

# FOR FORESTER (NC2 & NC3)

Department of Occupational Standards
Ministry of Labour and Human Resources
Thimphu, Bhutan.
APRIL 2019



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#### **FOREWORD**

The Department of Occupational Standards of the Ministry of Labour and Human Resources proudly presents National Competency Standards (NCS) for Forester as part of TVET reform initiative for improving the quality of Vocational Education and Training System in Bhutan. The standards represent the fruits of hard work and invaluable experiences gained by the department since its establishment in the latter half of 2003. The main aim of developing Competency Standards is to set up a well defined nationally recognized Vocational Qualification and Certification system that will help set a benchmark for the Technical Vocational Education and Training (VET) System in our country aligned to international best practices.

National Competency Standards is one of the base pillars in the Bhutan Vocational Qualification Framework (BVQF) and is the first step in its implementation. The standards are developed to ensure that employees or vocational graduates possess and acquire the desired skills, knowledge and attitude required by industries and employers. In order to ensure this close match in supply and demand of skills, knowledge and attitude, standards have been developed in close consultation and partnership with industry experts and validated by the Technical Advisory Committees for the concerned economic sectors.

A vocational education and training system based on National Competency Standards shall ensure that delivered training is of a high quality and relevant to the needs of the labour market. As a result, future TVET graduates will be better equipped to meet the need and expectations of industries and employers. This positive impact on the employability of TVET graduates will enhance the reputation of vocational education and training and make it attractive to school leavers.

While acknowledging the existing level of cooperation and collaboration, the ministry earnestly requests employers and training providers to extend the fullest support and cooperation in implementing the Standards. The ultimate objective is to build a competent and productive national workforce that will contribute to the continued socio-economic progress of our country.

I gratefully acknowledge the valuable contributions made by experts from industries during the consultation, verification and validation processes of the

standards. I look forward to improved engagement and active participation of the industry and employers in the development of a quality assured demand driven TVET system in the near future.

Director
Department of Occupational Standards
Ministry of Labour and Human Resources

#### Acknowledgement

Validation date : 27/04/2019

Endorsement date : 09/05/2019

**Date of Review** : 27/04/2022 (max. 3 years).

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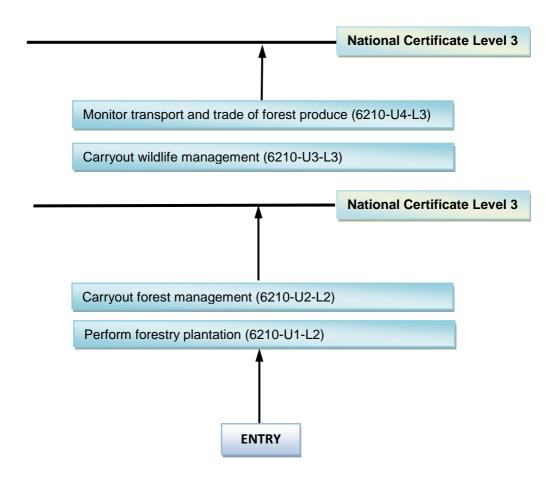
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#### **PACKAGING OF QUALIFICATIONS**



# **OVERVIEW OF NATIONAL COMPETENCY STANDARDS**

UNIT TITLE	ELEMENTS OF COMPETENCE
Perform forestry plantation	<ol> <li>Manage nurseries</li> <li>Manage seedlings</li> <li>Carryout plantation</li> </ol>
Carryout forest management	<ol> <li>Manage state reserve forest</li> <li>Manage non state reserve forest</li> <li>Manage forest fire</li> <li>Carryout general forest survey</li> <li>Manage watershed</li> </ol>
Carryout wildlife management	<ol> <li>Conduct wildlife survey</li> <li>Manage wildlife habitat</li> <li>Conduct patrolling</li> <li>Carryout wildlife rescue</li> </ol>
Monitor transport and trade of forest produce	<ol> <li>Monitor timber movement</li> <li>Monitor non wood forest produce (NWFP)</li> </ol>

**UNIT TITLE**: Perform forestry plantation

**DESCRIPTOR:** 

This unit covers the competencies required to manage nurseries, manage seedlings and carryout plantation

following standard procedures at all times.

CODE 6210-U1-L2

ELEMENTS OF COMPETENCE		PERFORMANCE CRITERIA
Manage     nurseries	1.1	Select and use personal protective equipment ( <i>PPE</i> ) as per the job requirement following standard procedures
	1.2	Select and use <b>tools and equipment</b> as per the job requirement following standard procedures
	1.3	Collect seeds as per the job requirement following standard procedures
	1.4	Prepare site / beds for nurseries as per the job requirement following standard procedures
	1.5	Treat seeds as per the job requirement following standard procedures
	1.6	Sow seeds as per the job requirement following standard procedures
Manage seedlings	2.1 sta	Perform watering of seedlings as per the ndard procedures
	2.2	Perform weeding as per the job requirement following standard procedures
	2.3	Prepare poly pots for seedlings as per job requirement following standard procedures
	2.4	Perform transplantation of seedlings as per the standard procedures
	2.5	Perform hardening of seedlings as per the standard procedures

Carryout plantation	3.1	Prepare sites as per the job requirement following standard procedures
	3.2	Plant seedlings as per the job requirement following standard procedures
	3.3	Manage seedlings as per the job requirement following standard procedures

#### **RANGE STATEMENT**

#### PPE may include but not limited to:

- Goggles
- Mask
- Gloves

- Safety shoes
- Uniform dress

# Tools and equipment may include but not limited to:

- Knife
- Spade
- Watering Can
- Sickle
- Climbing gears
- Tarpuline

- Shovel
- Sieving net
- Pipe
- Measuring Tape
- Container

# **Critical Aspects:**

- Demonstrate compliance with safety regulation applicable to work site operation.
- Collect seeds as per the job requirement following standard procedures
- Prepare poly pot as per the standard procedures

UN	IDERPINNING KNOWLEDGE		UNDERPINNING SKILLS
	Ethics and Integrity Occupational Health and Safety (OHS) Regulations Seed collection and treatment procedures Quality of seeds Types of Nursery beds Basic soil chemistry Basic First Aid Bioengineering plantation Root balling plantation Bonsai Compost preparation Uniform code of conduct Estimation and costing Norms and Standard for forest nursery and plantation	• • • • •	Team Work Communication Interpersonal relationship Problem solving Leadership Public relationship

**UNIT TITLE**: Carryout forest management

**DESCRIPTOR**: This unit covers the competencies required to manage

state reserve forest, non-state reserve forest, carryout general forest survey and manage watershed as per

the standard procedures at all times.

CODE : 6210-U2-L2

ELEMENTS OF COMPETENCE	PERFORMANCE CRITERIA		
Manage state reserve forest	1.1	Select and use <i>personal protective equipment</i> ( <i>PPE</i> ) as per the job requirement following standard procedures	
	1.2	Select and use <i>materials</i> as per the job requirement following standard procedures	
	1.3	Select and use <b>tools and equipment</b> as per the job requirement following standard procedures	
	1.4	Conduct patrolling to identify the possible <i>illegal activities</i> as per the job requirement following standard procedures	
	1.5	Conduct <b>assessment of state reserve forest</b> as per the job requirement following standard procedures	
	1.6	Perform pest and disease control measures as per the job requirement following standard procedures	
	1.7	Process <i>timber harvest and disposal activities</i> as per the job requirement following standard procedures	
	1.8	Prepare field reports as per the job requirement following standard procedures	
Manage non state reserve	2.1	Monitor <i>non state reserve forest</i> as per the job requirement following standard procedures	
forest	2.2	Conduct assessment of non-state reserve forest as per the job requirement following	

		standard procedures
	2.3	Process timber harvest and disposal activities as per the job requirement following standard procedures
	2.4	Prepare field reports as per the job requirement following standard procedures
	2.5	Assist in reviewing the annual performance of community forest and take necessary actions as per the job requirement following standard procedures
Manage forest fire	3.1	Select and use <i>firefighting equipment</i> as per the job requirement following standard procedures
	3.2	Select and use personal protective equipment as per the job requirement following standard procedures
	3.3	Construct fire line as per the job requirement following standard procedures
	3.4	Perform back fire as per the job requirement following standard procedures
	3.5	Extinguish forest fire following standard procedures
	3.6	Conduct post fire assessment as per the standard procedures
	3.7	Prepare field reports as per the standard procedures.
Carryout general forest	4.1	Conduct forest inventory as per the standard procedures
survey	4.2	Conduct operational inventory as per the standard procedures
	4.3	Conduct cable line survey as per the job requirement following the standard procedures
	4.4	Conduct forest regeneration survey as per the standard procedures
	4.5	Assist in conducting road survey as per the

		standard procedures
5. Manage watershed	5.1	Assess the water source and recommend for necessary action following standard procedures
	5.2	Identify watershed and spring shed as per the job requirement following standard procedures
	5.3	Measure the <b>water quality</b> as per the standard procedures
	5.4	Measure the water discharge as per the standard procedures

#### **RANGE STATEMENT**

#### PPE may include but not limited to:

Helmet

110111101

Goggles

Mask

Ear muff

Safety shoes

Gloves

Fire safety dress

# Tools and equipment may include but not limited to:

Knife

Hammer

Diameter tape

Measuring tape

Fire Arms

Cyber trackers

Wedge prism

Hand set

GPS

Compass

Clinometer

Water bag

Hypsometer

# Materials may include but not limited to:

Field books

Maps

Survey forms

Volume table

#### Illegal activities may include but not limited to:

Timber extraction

Sand and stone extraction

Fishing

Poaching

 Illegal Non wood forest produce (NWFP)

#### Firefighting equipment may include but not limited to:

Water spray

Shovels

Spade

Rack

#### Timber harvest and disposal activities may include but not limited to:

Issue of permits

Marking of timbers

Passing of timbers

#### Assessment of the state reserve forest may include but not limited to:

Plant taxonomy

Forest mensuration

Silviculture

Forest utilization

# Non-state reserve forest may include but not limited to:

Private forest

Heritage forest

Community forest

# Water quality may include but not limited to:

Physical parameters

Biological parameters

# **Critical Aspects:**

- Demonstrate compliance with safety regulation applicable to work site operation.
- Conduct assessment of state reserve forest and non-state reserve

- forest as per the standard procedures
- Conduct general forest survey as per the job requirement following standard procedures
- Identify watershed as per the standard procedures

Water regulations
Wetland management
Revenue collection and deposit
Types of permits and forms
Protected area systems

UNIT TITLE : Carryout wildlife management

**DESCRIPTOR:** This unit covers the competencies required to conduct

wild life survey, manage wildlife habitat, conduct patrolling and carryout wild life rescue as per the

standard procedures at all times

CODE : 6210-U3-L3

ELEMENTS OF COMPETENCE		PERFORMANCE CRITERIA
Conduct     wildlife survey	1.1	Select and use <b>survey documents</b> as per the job requirement following standard procedures
	1.2	Set camera trap as per the job requirement following standard procedures
	1.3	Set small mammal traps as per the job requirement following standard procedures
	1.4	Set transect for wildlife survey as per the standard procedures
	1.5	Set mist-net as per the job requirement following standard procedures
	1.6	Fix radio collar and GPS tags as per the job requirement following standard procedures
	1.7	Provide animal care and handling as per the standard procedures
	1.8	Collect animal signs and evidences as per the job requirement following standard procedures
	1.9	Prepare reports as per the job requirement following standard procedures
Manage wildlife habitat	2.1	Perform prescribed burning for habitat management as per the job requirement following standard procedures

	2.2	Develop waterhole as per the job requirement following standard procedures
	2.3	Develop saltlick as per the job requirement following standard procedures
	2.4	Prepare field report as per the job requirement following standard procedures
Conduct patrolling	3.1	Select and use <i>personal protective equipment</i> ( <i>PPE</i> ) as per the job requirements following standard procedures
	3.2	Select and use <b>tools and equipment</b> as per the job requirement following standard procedures
	3.3	Perform patrolling to identify and prevent the possible <i>illegal activities</i> as per the job requirement following standard procedures
	3.4	Apprehend and seize the <b>illegal items</b> (equipment, related object) as per the job requirement following standard procedures
	3.5	Maintain <i>reports</i> as per the job requirement following standard procedures
Carryout wildlife rescue	4.1	Handle injured wild animals as per the job requirement following standard procedures
	4.2	Apply first aid as per the job requirement following standard procedures
	4.3	Rehabilitate rescued animal as per the job requirement following standard procedures
	4.4	Assist in translocation of rescued animals as per the job requirement following standard procedures
	4.5	Prepare report as per the job requirement following standard procedures

#### **RANGE STATEMENT**

#### PPE may include but not limited to:

- Goggles
- Mask
- Gloves

- · Safety shoes
- Uniform dress

## Tools and equipment may include but not limited to:

- Knife
- Handset
- GPS
- Fire Arms
- Camera
- Binoculars
- Mist-net
- Radio collar

- Extension kits
- Tents
- Rain gears
- Oxygen cylinder
- Cyber tracker apps
- Camera traps
- Small mammal trap

# Illegal activities may include but not limited to:

- Poaching
- Fishing

- Poisoning
- Smuggling

# Reports may include but not limited to:

- Seizure forms
- Field reports

- Offence reports
- Offence Statements

### Survey documents may include but not limited to:

Survey forms

Maps

# **Critical Aspects:**

Demonstrate compliance with safety regulation applicable to work site

operation.

- Perform patrolling to identify and prevent the possible illegal activities as per the job requirement following standard procedures
- Collect animal signs and evidences as per the job requirement following standard procedures
- Handle injured animal as per the job requirement following standard procedures

UND	ERPINNING KNOWLEDGE		UNDERPINNING SKILLS
• (( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( ( (	Ethics and Integrity Occupational Health and Safety (OHS) Regulations Basic First Aid Camera traps Basic photography GPS collars and Tags Basic survey methodology Wild life taxonomy Wild life habitats Forest and nature conservation rules and regulations Protected areas GPS Human wildlife conflict Basic GIS and Google earth Basic computer skills Uniform code of conduct	•	Team Work Communication Interpersonal relationship Problem solving

UNIT TITLE : Monitor transport and trade of forest produce

**DESCRIPTOR:** This unit covers the competencies required to monitor

timber movement and monitor non wood forest produce (NWFP) as per the standard procedures at all

times

CODE : 6210-U4-L3

	EMENTS OF OMPETENCE	PERFO	DRMANCE CRITERIA	
1.	Monitor timber	1.1	Select and use tools and equipment as per the job requirement following standard procedures	
	movement	1.2	Select and use <b>personal protective equipment (PPE)</b> as per the job requirement following standard procedures	
		1.3	Verify timber permits as per the job requirement following standard procedures	
		1.4	Conduct <b>physical verification</b> of forest produce as per the job requirement following standard procedures	
		1.5	Apprehend and seize <i>illegal items</i> (forest produce, equipment, related objects) as per the job requirement following standard procedures	
		1.6	Prepare <i>report</i> as per the job requirement following standard procedures	
2.	Monitor Non- wood Forest	2.1	Verify NWFP permits as per the job requirement following standard procedures	
Produce (NWFP)		2.2	Conduct <b>physical verification</b> of NWFP as per the job requirement following standard procedures	
		2.3	Apprehend and seize <i>illegal items</i> (sand, stones, cordyceps, bamboos, equipment) as per the job requirement following standard procedures	

2.4	Prepare	report	as	per	the	job	requirement
following standard procedures.							

Gloves

#### **RANGE STATEMENT**

#### PPE may include but not limited to:

Goggles

MaskUniform

Safety shoes
 Safety ropes

• Rain gears

#### Physical verification may include but not limited to:

VolumeSpecies

Hammer impression • Permits

#### Reports may include but not limited to:

Statement Template(FNCRR)
 Offence report

#### **Critical Aspects:**

- Demonstrate compliance with safety regulation applicable to work site operation.
- Conduct physical verification of timber and NWFP as per the job requirement following standard procedures

#### Annexure

#### 1.1National Competency Standards (NCS)

The National Competency Standards specify the skill, knowledge and attitudes applied to a particular occupation. Standards also specify the standards or criteria of performance of a competent worker and the various contexts in which work may take place. Standards provide explicit advice to assessors regarding the skill and knowledge to be demonstrated by candidates seeking formal recognition either following training or through work experience.

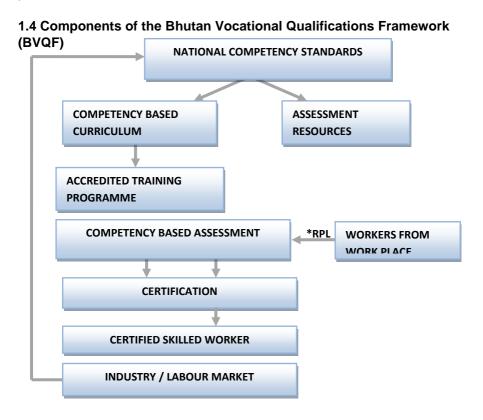
# 1.2 Purpose of National Competency Standards

National Competency Standards serve a number of purposes including:

- Providing advice to curriculum developers about the competencies to be included in curriculum.
- Providing specifications to assessment resource developers about the competencies within an occupation to be demonstrated by candidates.
- Providing advice to industry/employers about job functions, which in turn can be used for the development of job descriptions, performance appraisal systems and work flow analysis.

#### 1.3 Bhutan Vocational Qualifications Framework (BVQF)

Bhutan Vocational Qualifications Framework is an agreed system of Assessing, Certifying and Monitoring nationally recognized qualifications for all learning in the TVET sector against national competency standards, in training institutions, in the workplace, in schools or anywhere where learning takes place.



\* RPL = Recognition of Prior Learning

#### 1.5 BVQF Levels

The Bhutan Vocational Qualifications Framework has three levels classified based on the competency of the skilled workers. The three levels are:

- National Certificate Level 3 (NC III)
- National Certificate Level 2 (NC II)
- National Certificate Level 1 (NC I)

### **BVQF Level Descriptors**

The qualification levels are decided based on level descriptors. The detail of the qualification level descriptor is as follows:

#### **National Certificate Level 1**

Carry out processes that:	Learning demand:	Responsibilities which are applied:
<ul> <li>Are narrow in range.</li> <li>Are established and familiar.</li> <li>Offer a clear choice of routine responses.</li> <li>Involve some prioritizing of tasks from known solutions.</li> </ul>	<ul> <li>Basic operational knowledge and skill.</li> <li>Utilization of basic available information.</li> <li>Known solutions to familiar problems.</li> <li>Little generation of new ideas.</li> </ul>	<ul> <li>In directed activity.</li> <li>Under general supervision and quality control.</li> <li>With some responsibility for quantity and quality.</li> <li>With no responsibility for guiding others.</li> </ul>

# **National Certificate Level 2**

Carry out processes that:	Learning demand:	Responsibilities which are applied:
<ul> <li>Require a range of well-developed skills.</li> <li>Offer a significant choice of procedures requiring prioritization.</li> <li>Are employed</li> </ul>	<ul> <li>Some relevant theoretical knowledge.</li> <li>Interpretation of available information.</li> <li>Discretion and judgments.</li> <li>A range of known responses to familiar</li> </ul>	<ul> <li>In directed activity with some autonomy.</li> <li>Under general supervision and quality checking.</li> <li>With significant responsibility for the quantity and quality of output.</li> </ul>
within a range of familiar context.	problems	With some possible responsibility for the output of others.

# **National Certificate Level 3**

Carry out processes that:	Learning demand:	Responsibilities which are applied:
<ul> <li>Requires a wide range of technical or scholastic skills.</li> <li>Offer a considerable choice of procedures requiring prioritization to achieve optimum outcomes.</li> <li>Are employed in a variety of familiar and unfamiliar contexts.</li> </ul>	<ul> <li>A broad knowledge base which incorporates some theoretical concepts.</li> <li>Analytical interpretation of information.</li> <li>Informed judgment.</li> <li>A range of sometimes innovative responses to concrete but often unfamiliar problems.</li> </ul>	<ul> <li>In self-directed activity.</li> <li>Under broad guidance and evaluation.</li> <li>With complete responsibility for quantity and quality of output.</li> <li>With possible responsibility for the output of others.</li> </ul>

#### 1.6 PURPOSE

This qualification is designed for people interested in a career as a Forester at the Certificate level. It comprises of four units that cover the essential knowledge and skills required at workplace.

It provides industry specific skills and demands a level of performance that will enable new recruits to the industry to be immediately productive.

#### 1.7 CODING USED FOR NATIONAL COMPETENCY STANDARDS

The coding and classification system developed in Bhutan is logical, easy to use, and also aligned with international best practises. The Bhutanese coding and classification system is based on the International Standard Classification of Occupations, 2008 (ISCO-08) developed by the International Labour Organisation (ILO).

The coding of the National competency standards forms the basis of the identification code for the Vocational Education and Training Management Information System (VET – MIS) both in terms of economic sector identification and that of the individual standard.

#### Coding the individual national competency standards

Coding the individual skills standard has a multiple purpose:

- to identify the level,
- to identify to which module the standard belongs,
- to identify in which order the standard is clustered within that module.

A job can include a number of competencies described in the national competency standards.

However, in order to follow a logical order, only national competency standards related to each other and following a logical sequence in terms of training delivery, from the simple to the complex, are clustered into a module. Some standards are so complex that they need to stand alone.

To illustrate with an example, the ILO assigns the code 6210 to the occupation related to forester. Therefore, in the Bhutan's context, the occupation forester has been assigned the code 6210 in the National Coding System. The first unit is assigned the code U1. Levels are assigned the code L and follow a logical progression from the National Certificate Level 1 (NC I) to the National Certificate Level 3 (NC III). Therefore the National Certificate Level 1 is assigned the code L1.

Implementation and operational procedures for National Competency Standards (NCS)



# Key:

MoLHR – Ministry of Labour and Human Resources DOS – Department of Occupational Standards

#### 1.8 ASSESSMENT GUIDE

#### Form of assessments

- Continuous assessment together with collected evidence of performance will be used.
- Evidence of the performance shall be based on practical demonstration.
- Knowledge can be assessed through diagrams, in writing or orally (vivavoce).

#### **Assessment context**

 Competency may be assessed in the actual work place or in a simulated workplace setting.

#### **Assessment condition**

- The candidate shall have access to all required tools, equipments, materials and documents.
- Candidate must complete the assessment in industry accepted time frame.



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