualification offered by Eastern Caribbean Institute of Agriculture and Forestry (E.C.I.A.F), The University of Trinidad and Tobago does not offer range ecology courses and hence the titles of the two qualification differ.

REVIEW PERIOD

The qualification will be reviewed every five years, after running its full cycle. However, ad-hoc reviews will be done in line with environmental changes.