



COMPETENCY BASED CURRICULUM



COMMERCIAL AGRIPRENEURSHIP BQF C-III



Technical Trainers Training and Resources Centre
Department of Workforce Planning and Skills Development
Ministry of Education and Skills Development

Published by Technical Trainers Training and Resource Center
Department of Workforce Planning and Skills Development
Ministry of Education and Skills Development
Royal Government of Bhutan
Thimphu, Bhutan

Copyright © 2026 Technical Trainers Training and Resource Center
Department of Workforce Planning and Skills Development

All rights reserved. No part of this book may be reproduced in any form without the permission from Technical Trainers Training and Resource Center (TTTRC)

This book remains the property of the Technical Trainers Training and Resource Center (TTTRC).

ISBN 978-99980-25-01-1

FOREWORD

Bhutan has seen a gradual increase in the requirement of skilled workers in recent years due to growth of industries. However, supply of skilled workforce that are responsive to the needs of the industry has not been able to keep in pace with the industry demand. Since skilled workers are crucial ingredient for socio-economic development of the country, it is important to have adequate number of trained and certified workers. With growing industries, the “Commercial Agripreneur” is not only the most significant occupation but also have high demand in the labour market. In an effort to meet the skilled human resources, it is imperative to deliver training based on Competency Based Training system in Commercial Agripreneurship BQF Certificate-3 to ensure quality and adequate number of work force in this sector.

To this end, the Department of Workforce Planning and Skills Development (DWPSD) is pleased to present first edition of Competency Based Curriculum for Commercial Agripreneurship BQF Certificate 3 course developed based on national competency standards. Since it is an outcome of a more participatory process of curriculum development, it is expected to provide training delivery with reformed approaches having its content being directly related to labour market needs, focusing on imparting of skills and assessment based on industry work standards. We believe that the Competency Based Curriculum will help in bridging the skill gap between industry’s needs and training institutes thereby enhance the employability of the technical graduates.

The Department acknowledges the valuable contributions made by institutes, officials, and experts from relevant industries who were involved in the design and development of this curriculum. As it is a dynamic document which may require revision based on the needs of the changing labour market, the Department look forward to receiving valuable feedbacks from the institutes and the industries to further improve and refine the curriculum

The Department hope that this document will help advance Competency Based Learning in most of the TVET Institutions.

A handwritten signature in blue ink, appearing to read 'Phub Rinzin', is written over a faint, stylized background graphic that resembles a mountain range or a series of curved lines.

(Phub Rinzin)

Director General

Department of Workforce Planning and Skills Development



དཔལ་ལྷན་འབྲུག་གཞི་རིག་མཁུ་གྲོལ་ལྷན་ཁག།
ལས་མི་འཆར་གཞི་དང་རིག་མཁུ་གྲོལ་ལས་ཁུངས།

Royal Government of Bhutan
Ministry of Education and Skills Development
Department of Workforce Planning and Skills Development

Certificate No: DWPSD/CEC-CA/2026-27/010

Curriculum Endorsement Certificate

This is to certify that the curriculum for the following course(s) developed by

Technical Trainers Training and Resource Center

has been endorsed by the department.

Course	Level
Commercial Agripreneurship	BQF Certificate 3

Date of Endorsement: 30/9/2026



This certificate is valid till 29/09/2031 from the date of endorsement

Director General
Department of Workforce Planning and Skills Development

ACKNOWLEDGEMENT

Technical Trainers Training and Resource Center, Department of Workforce Planning and Skills Development under MoESD would like to express our appreciation to the following subject experts and facilitators who have participated in curriculum development and validation for Commercial Agripreneurship BQF Certificate 3:

Experts involved in the development of curriculum:

1. Mr. Dawa Penjor, Specialist, National Mushroom Center, Thimphu
2. Ms. Kesang Tshomo, Specialist, Department of Agriculture
3. Mr. Tenzin Chopel, Sr. Horticulture supervisor, Dechencholing Royal Project
4. Ms. Sonam Wangmo, Educated farmer, Sarpang
5. Mr. Passang Dorji, Sr. Mushroom Supervisor, Chimipang Royal Project, Punakha
6. Mr. Pema Gyeltshen, Sr. Instructor, RDTC, Zhemgang
7. Ms. Karma Cheki, Post Production Officer, National Post Harvest Center, Paro
8. Mr. Tshering Wangchuk, Sr. Agriculture officer, Regional Seed Center, Samtenling, Sarpang
9. Mr. Tashi Dendup, Secretary General, Horticulture Association of Bhutan

Subject experts involved in the validation of curriculum:

1. Mr. Tirtha Bdr. Katwal, Specialist I, National Center for Organic Agriculture. Department of Agriculture (**Chairperson**)
2. Mr. Dawa Penjor, Specialist, National Mushroom Center, Thimphu
3. Ms. Tanka Maya Pulami, Principal Agriculture Officer, ARDC Bajo
4. Mr. Karma Wangchuk, Instructor, RDTC
5. Ms. Tshering Wangmo, National Soil Service Center, DoA
6. Ms. Bunu Maya Chhetri, Aggregation Manager, Farm Machinery Cooperation Ltd, Paro
7. Mr. Prem Kumar Bhattarai, TVET Quality Council, BQPCA

Facilitators for development and validation of curriculum

1. Mr. Ieki Dorji, Sr. Instructor, TTI Thimphu
2. Ms. Karma Dema, Program Officer, TTTRC, DWPSD, MoESD

Chief editor

1. Mr. Karma Dorji, Offtg. Chief Program Officer, TTTRC, DWPSD, MoESD

Table of Contents

FOREWORD	2
ACKNOWLEDGEMENT	3
COMPETENCY PROFILE	6
COURSE INFORMATION	10
COURSE OUTLINE	11
COURSE STRUCTURE FOR CORE COMPETENCIES.....	12
ASSESSMENT AND CERTIFICATION SYSTEM	1
MODULE INFORMATION	4
MODULE 1: CARRYING OUT PLANNING AND PREPARATION FOR CROP	
PRODUCTION	5
PREPARE PRODUCTION FIELD.....	11
CONDUCT SOIL FERTILITY AND NUTRIENT MANAGEMENT	15
MODULE 2: IMPLEMENTING IRRIGATION AND WATER MANAGEMENT	24
PLAN IRRIGATION REQUIREMENTS.....	26
OPERATE IRRIGATION SYSTEMS.....	29
CONSERVE WATER RESOURCES.....	32
MODULE 3: MANAGING PEST, DISEASES, AND WEEDS	35
MANAGE PESTS	37
MANAGE DISEASES.....	41
MANAGE WEEDS.....	19
MODULE 4: CARRYING OUT COMMERCIAL VEGETABLE PRODUCTION.....	23
PERFORM PRODUCTION ACTIVITIES	25
PERFORM VEGETABLE MANAGEMENT	31
PERFORM HARVESTING	34
PERFORM POST-HARVEST MANAGEMENT	37
MODULE 5: CARRYING OUT CEREAL PRODUCTION.....	41
PERFORM PRODUCTION ACTIVITIES	43
PERFORM HARVESTING	47
PERFORM POST-HARVEST MANAGEMENT	50
MODULE 6	54
PERFORM PRODUCTION OF MUSHROOM ON SAWDUST (SHIITAKE)	56
PERFORM SPAWN MANAGEMENT	62
MANAGE PEST AND DISEASES	65
PERFORM POST-HARVESTING.....	71
ANNEXURE	75
ANNEX I: TIME DISTRIBUTION	75
ANNEX II: MODULE RECOGNITION	80
ANNEX IV: LESSON PLAN	81
ANNEX V: COURSE PLAN	86

COMPETENCY PROFILE

Trade: Commercial Agripreneur BQF Certificate 3

Competency Area	Sub- Competency Area	Competencies/Task			
A. Carry out planning and preparation for crop production	A1. Prepare for crop production	A1.1 Select site	A1.2 Select crops	A1.3 Conduct soil testing	A1.4 Prepare Crop specific-crop production plan
		A1.5 Prepare estimation and costing			
	A2. Prepare production field	A2.1 Conduct site analysis	A2.2 Perform land development	A2.3 Perform soil preparation	A2.4 Prepare bed
		A2.5 Construct fence			
	A3. Conduct soil fertility and nutrient management	A3.1 Develop soil fertility management interventions	A3.2 Perform appropriate crop rotation	A3.3 Prepare compost	A3.4 Prepare vermi-compost
		A3.5 Prepare liquid manure /bio-fertilizers	A3.6 Prepare bokashi	A3.7 Apply organic matter/compost	A3.8 Apply green manure
		A3.9 Plant/Grow cover crops	A3.10 Apply mulch	A3.11 Apply soil amendments	A3.12 Conduct soil pH correction
		A3.13 Apply chemical fertilizers			

B. Implement irrigation and water management	B1. Plan irrigation requirements	B1.1 Prepare crop irrigation schedule	B1.2 Conduct soil moisture testing	B1.3 Select irrigation system	
	B2. Operate irrigation systems	B2.1 Install sprinkler irrigation system	B2.2 Install drip irrigation system	B2.3 Troubleshoot irrigation system	
	B3. Conserve water resources	B3.1 Construct water harvesting system	B3.2 Construct drainage for waterlogged area	B3.2 Apply on-farm soil moisture conservation practices	
C. Manage pest, diseases and weeds	C1. Manage pests	C1.01 Identify pests	C1.02 Conduct pest surveillance	C1.03 Plan pest management interventions	C1.04 Apply integrated pest management practices
	C2. Manage diseases	C2.01 Identify diseases	C2.02 Conduct disease surveillance	C2.03 Plan disease management interventions	C2.04 Apply integrated disease management practices
	C3. Manage weeds	C3.01 Identify weeds	C3.02 Conduct weed surveillance	C3.03 Plan weed management interventions	C3.04 Apply integrated weed management practices
D. Carry out commercial vegetable production	D1. Perform production activities	D1.1 Construct/Install basic greenhouse	D1.2 Manage smart green house	D1.3 Select seed	D1.4 Perform nursery raising on bed
		D1.5 Perform nursery raising on trays	D1.6 Manage nursery	D1.7 Perform direct sowing of seed	D1.8 Transplant seedling
	D2. Perform vegetable management	D2.01 Perform staking & trellising	D2.02 Perform pruning & training	D2.03 Perform thinning & de-shooting	
	D3. Perform harvesting	D3.01 Assess maturity indices	D3.02 Prepare for harvesting	D3.03 Harvest vegetables	

	D4. Perform post-harvest management	D4.01 Conduct sorting and grading	D4.02 Select appropriate packaging materials	D4.03 Perform packaging	D4.4 Perform labeling
		D4.5 Perform Storing			
E. Carry out Cereal production	E1. Perform production activities	E1.1 Select seed	E1.2 Perform nursery raising	E1.3 Perform direct sowing of seed	E1.4 Transplant seedlings
		E1.5 Perform crop management			
	E2. Perform harvesting	E2.01 Assess crop maturity	E2.02 Prepare for harvesting	E2.03 Harvest crops	E2.04 Perform threshing and cleaning
	E3. Perform post-harvest management	E3.01 Perform drying	E3.02 Select appropriate packaging materials	E3.03 Perform packaging	E3.4 Perform labeling
		E3.5 Perform Storing			
F. Carry out mushroom cultivation	F1. Perform production of mushroom on sawdust (Shiitake)	F1.01 Select site	F1.02 Manage mushroom house	F1.03 Prepare media	F1.04 Sterilize media
		F1.05 Inoculate media with mushroom spawn	F1.06 Incubate inoculated media	F1.07 Induce fruiting	F1.08 Harvest mushroom
	F2. Perform spawn management	F2.01 Store spawn	F2.03 Transfer spawn	F2.03 Maintain hygiene and sanitation	
	F3. Manage pest and diseases	F3.01 Identify pest and diseases	F3.02 Conduct pest and diseases surveillance	F3.03 Identify interventions for management	F3.04 Plan pest and diseases intervention measures
		F3.05 Apply pest prevention measures	F3.06 Apply pest management measures	F3.07 Apply pest control measures	F3.08 Apply diseases prevention measures

		F3.9 Apply diseases management measures	F3.10 Apply diseases control measures		
	F4. Perform post harvesting	F4.01 Conduct drying	F4.02 Select appropriate packaging materials	F4.03 Perform packaging	F4.4 Perform labeling
		F4.5 Perform storing			

COURSE INFORMATION

COURSE TITLE	Commercial Agripreneurship
LEVEL	BQF Certificate Level 3
COURSE OBJECTIVE	Upon completion of this training program, the trainees will be able to: • Be a commercial agripreneur with expertise on vegetables, cereal crops and mushroom production • Be able to undertake agribusiness
COURSE DESCRIPTION	Upon successful completion of the course, graduates will be equipped with the competencies required to pursue agripreneurship and to work in or manage commercial agricultural farms. They will have practical knowledge and skills in vegetable, cereal crop, and mushroom production, as well as basic competencies in farm economics and agribusiness management. To obtain certification for this course, learners must successfully achieve all the prescribed learning outcomes.
COURSE DURATION	1664 Hours (11.5 months)
TRAINER AND TRAINEE RATIO	1:12 (Practical) 1:20 (Theory)
ENTRY REQUIREMENT	Completed class X
TVET TRAINER REQUIREMENTS	• Must have a minimum qualification of Diploma in relevant field; • Must have undergone Training of Trainers-Technical Instruction and Andragogy; • Must have at least 5 years job/industry experience if institute hires instructor or guest lecturer from industry

COURSE OUTLINE

Sl. No	Subject /Module	Duration (Hours)	Content Competencies (Mapped)
1.	Core modules	896	CC
2.	OJT	420 (3 months)	CC
Total hours for Core Competencies (CC)		1316	
1.	Applied Dzongkha	42	SS
2.	ICT	48	SS
3.	Applied Mathematics	53	SS
4.	Technical English	51	SS
5.	Entrepreneurship	84	
Total hours for Soft Skills (SS)		278	
1.	Assessment	70	
Entire Course Duration		1664	

Note:

- 35 Hours per week and 7 hours per day
- (*) This curriculum contains core modules which cover main competencies of Commercial Agripreneurship BQF Certificate level-3 and OJT component. There are separate curricula for subjects/modules for delivery of soft skills, professional development & values and environmental concern & safety. In order to achieve the qualification of Commercial Agripreneurship BQF Certificate level 3, the subjects and modules listed must be accomplished as per the credit hours provided.

Content Competencies:

CC-Core Competencies

SS-Soft Skills

PD-Professional Development and Values

ES-Environmental concern and Safety

COURSE STRUCTURE FOR CORE COMPETENCIES

Training Modality	Module Title	Learning outcomes	Nominal Duration (Hour)
1. Institute Training	A. Carry out planning and preparation for crop production	A1. Prepare for crop production A2. Prepare production field A3. Conduct soil fertility and nutrient management	300
	B. Implement irrigation and water management	B1. Plan irrigation requirements B2. Operate irrigation systems B3. Conserve water resources	70.5
	C. Manage pest, diseases and weeds	C1. Manage pests C2. Manage diseases C3. Manage weeds	35.5
	D. Carry out commercial vegetable production	D1. Perform production activities D2. Perform vegetable management D3. Perform harvesting D4. Perform post-harvest management	182
	E. Carry out Cereal production	E1. Perform production activities E2. Perform harvesting E3. Perform post-harvest management	62
	F. Carrying out mushroom cultivation	F1. Perform production of mushroom on sawdust (Shiitake) F2. Perform spawn management F3. Manage pest and diseases F4. Perform post harvesting	246
2. On the Job Training			420
Total Core Competencies Duration:			1316

ASSESSMENT AND CERTIFICATION SYSTEM	
ASSESSMENT	Diagnostic assessment of each skill will be conducted to identify areas where trainees may require additional support or intervention. This assessment will also evaluate their existing knowledge, skills, and understanding prior to a specific learning experience or unit of study. Methods such as pre-tests, concept mapping, KWL charts, and observations of student work will be utilized. Formative assessment for every module and learning outcome will be conducted through assignments, project works, continuous assessment, demonstration of practical skills/observations, oral questioning and written test. Summative assessment after completion of each national certificate level will be conducted by TVET Quality Council, Bhutan Qualifications and professional certification authority, MoESD as per the National Competency Standards and Guidelines for National Assessment and Certification System, provided the course is accredited with TVET Quality Council, Bhutan Qualifications and professional certification authority, MoESD.
CERTIFICATION	On successful completion of every module, the institute will award a certificate of achievement to the trainees. The TVET Quality Council, Bhutan Qualifications and professional certification authority, MoESD will award a National Certificate to the trainees upon the successful completion of NC level assessment.
COURSE DELIVERY	1. Modular 2. Demonstration 3. Lecture 4. Industrial training/attachment 5. Project work 6. Problem-based learning 7. Project-based learning
RESOURCES	Materials • Pen, Paper, Notebook, File, Book, Market information/data, Meteorological data, Reference charts (pH chart, BSR sheet, CoP sheet, harvest maturity charts, grading reference charts, nutrient calculation chart), Field notebook, record sheets, Soil sample form, Soil test report, sample collection bags, collection bags, rubber bands, Labelling paper, Marker pen, Waste collection bag, twine thread, sewing thread, Rope, String tags, Clips, Fencing poles, Fabric, Fittings, Rail, Tension bands, Tension wire, Bolt and nut, Hinges, Latch, Electric fence wire, Energizer, Insulators, Sand, Cement, Gravel, Bricks, Stone, Greenhouse set, Shade net, Wooden layout peg, wooden/bamboo stakes, bamboo pole, Plastic sheet, plastic film, GI wire, Nails, Tissue paper, cloth, Sanitizer / alcohol, Detergent, Hand towel, Seeds, Seedlings, Cover crop seeds, Green manure seeds, Crop residues, Dry materials, Green materials, Kitchen waste, Animal manure, Animal urine, Top-soil; soil, Manure, Compost, Organic manures, Bio-fertilizers, Organic fertilizers, Liquid manure, Bokashi bran / yeast, Microbial solution (EM), Cocopeat, Perlite, Biochar, Earthworms, Coconut husk, Rock phosphate, Sulphur dust, Gypsum, Dolomite,

	Limestone powder, Fungicide, pesticides, Fumigants, Disinfectants (70% isopropyl alcohol/IPA, hydrogen peroxide, ammonia-based cleaners), Insect trap net, Sprayer nozzles, Mulching materials, Nursery tray, Water, Hose, Irrigation system catalogues/manuals, Farm layout map and Polybag Tools - Auger, Spade, Shovel, Pickaxe, Hoe, Rake, Trowel, Dibblers, Soil sieving net, Compost fork / pitch fork, Sickle, Stakes, Hammer, wooden mallet, Crowbar, A-frame, Knife (including grafting knife, harvesting knife), Secateurs, Pruning scissors, scissors, Wire cutter, Pliers, Wrench set, Screwdrivers, Hacksaw, Saw, Ladder, Measuring tape, Rapid soil test kits, pH testing kit, Watering can, Hose pipe, Wheelbarrow, Harvest trolley, Cart, gorilla cart, trolley, Pallet jack, Wheel carts, plastic crates, Boxes, Trays, Basket, Racks, Work table, Paper cutters, Staplers, Mulch puncher, Bucket, Tank / drum (airtight container), Funnel, Jug, Measuring container, Measuring tools, Weighing balance, Spatula, Stirring stick, Pressure gauge, Spirit level, Brushes, Petri dish, Tweezers / forceps, Scalpels, Spacer, Manual transplanter, Inoculation tools, Bunsen burner, Lighter, magnifying glass, Cleaning tools, Sprayers Instruments - Compass, altimeter, measuring tape, pH meter / pH reader, calculator, thermometer, tensiometer, moisture meter, moisture analyser and weighing balance Equipment - Computer, tractor with levelling attachment, farm machinery for soil preparation, portable drilling machine, knapsack sprayer, power tiller / tractor, brush cutter, wheelbarrow, rotovator, water pump, hand drilling machine, pipe cutter, mini ditch digger, microscope, stainless steel table, heat sealing machine, weighing scale, sewing machine, binding machine, colour printer, label paster, forklift, sawdust mixer, bagging, autoclave, sterilizer, Laminar flow cabinet, thermo-hygrometers, CO2 sensor, exhaust fans, air conditioners, misting machines, sorting & grading table, Refrigerator and cold storage. PPE - Work dress, lab coat, chemical spray suit, hair net, hats, safety goggles, face mask, face shield, safety boots, foot wears and hand gloves Learning Materials - Competency Based Learning Materials (CBLM) - Reference books - Hand-outs - Audio visuals Infrastructure and training facilities <i>Theory classroom size:</i> Minimum of 1 m2 per trainee;
--	---

	• <i>Practical Workshop size:</i> Minimum of 2.25 m² per trainee. Variables must be considered depending upon the type of skills being taught and the number of trainees participating at a time.
--	--

MODULE INFORMATION
COMMERCIAL AGRIPRENEURSHIP BQF CERTIFICATE-III

MODULE 1: CARRYING OUT PLANNING AND PREPARATION FOR CROP PRODUCTION

MODULE INFORMATION

Occupation	Commercial Agripreneur
Competency Area	Carry out planning and preparation for crop production
Module Title	Carrying out planning and preparation for crop production
Module Code	6111-L3-M1
Module Description	This module is structured to provide learners with the knowledge, skills and right attitude required to prepare for crop production, preparing production fields and conducting soil fertility and nutrient management.
Nominal Duration	300 Hours
Certificate Level	BQF Certificate 3
Pre-requisite	Class X passed
Learning Outcome	1. Prepare for crop production 2. Prepare production field 3. Conduct soil fertility and nutrient management

Module Title	Carrying out planning and preparation for crop production		
Module Code	6111-L3-M1		
Learning Outcome 1	Prepare for crop production		
Duration	Theory: 14hours	Practical: 25hours	Total: 39hours
Assessment Criteria	• Site is selected as per job requirement following standard procedures • Crop is selected as per job requirement following standard procedures • Soil testing is conducted as per standard procedure following soil testing guidelines of NSSC • Specific crop production plan is prepared as per job requirement following standard procedures • Estimation and costing are prepared as per the standard procedure following Cost of Production (CoP) for selected crops		
Content	A1.00 Introductory knowledge • Introduction to commercial Agripreneurs • Trends and scope for commercial Agripreneurs • Introduction to crops • Types of crops for commercial production • Basics of Farm Economics • Entrepreneurship course for commercial farmer A1.01 Selecting site Knowledge • Introduction to site selection • Criteria for site selection • Agro-ecological zones • Importance of collecting metrological data • Procedure for obtaining clearances and land lease approval Skills • Interpreting metrological data • Analytical skills • Communication skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being vigilant and patient • Having work ethics and integrity • Being a team player • Ensuring proper use of PPE • Ensuring to follow OHS (Occupational Health and Safety) rules and regulations A1.02 Conducting soil testing Knowledge • Importance of soil properties • Types of soil • Importance of soil testing		

	• Methods of soil testing • Soil sample collection procedure • Importance of proper handling, labeling and storage of soil sample • Calculation of fertilizer dose Skills • Interpreting soil test result • Observation skills • Communication skill • Planning skills • Data analysis Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation • Ensuring proper handling of soil samples A1.03 Selecting crops Knowledge • Definition of commercial crops • Crop suitability to agro-ecological zone • Classification of vegetable crops • Variety of crops • Importance of gathering market information • Criteria for crop selection Skills • Interpreting soil test result • Analytical skills • Communication skills • Observation skills • Planning skills • Decision making skills Attitude, safety and environmental concern • Effective time management • Being vigilant and patient • Having work ethics and integrity • Being a team player • Ensuring to follow OHS (Occupational Health and Safety) rules and regulations • Ensuring correct selection of crop variety as per market information and Agro-ecological zone
--	--

	A1.04 Preparing specific crop production plan Knowledge • Introduction to vegetable • Importance of vegetables (Nutrition, economic, culture) • Importance of selecting appropriate crops based on types, location, market and environment • Interpretation of the cropping calendar • Cultivation and cropping systems of the selected crops • Definition of seed rate • Seed requirement estimation • Cultural practices Skills • Analytical skills • Observation skills • Planning skills • Decision-making skill • Interpreting Data Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Having sense of ownership and accountability • Ensuring to follow OHS rules and regulation A1.05 Preparing estimation and costing Knowledge • Definition of Cost of Production (CoP) • Importance of calculating cost of production • Types of costs to be included in the estimation and costing • Types of cost for production (Fixed and variable) Skills • Numeracy Skill • Analytical skills • Communication skills • Observation skills • Planning skills • Data analysis skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation
--	--

	• Ensure to use current and updated information
Learning Conditions	Learning Materials • Competency Based Learning Materials (CBLM) • Hand-outs • Audio Visuals • Reference books: (BSR sheet and CoP sheet) • Manuals • Google classroom Learning facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Practical field Materials • Pen, paper, notebook, market information/data, meteorological data, sample bags, rubber band, label, marker pen, soil sample form, pH chart, BSR sheet and CoP sheet Tools • Auger, spade, shovel, rapid test kits, pH testing kit and calculator Instrument • Compass, altimeter, measuring tape, pH meter and moisture meter Equipment • Computer PPE • Work dress, hats, safety goggles, mask and safety boots
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Field visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work

Module Title	Carrying out planning and preparation for crop production		
Module Code	6111- L3-M1		
Learning Outcome 2	Prepare production field		
Duration	Theory: 14hours	Practical: 97hours	Total: 111hours
Assessment Criteria	• Site analysis is conducted as per the job requirement following standard procedure • Terracing /contouring is performed as per the standard procedure following NSSC guidelines for Agriculture Land Development (ALD) • Soil preparation is performed as per job requirement following standard procedures • Fence is constructed as per job requirement following standard procedure • Bed is prepared as per job requirement following standard procedure		
Content	A2.01 Conducting site analysis for site preparation Knowledge • Importance of conducting site analysis • Field requirement for vegetable production • Criteria for land development for selected vegetable production • Criteria for site analysis Skills • Analytical skills • Observation skills • Information processing skill • Planning skills • Interpretation skill Attitude, safety and environmental concern • Effective time management • Being vigilant and patient • Having work ethics and integrity • Being a team player • Organized and resourceful • Ensuring proper use of PPE • Ensuring to follow OHS (Occupational Health and Safety) rules and regulations A2.02 Performing land development (terracing /contouring) Knowledge • Sustainable Land Management (SLM) • Agriculture Land Development (ALD) • Definition of terracing and contouring • Importance of maintaining terrace/contour • Sloping Agricultural Land Technology (SALT) • Water management and irrigation • Soil nutrient management • Slope and land contour principles • Climate and microclimate effects on crops		

	Skills • Machine operating skills • Using clinometer • Observational skills • Analytical skill • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Ensuring proper use of PPE • Following OHS rules and regulations • Ensuring to comply National Soil Service Center's guidelines (SLM guidelines, ALD guideline) A2.03 Performing soil preparation Knowledge • Basics soil science • Importance of soil preparation • Tillage & soil conditioning • Types of soil preparation • Type of farm machineries for soil preparation Skills • Using tensiometer • Analytical skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Ensuring proper use of PPE • Ensuring to follow OHS (Occupational Health and Safety) rules and regulations • Ensuring to handle the machineries safely A2.04 Constructing fence Knowledge • Function of fence • Types of fences and its application • Suitability of fence • Safety requirements for electric fencing
--	--

	Skills • Analytical skills • Communication skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Proper handling of tools, materials and equipment • Ensuring proper use of PPE • Ensuring to follow OHS (Occupational Health and Safety) rules and regulations A2.05 Preparing bed Knowledge • Types of beds • Standard requirement for bed preparation • Advantages and disadvantages of bed preparation • Importance of bed levelling Skills • Analytical skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being vigilant and patient • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation
Learning Conditions	Learning Materials • CBLM • Hand-outs • Audio Visuals • Reference books: • Manuals • Google classroom Learning Facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Practical field

	Materials • Pen, paper, file, rainfall and soil data, markers, thread / rope, fencing poles, fabric, fittings, rail, tension bands, tension wire, bolt and nut, hinges, latch, electric fence wire, energizer, insulators, sand, cement, gravel, wooden layout peg and twine thread. Tools • Spade, pickaxe, stakes, hammer, crowbar, A-frame, knife, sickle, hoe, rake, tensioning crowbar, wrench set, pliers, wire cutter, hacksaw, shovel, ladder and screwdriver. Instrument • Thermometer, pH reader, tensiometer, clinometer, humidity meter and measuring tape Equipment • Tractors with levelling attachments, farm machineries for soil preparation and portable drilling machine PPE • Work dress, hats, hand gloves, mask and safety boot
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work

Module Title	Carrying out planning and preparation for crop production		
Module Code	6111- L3-M1		
Learning Outcome 3	Conduct soil fertility and nutrient management		
Duration	Theory: 23 hours	Practical: 127 hours	Total: 150 hours
Assessment Criteria	• Soil Fertility Management Interventions are ~~is~~ developed as per the job requirement following standard procedure • Appropriate crop rotation is performed as per the job requirement following standard procedure • Compost is prepared as per job requirement following standard practices and NSSC guidelines • Vermi-compost is prepared as per job requirement following standard procedure • Liquid manure is prepared as per job requirement following standard procedure • Bokashi is prepared as per job requirement following standard procedure • Organic matter/compost is applied as per the job requirement following standard procedure • Green manuring is performed with appropriate green manuring crops as per job requirement following standard procedure • Cover crops are planted or grown as per the job requirement following standard procedure • Mulching is performed as per the job requirement following standard procedure • Soil amendment is applied as per job requirement following standard procedure • Soil pH correction is applied as per job requirement following standard procedure • Chemical fertilizer for soil is applied as per job requirement following standard procedure		
Content	A3.01 Developing soil fertility management intervention Knowledge • Importance of soil nutrition and fertility management • Type of farm inputs for soil nutrition • Types of soil fertility management interventions • Nutrient required at different stages of crop Skills • Analytical skill • Interpretation skills • Observation skills • Information processing skill • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources		

	• Being vigilant and patient • Having work ethics and integrity • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation A3.02 Performing appropriate crop rotation Knowledge • Definition of crop rotation • Purpose of practicing crop rotation • Growth habit and life span of the crops • Suitability of plants for the crop rotation • Effects on the soil and yield of the main crop Skills • Analytical skills • Observation skills • Information processing skill • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation A3.03 Preparing compost Knowledge • Definition of compost and its benefits • Types of compost and composting methods • Materials used for composting (<i>green materials, dry materials, Farm Yard Manure(FYM)</i>) • Carbon and nitrogen balance (C:N ratio) in compost materials • Importance of chopping materials for faster decomposition • Suitable site conditions for compost preparation • Moisture and optimum temperature requirements for composting • Indicators of compost maturity • Benefits of compost in soil fertility and crop production • Function of microbes and amendment • Types of compost amendments • Management of compost • Quality and standard of compost Skills • Analytical skills • Observation skills
--	---

	• Information processing skill • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring proper use of PPE • Ensuring to follow OHS rules and regulation • Ensuring proper protection for compost heap A3.04 Preparing Vermi-compost • Definition of vermi-compost • Benefits of vermi-composting • Suitable earthworm species and their care • Types of organic wastes to be used and avoid • Proper pre-decomposition of raw materials • Requirement of site selection and vermined/pit preparation • Optimum moisture and temperature requirement • Method of adding and handling earthworms • Importance of vermi-composting environment • Indicators of mature vermicompost • Common problems and their management while preparing vermi-compost • Difference between compost and vermicompost • Life cycle and feeding habits of earthworms • Vermi Culture • Earthworm collection methods • Vermi compost standards Skills • Analytical skills • Observation skills • Planning skills • Decision-making skills • Using moisture meter Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Ensuring proper use of PPE
--	--

	- Ensuring to follow OHS (Occupational Health and Safety) rules and regulations A3.05 Preparing liquid manure - Definition of liquid manure - Benefits of liquid manure - Method of liquid manure preparation - Fermentation of liquid manure - Application of liquid manure - Benefits of Effective Micro-organism (EM) - Types of plant used in liquid manure Skills - Analytical skills - Observation skills - Decision-making skills Attitude, safety and environmental concern - Effective time management - Being team player - Being efficient in using resources - Being vigilant and patient - Having work ethics and integrity - Proper handling of tools, materials and equipment - Ensuring proper use of PPE - Ensuring to follow OHS (Occupational Health and Safety) rules and regulations A3.06 Preparing Bokashi Knowledge - Definition of Bokashi - Benefits of Bokashi - Methods of preparing Bokashi - Raw materials used for Bokashi preparation - Role of microorganisms in fermentation - Fermentation time and quality indicators - Storage and application methods Skills - Analytical skills - Observation skills - Decision-making skills Attitude, safety and environmental concern - Effective time management - Being team player - Being efficient in using resources - Being vigilant and patient - Having work ethics and integrity - Proper handling of tools, materials and equipment - Ensuring proper use of PPE
--	--

	- Ensuring to follow OHS (Occupational Health and Safety) rules and regulations A3.07 Applying Organic Matter/compost Knowledge - Definition of organic matter/compost - Organic inputs for nutrient management - Organic soil fertility principles and nutrient management - Crop nutrient requirements Skills - Analytical skills - Observation skills - Decision-making skills Attitude, safety and environmental concern - Effective time management - Being team player - Being efficient in using resources - Being vigilant and patient - Having work ethics and integrity - Proper handling of tools, materials and equipment - Ensuring proper use of PPE - Ensuring to follow OHS (Occupational Health and Safety) rules and regulations A3.08 Performing green manuring Knowledge - Definition of green manure - Importance of green manuring - Types of green manure crops - Selection of green manuring crops - Green manuring crops stages - Method of incorporating green manure Skills - Using brush cutter - Analytical skills - Observation skills - Decision-making skills Attitude, safety and environmental concern - Effective time management - Being team player - Being efficient in using resources - Being vigilant and patient - Having work ethics and integrity - Proper handling of tools, materials and equipment - Ensuring proper use of PPE - Ensuring to follow OHS (Occupational Health and Safety) rules and regulations
--	---

	A3.09 Planting/Growing cover crops Knowledge • Definition of cover crops • Purpose of cover crops • Identification of the cover crops • Growth habit and life span of the cover crops • Correct stage for cutting down the cover crops • Effects on soil and yield of the main crop Skills • Using brush cutter • Analytical skills • Observation skills • Decision-making skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Ensuring proper use of PPE • Ensuring to follow OHS (Occupational Health and Safety) rules and regulations A3.10 Performing mulching Knowledge • Definition of mulching • Benefits of mulching • Types of mulches (Organic and In-organic mulches) • Mulch film requirement • Techniques of laying mulch • Importance of managing non-biodegradable mulching materials Skills • Analytical skills • Communication skills • Observation skills • Planning skills • Decision making skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Ensuring proper use of PPE
--	---

	- Ensuring to follow OHS (Occupational Health and Safety) rules and regulations A3.11 Applying soil amendment Knowledge - Definition of soil amendment - Purpose of soil amendment - Types of soil amendments (organic and inorganic) - Recommended application rates and methods - Time of soil amendment application Skills - Analytical skills - Communication skills - Observation skills - Planning skills - Decision making skills Attitude, safety and environmental concern - Effective time management - Being team player - Being efficient in using resources - Being vigilant and patient - Having work ethics and integrity - Proper handling of tools, materials and equipment - Ensuring proper use of PPE - Ensuring to follow OHS (Occupational Health and Safety) rules and regulations - Ensuring to use correct amount of soil amendment and prevent nutrient runoff A3.12 Applying soil pH correction Knowledge - Definition of soil pH - Effect of soil pH on plant growth and nutrient availability - Optimum pH range for crops - Types of amendment for pH correction - Dosage of soil amendment for pH correction - Application methods and timing Skills - Analytical skills - Communication skills - Observation skills - Planning skills - Decision making skills Attitude, safety and environmental concern - Effective time management - Being team player - Being efficient in using resources
--	---

	• Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Ensuring proper use of PPE • Ensuring to follow OHS (Occupational Health and Safety) rules and regulations A3.13 Applying chemical fertilizer Knowledge • Definition of chemical fertilizer • Plant Nutrients (Primary and secondary) • Benefits of chemical fertilizers • Types of chemical fertilizer • Fertilizer composition • Calculation and dose determination • Fertilizer application methods • Advantages and disadvantages of chemical fertilizer Skills • Analytical skills • Communication skills • Observation skills • Planning skills • Decision making skills • Data analysis skill Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Ensuring proper use of PPE • Ensuring to follow OHS (Occupational Health and Safety) rules and regulations
Learning Conditions	Learning Materials • CBLM • Hand-outs • Audio Visuals • Reference books • Manuals • Google classroom Learning Facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Practical field including vermi shed

	Materials • Pen, paper, file, book, cover crop seeds, green manure seeds, crop residues, dry materials, green materials, kitchen waste, animal manure / dung, animal urine, top-soil, compost, organic manures, bio-fertilizers, organic fertilizers, liquid manure, Bokashi bran / yeast, microbial solution (EM), gypsum, dolomite, limestone powder, rock phosphate, sulphur dust, plastic sheet / plastic film, jute sack, hose, water, earthworms, coconut husk, stone, soil test report and nutrient calculation chart. Tools • Spade, rake, hoe, shovel, compost fork / Pitch fork, watering can, knife, hose pipe, gunny bags, sieve/mesh, bucket, tank / drum (airtight container), stirring stick, funnel, jug, measuring container, sickle, measuring tape, scissors, mulch puncher and wooden mallet. Equipment • Power tiller/tractor and brush cutter, wheelbarrow and rotovator Instrument • Thermometer, moisture meter, weighing balance and calculator PPE • Working dress, safety boot, hand gloves, mask and safety goggles.
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work

MODULE 2: IMPLEMENTING IRRIGATION AND WATER MANAGEMENT

MODULE INFORMATION

Occupation	Commercial Agripreneur
Competency Area	Implement irrigation and water management
Module Title	Implementing irrigation and water management
Module Code	6111- L3-M2
Module Description	This module is structured to provide the learners with knowledge, skills and right attitude to plan and operate irrigation systems and also to conserve water resources.
Nominal Duration	70.5 Hours
Qualification Level	BQF Certificate Level 3
Pre-requisite	Completed Module: 6111-L3-M1
Learning Outcome	1. Plan irrigation requirements 2. Operate irrigation systems 3. Conserve water resources

Module Title	Implementing irrigation and water management		
Module Code	6111- L3-M2		
Learning Outcome 1	Plan irrigation requirements		
Duration	Theory: 3.5hours	Practical: 5hours	Total: 8.5hours
Assessment Criteria	• Crop irrigation schedule is prepared as per the standard procedure • Soil moisture testing is conducted as per the job requirement following standard procedure • Irrigation system is selected as per job requirement following standard procedure		
Content	B1.01 Preparing crop irrigation schedule Knowledge • Importance of preparing crop irrigation schedule • Water requirement for crops • Critical growth stages/water sensitive stages of crops • Crop evapotranspiration rate • Factors contributing to water loss • Soil moisture depletion threshold Skills • Analytical skills • Interpretation skills • Observation skills • Information processing skill • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation B1.02 Conducting soil moisture testing Knowledge • Definition of soil moisture • Importance of checking soil moisture content • Ideal soil moisture for vegetables • Methods of soil moisture measurement • Soil moisture conservation Skills • Using tensiometer • Analytical skills • Interpretation skills • Observation skills • Information processing skill • Planning skills		

	<i>Attitude, safety and environmental concern</i> • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation B1.03 Selecting irrigation system <i>Knowledge</i> • Soil–water relationships • Critical stages of water requirement for crop/watering frequency • Definition of irrigation • Importance of irrigation system • Types of irrigation systems • Water management <i>Skills</i> • Analytical skills • Observation skills • Planning skills <i>Attitude, safety and environmental concern</i> • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation
Learning Conditions	Learning Materials • CBLM • Hand-outs • Audio Visuals • Reference books • Manuals • Google classroom Learning Facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Practical field Materials • Pen, paper, file, water, polybag, irrigation system catalogues/manuals, farm layout map, cement, bricks, stone, gravel, sand, jointing union, threading tape, sprinkler set, jointing glue, water tank, valve, filter, drip

	irrigation set, pipes, gutters, storage tank or pond liner, rain water filter and twine thread. Tools • Hacksaw, measuring tape, wrench set, hammer, shovel, spade, trowel, pressure gauge, screwdrivers, pliers, plumbing tools set, brushes, knife, crowbar, pickaxe and spirit level. Instrument • Tensiometer Equipment • Water pump, hand drilling machine, pipe cutter and mini ditch digger PPE • Working dress, safety boot, hand gloves, mask and safety goggles
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work

Module Title	Implementing irrigation and water management		
Module Code	6111- L3-M2		
Learning Outcome 2	Operate irrigation systems		
Duration	Theory: 5 hours	Practical: 27 hours	Total: 32 hours
Assessment Criteria	• Sprinkler irrigation is installed as per job requirement following standard procedure • Drip irrigation is installed as per job requirement following standard procedure • Irrigation system is troubleshooted as per job requirement following standard procedure		
Content	B2.01 Installing sprinkler irrigation Knowledge • Irrigation system suitability for crops • Definition of sprinkler irrigation • Types of sprinkler irrigation • Working principle of sprinkler irrigation • Components of sprinkler irrigation system • Advantages and disadvantage of sprinkler irrigation Skills • Basic plumbing skill • Analytical skills • Observation skills • Planning skills • ICT skill Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring proper use of PPE • Ensuring to follow OHS rules and regulation B2.02 Installing drip irrigation Knowledge • Definition of drip irrigation • Components of drip irrigation system • Working principle of drip irrigation • Advantages and disadvantages of drip irrigation • Water filtration for drip irrigation Skills • Basic plumbing skill • Analytical skills • Observation skills • Planning skills		

	<i>Attitude, safety and environmental concern</i> • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Ensuring proper use of PPE • Ensuring to follow OHS (Occupational Health and Safety) rules and regulations B2.03 Troubleshooting irrigation system <i>Knowledge</i> • Problem, causes and remedies for faulty irrigation system <i>Skills</i> • Analytical skills • Observation skills • Decision-making skills <i>Attitude, safety and environmental concern</i> • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Ensuring proper use of PPE • Ensuring to follow OHS (Occupational Health and Safety) rules and regulations
Learning Conditions	Learning Materials • CBLM • Hand-outs • Audio Visuals • Reference books • Manuals • Google classroom Learning Facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Practical field Materials • Pen, paper, file, water, polybag, irrigation system catalogues/manuals, farm layout map, cement, bricks, stone, gravel, sand, jointing union, threading tape, sprinkler set, jointing glue, water tank, valve, filter, drip irrigation set, pipes, gutters, storage tank or pond liner, rain water filter and twine thread.

	Tools • Hacksaw, measuring tape, wrench set, hammer, shovel, spade, trowel, pressure gauge, screwdrivers, pliers, plumbing tools set, brushes, knife, crowbar, pickaxe and spirit level. Instrument • Tensiometer Equipment • Water pump, hand drilling machine, pipe cutter and mini ditch digger PPE • Working dress, safety boot, hand gloves, mask and safety goggles
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work

Module Title	Implementing irrigation and water management		
Module Code	6111- L3-M2		
Learning Outcome 3	Conserve water resources		
Duration	Theory: 4 hours	Practical: 26 hours	Total: 30 hours
Assessment Criteria	- Water harvesting system is constructed as per job requirement following standard procedure - Drainage system is constructed as per job requirement following standard procedure - On-farm soil moisture conservation practices are applied as per the job requirement following standard procedure		
Content	B3.01 Constructing water harvesting system Knowledge - Water conservation principle - Water sources - Purpose of water harvesting - Types of water harvesting techniques - Types of material used for water storage - Importance of storage and drainage systems Skills - Basic plumbing skills - Analytical skills - Observation skills - Planning skills Attitude, safety and environmental concern - Effective time management - Being team player - Being efficient in using resources - Being vigilant and patient - Having work ethics and integrity - Proper handling of tools, materials and equipment - Ensuring proper use of PPE - Ensuring to follow OHS (Occupational Health and Safety) rules and regulations - Ensuring to prevent water contamination B3.02 Constructing drainage for waterlogged area Knowledge - Definition of waterlogging - Causes of waterlogging - Purpose of drainage systems - Types of drainage systems - Waterlogging sensitive crops Skills - Analytical skills - Observation skills - Planning skill - Decision-making skills		

	<i>Attitude, safety and environmental concern</i> • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Ensuring proper use of PPE • Ensuring to follow OHS (Occupational Health and Safety) rules and regulations B3.03 Applying on-farm soil moisture conservation practices <i>Knowledge</i> • Conservation tillage • Mulching • Contour farming • Strip cropping • Micro-catchment and pitting • Wind breaks <i>Skills</i> • Analytical skills • Observation skills • Planning skill • Decision-making skills <i>Attitude, safety and environmental concern</i> • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Ensuring proper use of PPE • Ensuring to follow OHS (Occupational Health and Safety) rules and regulations
Learning Conditions	Learning Materials • CBLM • Hand-outs • Audio Visuals • Reference books • Manuals • Google classroom Learning Facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Practical field

	Materials - Pen, paper, file, water, polybag, irrigation system catalogues/manuals, farm layout map, cement, bricks, stone, gravel, sand, jointing union, threading tape, sprinkler set, jointing glue, water tank, valve, filter, drip irrigation set, pipes, gutters, storage tank or pond liner, rain water filter and twine thread. Tools - Hacksaw, measuring tape, wrench set, hammer, shovel, spade, trowel, pressure gauge, screwdrivers, pliers, plumbing tools set, brushes, knife, crowbar, pickaxe and spirit level. Instrument - Tensiometer Equipment - Water pump, hand drilling machine, pipe cutter and mini ditch digger PPE - Working dress, safety boot, hand gloves, mask and safety goggles
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: - Lecture - Interactive discussion - Demonstration - Industrial visit/training - Guided practice - Group practice with project-based learning - Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: - Practical observation - Oral/viva-voce - Written test - Assignment - Project work

MODULE 3: MANAGING PEST, DISEASES, AND WEEDS

MODULE INFORMATION

Occupation	Commercial Agripreneur
Competency Area	Manage pest, diseases, and weeds
Module Title	Managing pest, diseases and weeds
Module Code	6111- L3-M3
Module Description	This module is structured to provide the learners with knowledge, skills and the right attitude required to manage pests, diseases and weeds.
Nominal Duration	35.5 Hours
Qualification Level	BQF Certificate Level 3
Pre-requisite	Completed Module 6111-L3-M2
Learning Outcome	1. Manage pests 2. Manage diseases 3. Manage weeds

Module Title	Managing pest, disease and weeds		
Module Code	6111- L3-M3		
Learning Outcome 1	Manage pests		
Duration	Theory: 5 hours	Practical: 7.5 hours	Total: 12.5 hours
Assessment Criteria	• Pests are identified as per job requirement following guidelines / Reference charts and standard procedure • Pest surveillance is conducted as per job requirement following standard procedure • Pest management intervention measures are planned as per job requirement following standard procedures • Integrated Pest Management practices are applied as per job requirement following standard procedure		
Content	C1.01 Identifying pest Knowledge • Definition of pest • Types of pests • Signs and symptoms of pest infestation • Economic threshold concept of damage • Climate related pests Skills • Using microscope • Analytical Skills • Observation skills • Interpretation skills • Information processing skill • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation C1.02 Conducting pest surveillance measures Knowledge • Definition of surveillance • Importance of surveillance for pest, disease and weeds • Timing and frequency of surveillance • Life cycles of pests • Economic threshold levels Skills • Analytical skills • Observation skills • Planning skills • ICT skills		

	<i>Attitude, safety and environmental concern</i> • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation C1.03 Planning pest management interventions <i>Knowledge</i> • Economic impacts of pest • Importance of planning pest intervention measures • Severity of infection or infestation • Types of intervention measures • Selection of appropriate prevention, management and control measures <i>Skills</i> • Analytical skills • Observation skills • Planning skills • ICT skills <i>Attitude, safety and environmental concern</i> • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation C1.04 Applying Integrated Pest Management Practices <i>Knowledge</i> • Definition of Integrated Pest Management • Pest biology and ecology • Pest management practices (preventive, cultural, biological, chemical) • Integrated Pest Management (IPM) • Conditions for pesticide application • Importance of calibrating pesticide sprayer <i>Skills</i> • Using sprayer • Analytical skills • Observation skills • Planning skills <i>Attitude, safety and environmental concern</i> • Effective time management
--	---

	• Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring proper use of PPE • Ensuring to follow OHS rules and regulation
Learning Conditions	Learning Materials • CBLM • Hand-outs • Audio Visuals • Reference books • Manuals • Google classroom Learning Facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Practical field Materials • Pen, paper, file, reference chart, sample collection bags, labels, markers, field notebook/ record sheets, surveillance data, pesticide, detergent, insect trap net, mulching materials and manual book for herbicides application Tools • Bucket, spatula, weighing balance, container, measuring tools, hoe and spade Equipment • Microscope and sprayer Instrument • Tensiometer PPE • Work dress, chemical spray suit, hats, safety mask, face shield, safety goggles and safety boots
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning

Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work
-----------------------------	---

Module Title	Managing pest, disease and weeds		
Module Code	6111- L3-M3		
Learning Outcome 2	Manage diseases		
Duration	Theory: 4 hours	Practical: 7.5 hours	Total: 11.5 hours
Assessment Criteria	- Diseases are identified as per job requirement following guidelines / Reference charts and standard procedure - Diseases surveillance is conducted as per job requirement following standard procedure - Diseases management intervention measures are planned as per job requirement following standard procedures - Integrated Diseases Management practices are applied as per job requirement following standard procedure		
Content	C2.01 Identifying diseases Knowledge - Definition of diseases - Types of diseases - Disease triangle - Signs and symptoms of diseases infestation - Economic threshold concept of damage - Climate related diseases - Crop specific diseases Skills - Using microscope - Analytical Skills - Observation skills - Interpretation skills - Information processing skill - Planning skills Attitude, safety and environmental concern - Effective time management - Being team player - Being efficient in using resources - Being vigilant and patient - Having work ethics and integrity - Ensuring appropriate use of PPE - Ensuring to follow OHS rules and regulation C2.02 Conducting diseases surveillance measures Knowledge - Definition of surveillance - Importance of surveillance for disease - Timing and frequency of surveillance - Life cycles of disease - Economic threshold levels Skills - Analytical skills - Observation skills		

	• Planning skills • ICT skills <i>Attitude, safety and environmental concern</i> • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation C2.03 Planning diseases management interventions <i>Knowledge</i> • Economic impacts of disease • Importance of planning disease intervention measures • Severity of infection or infestation • Selection of appropriate prevention, management and control measures <i>Skills</i> • Analytical skills • Observation skills • Planning skills • ICT skills <i>Attitude, safety and environmental concern</i> • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation C2.04 Applying Integrated diseases Management Practices <i>Knowledge</i> • Definition of Integrated disease management • Phytosynatory regulation • Cultural and sanitation management • Habitat and micro-climate modification • Biological interventions • Chemical interventions <i>Skills</i> • Using sprayer • Analytical skills • Observation skills • Planning skills
--	---

	Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring proper use of PPE • Ensuring to follow OHS rules and regulation
Learning Conditions	Learning Materials • CBLM • Hand-outs • Audio Visuals • Reference books • Manuals • Google classroom Learning Facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Practical field Materials • Pen, paper, file, reference chart, sample collection bags, labels, markers, field notebook/ record sheets, surveillance data, pesticide, detergent, insect trap net, mulching materials and manual book for herbicides application Tools • Bucket, spatula, weighing balance, container, measuring tools, hoe and spade Equipment • Microscope and sprayer Instrument • Tensiometer PPE • Work dress, chemical spray suit, hats, safety mask, face shield, safety goggles and safety boots
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning

Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work
-----------------------------	---

Module Title	Managing pest, disease and weeds		
Module Code	6111- L3-M3		
Learning Outcome 3	Manage weeds		
Duration	Theory: 4 hours	Practical: 7.5 hours	Total: 11.5 hours
Assessment Criteria	- Weeds are identified as per job requirement following guidelines / Reference charts and standard procedure - Weeds surveillance is conducted as per job requirement following standard procedure - Weeds management intervention measures are planned as per job requirement following standard procedures - Integrated Weeds Management practices are applied as per job requirement following standard procedure		
Content	C3.01 Identifying weeds Knowledge - Definition of weeds - Weed biology and ecology - Classification of weeds - Types of weeds - Life cycle of weeds - Climate related weeds Skills - Using microscope - Analytical Skills - Observation skills - Interpretation skills - Information processing skill - Planning skills Attitude, safety and environmental concern - Effective time management - Being team player - Being efficient in using resources - Being vigilant and patient - Having work ethics and integrity - Ensuring appropriate use of PPE - Ensuring to follow OHS rules and regulation C3.02 Conducting weeds surveillance measures Knowledge - Definition of surveillance - Importance of surveillance for weeds - Timing and frequency of surveillance - Economic threshold levels Skills - Analytical skills - Observation skills - Planning skills		

	• ICT skills <i>Attitude, safety and environmental concern</i> • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation C3.03 Planning weeds management interventions <i>Knowledge</i> • Economic impacts of weeds • Importance of planning weeds intervention measures • Critical period of weed interference • Integrated Weed Management (IWM) • Herbicide and mode of actions • Selection of appropriate prevention, management and control measures <i>Skills</i> • Analytical skills • Observation skills • Planning skills • ICT skills <i>Attitude, safety and environmental concern</i> • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation C3.04 Applying Integrated weed Management Practices <i>Knowledge</i> • Definition of weed management • Pest biology and ecology • Weed management practices (preventive, cultural, biological, chemical) • Conditions for herbicide application <i>Skills</i> • Analytical skills • Observation skills • Planning skills
--	---

	Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring proper use of PPE • Ensuring to follow OHS rules and regulation
Learning Conditions	Learning Materials • CBLM • Hand-outs • Audio Visuals • Reference books • Manuals • Google classroom Learning Facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Practical field Materials • Pen, paper, file, reference chart, sample collection bags, labels, markers, field notebook/ record sheets, surveillance data, pesticide, detergent, insect trap net, herbicide, mulching materials and manual book for herbicides application Tools • Bucket, spatula, weighing balance, container, measuring tools, hoe and spade Equipment • Microscope and sprayer Instrument • Tensiometer PPE • Work dress, chemical spray suit, hats, safety mask, face shield, safety goggles and safety boots

Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work

MODULE 4: CARRYING OUT COMMERCIAL VEGETABLE PRODUCTION

MODULE INFORMATION

Occupation	Commercial Agripreneur
Competency Area	Carry out commercial vegetable production
Module Title	Carrying out commercial vegetable production
Module Code	6111- L3-M4
Module Description	This module is structured to provide the learners with knowledge, skills and right attitude required to perform production activities, vegetable management, harvesting and post-harvest management.
Nominal Duration	182 Hours
Qualification Level	BQF Certificate Level 3
Pre-requisite	Completed Module 6111-L3-M3
Learning Outcome	1. Perform production activities 2. Perform vegetable management 3. Perform harvesting 4. Perform post harvesting

Module Title	Carrying out commercial vegetable production		
Module Code	6111- L3-M4		
Learning Outcome 1	Perform production activities		
Duration	Theory: 17 hours	Practical: 81hours	Total: 98 hours
Assessment Criteria	- Greenhouse is constructed/installed as per the standard procedure - Smart greenhouse is operated as per the standard procedure - Seed is selected as per job requirement following standard procedures - Nursery raising on bed is performed as per job requirement following standard procedures - Nursery raising on plug trays is performed as per the job requirement following standard procedure - Nursery is managed as per job requirement following standard procedures - Direct sowing of seed is performed as per job requirement following standard procedures - Seedling is transplanted as per job requirement following standard procedure		
Content	D1.01 Constructing basic greenhouse Knowledge - Definition of greenhouse - Function of greenhouse - Types of greenhouses - Working principle of greenhouse - Method of layout - Criteria for greenhouse site selection Skills - Analytical skills - Observation skills - Information processing skill - Planning skills Attitude, safety and environmental concern - Effective time management - Being team player - Being efficient in using resources - Being vigilant and patient - Having work ethics and integrity - Proper handling of tools, materials and equipment - Having sense of ownership and accountability - Ensuring appropriate use of PPE - Ensuring proper disposal of waste - Ensuring to follow OHS rules and regulation D1.02 Operating smart green house Knowledge - Introduction to smart green house - Types of smart greenhouses		

	• Components of smart green house (<i>Automation and digitization</i>) • Working principle of smart greenhouse Skills • ICT skills • Analytical skills • Observation skills • Information processing skill • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring proper disposal of waste Ensuring to follow OHS rules and regulation D1.03 Selecting seed Knowledge • Seed biology • Importance of seed selection • Adaptability and climatic suitability • Parameters of seed quality • Seed germination test • Classification of Seed type (Hybrid & OP) • Market demand for selected vegetables • Seed varieties suitability for different seasons • Seed availability in market Skills • Analytical skills • Observation skills • Information processing skill • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation
--	--

	D1.02 Performing nursery raising on bed Knowledge • Definition of nursery • Types of nurseries raising • Importance of nursery raising on bed • Seed dormancy • Conditions for seed germination • Seed sowing time • Spacing and sowing depth • Importance of seed treatment • Nursery irrigation requirements Skills • Analytical skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation • Ensuring proper soil drainage D1.03 Performing nursery raising on trays Knowledge • Definition of nursery trays • Types of nursery trays • Importance of nursery raising on trays • Conditions for seed germination • Types of media and its properties • Growing media formulation Skills • Observation skill • Communication skill Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring proper use of PPE
--	--

	- Ensuring to follow OHS rules and regulation D1.04 Managing nursery Knowledge - Plant biology and plant growth habits - Definition of plant nutrition - Types of soil nutrients for nursery - Method of fertilizer application - Nursery sanitation and hygiene - Nutrient and water management - Pest and disease management - Importance of intercultural operations Skills - Using sprayer - Observation skills - Analytical skill - Planning skill - Decision making skill Attitude, safety and environmental concern - Effective time management - Being team player - Being efficient in using resources - Being vigilant and patient - Having work ethics and integrity - Proper handling of tools, materials and equipment - Ensuring appropriate use of PPE - Ensuring to follow OHS rules and regulation - Ensuring proper disposal of waste D1.05 Performing direct sowing of seed Knowledge - Methods of seed sowing - Sowing depth and spacing - Seeds rate calculation - Common crops for direct sowing - Advantage and disadvantages of direct seed sowing Skills - Using seeder - Analytical skills - Observation skills Attitude, safety and environmental concern - Effective time management - Being team player - Being efficient in using resources - Being vigilant and patient - Proper handling of tools, materials and equipment - Ensuring appropriate use of PPE
--	--

	• Ensuring to follow OHS rules and regulation • Ensure proper soil drainage D1.06 Transplanting seedling Knowledge • Definition of seedling transplanting • Importance of transplanting • Criteria of quality seedlings • Precautions on handling of seedlings • Planting depth and spacing • Optimal time and conditions for transplanting • Definition and purpose of seedling hardening • Hardening process Skills • Analytical skills • Communication skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation • Ensure proper handling of seedlings
Learning Conditions	Learning Materials • CBLM • Hand-outs • Audio Visuals • Reference books • Manuals • Google classroom Learning Facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Practical field Materials • Pen, marker, paper, file, book, seeds, seedlings, tissue paper / cloth, labelling paper, sanitizer, plastic sheet, bamboo pole, GI wire, sand, soil, manure, compost, cocopeat, perlite, biochar, fertilizers, fungicide,

	pesticides, mulching materials, nursery tray, irrigation pipe, greenhouse set, sprayer nozzles and thread. polypots Tools • Petri dish, tweezers/forceps, spade, hoe, knife, wheelbarrow, measuring tape, watering can, rake, trowel, dibblers, soil sieving net, secateurs, shovel, spacer and manual transplanter. Equipment • Sprayer and seeder PPE • Working dress, safety boot, hand gloves and safety goggles
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work

Module Title	Carrying out Commercial Vegetable production
---------------------	---

Module Code	6111- L3-M4		
Learning Outcome 2	Perform vegetable management		
Duration	Theory: 5 hours	Practical: 35 hours	Total: 40 hours
Assessment Criteria	- Staking is performed as per the job requirement following the standard procedure - Pruning and training is performed as per the job requirement following standard practices - Thinning/pinching is performed as per job requirement following standard procedure		
Content	D2.01 Performing staking Knowledge - Growth stages of vegetables - Definition of staking Types of vegetable crops requiring staking - Function of staking - Types of staking - Method of staking Skills - Observation skill - Analytical skill - Planning skill Attitude, safety and environmental concern - Effective time management - Being team player - Being efficient in using resources - Being vigilant and patient - Having work ethics and integrity - Ensuring appropriate use of PPE - Ensuring to follow OHS rules and regulation - Ensuring proper disposal of waste D2.02 Performing pruning/training Knowledge - Definition of pruning and training - Purpose of pruning and training - Growth habit of the plant - Identification of main stem and side shoots - Correct stage for pruning - Types of training systems Skills - Analytical skills - Observation skills Attitude, safety and environmental concern - Effective time management - Being team player - Being efficient in using resources - Being vigilant and patient		

	• Having work ethics and integrity • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation • Ensuring to properly dispose removed plant parts • Ensuring to maintain hygiene and sanitation D2.03 Perform thinning/pinching Knowledge • Definition of thinning and pinching • Purpose of thinning and pinching • Key difference between thinning and pinching • Thinning and pinching for plant spacing/management • Thinning and pinching for fruit/crop quality management • Appropriate timing for thinning and pinching • Common crops requiring thinning and pinching Skills • Analytical skills • Observation skills • Planning skills • Decision making skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring proper use of PPE • Ensuring to follow OHS rules and regulation • Ensure to follow guidelines and procedures
Learning Conditions	Learning Materials • CBLM • Hand-outs • Audio Visuals • Reference books • Manuals • Google classroom Learning Facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Practical field Materials

	• Wooden / bamboo stakes, nylon string, jute rope, GI wire, nails, twine thread, waste collection bag, clips, pen, paper and file Tools • Hammer, mallet, measuring tape, saw, pliers, crowbar, knife, wire winch, pruning scissors, secateurs, wheelbarrow, scalpels and grafting knife PPE • Working dress, safety boot, mask, hand gloves and safety goggles
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work

Module Title	Carrying out Commercial vegetable production
---------------------	---

Module Code	6111- L3-M4		
Learning Outcome 3	Perform harvesting		
Duration	Theory: 5 hours	Practical: 11 hours	Total: 16 hours
Assessment Criteria	• Maturity indices are assessed as per job requirement following standard procedure • Crop harvesting is prepared as per job requirement following standard procedure • Vegetables are harvested as per job requirement following standard procedure		
Content	D3.01 Assessing maturity indices Knowledge • Definition of maturity indices • Importance of maturity indices • Vegetable maturity indicators • Methods of assessing maturity indices • Maturity indices of common vegetables Skills • Analytical skills • Interpretation skills • Observation skills • Information processing skill • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation D3.02 Preparing for harvesting Knowledge • Recommended harvest stage • Days to maturity of vegetables • Suitable weather conditions • Appropriate time of day for crop harvest Skills • Analytical skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient		

	• Having work ethics and integrity • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation D3.03 Harvesting vegetables Knowledge • Harvesting methods • Harvesting techniques • Importance of proper handling of crops • Quality standards of produce • Market requirements • Harvesting time • Methods of pre-cooling Skills • Machine operating skills • Analytical skills • Observation skills • Planning skills • Decision making skill Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation
Learning Conditions	Learning Materials • CBLM • Hand-outs • Audio Visuals • Reference books • Manuals • Google classroom Learning Facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Practical field Materials • Pen, paper, file, harvest maturity charts, bags and field record book. Tools

	- Sickle, crates, spade, hoe, basket, knife, harvest trolley and secateurs PPE - Work dress, hand gloves, hats, face mask, safety goggles and safety boots
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: - Lecture - Interactive discussion - Demonstration - Industrial visit/training - Guided practice - Group practice with project-based learning - Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: - Practical observation - Oral/viva-voce - Written test - Assignment - Project work

Module Title	Carrying out commercial vegetable production
---------------------	---

Module Code	6111- L3-M4		
Learning Outcome 4	Perform post-harvest management		
Duration	Theory: 6 hours	Practical: 22 hours	Total: 28 hours
Assessment Criteria	• Vegetables sorting and grading is conducted as per job requirement following standard procedure and recommended guidelines • Appropriate packaging is selected as per job requirement following standard procedure • Packaging is performed as per job requirement following standard procedure • Labelling is performed as per job requirement following standard procedure and BFDA labelling guidelines • Vegetable storing is performed as per job requirement following standard procedure		
Content	D4.01 Performing sorting and grading Knowledge • Introduction to post harvest, processing and value addition • Importance of post-harvest management • Definition of Sorting and grading • Importance of curing • Market preference of sizes and colour • Price and grading • Types of measurements • Post harvest losses Skills • Analytical and interpretation skills • Observation skills • Information processing skill • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation D4.02 Selecting appropriate packaging Knowledge • Definition of packaging • Purpose of packaging • Types of packaging • Types of vegetable packaging materials • Packaging requirements for different vegetables • Post-harvest handling of vegetables • Market and food safety standards		

	Skills • Analytical skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation • Ensuring proper disposal or reuse of packaging materials D4.03 Performing packaging Knowledge • Methods of packaging • Techniques of packaging • Importance of maintaining package ventilation Skills • Using heat sealing machine • Using sewing machine • Using binding machine • Using vacuum packaging machine • Analytical skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, equipment and materials • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation D4.04 Performing labeling Knowledge • Definition of labelling • Purpose of labelling • Types of labels and key information required • National and international standard requirement for labelling • Product certification procedures
--	---

	Skills • ICT skill • Analytical skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, equipment and materials • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation D4.05 Performing storing Knowledge • Types of storage • Importance of proper storage • Post-harvest loss of vegetables • Storage pest and diseases and their management • Factors affecting stored produce • Climacterics and non-climacteric products Skills • Analytical skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, equipment and materials • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation
Learning Conditions	Learning Materials • CBLM • Hand-outs • Audio Visuals • Reference books • Manuals • Google classroom Learning Facilities and infrastructure

	• Classroom with adequate facilities • Information Technology (IT) lab • Library • Practical field with curing shed • Sorting, grading and packaging shed Materials • Pen, paper, file, collection bags, markers, labels, grading reference charts, water, cleaning cloth, plastic crates, plastic, jute bags, gunny bags, shrink wraps, biodegradable films, sewing thread, nails, cardboard boxes, sticker paper, coated paper, plastic sleeves, string tags, adhesive glue, transparent cellotape and pallet Tools • Sizing rings, weighing scale, measuring tape, secateurs / knife, scissors, paper cutters, boxes / crates, trays, staplers, hammer, pallet jack and trolley Equipment • Stainless steel table, wheel barrow, computer, heat sealing machine, weighing scale, sewing machine, vacuum packaging machine, binding machine, colour printer, label paster and forklift PPE • Work dress, hair net, mask, hand gloves, safety goggles and safety boots
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work

MODULE 5: CARRYING OUT CEREAL PRODUCTION

MODULE INFORMATION	
Occupation	Commercial Agripreneur
Competency Area	Carry out cereal production
Module Title	Carrying out cereal production
Module Code	6111-L3-M5
Module Description	This module is structured to provide the learners with knowledge, skills and right attitude required to perform cereal production activities, harvesting and post-harvest management.
Nominal Duration	62 Hours
Qualification Level	BQF Certificate 3
Pre-requisite	Completed Module 6111-L3-M4
Learning Outcome	1. Perform production activities 2. Perform harvesting 3. Perform post-harvest management

Module Title	Carrying out Cereal production		
Module Code	6111- L3-M5		
Learning Outcome 1	Perform production activities		
Duration	Theory: 6 hours	Practical: 17 hours	Total: 23 hours
Assessment Criteria	- Seed is selected as per job requirement following standard procedures - Nursery raising on bed is performed as per job requirement following standard procedures - Direct sowing of seed is performed as per job requirement following standard procedures - Seedling is transplanted as per job requirement following standard procedure - Crop management is performed as per job requirement following standard procedure		
Content	E1.01 Selecting seed Knowledge - Importance of seed selection - Parameters of seed quality - Market demand for selected cereal crops - Seed varieties suitability for different seasons - Seed availability in market Skills - Analytical skills - Observation skills - Information processing skill - Planning skills Attitude, safety and environmental concern - Effective time management - Being team player - Being efficient in using resources - Being vigilant and patient - Having work ethics and integrity - Ensuring appropriate use of PPE - Ensuring to follow OHS rules and regulation E1.02 Performing nursery raising Knowledge - Importance of nursery raising on bed - Seed dormancy - Conditions for seed germination - Seed sowing time - Spacing and sowing depth - Importance of seed treatment - Nursery irrigation requirements Skills - Analytical skills - Observation skills		

	• Planning skills <i>Attitude, safety and environmental concern</i> • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation • Ensuring proper soil drainage E1.03 Performing direct sowing of seed <i>Knowledge</i> • Methods of seed sowing • Common crops for direct sowing • Sowing depth and spacing • Advantage and disadvantages of direct seed sowing <i>Skills</i> • Using seeder • Analytical skills • Observation skills <i>Attitude, safety and environmental concern</i> • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Proper handling of tools, materials and equipment • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation • Ensure proper soil drainage E1.04 Transplanting seedling <i>Knowledge</i> • Definition of seedling transplanting • Importance of transplanting • Criteria of quality seedlings • Precautions on handling of seedlings • Planting depth and spacing • Optimal time and conditions for transplanting <i>Skills</i> • Operating seeder and transplanter • Analytical skills • Communication skills • Observation skills • Planning skills
--	---

	<i>Attitude, safety and environmental concern</i> • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation • Ensure proper handling of seedlings E1.05 Performing crop management <i>Knowledge</i> • Introduction to crop management • Crop management required for different stages of crops • Crop management practices <i>Skills</i> • Analytical skills • Communication skills • Observation skills • Planning skills <i>Attitude, safety and environmental concern</i> • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation • Ensure proper handling of seedlings
Learning Conditions	Learning Materials • CBLM • Hand-outs • Audio Visuals • Reference books • Manuals • Google classroom Learning Facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Practical field Materials • Pen, marker, paper, file, book, seeds, seedlings, tissue paper / cloth, labelling paper, sanitizer, plastic sheet, bamboo pole, GI wire, sand, soil,

	manure, compost, cocopeat, perlite, biochar, fertilizers, fungicide, pesticides, mulching materials, nursery tray, irrigation pipe, sprayer nozzles and thread. Tools • Petri dish, tweezers/forceps, spade, hoe, knife, wheelbarrow, measuring tape, watering can, rake, trowel, dibblers, soil sieving net and shovel Instrument • Moisture meter Equipment • Sprayer, transplanter and seeder PPE • Working dress, safety boot, hand gloves and safety goggles
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work

Module Title	Carrying out Cereal production		
Module Code	6111- L3-M5		
Learning Outcome 2	Perform harvesting		
Duration	Theory: 7 hours	Practical: 12 hours	Total: 19 hours
Assessment Criteria	• Maturity is assessed as per job requirement following standard procedure • Crop harvesting is prepared as per job requirement following standard procedure • Crops are harvested as per job requirement following standard procedure • Threshing and cleaning is performed as per standard procedure		
Content	E2.01 Assessing maturity Knowledge • Importance of assessing maturity • Methods of assessing crop maturity • Crop maturity indicators Skills • Using moisture meter • Analytical skills • Interpretation skills • Observation skills • Information processing skill • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation E2.02 Preparing for harvesting Knowledge • Recommended harvest stage • Days to maturity of crops • Crop advisory services (ADSS-Agromet Decision Support System) Skills • Analytical skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient		

	• Having work ethics and integrity • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation E2.03 Harvesting crops Knowledge • Harvesting methods • Harvesting techniques • Importance of proper handling of crops • Quality standards of produce • Market requirements • Harvesting time Skills • Machine operating skills • Analytical skills • Observation skills • Planning skills • Decision making skill Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation E2.03 Performing threshing and cleaning Knowledge • Introduction to threshing and cleaning • Techniques of threshing • Techniques of cleaning Skills • Operating threshers and winnowers • Analytical skills • Observation skills • Planning skills • Decision making skill Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient
--	--

	• Having work ethics and integrity • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation
Learning Conditions	Learning Materials • CBLM • Hand-outs • Audio Visuals • Reference books • Manuals • Google classroom Learning Facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Practical field Materials • Pen, paper, file, harvest maturity charts, bags/sack, tarpaulin and field record book Tools • Sickle, peanut digger and weighing balance Equipment • Harvester, multi-crop threshers and winnowers PPE • Work dress, hand gloves, hats, face mask, safety goggles and safety boots
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work

Module Title	Carrying out cereal production		
Module Code	6111-L3-M5		
Learning Outcome 3	Perform post-harvest management		
Duration	Theory: 6 hours	Practical: 14 hours	Total: 20 hours
Assessment Criteria	• Crop sorting and grading is conducted as per job requirement following standard procedure and recommended guidelines • Appropriate packaging is selected as per job requirement following standard procedure • Packaging is performed as per job requirement following standard procedure • Labelling is performed as per job requirement following standard procedure and BFDA labelling guidelines • Crop storing is performed as per job requirement following standard procedure		
Content	E3.01 Performing drying Knowledge • Importance of post-harvest management • Methods of drying • Moisture content of dried cereals • Importance of drying • Post harvest losses Skills • Using moisture meter • Operating milling machine • Analytical and interpretation skills • Observation skills • Information processing skill • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation E3.02 Selecting appropriate packaging Knowledge • Definition of packaging • Purpose of packaging • Types of packaging • Types of grain packaging materials • Packaging requirements for different grains • Post-harvest handling of crops • Market and food safety standards		

	Skills • Analytical skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation • Ensuring proper disposal or reuse of packaging materials E3.03 Performing packaging Knowledge • Methods of packaging • Techniques of packaging Skills • Using moisture meter • Using heat sealing machine • Using sewing machine • Using vacuum packaging machine • Analytical skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, equipment and materials • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation E3.04 Performing labeling Knowledge • Definition of labelling • Purpose of labelling • Types of labels and key information required • National and international standard requirement for labelling • Product certification procedures
--	---

	Skills • ICT skill • Analytical skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, equipment and materials • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation E3.05 Performing storing Knowledge • Types of storage • Importance of proper storage • Storage pest and diseases and their management • Factors affecting stored produce • Climacterics and non-climacteric products Skills • Analytical skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, equipment and materials • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation
Learning Conditions	Learning Materials • CBLM • Hand-outs • Audio Visuals • Reference books • Manuals • Google classroom Learning Facilities and infrastructure • Classroom with adequate facilities

	• Information Technology (IT) lab • Library • Practical field with curing shed Materials • Pen, paper, file, collection bags, markers, labels, grading reference charts, water, cleaning cloth, plastic crates, plastic, jute bags, gunny bags, super grain bags, plastic pouch, shrink wraps, biodegradable films, sewing thread, nails, sticker paper, coated paper, plastic sleeves, string tags, adhesive glue, transparent cellotape and pallet Tools • Weighing scale, measuring tape, scissors, staplers and trolley Equipment • Wheel barrow, heat sealing machine, weighing scale, sewing machine, vacuum packaging machine, colour printer, label paster and forklift PPE • Work dress, hair net, mask, hand gloves, safety goggles and safety boots
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work

MODULE 6
ON
CARRYING OUT MUSHROOM CULTIVATION

MODULE INFORMATION	
Occupation	Commercial Agripreneur
Competency Area	Carry out mushroom cultivation
Module Title	Carrying out mushroom cultivation
Module Code	6111-L3-M6
Module Description	This module is structured to provide learners with the knowledge, skills and right attitude required to perform production of mushroom on sawdust (Shiitake), perform spawn management, manage pests and diseases and perform post harvesting.
Nominal Duration	246 Hours
Certificate Level	Certificate 3
Pre-requisite	Completed module 6111-L3-M6
Learning Outcome	1. Perform production of mushroom on sawdust (Shiitake) 2. Perform spawn management 3. Manage pest and disease 4. Perform post harvesting

Module Title	Carrying out mushroom cultivation		
Module Code	6111- L3-M6		
Learning Outcome 1	Perform production of mushroom on sawdust (Shiitake)		
Duration	Theory: 13 hours	Practical: 107 hours	Total: 120 hours
Assessment Criteria	• Site is selected as per job requirement following standard procedure • Mushroom house is constructed as per job requirement following standard procedure • Media is prepared as per job requirement following standard procedure • Mushroom media is sterilized as per job requirement following standard procedure • Media is inoculated with mushroom spawn as per job requirement following standard procedure • Inoculated media is incubated as per the job requirement following standard procedure • Fruiting is induced in mushroom media as per job requirement following standard procedure • Mushroom is harvested as per job requirement following standard procedure		
Content	F1.01 Selecting site Knowledge • Principles of mushroom production • Criteria for site selection • Agro-meteorological information • Agro-ecological conditions • Procedures for obtaining clearance and land lease • Cost benefit analysis Skills • Analytical skills • Communication skills • Observation skills • Planning skills • Data analysis skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation F1.02 Managing mushroom production house Knowledge • Purpose of mushroom production house • Requirements of mushroom production house • Criteria for selection of design and type of mushroom production house		

	• Choice of materials for construction Skills • Analytical skills • Observation skills • Planning skills • Communication skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation • Ensuring proper disposal of waste materials F1.03 Preparing media Knowledge • Definition of mushroom media • Functions of mushroom media • Type of mushroom media • Choice of materials and ratio Skills • Using moisture analyzer • Using altimeter • Using saw dust mixture • Analytical skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, equipment and materials • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation • Ensuring safe disposal of spent media F1.04 Sterilizing media Knowledge • Definition of sterilization of media • Importance of sterilization of media
--	--

	• Methods for media sterilization • Sterilization process • Standard Operating Procedure (SOP) for Sterilizer/autoclave Skills • Using autoclave/sterilizer • Analytical skills • Communication skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, equipment and materials • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation F1.05 Inoculating media with mushroom spawn Knowledge • Definition of mushroom spawn • Definition of inoculation • Purpose of mushroom spawn inoculation • Choice and state of mushroom spawn • Treating of media after sterilization • Aseptic techniques of mushroom spawn inoculation • Vectors of disease in mushroom spawn production • Standard Operating Procedure (SOP) for laminar flow cabinet Skills • Using laminar flow cabinet • Analytical skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, equipment and materials • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation
--	---

	F1.06 Incubating inoculated media Knowledge • Definition of incubation • Purpose of incubation • Stages of incubation • Conditions for incubation • Quality assessment of incubated media Skills • Using thermohygrometer • Using climate control equipment (<i>humidifier, cooler, heater, CO2 reader, luxmeter</i>) • Analytical skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, equipment and materials • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation • Ensuring proper disposal of waste materials F1.07 Inducing fruiting Knowledge • Mushroom growth stages • Importance of air conditioning • Conditions for fruiting Skills • Using thermohygrometer • Using climate control equipment (<i>humidifier, cooler, heater, CO2 reader, luxmeter</i>) • Analytical skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, equipment and materials • Having sense of ownership and accountability • Ensuring appropriate use of PPE
--	---

	• Ensuring to follow OHS rules and regulation • Ensuring proper disposal of waste materials F1.08 Harvesting mushroom Knowledge • Maturity indicators • Mushroom growth stages • Mushroom harvesting techniques • Purpose of storing mushroom after harvesting Skills • Analytical skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, equipment and materials • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation • Ensuring proper disposal of waste materials
Learning Conditions	Learning Materials • CBLM • Hand-outs • Audio Visuals • Reference books • Manuals • Google classroom Learning Facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Practical field Materials • Pen, paper, file, meteorology information, mushroom house construction materials, polypropylene (PP) bags, cotton wool / cotton, fibre, neck rings for bags, rubber bands, sawdust, rice or corn bran, gypsum / lime, plastic sheets, sacks, substrate, water, mushroom spawn, alcohol / hand sanitizer, plastic crates, plastic trays, bags, containers and air inlet filters. Tools • Measuring tape, hammer, spade, shovel, pickaxe, crowbar, construction

	tools, wheelbarrow, watering cans, weighing balance, stools, cart / gorilla cart, plastic crates, racks, wheel carts, inoculation tools, bunsen burner, magnifying glasses and harvesting knife. Instrument - Compass, altimeter, luxmeter, thermo-hygrometer/humidity clock and moisture analyzer Equipment - Computer, printer, sawdust mixer, bagging /filling machine, autoclave/sterilizer, Laminar Flow Cabinet, exhaust fans, Air conditioners, humidifier, and CO2 sensor PPE - Work dress, and safety boot, safety hand gloves, face shield and lab coat
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: - Lecture - Interactive discussion - Demonstration - Industrial visit/training - Guided practice - Group practice with project-based learning - Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: - Practical observation - Oral/viva-voce - Written test - Assignment - Project work

Module Title	Carrying out mushroom cultivation		
Module Code	6111- L3-M6		
Learning Outcome 2	Perform spawn management		
Duration	Theory: 4 hours	Practical: 25 hours	Total: 29 hours
Assessment Criteria	• Spawn is stored as per the job requirement following standard procedure • Spawn is stored properly to maintain quality and avoid spoilage • Hygiene and sanitation are maintained as per job requirement following standard procedure		
Content	F2.01 Storing spawn Knowledge • Temperature requirement for spawn storage • Spawn handling • Spawn and mushroom type • Types of mushrooms and their storage requirement Skills • Communication skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation F2.02 Transferring spawn Knowledge • Purpose of spawn transfer • Types of substrates Skills • Communication skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation • Ensuring proper disposal of waste materials		

	F2.03 Maintaining hygiene and sanitation Knowledge • Importance of maintaining hygiene and sanitation in mushroom farms and lab • Contaminations in mushroom farms and vectors • Methods of sanitization • SOP for mushroom farms and labs Skills • Analytical skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, equipment and materials • Having sense of ownership and accountability • Ensuring safe use of chemicals • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation
Learning Conditions	Learning Materials • CBLM • Hand-outs • Audio Visuals • Reference books • Manuals • Google classroom Learning Facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Practical field Materials • Pen, paper, file, plastic trays, bags, containers, spawn, buckets, fumigants, disinfectants (70% Isopropyl Alcohol (IPA), Hydrogen peroxide, Ammonia-based cleaners) Tools • Racks, wheel carts, Lighter or Alcohol Lamp/ flame, inoculator, cleaning tools and sprayers Equipment • Refrigerator or cold storage rooms and Laminar Air Flow Hood/Cabinet

	PPE • Work dress, and safety boot, safety hand gloves, face shield and lab coat
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work

Module Title	Carrying out mushroom cultivation		
Module Code	6111- L3-M6		
Learning Outcome 3	Manage pest and diseases		
Duration	Theory: 19 hours	Practical: 45 hours	Total: 64 hours
Assessment Criteria	• Pests and diseases are identified as per job requirement following standard procedures • Pest and disease surveillance is conducted as per job requirement following standard procedures • Interventions for management is identified as per job requirement following standard procedures • Pest and disease prevention measures are planned as per job requirement following standard procedure • Pest prevention measures are applied as per job requirement following standard procedure • Pest management measures are applied as per job requirement following standard procedure • Pest control measures are applied as per job requirement following standard procedure • Disease prevention measures are applied as job requirement following standard procedure • Disease management measures are applied as per job requirement following standard procedure • Disease control measures are applied as per job requirement following standard procedure		
Content	F3.01 Identifying pest and diseases Knowledge • Types of pest and disease • Environmental conditions for pest and diseases outbreak • Types of contaminants in mushroom • Economic threshold level • Vectors for diseases Skills • Communication skills • Observation skills • Analytical skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation		

	F3.02 Conducting pest and disease surveillance Knowledge • Importance of pest and disease surveillance • Common pests and disease • Means of pest and disease spread • Pest and disease life cycle Skills • Communication skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation F3.03 Identifying interventions for management Knowledge • Importance of Identifying interventions for management • Types of interventions Skills • Analytical skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, equipment and materials • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation F3.04 Planning pest and disease prevention measures Knowledge • Common pest and disease in mushroom farms • Purpose of pest and disease intervention measures • Contaminations and vectors in mushroom farms • SOP for sanitization
--	---

	Skills • Analytical skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, equipment and materials • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation F3.05 Applying pest and disease prevention measures Knowledge • Purpose of pest and disease prevention measures • Prevention measures for pest and diseases Skills • Analytical skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, equipment and materials • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation F3.06 Applying pest management measures Knowledge • Importance of pest management measure • Types of pest management measures • Integrated Pest Management (IPM) Skills • Analytical skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources
--	---

	• Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, equipment and materials • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation F3.07 Applying pest control measures Knowledge • Importance of pest control measures • Pest control measures in mushroom farm Skills • Analytical skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, equipment and materials • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation F3.08 Applying diseases prevention measures Knowledge • Importance of disease prevention measures • Types of disease prevention measures • Function of foot dip Skills • Analytical skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, equipment and materials • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation
--	--

	F3.09 Applying diseases management measures Knowledge • Importance of disease management measures • Types of disease management measures • Factors for disease outbreak Skills • Analytical skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, equipment and materials • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation F3.10 Applying diseases control measures Knowledge • Importance of disease control measures • Types of disease control measures • Methods of fungicide application Skills • Analytical skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, equipment and materials • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation
Learning Conditions	Learning Materials • CBLM • Hand-outs • Audio Visuals • Reference books • Manuals • Google classroom

	Learning Facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Practical field Materials • Pen, paper, file, sample collection bags, markers, buckets, list of pests and diseases in mushroom farms, standards for mushroom production and facility design, pesticides, fungicides, disinfectants (70% isopropyl alcohol, Hydrogen peroxide, Ammonia-based cleaners), soap and hand towel. Tools • Hand lens, microscope camera / smartphone, forceps, knife, scissors, labels, cleaning tools, sprayers, sacks, wheel carts, weighing balance, measuring container and spatula PPE • Work dress, lab coat, hand gloves, hair net, face mask, safety goggles, foot wears and safety boots
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: • Lecture • Interactive discussion • Demonstration • Industrial visit/training • Guided practice • Group practice with project-based learning • Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: • Practical observation • Oral/viva-voce • Written test • Assignment • Project work

Module Title	Carrying out mushroom cultivation		
Module Code	6111- L3-M6		
Learning Outcome 4	Perform post-harvesting		
Duration	Theory: 10 hours	Practical: 23 hours	Total: 33 hours
Assessment Criteria	• Mushrooms sorting and grading are conducted as per job requirement following standard procedure • Appropriate packaging material are selected as per the job requirement following standard procedure • Packaging is performed as per the job requirement following standard procedure • Labeling is performed as per the job requirement following standard procedure and BFDA labeling guidelines • Storing is performed as per the job requirement following standard procedure		
Content	F4.01 Conducting sorting and grading Knowledge • Importance of sorting and grading • Requirement of mushroom quality and growth stage for market Skills • Communication skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation F4.02 Selecting appropriate packaging materials Knowledge • Purpose of packaging • Respiration rate and senescence of mushrooms • Factors affecting perishability (temperature, humidity, mechanical damage) • Market standards and consumer requirements • Types of packing materials Skills • Communication skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player		

	• Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, materials and equipment • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation F4.03 Performing packaging Knowledge • Importance of aeration in mushroom packaging • Suitable food grade packaging materials for mushrooms • Different Packaging methods Skills • Using sealing machine • Analytical skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, equipment and materials • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation F4.04 Performing labelling Knowledge • Purpose of labelling • Types of labels • Key information required • National or international standards Skills • Analytical skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, equipment and materials • Having sense of ownership and accountability
--	--

	• Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation F4.05 Performing storing Knowledge • Condition requirements for mushroom storage • Appropriate storage environment for mushroom • Importance of proper storage • Types of storage facilities Skills • Analytical skills • Observation skills • Planning skills Attitude, safety and environmental concern • Effective time management • Being team player • Being efficient in using resources • Being vigilant and patient • Having work ethics and integrity • Proper handling of tools, equipment and materials • Having sense of ownership and accountability • Ensuring appropriate use of PPE • Ensuring to follow OHS rules and regulation
Learning Conditions	Learning Materials • CBLM • Hand-outs • Audio Visuals • Reference books • Manuals • Google classroom Learning Facilities and infrastructure • Classroom with adequate facilities • Information Technology (IT) lab • Library • Practical field Materials • Pen, paper, file, markers / marker pen, collection bags, grading reference charts, market information, packaging regulatory guidelines, mushrooms, packaging materials, crates, cardboard boxes, cellotape, rubber bands, sticker paper, coated paper, plastic sleeves, adhesive glue and pallets. Tools • Weighing balance, measuring tape, secateurs / knife, scissors, paper cutters, work table, boxes, crates, tray, pallet jack and wheelbarrow.

	Equipment ● Sorting/grading table, computer, sealing machine, color printer and refrigerator PPE ● Work dress, lab coat, hand gloves, hair net, face mask, safety goggles, foot wears and safety boots
Instructional Methodologies	The trainer shall use <i>inter alia</i>, the following instructional methods: ● Lecture ● Interactive discussion ● Demonstration ● Industrial visit/training ● Guided practice ● Group practice with project-based learning ● Individual practice with problem-based learning
Method of Assessment	The trainer shall use <i>inter alia</i>, the following assessment methods: ● Practical observation ● Oral/viva-voce ● Written test ● Assignment ● Project work

ANNEXURE

Annex I: Time Distribution

Commercial Agripreneurship BQF-3, Time Distribution					
Module Title	Learning outcomes	Tasks	Theory (Hours)	Practical (Hours)	Total (hours)
A: Carry out planning and preparation for crop production	A1. Prepare for crop production	A1.00 Introductory knowledge	2	0	2
		A1.1 Select site	2	5	7
		A1.2 Select crops	3	4	7
		A1.3 Conduct soil testing	2	5	7
		A1.4 Prepare specific crop production plan	3	5	8
		A1.5 Prepare estimation and costing	2	6	8
	Sub Total Duration		14	25	39
	A2. Prepare production field	A2.1 Conduct site analysis	2	6	8
		A2.2 Perform terracing/contouring	6	42	48
		A2.3 Perform soil preparation	2	14	16
		A2.4 Construct fence	2	14	16
		A2.5 Prepare bed	2	21	23
	Sub Total Duration		14	97	111
	A3. Conduct soil fertility and nutrient management	A3.1 Develop soil fertility management intervention	2	7	9
		A3.2 Perform appropriate crop rotation	2	14	16
		A3.3 Prepare compost	2	21	23
		A3.4 Prepare vermi-compost	2	14	16
		A3.5 Prepare liquid manure /bio-fertilizers	2	7	9
		A3.6 Prepare bokashi	1	3	4
		A3.7 Apply organic matter/compost	1	6	7
		A3.8 Apply green manure	1	6	7
		A3.9 Plant/Grow cover crops	2	14	16
		A3.10 Apply mulch	2	14	16
		A3.11 Apply soil amendments	2	7	9
		A3.12 Conduct soil pH correction	2	7	9
		A3.13 Apply chemical fertilizers	2	7	9
	Sub Total Duration		23	127	150

	Total Duration (A)		51	249	300
B. Implement irrigation and water management	B1. Plan irrigation requirements	B1.1 Prepare crop irrigation schedule	0.5	1	1.5
		B1.2 Conduct soil moisture testing	1	2	3
		B1.3 Select irrigation system	2	2	4
	Sub Total Duration		3.5	5	8.5
	B2. Operate irrigation systems	B2.1 Install sprinkler irrigation system	2	10	12
		B2.2 Install drip irrigation system	2	14	16
		B2.3 Troubleshoot irrigation system	1	3	4
	Sub Total Duration		5	27	32
	B3. Conserve water resources	B3.1 Construct water harvesting system	2	21	23
		B3.2 Construct drainage for waterlogged area	1	3	4
		B3.3 Apply on-farm soil moisture conservation practices	1	2	3
	Sub Total Duration		4	26	30
	Total Duration (B)		12.5	58	70.5
C. Manage pest, diseases and weeds	C1. Manage pests	C1.1 Identify pest	1	0.5	1.5
		C1.2 Conduct pest surveillance	1	1	2
		C1.3 Plan pest management interventions	1	1	2
		C1.4 Apply integrated pest management practices	2	5	7
	Sub Total Duration		5	7.5	12.5
	C2. Manage diseases	C2.1 Identify diseases	1	0.5	1.5
		C2.2 Conduct disease surveillance	0.5	1	1.5
		C2.3 Plan disease management interventions	0.5	1	1.5
		C2.4 Apply integrated disease management practices	2	5	7
	Sub Total Duration		4	7.5	11.5
	C3. Manage weeds	C3.1 Identify weeds	1	0.5	1.5
		C3.2 Conduct weed surveillance	0.5	1	1.5
		C3.3 Plan weed management interventions	0.5	1	1.5
		C3.4 Apply integrated weed management practices	2	5	7
	Sub Total Duration		4	7.5	11.5
	Total Duration (C)		13	22.5	35.5
D. Carry out commercial	D1. Perform production activities	D1.1 Construct/Install basic greenhouse	2	21	23
		D1.2 Manage smart green house	3	21	24

vegetable production		D1.3 Select seed	2	3	5
		D1.4 Perform nursery raising on bed	2	5	7
		D1.5 Perform nursery raising on trays	2	5	7
		D1.6 Manage nursery	3	10	13
		D1.7 Perform direct sowing of seed	1	6	7
		D1.8 Transplant seedling	2	10	12
	Sub Total Duration		17	81	98
	D2. Perform vegetable management	D2.1 Perform staking & trellising	1	7	8
		D2.2 Perform pruning & training	2	14	16
		D2.3 Perform thinning & de-shooting	2	14	16
	Sub Total Duration		5	35	40
	D3. Perform harvesting	D3.1 Assess maturity indices	2	3	5
		D3.2 Prepare for harvesting	1	1	2
		D3.3 Harvest vegetables	2	7	9
	Sub Total Duration		5	11	16
	D4. Perform post-harvest management	D4.1 Conduct sorting and grading	2	5	7
		D4.2 Select appropriate packaging materials	1	2	3
		D4.3 Perform packaging	1	5	6
		D4.4 Perform labeling	1	7	8
		D4.5 Perform Storing	1	3	4
	Sub Total Duration		6	22	28
	Total Duration (D)		33	149	182
E. Carry out Cereal production	E1. Perform production activities	E1.1 Select seed	1	1	2
		E1.2 Perform nursery raising	1	2	3
		E1.3 Perform direct sowing of seed	1	3	4
		E1.4 Transplant seedlings	1	6	7
		E1.5 Perform crop management	2	5	7
	Sub Total Duration		6	17	23
	E2. Perform harvesting	E2.1 Assess crop maturity	2	2	4
		E2.2 Prepare for harvesting	2	2	4
		E2.3 Harvest crops	1	4	5
		E2.4 Perform threshing and cleaning	2	4	6
			7	12	19
		E3.1 Conduct cleaning and milling	2	4	6

	E3. Perform post-harvest management	E3.2 Perform Storing	1	3	4
		E3.3 Select appropriate packaging materials	1	1	2
		E3.4 Perform packaging	1	4	5
		E3.5 Perform labeling	1	2	3
			6	14	20
	Total Duration (E)		19	43	62
F. Carry out mushroom cultivation	F1. Perform production of mushroom on sawdust (Shiitake)	F1.1 Select site	2	5	7
		F1.2 Manage mushroom house	3	4	7
		F1.3 Prepare media	3	21	24
		F1.4 Sterilize media	1	14	15
		F1.5 Inoculate media with mushroom spawn	1	14	15
		F1.6 Incubate inoculated media	1	21	22
		F1.7 Induce fruiting	1	7	8
		F1.8 Harvest mushroom	1	21	22
			13	107	120
	F2. Perform spawn management	F2.1 Store spawn	1	8	9
		F2.2 Transfer spawn	2	10	12
		F2.3 Maintain hygiene and sanitation	1	7	8
			4	25	29
	F3. Manage pest and diseases	F3.1 Identify pest and diseases	1	5	6
		F3.2 Conduct pest and diseases surveillance	2	4	6
		F3.3 Identify interventions for management	2	3	5
		F3.4 Plan pest and diseases intervention measures	2	3	5
		F3.5 Apply pest prevention measures	2	5	7
		F3.6 Apply pest management measures	2	5	7
		F3.7 Apply pest control measures	2	5	7
		F3.8 Apply diseases prevention measures	2	5	7
		F3.9 Apply diseases management measures	2	5	7
		F3.10 Apply diseases control measures	2	5	7
			19	45	64
	F4. Perform post harvesting	F4.1 Conduct sorting and grading	2	3	5
		F4.2 Select appropriate packaging materials	2	3	5

		F4.3 Perform packaging	2	7	9
		F4.4 Perform labeling	2	7	9
		F4.5 Perform storing	2	3	5
			10	23	33
	Total Duration (F)		46	200	246
Grand Total			174.5	721.5	896

Annex II: Module Recognition

This is to verify that

Mr/Ms.....

has completed module on

.....

Covering following learning outcomes:

1.
2.
3.

Instructor:

Head of the Department:

.....

.....

Signature:

Signature:

Date: / / (dd/mm/yyyy)
.....(dd/mm/yyyy)

Date: / /

Head of the Institute:

Trained Assessor (Institute)/Exam OC:

.....

.....

Signature:

Signature:

Date: / .. / (dd/mm/yyyy)

Date: / /(dd/mm/yyyy)

Annex IV: Lesson Plan

Lesson Plan

Course Title:		NC Level:
Module Code:		Duration:
Module Title:		
Learning Outcome:		
Skill/Task/Topic:		
Terminal Performance Objective: <i>(Note: Write narrative statement extracted from TPO of Task Sheet)</i>		
Enabling Objectives (Related knowledge): <i>By the end of the lesson learners will be able to:</i> i) ii) iii)		
What (Content/Activity)	Who (T/L)	How (Methods/ Media)
Duration (Min.)	Questions	
<i>Introduction:</i> <i>Main body</i> <i>Conclusion</i>		
Projects/Problems: 		

Instructional Resources Plan				
Skills/Task/Topic:				
No. of Trainees:				
Sl. No.:	Instructional materials/resources	Specifications	Qty.	Remarks
Prepared by :		Signature	Date:	
Revised by:		Signature	Date:	
Approved by:		Signature	Date:	

Task sheet

TS-1/4: Practical Plan			
Course Title:		N C Level:	
Module code:		Duration:	
Module Title			
Learning outcome			
Skills/Task Title:		Task no:	
Terminal Performance Objective: <i>Given:</i> <i>Cue:</i> <i>Who:</i> <i>What:</i> <i>Within:</i> <i>How well:</i> - - -			
Enabling Objectives (Related Skills): <i>By the end of a lesson, the learners will be able to:</i> i) ii) iii) iv)			
Activities	Who (T/L)	How (methods/ media)	Duration
Project/Assignment: 			

TS-2/4: Tool and Equipment required:						
<i>Sl no.</i>	<i>Particulars</i>	<i>Specifications</i>	<i>Qty.</i>	<i>Remarks</i>		
Training Materials required:						
<i>Sl no.</i>	<i>Particulars</i>	<i>Specifications</i>	<i>Qty.</i>	<i>Rate</i>	<i>Amount</i>	<i>Remarks</i>
TS-3/4: Performance Guide						
Skill/Task:					Date:	
Directions: Use the following performance criteria to rate the learner. Check YES/NO to indicate whether the learner performed each step as indicated or not?						
Sl. No:	Steps				Yes	No
Note: <i>Critical steps: All * marked steps should be carried out very carefully. For a quality performance guide, all items should be checked "YES"</i>						

TS-4/4: Instruction and Drawing

General Instructions for Trainees

- i)
- ii)
- iii)
- iv)

Drawing (if any)

Safety Precaution

- i)
- ii)
- iii)

Prepared by:

Signature

Date:

Revised By:

Signature

Date:

Approved by:

Signature

Date:

Annex V: Course Plan
Institutes letter head and Logo

(Trade)YEAR PLAN- _____ **Semester** _____ **(Year)**

Trade: NC Level:			Schedule																																								Total Hours			
Module Code	Module Title	Learning Outcome	Feb.				March				April				May				June				July				Aug.				Sept				Oct.				Nov.							
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4								
OJT																																														
Assessment and Certification																																														

Prepared by:

Verified & Approved by:

Date:

Monthly/Weekly Plan

Month: Trade: Trainer:

Week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Week 01							
Week 02							
Week 03							
Week 04							
Week 05							

Developed by: Approved by:

Date



For more information please contact:

Technical Trainers Training and Resource Center (TTTRC), DWPSD

Email ID: tttrd@moesd.gov.bt/dwpsd@moesd.gov.bt