



**NATIONAL COMPETENCY STANDARDS
FOR
AGRICULTURIST
(VEGETABLE FARMING)**

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



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FOREWORD

The Department of Occupational Standards of the Ministry of Labour and Human Resources proudly presents the National Competency Standards (NCS) for Agriculturist (vegetable farming) as a major initiative for improving the quality of Vocational Education and Training System in Bhutan. These 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 National Competency Standards is to set up a well defined nationally recognized Vocational Qualification and Certification system that will help set a benchmark for the 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 technical 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 National Competency 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 VET system in the near future.

I firmly believe we can sacrifice a bit today for a better tomorrow.

Dorji Wangdi

Minister

Ministry of Labour and Human Resources

INTRODUCTION

A. National Competency Standards (NCS)

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.

Purpose of National Competency Standards

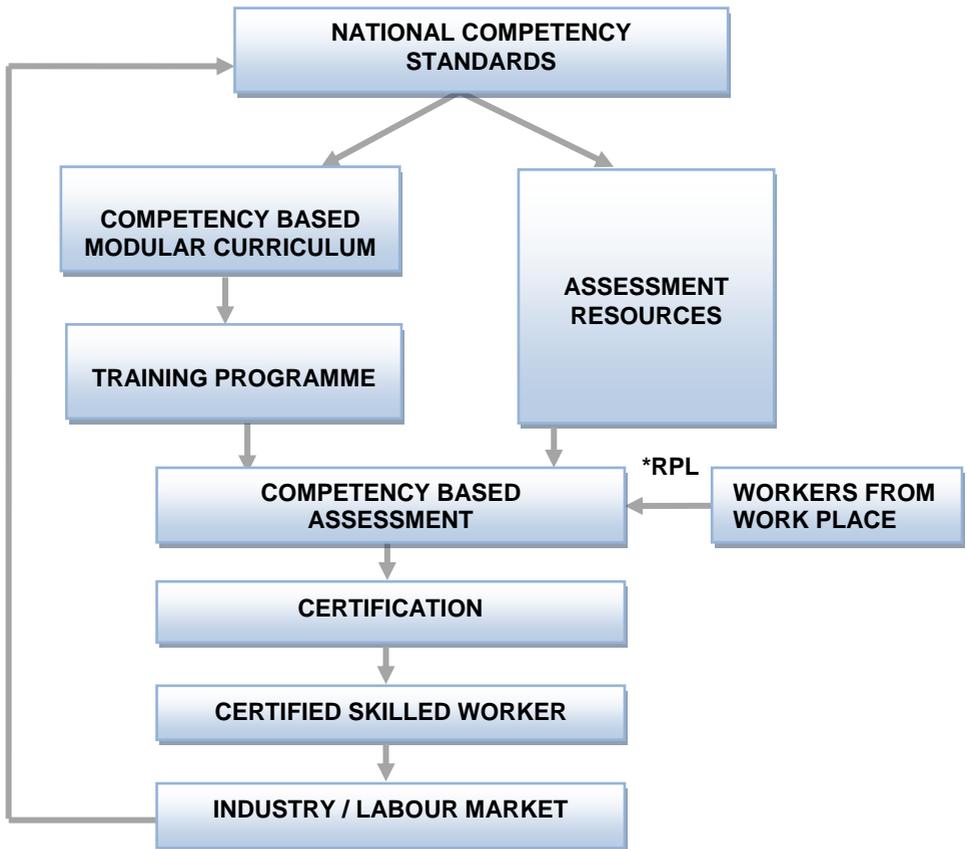
National Competency Standards serve a number of purposes including:

- Provides advice to curriculum developers about the skill and knowledge to be included in curriculum.
- Provides specifications to assessment resource developers about the skill, knowledge and attitudes within an occupation to be demonstrated by candidates.
- Provides 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.

B. Bhutan Vocational Qualification 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 standards, in training institutions, in the workplace, in schools or anywhere where learning takes place.

Components of the Bhutan Vocational Qualification Framework (BVQF)



* RPL = Recognition of Prior Learning

BVQF Levels

The Bhutan Vocational Qualification 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 style="list-style-type: none">• Are narrow in range.• Are established and familiar.• Offer a clear choice of routine responses.• Involve some prioritizing of tasks from known solutions.	<ul style="list-style-type: none">• Basic operational knowledge and skill.• Utilization of basic available information.• Known solutions to familiar problems.• Little generation of new ideas.	<ul style="list-style-type: none">• In directed activity.• Under general supervision and quality control.• With some responsibility for quantity and quality.• With no responsibility for guiding others.

National Certificate Level 2

Carry out processes that:	Learning demand:	Responsibilities which are applied:
<ul style="list-style-type: none"> • Require a range of well developed skills. • Offer a significant choice of procedures requiring prioritisation. • Are employed within a range of familiar context. 	<ul style="list-style-type: none"> • Some relevant theoretical knowledge. • Interpretation of available information. • Discretion and judgement. • A range of known responses to familiar problems 	<ul style="list-style-type: none"> • In directed activity with some autonomy. • Under general supervision and quality checking. • With significant responsibility for the quantity and quality of output. • With some possible responsibility for the output of others.

National Certificate Level 3

Carry out processes that:	Learning demand:	Responsibilities which are applied:
<ul style="list-style-type: none"> • Requires a wide range of technical or scholastic skills. • Offer a considerable choice of procedures requiring prioritization to achieve optimum outcomes. • Are employed in a variety of familiar and unfamiliar contexts. 	<ul style="list-style-type: none"> • A broad knowledge base which incorporates some theoretical concepts. • Analytical interpretation of information. • Informed judgement. • A range of sometimes innovative responses to concrete but often unfamiliar problems. 	<ul style="list-style-type: none"> • In self-directed activity. • Under broad guidance and evaluation. • With complete responsibility for quantity and quality of output. • With possible responsibility for the output of others.

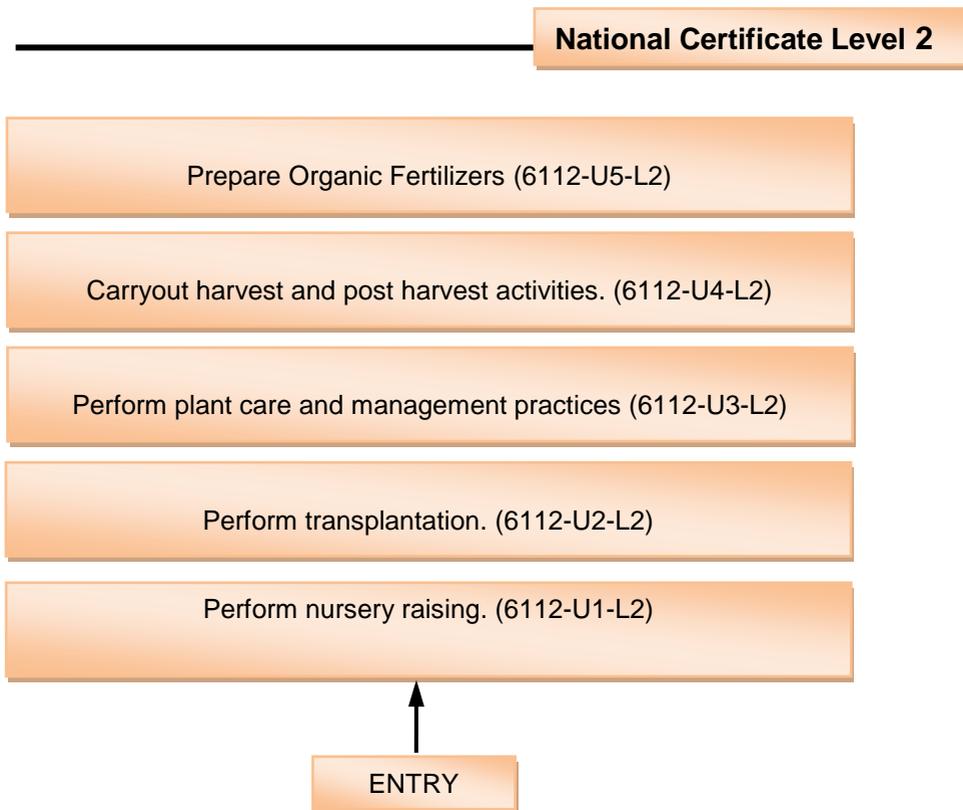
PURPOSE

This suite of one qualification is designed for people interested in a career as agriculturist (vegetable). The National Certificate in the mentioned trade comprises of five units that cover all the essential knowledge and skills required for people working as skilled agriculturist (vegetable farming).

The units covered are; perform nursery raising, transplantation, plant care and management practices, carry out harvest and post harvest activities and to prepare organic fertilizers. Successful completion of this qualification is a pre requisite for entry into Level 3 qualification if there is any.

PACKAGING OF QUALIFICATIONS FOR AGRICULTURIST (VEGETABLE FARMING)

The National Competency Standards for the agriculturist (vegetable farming) comprises of five units. They form one qualification levels as shown below:



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).

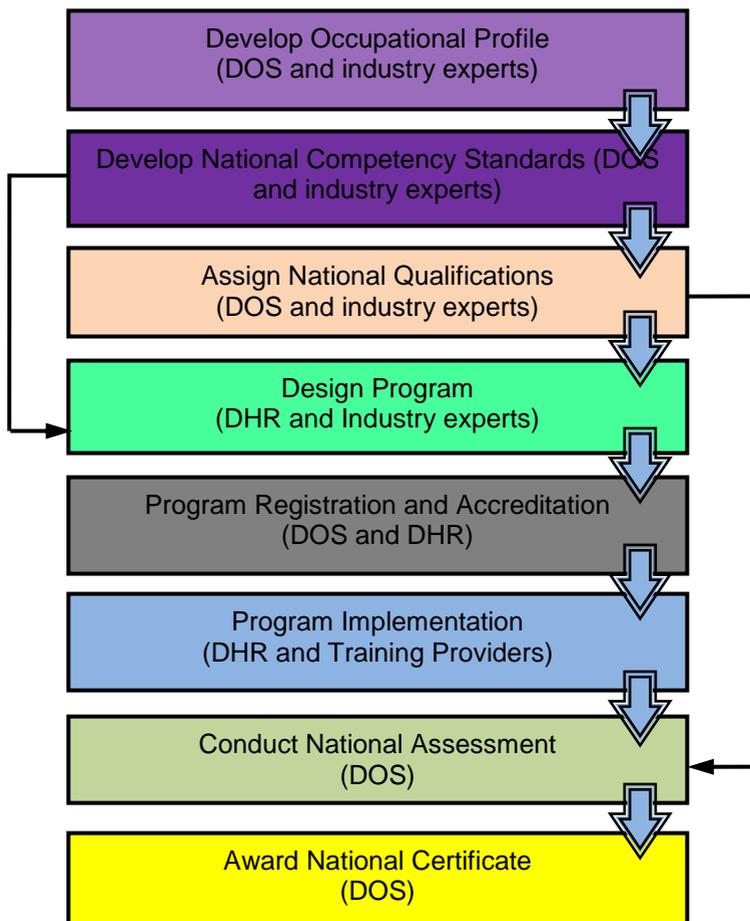
The coding of the national competency standards forms the basis of the identification code for the Vocational Education and Training Management Information System (VET – MIS) both in terms of economic sector identification and that of the individual standard.

Coding the individual unit of competency standard is to identify the level where qualification package belongs.

While packaging, 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 qualification packages.

The ILO assigns the code 6112 to the occupation, vegetable growers and related trades. Therefore in Bhutan, the occupation agriculturist (vegetable farming) has been assigned the code 6112 in the national coding system. The units are assigned the code U while the Levels are assigned the code L. Therefore the code for the National Certificate Level 2 will be 6112 - U1 - L2.

Implementation and operational procedures for National Competency Standard (NCS)



Key:

MoLHR – Ministry of Labour and Human Resources

DHR – Department of Human Resources

DOS – Department of Occupational Standards

NATIONAL COMPETENCY STANDARDS FOR AGRICULTURIST (VEGETABLE FARMING)

Subject experts involved during the consultative workshop for Agriculturist (Vegetable farming):

1. Tshewang Thinley
Extension. Tingtibi, Zhemgang
2. Yeshi Dorji
Researcher, RDC. Tingtibi, Zhemgang
3. Karma Wangchuk
Jr. Instructor II, RDTC
4. Dorji Tshering
Jr. Instructor II, RDTC
5. Pema Gyeltshen
Jr. Instructor II, RDTC
6. Dorji Lhamo
Vegetable grower. Trong, Zhemgang

Development Group (Facilitator):

1. Tshewang, Sr. Program Officer
DOS. MoLHR, Thimphu
2. Chogay Lhendup, Asst. Program Officer
DOS. MoLHR, Thimphu

Editor:

Wangchuk Zangmo, Asst. Program Officer
DOS, MoLHR. Thimphu

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NATIONAL CERTIFICATE - LEVEL 2

UNIT TITLE	ELEMENTS OF COMPETENCE	PAGE
Perform Nursery raising.	<ol style="list-style-type: none">1. Prepare for work2. Prepare for nursery3. Seed sowing4. Nursery care and management	
Perform Transplantation.	<ol style="list-style-type: none">5. Prepare for work6. Prepare bed/land7. Plant the seedlings	
Perform plant care and management practices.	<ol style="list-style-type: none">1. Weeding and hoeing2. Plant fertilization3. Irrigation4. Pruning and training5. Pest and disease control	
Carryout harvest and post harvest activities.	<ol style="list-style-type: none">1. Prepare for work2. Harvest3. Post - Harvest	
Prepare Organic Fertilizers.	<ol style="list-style-type: none">1. Prepare compost2. Prepare for work	

UNIT TITLE : **Perform nursery raising**

DESCRIPTOR : This unit covers the competencies required to prepare for work, prepare for nursery, sow seed and manage and care for nursery.

CODE : **6112-U1-L2**

ELEMENTS OF COMPETENCE	PERFORMANCE CRITERIA
1. Prepare for work.	1.1 Select and use required tools and equipment as per the job requirements 1.2 Select and use required as per the job requirements. 1.3 Select and use required Personal Protective equipment (PPE) as per the job requirements.
2. Prepare for nursery	2.1 Select and prepare site as per the job requirements. 2.2 Select seeds as per the job requirements. 2.3 Carry out seed viability test following standard procedures. 2.4 Mix soil with manure following standard mixing ratio. 2.5 Prepare seedbeds following standard practices.

<p>3. Sow Seed</p>	<p>3.1 Sow seeds maintaining standard spacing and depth.</p> <p>3.2 Carry out watering following standard procedures.</p> <p>3.3 Carry out mulching, if necessary as per the job requirements.</p> <p>3.4 Construct poly tunnel, if necessary as per the job requirements.</p>
<p>4. Manage and care for nursery</p>	<p>3.5 Monitor seed germination and take necessary action as per the job requirements.</p> <p>3.6 Water the nursery beds as per the moisture content of the soil.</p> <p>3.7 Carry out weeding the nursery if necessary as per the job requirements.</p> <p>3.8 Carry out thinning of the seedlings if necessary as per the job requirements.</p> <p>3.9 Control pest and diseases as per the job requirements.</p> <p>3.10 Manage heat and ventilation as per the job requirements.</p> <p>3.11 Carry out harden process following standard procedures.</p> <p>3.12 Water the nursery bed to ease uprooting the seedlings with minimum damages to root system as per the job requirement.</p>

RANGE STATEMENT

Tools and equipment may include but not limited to:

- Spade
- Watering can
- Knife
- Hoe

<ul style="list-style-type: none"> • Measuring tape • Hand rack
<p>Materials may include but not limited to:</p> <ul style="list-style-type: none"> • Flexible pipe • Bamboo split • Plastic sheet • Seeds
<p>Personal Protective equipment (PPE) may include but not limited to:</p> <ul style="list-style-type: none"> • Gloves • Working dress • Dust mask
<p>Seeds included are limited to:</p> <ul style="list-style-type: none"> • Open pollinated seeds • Hybrid seeds • Local seeds •
<p>Pest and disease may include but not limited to:</p> <ul style="list-style-type: none"> • Fungal disease • Termites • Bacterial disease • Cut worm • Nematodes • Aphids

<p>ASSESSMENT GUIDE</p>
<p>Form of assessment</p> <ul style="list-style-type: none"> • 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 written form of assessment. <p>Assessment context</p>

- 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, equipment, materials and documents.
- The candidate must complete the assessment in an accepted time frame.

Critical aspects

- Demonstrate compliance with Occupational Health and Safety Regulations applicable to work site operation.
- Monitor seed germination and take necessary action as per the job requirements.
- Carry out harden process following standard procedures.

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none"> • Estimation and costing • Seed viability test • Identification of pest and diseases • Types of soil • Farm economics • Plant nutrient deficiencies / symptoms • Tools and equipment • Safety measures • Fertilizer and chemical dosage calculation 	<ul style="list-style-type: none"> • Communication skill • Team work • Planning • Problem solving skills • Decision making skills • Handling of tools and equipment

UNIT TITLE : **Perform Transplantation**

DESCRIPTOR : This unit covers the competencies required to prepare for work, prepare bed/land and plant seedlings.

CODE : **6112-U2-L2**

ELEMENTS OF COMPETENCE	PERFORMANCE CRITERIA
1. Prepare for work.	1.1 Select and use required tools and equipment as per the job requirements. 1.2 Select and use required materials as per the job requirements. 1.3 Select and use required Personal Protective equipment (PPE) as per the job requirements.
2. Prepare bed/land.	2.1 Select and prepare land as per the job requirements. 2.2 Select quality seedlings as per the

	<p>standard practices.</p> <p>2.3 Mix soil with manure following standard mixing ratio.</p> <p>2.4 Prepare beds following standard practices.</p>
3. Plant the seedlings.	<p>3.1 Plant the seedlings maintaining required spacing and depth following standard practices.</p> <p>3.2 Carry out watering following standard procedures.</p> <p>3.3 Carry out mulching as per the job requirements.</p>

RANGE STATEMENT	
Tools and equipment may include but not limited to:	
<ul style="list-style-type: none"> • Spade • Measuring tape • Watering can 	<ul style="list-style-type: none"> • Hoe • Hand rack • Sprinkler
Materials may include but not limited to:	
<ul style="list-style-type: none"> • Flexible pipe • Black plastic sheet 	<ul style="list-style-type: none"> • Seedlings
Personal Protective Equipment (PPE) may include but not limited to:	
<ul style="list-style-type: none"> • Gloves • Muff 	<ul style="list-style-type: none"> • Working dress
Quality seedlings are:	
<ul style="list-style-type: none"> • Number of leaves 	<ul style="list-style-type: none"> • Free of pest and diseases

- Height

ASSESSMENT GUIDE

Form of assessment

- 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 written form of assessment.

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, equipment, materials and documents.
- The candidate must complete the assessment in an accepted time frame.

Critical aspects

- Demonstrate compliance with Occupational Health and Safety Regulations applicable to work site operation.

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none"> • Occupational Health and Safety (OHS) Regulations • First Aid 	<ul style="list-style-type: none"> • Communication skill • Team work • Planning • Problem solving skills • Decision making skills

UNIT TITLE : **Perform plant care and management practices**

DESCRIPTOR : This unit covers the competencies required to weed, hoe, plant fertilization, irrigate, prune, train and to control pest and disease.

CODE : **6112-U3-L2**

ELEMENTS OF COMPETENCE	PERFORMANCE CRITERIA
1. Weed and hoe	1.1 Select and use required tools and equipment as per the job requirement 1.2 Identify the level of weed infestation as per the standard practices. 1.3 Carry out weeding work as per the job requirement. 1.4 Carry out hoeing work as per the job requirement.

2. Plant fertilization	<p>2.1 Select and use PPE as per the job requirement.</p> <p>2.2 Carry out top dressing as per the plant stages following standard practices.</p> <p>2.3 Apply right amount of fertilizer as per the standard practices.</p>
3. Irrigate	<p>3.1 Identify and select irrigation methods as per the job requirement.</p> <p>3.2 Identify water stress stage as per the standard procedures.</p> <p>3.3 Irrigate as per the job requirement and environmental conditions.</p>
4. Prune and train	<p>4.1 Carry out pruning as per the job requirement.</p> <p>4.2 Carry out training as per the job requirement.</p>
5. Control pest and disease	<p>5.1 Identify pest and disease as per the</p> <p>5.2 Implement effective control measures as per the job requirement.</p> <p>5.3 Report to the concerned authority about the new emergence and outbreak of pest and disease.</p> <p>5.4 Plan and apply pest control measures in accordance with pest life cycle.</p>

RANGE STATEMENT

Tools and equipment may include but not limited to:

- Spade
- Hand rack
- Hoe

PPE may include but not limited to:

- Mask
- Gloves
- Goggles
- Working dress
- Safety boots

Irrigation methods may include but not limited to:

- Furrow
- Basin
- Dip
- Flooding
- Manual
- Sprinkler

Control measure include:

- IPM method
- Chemical method.

ASSESSMENT GUIDE

Form of assessment

- 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 written form of assessment.

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, equipment, materials and documents.
- The candidate must complete the assessment in an accepted time

frame.

Critical aspects

- Demonstrate compliance with Occupational Health and Safety Regulations applicable to work site operation.

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none">• Occupational Health and Safety (OHS) Regulations• First Aid	<ul style="list-style-type: none">• Communication skill• Team work• Planning• People handling skills• Problem solving skills• Decision making skills• Handling tools and equipments

UNIT TITLE : Carry out harvest and post- harvest activities

DESCRIPTOR : This unit covers the competencies required to prepare for work, harvest and post harvest the

CODE : 6112-U4-L2

ELEMENTS OF COMPETENCE	PERFORMANCE CRITERIA
1. Prepare for work.	1.1 Select and use required tools and equipment as per the job requirement 1.2 Select and use required materials as per the job requirement.

<p>2. Harvest the product.</p>	<p>2.1 Select and use PPE as per the job requirement.</p> <p>2.2 Check the maturity stage as per the standard practices.</p> <p>2.3 Harvest marketable products following correct procedures</p>
<p>3. Post-Harvest the product.</p>	<p>3.1 Sort the products as per standard practices.</p> <p>3.2 Cure products if necessary as per the job requirement.</p> <p>3.3 Clean products as per the standard practices.</p> <p>3.4 Grade the products as per the standard procedures.</p> <p>3.5 Pre-cool the products as per the standard practices.</p> <p>3.6 Pack and label the products as per the standard practices.</p> <p>3.7 Store the products following standard practices.</p>

RANGE STATEMENT

Tools and equipment may include but not limited to:

- Spade
- Hoe
- Sickle

Materials may include but not limited to:

- Tray
- Basket

PPE may include but not limited to:

- | | |
|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • Mask • Glove • Goggles | <ul style="list-style-type: none"> • Working dress • Safety boots |
|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|

ASSESSMENT GUIDE

Form of assessment

- 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 written form of assessment.

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, equipment, materials and documents.
- The candidate must complete the assessment in an accepted time frame.

Critical aspects

- Demonstrate compliance with Occupational Health and Safety Regulations applicable to work site operation.

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none"> • Occupational Health and Safety (OHS) Regulations • First Aid 	<ul style="list-style-type: none"> • Communication skill • Team work • Planning • Problem solving skills

	<ul style="list-style-type: none"> • Decision making skills
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UNIT TITLE : **Prepare organic fertilizers**

DESCRIPTOR : This unit covers the competencies required prepare for work and prepare compost.

CODE : **6112-U5-L2**

ELEMENTS OF COMPETENCE	PERFORMANCE CRITERIA
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<p>1. Prepare for work</p>	<p>1.3 Select and use required tools and equipment as per the job requirement</p> <p>1.4 Select and prepare required materials as per the job requirement.</p> <p>1.5 Select and prepare site as per the job requirement.</p>
<p>2. Prepare compost</p>	<p>2.1 Add the materials following correct sequence as per the standard procedures.</p> <p>2.2 Tilt the compost materials at appropriate duration as per the environmental conditions.</p> <p>2.3 Check the quality of compost as per the standard practices.</p> <p>2.4 Harvest the compost as per the job requirement.</p>

RANGE STATEMENT

Tools and equipment may include but not limited to:

- Spade
- Hoe
- Sickle.

Materials may include but not limited to: (grass, cow dung, leaf mould)

- Grass
- Cow dung
- Leaf mould

ASSESSMENT GUIDE

Form of assessment

- 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 written form of assessment.

Assessment context

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

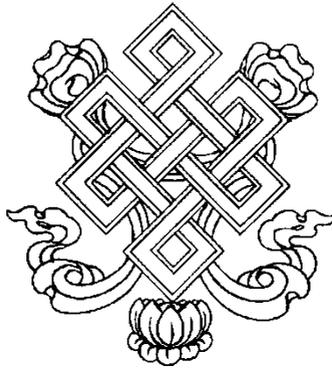
Assessment condition

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

Critical aspects

- Demonstrate compliance with Occupational Health and Safety Regulations applicable to work site operation.

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none">• Occupational Health and Safety (OHS) Regulations• First Aid• Weed sciences• Dosage of fungicide and pesticide,• Rodenticide• Economy threshold level• Plant physiology• Different methods of compost making.	<ul style="list-style-type: none">• Communication skill• Team work• Planning• Problem solving skills• Decision making skills



Department of Occupational Standards
Ministry of Labour & Human Resources
Thongsel Lam, Lower Motithang
P.O. Box 1036, Thimphu.
Tel: 02-331611, Fax: 02-326873
www.molhr.gov.bt