

National Occupational Skill Standard (NOSS)

Occupational Title : Herbal Farm Worker

Level : 1

Sector : Agriculture

Sub - Sector : Plant Science

NOSS ID/NSCO ID :

ISCO NO :



Council for Technical Education and Vocational Training

NATIONAL SKILL TESTING BOARD

Madhyapur Thimi-17, Sanothimi, Bhaktapur, Nepal

Developed: 15-04-2021 (02-01-2078)



DACUM Panel:

S. No.	Name	Designation	Organization
1.	Mr. Parshu Ram Shrestha	Member	Herbs producer, Tamaghadi.
2.	Mr. Dip Bahadur Sapkota	Member	Herbs producer, Tamaghadi.
3.	Mr. Indrabati Chaudhary	Member	Herbs producer, Tamaghadi.
4.	Mr. Manamaya Limbu	Member	K.P. Builders, Pokharichauri, Kavre.
5.	Mr. Lok Nath Chaudhary	Member	Herbs producer, Tamaghadi.
6.	Mr. Ramesh Bharati	Member	Herbs production and processing Co. Ltd., Tamaghadi.
7.	Mr. Kedar Chaudhary	Member	Herbs production and processing Co. Ltd., Tamaghadi.
8.	Mr. Panchu Chaudhary	Member	Herbs production and processing Co. Ltd., Tamaghadi.
9.	Mr. Ram Babu Chaudhary	Member	Herbs production and processing Co. Ltd., Tamaghadi.
10.	Mr. Santola Chaudhary	Member	Herbs producer, Tamaghadi.
11	Mr. Kamala Shrestha	Member	Herbs producer, Tamaghadi.
12	Mr. Mohan Kumar Chaudhary	Member	Herbs production and processing Co. Ltd., Tamaghadi.

DACUM Facilitator/Recorders:

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Mr. M.K. Mainali, Senior Curriculum Officer CDS Verification Panel

DACUM Workshop on 2010

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Verification Panel:

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2.	Mr. Dharma Maharas	Herbal Expert	Kharibot -1, Gorkha
3.	Mr. Kumar Shrestha	Herbal Plantation Worker	Chhoprak-2, Gorkha
4.	Mr. Keshav Neupane	Herbal Plantation Worker	Khopllang-5, Gorkha
5.	Ms. Bikram Gurung	Herbal Plantation Worker	Laprak-6, Gorkha
6.	Mr. Sachin Bikram Sha	Herbal Technician	Khopllang-5, Gorkha
7.	Mr. Rabi Kiran Shrestha	Herbal Plantation Worker	Gorkha-1, Gorkha
8.	Mr. Rudra Gurung	Herbal Technician	Laprak-9, Gorkha
9.	Mrs. Krishna Kumari Neupane	Herbal Plantation Worker	Chhoprak-1, Gorkha
10.	Mr. Subod chandra Pokhrel	Herbal Plantation Worker	Chhoprak-2, Gorkha
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12.	Mr. RupaGurung	Herbal Plantation Worker	Laprak-3, Gorkha

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Mr. Ishwar Chandra Ghimire, STO, NSTB

Customized DACUM workshop on April 21 2011

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The Occupational Profile Developed by:

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4.	Mr. Hem Chandra Dhakal	Member	Agriculture Extension Officer, Central Vegetable Seed Production Center, Khumaltar, Lalitpur
5.	Dr. Sanjit Sapkota	Member	Herbal Trainer, Aroma Nepal Herbs Production P.Ltd., Kamaladi, Kathmandu
6.	Dr. Nawa Raj Subedi	Member	Medical Officer, Dhanwantari Ayurveda Hospital and Research Center, Dhumbarai, Kathmandu
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Recommended by Agriculture Technical Sub Committee: 29 April 2011



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The National Occupational Skill Standard Developed by:

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4.	Ms. Sangeeta Swar	Member	Department of Plant Resources Thapathali, Kathmandu
5.	Mr. Madhu Shudan Thapa Magar	Member	Department of Plant Resources Thapathali, Kathmandu
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8.	Mr. Suresh Maharjan	Member	Skill Testing Officer, National Skill Testing Board Sanothimi, Bhaktapur
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1	<p>Occupational Title: Herbal Farm Worker Level: 1</p>
2	<p>Job Description: Herbal Farm Worker, L-1 prepares herbal nursery, performs herbal farming and post harvesting activities.</p>
3	<p>UNITS OF COMPETENCY:</p> <ol style="list-style-type: none"> 1. Prepare herbal nursery. 2. Perform herbal farming. 3. Perform post harvesting activities. 4. Perform communication. 5. Develop professionalism. <p>*Note: Units 4 and 5 are not for testing purpose.</p>
4	<p>Qualifying Notes/Prerequisites:</p> <ul style="list-style-type: none"> • Physical Requirements: Sound health • Entry Requirements: As per NSTB rules <p>Additional Information:</p> <ul style="list-style-type: none"> • Assessment Types: Performance test only • Assessment Duration: 4 to 4:30 hours (Single Competency) 5 to 6 hours (All Competency) • Recommended Group Size: 8 to 10 candidates



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5	Unit No:1 Unit Title: Prepare herbal nursery	Unit code:
	Elements of competency	Performance standards
	1.1 Prepare tools, equipment and materials	1.1.1 Personal protective equipment (PPE) used in accordance with task requirement. 1.1.2 Tools and equipment collected and checked for working condition in accordance with task requirement. 1.1.3 Materials collected and prepared in accordance with task requirements.
	1.2 Prepare compost	1.2.1 2m long, 1.5 to 2m wide and 1m deep compost pit prepared. 1.2.2 Materials placed in pit layer by layer maintaining thickness of 15-25 cm or piled up 30 cm above ground level as a heap. 1.2.3 Starter sprayed uniformly during piling process. 1.2.4 Compost covered with covering materials .
	1.3 Prepare Jhol Mal	1.3.1 200-500 gm plant leaves and ash, 1/3-part of livestock dung, 1/3-part of water and 1/3-part of livestock urine mixed uniformly in a drum. 1.3.2 Drum lid tightly covered.
	1.4 Prepare Vermi compost	1.4.1 2-3m long, 1.25m wide and 0.5-1m deep Vermi pit prepared. 1.4.2 Sand layering of 8-10 cm followed by bedding materials and 1:1 ratio of bio degradable materials and dried livestock dung placed layer by layer in pit. 1.4.3 Bio degradable materials and dried livestock dung placed one after another for 3-5 times. 1.4.4 Vermi pit covered with covering materials. 1.4.5 500 cultured earthworms placed on covering materials.
	1.5 Select seeds and propagules	1.5.1 Quality Seeds and propagules collected from healthy mother plants/market for sowing. 1.5.2 10-15cm long piece of cut from healthy portion of 1-2 years old stem/branch at 45 degree. 1.5.3 Seeds/propagules labelled and stored.
	1.6 Construct nursery polyhouse	1.6.1 Suitable land selected for nursery polyhouse construction.



	<ul style="list-style-type: none"> 1.6.2 3.5m wide and 4 m long area measured and marked on land. 1.6.3 Corner, mid and centre points marked from measured area. 1.6.4 Holes of 50cm deep and 15-20 cm diameter dug on marked points. 1.6.5 Required size of bamboo/wood prepared for central, side poles and frames. 1.6.6 Protective paint/plastic applied on base of bamboo poles up to 50cm. 1.6.7 Bamboo poles inserted vertically on holes and tightly fixed. 1.6.8 Bamboo poles fixed horizontally on top of central and side poles. 1.6.9 Split bamboo placed in arch shape and tightly fixed at distance of 50-60 cm. 1.6.10 Plastic sheet/silpaulin spread over arch and tightly fixed.
1.7 Prepare herbal nursery beds	<ul style="list-style-type: none"> 1.7.1 Foreign materials removed from land and waste disposed as per types of waste. 1.7.2 Land ploughed, clods broken, land pulverized and leveled. 1.7.3 Manure, soil and sand mixed uniformly in 1:2:1 ratio. 1.7.4 Bed prepared according to seasons and herbal type. 1.7.5 50 cm wide passage maintained between two beds. 1.7.6 Polybag filled with a mixture of manure, soil and sand in 1:2:1 ratio with compaction.
1.8 Irrigate nursery	<ul style="list-style-type: none"> 1.8.1 Irrigation system prepared based on available water source. 1.8.2 Irrigation schedule prepared on the basis of herbal types and season. 1.8.3 Water applied as per soil moisture content without damaging herbs. 1.8.4 Drain system prepared and excess water drained from field.
1.9 Produce planting materials	<ul style="list-style-type: none"> 1.9.1 1-3 cm deep straight lines drawn on nursery bed at a distance of 10cm. 1.9.2 Seeds/propagules dibbled in marked points in a line and covered with mixture of soil and manure. 1.9.3 Tiny quality seeds mixed with sand/ashes and uniformly spread on nursery bed. 1.9.4 Nursery bed covered with covering materials. 1.9.5 Seeds/propagules sown with germinating part on top at depth of 1-3cm in prepared polybag. 1.9.6 Base of stem cuttings dipped into rootex and planted in inclined position.



	1.10 Protect seedling/sapling	<p>1.10.1 Weeds and unhealthy herbs removed from nursery bed and disposed as per 3R's principle.</p> <p>1.10.2 Plant's diseases and harmful insects identified based on signs and symptoms.</p> <p>1.10.3 Suitable physical methods applied as per plant's diseases and insects.</p> <p>1.10.4 Bio pesticide prepared and sprayed in early morning or late evening to prevent excessive drift.</p> <p>1.10.5 Tools and equipment cleaned, maintained, stored and record updated.</p>
6	Task Performance Requirements (Tools, Equipment and Materials):	<ul style="list-style-type: none"> Sickle, secateur, shovel, drum, plastic roll, silpaulin, measuring tape, garden pipe, tray, rake, sprayer, bio pesticides, scissor, wooden slab, spade, hoe, bucket, mug, measuring tape, polybag, sampling tag, marker pen, sprinkler, watering can, weighing machine, measuring bucket/jar, rootex, urea, EM1, agriculture lime, manure, drip set, bamboo, hammer, nails, hacksaw, knife, axe, rope, protective paint, GI wire, ladder, wooden peg, insect net, agro net, starter, baskets, thunche, doko, Kuto, Kodalo, gal/khanti, pick, wheel barrow, litters, bricks, cultured earthworms, bedding materials, covering materials, seeds, propagules, livestock dung, urine, sand, ash, plant leaves, pen, paper, register, first aid kit and personal protective equipment (PPE).
7	Safety and Hygiene (Occupational Health and Safety):	<ul style="list-style-type: none"> Use personal protective equipment. Safe handling of materials, tools and equipment. Hazards involved in lifting tools, equipment and materials. Apply protective measures against chemical fertilizer. Safe use of debris. Prevent from cutting hazards.



8	Required Knowledge		
	Technical Knowledge	Applied Calculation	Graphical Information
	<ul style="list-style-type: none"> • Tools and equipment: <ul style="list-style-type: none"> ○ Types ○ Uses ○ Safe handling • Herbal plants <ul style="list-style-type: none"> ○ Introduction ○ Types ○ Importance ○ Potential herbal species for farming ○ Herbal nursery techniques • Manure <ul style="list-style-type: none"> ○ Introduction ○ Types ○ Preparation techniques ○ Application techniques • Nursery <ul style="list-style-type: none"> ○ Introduction ○ Types ○ Factors of site selection 	<ul style="list-style-type: none"> • Convert imperial unit to metric unit and vice versa • Calculate amount of bio pesticides 	<ul style="list-style-type: none"> • Read and interpret manufacturer's instruction



<ul style="list-style-type: none"> ○ Nursery bed preparation ○ Nursery polyhouse preparation ○ Nursery shed preparation ● Seeds and propagules <ul style="list-style-type: none"> ○ Introduction ○ Types ○ Quality ○ Identification ○ Selection method ○ Sowing and propagation methods ○ Stem/branch cutting for propagation ○ Storage ● Irrigation <ul style="list-style-type: none"> ○ Introduction ○ Types ○ Selection of irrigation system ○ Irrigation schedule ● Herbal plant protection <ul style="list-style-type: none"> ○ Introduction ○ Disease, pest and weeds ○ Sign, symptoms and treatment 		
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	<ul style="list-style-type: none">• Waste management• Record keeping and documentation• Occupational health and safety rules and regulations• Importance of first aid kit		
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9	Assessment of Competency					
	Unit: 1 Unit Title: Prepare herbal nursery					
	Candidate Details		Assessors Detail			
	Candidate's Name: Registration Number: Symbol No: Test Centre:		Assessors' Name 1. 2. 3.		ID/License No:	
Element of competency	Performance Standards		Standard Met	Standard Not Met	Evidence Type	Comments
1.1 Prepare tools, equipment and materials	1.1.1 Personal protective equipment (PPE) used in accordance with task requirement. 1.1.2 Tools and equipment collected and checked for working condition in accordance with task requirement. 1.1.3 Materials collected and prepared in accordance with task requirements.					
1.2 Prepare compost	1.2.1 2m long, 1.5 to 2m wide and 1m deep compost pit prepared. 1.2.5 Materials placed in pit layer by layer maintaining thickness of 15-25 cm or piled up 30 cm above ground level as a heap. 1.2.2 Starter sprayed uniformly during piling process. 1.2.3 Compost covered with covering materials .					



1.3 Prepare Jhol Mal	1.3.1 200-500 gm plant leaves and ash, 1/3-part of livestock dung, 1/3-part of water and 1/3-part of livestock urine mixed uniformly in a drum. 1.3.2 Drum lid tightly covered.				
1.4 Prepare Vermi compost	1.4.1 2-3m long, 1.25m wide and 0.5-1m deep Vermi pit prepared. 1.4.2 Sand layering of 8-10 cm followed by bedding materials and 1:1 ratio of bio degradable materials and dried livestock dung placed layer by layer in pit. 1.4.3 Bio degradable materials and dried livestock dung placed one after another for 3-5 times. 1.4.4 Vermi pit covered with covering materials . 1.4.5 500 cultured earthworms placed on covering materials.				
1.5 Select seeds and propagules	1.5.1 Quality Seeds and propagules collected from healthy mother plants/market for sowing. 1.5.2 10-15cm long piece of cut from healthy portion of 1-2 years old stem/branch at 45 degree. 1.5.3 Seeds/propagules labelled and stored.				
1.6 Construct nursery polyhouse	1.6.1 Suitable land selected for nursery tunnel/polyhouse construction. 1.6.2 3.5m wide and 4 m long area measured and marked on land. 1.6.3 Corner, mid and centre points marked from measured area. 1.6.4 Holes of 50cm deep and 15-20 cm diameter dug on marked points. 1.6.5 Required size of bamboo/wood prepared for central, side				



	<p>poles and frames.</p> <p>1.6.6 Protective paint/plastic on base of bamboo poles up to 50cm.</p> <p>1.6.7 Bamboo poles inserted vertically on holes and tightly fixed.</p> <p>1.6.8 Bamboo poles fixed horizontally on top of central and side poles.</p> <p>1.6.9 Split bamboo placed in arch shape and tightly fixed at distance of 50-60 cm.</p> <p>1.6.10 Plastic sheet/silpaulin spread over arch and tightly fixed.</p>			
1.7 Prepare herbal nursery beds	<p>1.7.1 Foreign materials removed from land and waste disposed as per types of waste.</p> <p>1.7.2 Land ploughed, clods broken, land pulverized and leveled.</p> <p>1.7.3 Manure, soil and sand mixed uniformly in 1:2:1 ratio.</p> <p>1.7.4 Bed prepared according to seasons and herbal type.</p> <p>1.7.5 50 cm wide passage maintained between two beds.</p> <p>1.7.6 Polybag filled with a mixture of manure, soil and sand in 1:2:1 ratio with compaction.</p>			
1.8 Irrigate nursery	<p>1.8.1 Irrigation system prepared based on available water source.</p> <p>1.8.2 Irrigation schedule prepared on the basis of herbal types and season.</p> <p>1.8.3 Water applied as per soil moisture content without damaging herbs.</p> <p>1.8.4 Drain system prepared and excess water drained from field.</p>			
1.9 Produce planting materials	1.9.1 1-3 cm deep straight lines drawn on nursery bed at a distance of 10cm.			



	<p>1.9.2 Seeds/propagules dibbled in marked points in a line and covered with mixture of soil and manure.</p> <p>1.9.3 Tiny quality seeds mixed with sand/ashes and uniformly spread on nursery bed.</p> <p>1.9.4 Nursery bed covered with covering materials.</p> <p>1.9.5 Seeds/propagules sown with germinating part on top at depth of 1-3cm in prepared polybag.</p> <p>1.9.6 Base of stem cuttings dipped into rootex and planted in inclined position.</p>			
1.10 Protect seedling/sapling	<p>1.10.1 Weeds and unhealthy herbs removed from nursery bed and disposed as per <i>3R's principle</i>.</p> <p>1.10.2 <i>Plant's diseases and harmful insects</i> identified based on signs and symptoms.</p> <p>1.10.3 <i>Suitable physical methods</i> applied as per plant's diseases and insects.</p> <p>1.10.4 Bio pesticide prepared and sprayed in early morning or late evening to prevent excessive drift.</p> <p>1.10.5 Tools and equipment cleaned, maintained, stored and record updated.</p>			

WT- Written Test

OQ- Oral Question

PT- Practical Test

DO – Direct Observation

SR- Supervisor's report

SN–Simulation

RP- Role Play

PG –Photographs

VD- Video

CT – Certificates

TS – Testimonials (Reward)

PP – Product Produced

CS – Case Study



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Range Statement

Variable	Range
Personal protective equipment	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Helmet • Hat • Mask • Apron • Goggles • Gloves • Safety shoes • Safety belt
Materials	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Compost <ul style="list-style-type: none"> ○ Organic matter: litters, kitchen waste, dung, urine ○ Starter: compost, Effective micro-organism (EM1), agriculture lime, urea • Jhol Mal <ul style="list-style-type: none"> ○ Livestock dung ○ Livestock urine ○ Water ○ Effective micro-organism (EM1) ○ Plant leaves: Sishno, Titepati, Banmara, Khirro, Mewa, Neem, Bakaino, Asuro ○ Ash • Vermi compost



	<ul style="list-style-type: none"> <input type="radio"/> Cultured Earthworm <input type="radio"/> Litters <input type="radio"/> Sand <input type="radio"/> Bedding materials: newspaper, cardboard, dried livestock dung <input type="radio"/> Bio degradable materials <input type="radio"/> Water
Covering materials	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Straw • Litters • Mixture of soil and livestock dung • Plastic
Quality seeds	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Free from disease and pest • Free from foreign matter • Free from other crop seed • Viable
Propagules	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Sucker • Slip • Runner • Stem/branch cutting • Rhizome • Roots • Bulbil



	<ul style="list-style-type: none"> • Bulb • Vegetative fragments
Suitable land	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Road accessibility • Fertile • Nearby water source • Flat land • Free from water logging • Shade free area
Required size	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Central/mid pole: 3 - 4m • Side pole: 2.5 - 3.5 m
Protective paints	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Enamel • Coal tar • Turpentine oil
Foreign materials	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Plant debris • Weed • Pebble • Stone • Plastic • Metals



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	<ul style="list-style-type: none"> • Glass
Types of waste	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Bio degradable • Non bio degradable
Bed	<p>May include but not limited to:</p> <ul style="list-style-type: none"> • Raised bed: 1 m wide, 3m long and 15 cm raised • Sunken bed: 1 m wide, 3m long and 15 cm deep
Polybag	<p>May include but not limited to:</p> <ul style="list-style-type: none"> • 2"X7" • 3"X7" • 4"X7" • 5"X8"
Irrigation system	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Sprinkler • Drip • Canal/channels • Garden pipe
Water source	<p>May include but not limited to:</p> <ul style="list-style-type: none"> • Well • Canal • Tube well • Pond



	<ul style="list-style-type: none"> • River
3R's principle	<p>May include but not limited to:</p> <ul style="list-style-type: none"> • Reduce • Reuse • Recycle
Plant's diseases and harmful insects	<p>May include but not limited to:</p> <ul style="list-style-type: none"> • Plant's diseases <ul style="list-style-type: none"> ○ Fungal ○ Bacterial ○ Viral • Harmful insects <ul style="list-style-type: none"> ○ Caterpillar ○ Ants ○ White grubs ○ Aphids ○ Cut worms
Suitable physical methods	<p>May include but not limited to:</p> <ul style="list-style-type: none"> • Destroy alternative host • Uprooting • Burning • Hand picking • Trapping



5	Unit No: 2 Unit Title: Perform herbal farming	Unit code:
	Elements of competency	Performance standards
	2.1 Prepare tools, equipment and materials	<p>2.1.1 Personal protective equipment (PPE) used in accordance with task requirement.</p> <p>2.1.2 Tools and equipment collected and checked for working condition in accordance with task requirement.</p> <p>2.1.3 Material collected and prepared in accordance with task requirements.</p>
	2.2 Collect soil sample	<p>2.2.1 Representative sampling points marked in 'Z' or 'N' manner covering at least 5 points.</p> <p>2.2.2 V-shaped sample holes of 15 cm deep dug at marked points.</p> <p>2.2.3 Soil samples taken as slice from V-shaped holes and thoroughly mixed.</p> <p>2.2.4 Half to one kilogram of thoroughly mixed sample packed and labeled with required information and sent for test.</p>
	2.3 Prepare land	<p>2.3.1 Foreign materials removed and segregated as per types of waste.</p> <p>2.3.2 Land ploughed, clods broken, land pulverized and leveled.</p> <p>2.3.3 Soil treated as per soil test report.</p> <p>2.3.4 Manure and soil mixed in 1:1 ratio.</p> <p>2.3.5 Bed or pit prepared as per herb type.</p> <p>2.3.6 Water applied based on soil moisture content.</p> <p>2.3.7 10 tone per hectare manure placed on pit and mixed uniformly 15 days before planting herbs.</p>
	2.4 Perform sowing and transplanting	<p>2.4.1 Planting distance marked on planting bed as per herb type.</p> <p>2.4.2 Direct sown seed dibbled and seedling transplanted at marked points in a line.</p> <p>2.4.3 Four/five leaves stage seedlings uprooted from nursery bed without damaging root.</p> <p>2.4.4 Plastic cover removed without damaging root from polybag and seedlings with soil transplanted on prepared bed in a line.</p> <p>2.4.5 Bed mulched around the planted seedlings.</p> <p>2.4.6 Sowed/transplanted field labelled and watered uniformly and gently.</p>
	2.5 Irrigate herbal field	2.5.1 Irrigation system prepared based on available water source .



		2.5.2 Irrigation schedule prepared on the basis of herbal types and season. 2.5.3 Water applied as per soil moisture content without damaging herbs. 2.5.4 Drain system prepared and excess water drained from field.
	2.6 Perform intercultural operations	2.6.1 Weeds and unhealthy herbs removed/pruned from field and disposed as per 3R's principle . 2.6.2 Hoeing and earthing up done without damaging root. 2.6.3 External support or staking provided for climbers and stalking need herbs. 2.6.4 Herbs replanted on the uprooted place. 2.6.5 Crops irrigated at critical stage of growth. 2.6.6 Excess water from the field drained.
	2.7 Apply additional fertilizer	2.7.1 Fertilizer schedule prepared on the basis of herb types. 2.7.2 Fertilizer placed around herbs after hoeing and covered with soil. 2.7.3 Nutrients provided to plants with deficiency symptoms.
	2.8 Perform herbal crops protection	2.8.1 Visual inspection performed and recorded. 2.8.2 Plant's diseases and harmful insects identified based on signs and symptoms. 2.8.3 Suitable physical methods applied as per plant's diseases and insects. 2.8.4 Dose of bio pesticide solution prepared based on manufacturer's instruction. 2.8.5 Bio pesticide sprayed in early morning or late evening to prevent excessive drift.
	2.9 Perform harvesting	2.9.1 Herbs to be harvested identified based on harvesting/maturity stages. 2.9.2 Herbs harvested without affecting other parts of herbs using suitable harvesting methods . 2.9.3 Herbs placed in a container . 2.9.4 Herbs stored in clean, dry and ventilated room. 2.9.5 Tools and equipment cleaned, maintained, stored and record updated.

6 Task Performance Requirements (Tools, Equipment and Materials):

- Sickle, secateur, shovel, drum, net, measuring tape, garden pipe, tray, rake, sprayer, bio pesticides, scissor, blade, fertilizer, manure, wooden slab, spade, hoe, bucket, mug, measuring tape, sampling tag, wheel barrow, marker pen, register, sprinkler, watering can, weighing machine, measuring bucket/jar, urea, DAP, Potash, Agriculture lime, Hand lens, EM1, drip set, insect net, basket, thunche, doko, Kuto, Kodalo, gal/khanti, pick, litters, covering materials, seeds, propagules, seedlings, livestock dung, plant leaves, container, first aid kit and personal



	protective equipment (PPE).
7	<p>Safety and Hygiene (Occupational Health and Safety):</p> <ul style="list-style-type: none"> • Use personal protective equipment. • Safe handling of materials, tools and equipment. • Apply protective measures against chemical fertilizer. • Safe use of pesticides. • Safe handling of debris. • Prevent from cutting hazards



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8	Required Knowledge		
	Technical Knowledge	Applied Calculation	Graphical Information
	<ul style="list-style-type: none"> • Tools and equipment: <ul style="list-style-type: none"> ○ Types ○ Uses ○ Safe handling • Herbal plants and their species • Soil test and soil treatment • Herbal farming <ul style="list-style-type: none"> ○ Introduction ○ Types ○ Importance ○ Potential herbal species for farming ○ Factor affecting herbal farming ○ Bed preparation ○ Interculture operations • Manure <ul style="list-style-type: none"> ○ Introduction ○ Types ○ Preparation techniques ○ Application techniques 	<ul style="list-style-type: none"> • Convert imperial unit to metric unit and vice versa • Calculate amount of bio pesticides 	<ul style="list-style-type: none"> • Read and interpret manufacturer's instruction



- Nutrients
- Seeds and propagules
 - Introduction
 - Types
 - Quality
 - Identification
 - Selection method
 - Sowing and propagation methods
 - Storage
- Irrigation
 - Introduction
 - Types
 - Selection of irrigation system
 - Irrigation schedule
- Herb's cultivation
- Control of disease, pest and weeds
- Herbs harvesting time, season and method
- Amount of production
- Storage of harvested herbs
- Waste management
- Record keeping and documentation



	<ul style="list-style-type: none">• Occupational health and safety rules and regulations• Importance of first aid kit		
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9	Assessment of Competency						
Unit: 2 Unit Title: Perform herbal farming	Candidate Details			Assessors Detail			
	Candidate's Name: Registration Number: Symbol No: Test Centre:			Assessors' Name 1. 2. 3.			
	Test Date:			ID/License No:			
	Element of competency		Performance Standards		Standard Met	Standard Not Met	Evidence Type
2.1 Prepare tools, equipment and materials		2.1.1 Personal protective equipment (PPE) used in accordance with task requirement. 2.1.2 Tools and equipment collected and checked for working condition in accordance with task requirement. 2.1.3 Material collected and prepared in accordance with task requirements.					
2.2 Collect soil sample		2.2.1 Representative sampling points marked in 'Z' or 'N' manner covering at least 5 points. 2.2.2 V-shaped sample holes of 15 cm deep dug at marked points. 2.2.3 Soil samples taken as slice from V-shaped holes and thoroughly mixed. 2.2.4 Half to one kilogram of thoroughly mixed sample packed and labeled with required information and sent for test.					
2.3 Prepare land		2.3.1 Foreign materials removed and segregated as per types of waste . 2.3.2 Land ploughed, clods broken, land pulverized and leveled. 2.3.3 Soil treated as per soil test report. 2.3.4 Manure and soil mixed in 1:1 ratio.					



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	2.3.5 Bed or pit prepared as per herb type. 2.3.6 Water applied based on soil moisture content. 2.3.7 10 tones per hectare manure placed on pit and mixed uniformly 15 days before planting herbs.			
2.4 Perform sowing and transplanting	2.4.1 Planting distance marked on planting bed as per herb type. 2.4.2 Direct sown seed dibbled and seedling transplanted at marked points in a line. 2.4.3 Four/five leaves stage seedlings uprooted from nursery bed without damaging root. 2.4.4 Plastic cover removed without damaging root from polybag and seedlings with soil transplanted on prepared bed in a line. 2.4.5 Bed mulched around the planted seedlings. 2.4.6 Sowed/transplanted field labelled and watered uniformly and gently.			
2.5 Irrigate herbal field	2.5.1 Irrigation system prepared based on available water source . 2.5.2 Irrigation schedule prepared on the basis of herbal types and season. 2.5.3 Water applied as per soil moisture content without damaging herbs. 2.5.4 Drain system prepared and excess water drained from field.			
2.6 Perform intercultural operations	2.6.1 Weeds and unhealthy herbs removed/pruned from field and disposed as per 3R's principle . 2.6.2 Hoeing and earthing up done without damaging root. 2.6.3 External support or staking provided for climbers and stalking need herbs. 2.6.4 Herbs replanted on the uprooted place. 2.6.5 Crops irrigated at critical stage of growth. 2.6.6 Excess water from the field drained			
2.7 Apply additional fertilizer	2.7.1 Fertilizer schedule prepared on the basis of herb types. 2.7.2 Fertilizer spread around herbs after hoeing and covered with soil. 2.7.3 Nutrients provided to plants with deficiency symptoms.			
2.8 Perform herbal crops protection	2.8.1 Visual inspection performed and recorded. 2.8.2 Plant's diseases and harmful insects identified based on signs and			



	<p>symptoms.</p> <p>2.8.3 <i>Suitable physical methods</i> applied as per plant's diseases and insects.</p> <p>2.8.4 Dose of bio pesticide solution prepared based on manufacturer's instruction.</p> <p>2.8.5 Bio pesticide sprayed in early morning or late evening to prevent excessive drift.</p>			
2.9 Perform harvesting	<p>2.9.1 <i>Herbs</i> to be harvested identified based on harvesting/maturity stages.</p> <p>2.9.2 Herbs harvested without affecting other parts of herbs using suitable <i>harvesting methods</i>.</p> <p>2.9.3 Herbs placed in a <i>container</i>.</p> <p>2.9.4 Herbs stored in clean, dry and ventilated room.</p> <p>2.9.5 Tools and equipment cleaned, maintained, stored and record updated.</p>			

WT- Written Test

OQ- Oral Question

PT- Practical Test

DO – Direct Observation

SR- Supervisor's report

SN–Simulation

RP- Role Play

PG –Photographs

VD- Video

CT – Certificates

TS – Testimonials (Reward)

PP – Product Produced

CS – Case Study



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Range Statement

Variable	Range
Personal protective equipment	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Helmet • Hat • Mask • Apron • Goggles • Gloves • Safety shoes • Safety belts
Required information	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Name and address of farmer • Location of field • Date of sampling • Previous crop grown • Test required: soil pH, moisture, Nitrogen, Phosphorus, Potassium • Crop to be grown
Foreign materials	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Plant debris • Weed • Trash • Pebble • Stone



Type of wastes	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Bio degradable • Non bio degradable
Bed or pit	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Bed <ul style="list-style-type: none"> ◦ Annual herbs: 8 cm raised beds at a distance of 7 to 10 cm between rows • Pit: <ul style="list-style-type: none"> ◦ Tree and bush: 45 cm × 45 cm × 45 cm at a distance of 1 m
Quality seeds	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Bold • Free from disease and pest • Free from inert matter • Free from other crop seed • Free from weed seed • Free from physical damage • Viable
Planting distance	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Row to row • Plant to plant
Irrigation system	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Sprinkler • Drip • Canal/channels • Garden pipe



Water sources	<p>May include but not limited to:</p> <ul style="list-style-type: none"> • Well • Canal • Tube wells • River • Pond
3R's principle	<p>May include but not limited to:</p> <ul style="list-style-type: none"> • Reduce • Reuse • Recycle
Critical stage	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • After transplanting • After sowing • After top dressing • After hoeing • During flowering and fruiting
Plant's diseases and harmful insects	<p>May include but not limited to:</p> <ul style="list-style-type: none"> • Plant's diseases <ul style="list-style-type: none"> ○ Fungal ○ Bacterial ○ Viral • Harmful insects <ul style="list-style-type: none"> ○ Caterpillar ○ Ants ○ White grubs



	<ul style="list-style-type: none"> <input type="radio"/> Aphids <input type="radio"/> Cut worms
Suitable physical methods	<p>May include but not limited to:</p> <ul style="list-style-type: none"> • Destroy alternative host • Uprooting • Burning • Hand picking • Trapping
Herbs	<p>May include but not limited to:</p> <ul style="list-style-type: none"> • Fruits • Flowers • Seeds • Leaves • Roots • Rhizomes • Barks • Stems • Whole plants
Harvesting method	<p>May include but not limited to:</p> <ul style="list-style-type: none"> • Hand picking • Cutting • Digging • Uprooting



Container

May include but not limited to:

- Basket
- Jute sack
- Tray
- Crate
- Box



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5	Unit No: 3 Unit Title: Perform post harvesting activities	Unit code:
	Elements of competency	Performance standards
	3.1 Prepare tools, equipment and materials	3.1.1 Personal protective equipment (PPE) used in accordance with task requirement. 3.1.2 Tools and equipment collected and checked for working condition in accordance with task requirement. 3.1.3 Materials collected and prepared in accordance with task requirements.
	3.2 Perform grading	3.2.1 Unwanted materials removed from harvested herbs and washed without damaging herbs. 3.2.2 Herbs sorted on the basis of shape, size and maturity. 3.2.3 Graded herbs packed in separate container and labelled.
	3.3 Process herbs	3.3.1 Herbs sprayed in clean surface and dried up to the allowable period. 3.3.2 Herbs cut to desirable shape and size. 3.3.3 Herbs processed according to herbal product using suitable processing methods . 3.3.4 Essential oil extracted from aromatic herbs using hydro distillation method.
	3.4 Perform packaging	3.4.1 Packaging materials prepared according to herbal products. 3.4.2 Herbal products placed inside packaging materials and sealed without leakage. 3.4.3 Labels placed in packaging materials. 3.4.4 Herbal products stored in designated place. 3.4.5 Tools and equipment cleaned, maintained, stored and record updated.
6	Task Performance Requirements (Tools, Equipment and Materials): <ul style="list-style-type: none"> Packaging materials, sealing machine, sealing tape, weighing machine, marker pen, pen, paper, register, rope, adhesive, label sticker, scissors, needle, thread, brush, knife, basket, doko, thunche, nanglo, mandro, chalno, plastic sheet, sickle, secateur, shovel, measuring tape, grinder, hydro distillation set, wooden slab, measuring cylinder, bucket, shovel, plastic bag, sampling tag, bucket, drum, mug, gas, gas stove, wheel barrow, first aid kit and personal protective equipment (PPE). 	



7	<p>Safety and Hygiene (Occupational Health and Safety):</p> <ul style="list-style-type: none">• Use personal protective equipment.• Safe handling of materials, tools and equipment.• Prevent from hazards involved in painting works.• Safe handling of debris.• Safe use of scaffolding.• Apply safety precautions while working at height.
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8	Required Knowledge		
	Technical Knowledge	Applied Calculation	Graphical Information
	<ul style="list-style-type: none"> • Tools and equipment: <ul style="list-style-type: none"> ○ Types ○ Uses ○ Safe handling • Herbal processing <ul style="list-style-type: none"> ○ Introduction ○ Types ○ Importance ○ Processing techniques and methods ○ Herbal processing practices • Production of herbal preparations <ul style="list-style-type: none"> ○ Cleaning, selection and grading ○ Hydro distillation ○ Grinding ○ Sieving and filtrations ○ Boiling • Packaging and labelling • Storage, transportation and marketing • Costing and estimation 	<ul style="list-style-type: none"> • Convert imperial to metric and vice versa 	<ul style="list-style-type: none"> • Read and interpret manufacturer instruction



	<ul style="list-style-type: none">• Waste management• Record keeping and documentation• Occupational health and safety rules and regulations• Importance of first aid kit		
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9	Assessment of Competency						
Unit: 3 Unit Title: Perform post harvesting activities	Candidate Details		Assessors Detail				
	Candidate's Name: Registration Number: Symbol No: Test Centre:		Assessors' Name 1. 2. 3.		ID/License No:		
	Test Date:						
Element of competency	Performance Standards			Standard Met	Standard Not Met	Evidence Type	Comments
3.1 Prepare tools, equipment and materials	3.1.1 Personal protective equipment (PPE) used in accordance with task requirement. 3.1.2 Tools and equipment collected and checked for working condition in accordance with task requirement. 3.1.3 Materials collected and prepared in accordance with task requirements.						
3.2 Perform grading	3.2.1 Unwanted materials removed from harvested herbs and washed without damaging herbs. 3.2.2 Herbs sorted on the basis of shape, size and maturity. 3.2.3 Graded herbs packed in separate container and labelled.						
3.3 Process herbs	3.3.1 Herbs sprayed in clean surface and dried up to the allowable period. 3.3.2 Herbs cut to desirable shape and size. 3.3.3 Herbs processed according to herbal product using suitable processing methods . 3.3.4 Essential oil extracted from aromatic herbs using hydro distillation method.						



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3.4 Perform packaging	3.4.1 <i>Packaging materials</i> prepared according to herbal products. 3.4.2 Herbal products placed inside packaging materials and sealed without leakage. 3.4.3 <i>Labels</i> placed in packaging materials. 3.4.4 Herbal products stored in designated place. 3.4.5 Tools and equipment cleaned, maintained, stored and record updated.				
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Range Statement

Variable	Range
Personal protective equipment	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Helmet • Hat • Mask • Apron • Goggles • Gloves • Safety shoes
Unwanted materials	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Damaged • Leaves and twigs • Stones • Disease and insect damaged herbs
Suitable processing methods	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Grinding • Sieving • Drying • Boiling • Distillation
Packaging materials	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Pouch • Can • Plastic bag



	<ul style="list-style-type: none"> • Jute bag • Paper bag • Box • Sack
Labels	<p><i>May include but not limited to:</i></p> <ul style="list-style-type: none"> • Source of origin • Date and batch number • Year of harvest • Net Weight • Sack/Bag no • Chemical contain

