TRAINING REGULATIONS

SEAWEED PRODUCTION NC II

AGRICULTURE, FORESTRY AND FISHERY SECTOR

TECHNICAL EDUCATION AND SKILLS DEVELOPMENT AUTHORITY
East Service Road, South Superhighway, Taguig City, Metro Manila

Technical Education and Skills Development Act of 1994

(Republic Act No. 7796)

Section 22, "Establishment and Administration of the National Trade Skills Standards" of the RA 7796 known as the TESDA Act mandates TESDA to establish national occupational skills standards. The Authority shall develop and implement a certification and accreditation program in which private industry group and trade associations are accredited to conduct approved trade tests, and the local government units to promote such trade testing activities in their respective areas in accordance with the guidelines to be set by the Authority.

The Training Regulations (TR) serve as basis for the:

1 Competency assessment and certification;
2 Registration and delivery of training programs; and
3 Development of curriculum and assessment instruments.

Each TR has four sections:

Section 1 **Definition of Qualification** – describes the qualification and defines the competencies that comprise the qualification.

Section 2 The **Competency Standards** format was revised to include the Required Knowledge and Required Skills per element. These fields explicitly state the required knowledge and skills for competent performance of a unit of competency in an informed and effective manner. These also emphasize the application of knowledge and skills to situations where understanding is converted into a workplace outcome.

Section 3 **Training Arrangements** - contain information and requirements which serve as bases for training providers in designing and delivering competency-based curriculum for the qualification. The revisions to section 3 entail identifying the Learning Activities leading to achievement of the identified Learning Outcome per unit of competency.

Section 4 **Assessment and Certification Arrangements** - describe the policies governing assessment and certification procedures for the qualification.

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TRAINING REGULATIONS FOR
SEAWEED PRODUCTION NC II

SECTION 1 SEAWEED PRODUCTION NC II QUALIFICATION

The **SEAWEED PRODUCTION NC II** Qualification consists of competencies that a person must achieve to operate and maintain seaweed nursery, grow-out seaweed, produce raw dried seaweed and market seaweed. These competencies are required to an individual who will be engaged in seaweed production at economic scale, handling at least one-fourth (1/4) to one (1) hectare of seaweed farm.

This Qualification is packaged from the competency` map of the Agriculture, Forestry and Fishery Sector as shown in Annex A.

The Units of Competency comprising this Qualification include the following:

Code	BASIC COMPETENCIES
500311105	Participate in workplace communication
500311106	Work in team environment
500311107	Practice career professionalism
500311108	Practice occupational health and safety procedures
Code	**COMMON COMPETENCIES**
AGR321201	Apply safety measures in farm operations
AGR321202	Use farm tools and equipment
AGR321203	Perform estimation and basic calculation
Code	**CORE COMPETENCIES**
AFF622305	Operate seaweed nursery
AFF622306	Grow-out seaweed
AFF622307	Produce raw dried seaweed
AFF622308	Market seaweed

A person who has achieved this Qualification is competent to be:

- Seaweed nursery operator
- Seaweed farmer/grower
- Seaweed trader

SECTION 2 COMPETENCY STANDARDS

This section gives the details of the contents of the basic, common and core units of competency required in **SEAWEED PRODUCTION NC II.**

BASIC COMPETENCIES

UNIT OF COMPETENCY : PARTICIPATE IN WORKPLACE COMMUNICATION

UNIT CODE : 500311105

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to gather, interpret and convey information in response to workplace requirements.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Obtain and convey workplace information	1.1 Specific and relevant information is accessed from ***appropriate sources*** 1.2 Effective questioning, active listening and speaking skills are used to gather and convey information 1.3 Appropriate ***medium*** is used to transfer information and ideas 1.4 Appropriate non-verbal communication is used 1.5 Appropriate lines of communication with supervisors and colleagues are identified and followed 1.6 Defined workplace procedures for the location and ***storage*** of information are used 1.7 Personal interaction is carried out clearly and concisely	1.1 Effective communication 1.2 Different modes of communication 1.3 Written communication 1.4 Organizational policies 1.5 Communication procedures and systems 1.6 Technology relevant to the enterprise and the individual's work responsibilities	1.1 Follow simple spoken language 1.2 Perform routine workplace duties following simple written notices 1.3 Participate in workplace meetings and discussions 1.4 Complete work related documents 1.5 Estimate, calculate and record routine workplace measures 1.6 Ability to relate to people of social range in the workplace 1.7 Gather and provide information in response to workplace requirements

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Participate in workplace meetings and discussions	2.1 Team meetings are attended on time 2.2 Own opinions are clearly expressed and those of others are listened to without interruption 2.3 Meeting inputs are consistent with the meeting purpose and established ***protocols*** 2.4 ***Workplace interactions*** are conducted in a courteous manner 2.5 Questions about simple routine workplace procedures and matters concerning working conditions of employment are asked and responded to 2.6 Meetings outcomes are interpreted and implemented	2.1 Effective communication 2.2 Different modes of communication 2.3 Written communication 2.4 Organizational policies 2.5 Communication procedures and systems 2.6 Technology relevant to the enterprise and the individual's work responsibilities	2.1 Follow simple spoken language 2.2 Perform routine workplace duties following simple written notices 2.3 Participate in workplace meetings and discussions 2.4 Complete work related documents 2.5 Estimate, calculate and record routine workplace measures 2.6 Ability to relate to people of social range in the workplace 2.7 Gather and provide information in response to workplace requirements
3. Complete relevant work related documents	3.1 Range of ***forms*** relating to conditions of employment are completed accurately and legibly 3.2 Workplace data is recorded on standard workplace forms and documents 3.3 Basic mathematical processes are used for routine calculations 3.4 Errors in recording information on forms/ documents are identified and properly acted upon 3.5 Reporting requirements to supervisor are completed according to organizational guidelines	3.1 Effective communication 3.2 Different modes of communication 3.3 Written communication 3.4 Organizational policies 3.5 Communication procedures and systems 3.6 Technology relevant to the enterprise and the individual's work responsibilities	3.1 Complete work related documents 3.2 Basic mathematical processes of addition, subtraction, division and multiplication 3.3 Gather and provide information in response to workplace requirements

RANGE OF VARIABLES

VARIABLE	RANGE
1. Appropriate sources	May include: 1.1 Team members 1.2 Suppliers 1.3 Trade personnel 1.4 Local government 1.5 Industry bodies
2. Medium	May include: 2.1 Memorandum 2.2 Circular 2.3 Notice 2.4 Information discussion 2.5 Follow-up or verbal instructions 2.6 Face to face communication
3. Storage	May include: 3.1 Manual filing system 3.2 Computer-based filing system
4. Forms	May include: 4.1 Personnel forms 4.2 Telephone message forms 4.3 Safety reports
5. Workplace interactions	May include: 5.1 Face to face 5.2 Telephone 5.3 Electronic and two-way radio 5.4 Written including electronic, memos, instruction and forms, non-verbal including gestures, signals, signs and diagrams
6. Protocols	May include: 6.1 Observing meeting 6.2 Compliance with meeting decisions 6.3 Obeying meeting instructions

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Prepared written communication following standard format of the organization 1.2 Accessed information using communication equipment 1.3 Made use of relevant terms as an aid to transfer information effectively 1.4 Conveyed information effectively adopting the formal or informal communication
2. Resource Implications	**The following resources should be provided:** 2.1 Fax machine 2.2 Telephone 2.3 Writing materials 2.4 Internet
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Direct Observation 3.2 Oral interview and written test
4. Context for Assessment	Competency may be assessed individually in the actual workplace or through accredited institution

UNIT OF COMPETENCY : WORK IN A TEAM ENVIRONMENT

UNIT CODE : 500311106

UNIT DESCRIPTOR : This unit covers the skills, knowledge and attitudes to identify role and responsibility as a member of a team.

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Describe team role and scope	1.1 The ***role and objective of the team*** is identified from available ***sources of information*** 1.2 Team parameters, reporting relationships and responsibilities are identified from team discussions and appropriate external sources	1.1 Communication process 1.2 Team structure 1.3 Team roles 1.4 Group planning and decision making	1.1 Communicate appropriately, consistent with the culture of the workplace
2. Identify own role and responsibility within team	2.1 Individual role and responsibilities within the team environment are identified 2.2 Roles and responsibility of other team members are identified and recognized 2.3 Reporting relationships within team and external to team are identified	2.1 Communication process 2.2 Team structure 2.3 Team roles 2.4 Group planning and decision making	2.1 Communicate appropriately, consistent with the culture of the workplace
3. Work as a team member	3.1 Effective and appropriate forms of communications used and interactions undertaken with team members who contribute to known team activities and objectives 3.2 Effective and appropriate contributions made to complement team activities and objectives, based on individual skills and	3.1 Communication process 3.2 Team structure 3.3 Team roles 3.4 Group planning and decision making	3.1 Communicate appropriately, consistent with the culture of the workplace 3.2 Interacting effectively with others

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	competencies and ***workplace context*** 3.3 Observed protocols in reporting using standard operating procedures 3.4 Contribute to the development of team work plans based on an understanding of team's role and objectives and individual competencies of the members		

RANGE OF VARIABLES

VARIABLE	RANGE
1. Role and objective of team	**May include:** 1.1 Work activities in a team environment with enterprise or specific sector 1.2 Limited discretion, initiative and judgment maybe demonstrated on the job, either individually or in a team environment
2. Sources of information	**May include:** 2.1 Standard operating and/or other workplace procedures 2.2 Job procedures 2.3 Machine/equipment manufacturer's specifications and instructions 2.4 Organizational or external personnel 2.5 Client/supplier instructions 2.6 Quality standards 2.7 OHS and environmental standards
3. Workplace context	**May include:** 3.1 Work procedures and practices 3.2 Conditions of work environments 3.3 Legislation and industrial agreements 3.4 Standard work practice including the storage, safe handling and disposal of chemicals 3.5 Safety, environmental, housekeeping and quality guidelines

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Operated in a team to complete workplace activity 1.2 Worked effectively with others 1.3 Conveyed information in written or oral form 1.4 Selected and used appropriate workplace language 1.5 Followed designated work plan for the job 1.6 Reported outcomes
2. Resource Implications	**The following resources should be provided:** 2.1 Access to relevant workplace or appropriately simulated environment where assessment can take place 2.2 Materials relevant to the proposed activity or tasks
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Observation of the individual member in relation to the work activities of the group 3.2 Observation of simulation and or role play involving the participation of individual member to the attainment of organizational goal 3.3 Case studies and scenarios as a basis for discussion of issues and strategies in teamwork
4. Context for Assessment	4.1 Competency may be assessed in workplace or in a simulated workplace setting 4.2 Assessment shall be observed while task are being undertaken whether individually or in group

UNIT OF COMPETENCY : PRACTICE CAREER PROFESSIONALISM

UNIT CODE : 500311107

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes in promoting career growth and advancement.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Integrate personal objectives with organizational goals	1.1 Personal growth and work plans are pursued towards improving the qualifications set for the profession 1.2 Intra- and interpersonal relationships are maintained in the course of managing oneself based on performance ***evaluation*** 1.3 Commitment to the organization and its goal is demonstrated in the performance of duties	1.1 Work values and ethics (Code of Conduct, Code of Ethics, etc.) 1.2 Company policies 1.3 Company operations, procedures and standards 1.4 Fundamental rights at work including gender sensitivity 1.5 Personal hygiene practices	1.1 Appropriate practice of personal hygiene 1.2 Intra and Interpersonal skills 1.3 Communication skills
2. Set and meet work priorities	2.1 Competing demands are prioritized to achieve personal, team and organizational goals and objectives. 2.2 ***Resources*** are utilized efficiently and effectively to manage work priorities and commitments 2.3 Practices along economic use and maintenance of equipment and facilities are followed as per established procedures	2.1 Work values and ethics (Code of Conduct, Code of Ethics, etc.) 2.2 Company policies 2.3 Company operations, procedures and standards 2.4 Fundamental rights at work including gender sensitivity 2.5 Personal hygiene practices 2.6 Time management	2.1 Appropriate practice of personal hygiene 2.2 Intra and Interpersonal skills 2.3 Communication skills 2.4 Managing goals and time

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Maintain professional growth and development	3.1 ***Trainings and career opportunities*** are identified and availed of based on job requirements 3.2 ***Recognitions*** are sought/received and demonstrated as proof of career advancement 3.3 ***Licenses and/or certifications*** relevant to job and career are obtained and renewed	3.1 Work values and ethics (Code of Conduct, Code of Ethics, etc.) 3.2 Company policies 3.3 Company operations, procedures and standards 3.4 Fundamental rights at work including gender sensitivity 3.5 Personal hygiene practices	3.1 Appropriate practice of personal hygiene 3.2 Intra and Interpersonal skills 3.3 Communication skills

RANGE OF VARIABLES

VARIABLE	RANGE
1. Evaluation	**May include:** 1.1 Performance Appraisal 1.2 Psychological Profile 1.3 Aptitude Tests
2. Resources	**May include:** 2.1 Human 2.2 Financial 2.3 Technology 2.3.1 Hardware 2.3.2 Software
3. Trainings and career opportunities	**May include:** 3.1 Participation in training programs 3.1.1 Technical 3.1.2 Supervisory 3.1.3 Managerial 3.1.4 Continuing Education 3.2 Serving as Resource Persons in conferences and workshops
4. Recognitions	4.1 Recommendations 4.2 Citations 4.3 Certificate of Appreciations 4.4 Commendations 4.5 Awards 4.6 Tangible and Intangible Rewards
5. Licenses and/or certifications	5.1 National Certificates 5.2 Certificate of Competency 5.3 Support Level Licenses 5.4 Professional Licenses

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Attained job targets within key result areas (KRAs) 1.2 Maintained intra - and interpersonal relationship in the course of managing oneself based on performance evaluation 1.3 Completed trainings and career opportunities which are based on the requirements of the industries 1.4 Acquired and maintained licenses and/or certifications according to the requirement of the qualification
2. Resource Implications	**The following resources should be provided:** 2.1 Workplace or assessment location 2.2 Case studies/scenarios
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Portfolio Assessment 3.2 Interview 3.3 Simulation/Role-plays 3.4 Observation 3.5 Third Party Reports 3.6 Exams and Tests
4. Context for Assessment	Competency may be assessed in the work place or in a simulated work place setting

UNIT OF COMPETENCY : PRACTICE OCCUPATIONAL HEALTH AND SAFETY PROCEDURES

UNIT CODE : 500311108

UNIT DESCRIPTOR : This unit covers the outcomes required to comply with regulatory and organizational requirements for occupational health and safety.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify hazards and risks	1.1 ***Safety regulations*** and workplace safety and hazard control practices and procedures are clarified and explained based on organization procedures 1.2 ***Hazards/risks*** in the workplace and their corresponding indicators are identified to minimize or eliminate risk to co-workers, workplace and environment in accordance with organization procedures 1.3 ***Contingency measures*** during workplace accidents, fire and other emergencies are recognized and established in accordance with organization procedures	1.1 OHS procedures and practices and regulations 1.2 Personal hygiene practices 1.3 Hazards/risks identification and control 1.4 Organization safety and health protocol 1.5 Safety consciousness 1.6 Health consciousness	1.1 Practice of personal hygiene 1.2 Hazards/risks identification and control skills 1.3 Interpersonal skills 1.4 Communication skills

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Evaluate hazards and risks	2.1 Terms of maximum tolerable limits which when exceeded will result in harm or damage are identified based on threshold limit values (TLV) 2.2 Effects of the hazards are determined 2.3 OHS issues and/or concerns and identified safety hazards are reported to designated personnel in accordance with workplace requirements and relevant workplace OHS legislation	2.1 OHS procedures and practices and regulations 2.2 Personal hygiene practices 2.3 Hazards/risks identification and control 2.4 Threshold Limit Value -TLV 2.5 OHS indicators 2.6 Organization safety and health protocol 2.7 Safety consciousness 2.8 Health consciousness	2.1 Practice of personal hygiene 2.2 Hazards/risks identification and control skills 2.3 Interpersonal skills 2.4 Communication skills
3. Control hazards and risks	3.1 Occupational Health and Safety (OHS) procedures for controlling hazards/risks in workplace are consistently followed 3.2 Procedures for dealing with workplace accidents, fire and emergencies are followed in accordance with organization OHS policies 3.3 ***Personal protective equipment (PPE)*** is correctly used in accordance with organization OHS procedures and practices 3.4 Appropriate assistance is provided in the event of a workplace emergency in accordance with established organization protocol	3.1 OHS procedures and practices and regulations 3.2 PPE types and uses 3.3 Personal hygiene practices 3.4 Hazards/risks identification and control 3.5 OHS indicators 3.6 Organization safety and health protocol 3.7 Safety consciousness 3.8 Health consciousness	3.1 Practice of personal hygiene 3.2 Hazards/risks identification and control skills 3.3 Interpersonal skills 3.4 Communication skills

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
4. Maintain OHS awareness	4.1 ***Emergency-related drills and trainings*** are participated in as per established organization guidelines and procedures 4.2 ***OHS personal records*** are completed and updated in accordance with workplace requirements	4.1 OHS procedures and practices and regulations 4.2 PPE types and uses 4.3 Personal hygiene practices 4.4 OHS indicators 4.5 Organization safety and health protocol 4.6 Safety consciousness 4.7 Health consciousness	4.1 Practice of personal hygiene 4.2 Interpersonal skills 4.3 Communication skills

RANGE OF VARIABLES

VARIABLE	RANGE
1. Safety regulations	**May include but are not limited to:** 1.1 Clean Air Act 1.2 Building code 1.3 National Electrical and Fire Safety Codes 1.4 Waste management statutes and rules 1.5 Philippine Occupational Safety and Health Standards 1.6 DOLE regulations on safety legal requirements 1.7 ECC regulations
2. Hazards/Risks	**May include but are not limited to:** 2.1 Physical hazards – impact, illumination, pressure, noise, vibration, temperature, radiation 2.2 Biological hazards - bacteria, viruses, plants, parasites, mites, molds, fungi, insects 2.3 Chemical hazards – dusts, fibers, mists, fumes, smoke, gasses, vapors 2.4 Ergonomics 2.4.1 Psychological factors – over exertion/ excessive force, awkward/static positions, fatigue, direct pressure, varying metabolic cycles 2.4.2 Physiological factors – monotony, personal relationship, work out cycle
3. Contingency measures	**May include but are not limited to:** 3.1 Evacuation 3.2 Isolation 3.3 Decontamination 3.4 (Calling designed) emergency personnel
4. PPE	**May include but are not limited to:** 4.1 Mask 4.2 Gloves 4.3 Goggles 4.4 Hair Net/cap/bonnet 4.5 Face mask/shield 4.6 Ear muffs 4.7 Apron/Gown/coverall/jump suit 4.8 Anti-static suits
5. Emergency-related drills and training	**May include:** 5.1 Fire drill 5.2 Earthquake drill 5.3 Basic life support/CPR 5.4 First aid 5.5 Spillage control 5.6 Decontamination of chemical and toxic 5.7 Disaster preparedness/management
6. OHS personal records	**May include:** 6.1 Medical/Health records 6.2 Incident reports 6.3 Accident reports 6.4 OHS-related training completed

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Explained clearly established workplace safety and hazard control practices and procedures 1.2 Identified hazards/risks in the workplace and its corresponding indicators in accordance with company procedures 1.3 Recognized contingency measures during workplace accidents, fire and other emergencies 1.4 Identified terms of maximum tolerable limits based on threshold limit value- TLV. 1.5 Followed Occupational Health and Safety (OHS) procedures for controlling hazards/risks in workplace 1.6 Used Personal Protective Equipment (PPE) in accordance with company OHS procedures and practices 1.7 Completed and updated OHS personal records in accordance with workplace requirements
2. Resource Implications	**The following resources should be provided:** 2.1 Workplace or assessment location 2.2 OHS personal records 2.3 PPE 2.4 Health records
3. Methods of Assessment	**Competency may be assessed through:** 3.1 Portfolio Assessment 3.2 Interview 3.3 Case Study/Situation
4. Context for Assessment	Competency may be assessed in the work place or in a simulated work place setting

COMMON COMPETENCIES

UNIT OF COMPETENCY : APPLY SAFETY MEASURES IN FARM OPERATION

UNIT CODE : AFF321201

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes requ to perform safety measures effectively and efficient includes identifying areas, tools, materials, time and p in performing safety measures.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Determine areas of concern for safety measures	1.1 ***Work tasks*** are identified in line with farm operations 1.2 ***Place*** for safety measures are determined in line with farm operations 1.3 ***Time*** for safety measures are determined in line with farm operations 1.4 Appropriate ***tools, materials and outfits*** are prepared in line with job requirements	1.1 Different work tasks in farm operations 1.2 Place and time for implementation of safety measures 1.3 Different hazards in the workplace 1.4 Types of tools, materials and outfits 1.5 Preparation of tools, materials and outfits	1.1 Identifying work tasks in farm operations 1.2 Determining place and time for implementation of safety measures 1.3 Reading labels, manuals and other basic safety information 1.4 Identifying effective/functional tools, materials and outfit 1.5 Preparing tools, materials and outfits 1.6 Discarding defective tools, and materials
2. Apply appropriate safety measures	2.1 Tools and materials are used according to specifications and procedures 2.2 Outfits are worn according to farm requirements 2.3 Effectivity/shelf life/expiration of materials are strictly observed 2.4 ***Emergency procedures*** are known and followed to	2.1 Uses and functions of tools 2.2 Outfits and how to wear it. 2.3 Expiration/shelf life of materials 2.4 Proper disposal of expired materials 2.5 Environmental rules and regulations 2.6 Emergency procedures	2.1 Using tools and materials in the workplace 2.2 Wearing of outfits 2.3 Observing expiration/shelf life of materials 2.4 Disposing of expired materials 2.5 Following emergency procedures

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	ensure a safework requirement 2.5 Hazards in the workplace are identified and reported in line with farm guidelines	2.7 Hazards identification and reporting 2.8 Communication skills 2.9 OSHS	2.6 Identifying and reporting of hazards in workplace area
3. Safekeep/ dispose tools, materials and outfit	3.1 Used tools and outfit are cleaned after use and stored in designated areas 3.2 Unused materials are properly labeled and stored according to manufacturers recommendation and farm requirements 3.3 Waste materials are disposed according to manufacturers, government and farm requirements	3.1 Procedures of cleaning used tools and outfits 3.2 Label and storage unused materials 3.3 Disposal of wastes materials 3.4 Manufacturers recommendation on keeping materials 3.5 Environmental rules and regulations	3.1 Cleaning used tools and outfit 3.2 Labelling and storing unused materials 3.3 Disposing waste materials

RANGE OF VARIABLES

VARIABLE	RANGE
1. Work tasks	**Work task may be selected from any of the subsectors:** 1.1 Crop Production 1.2 Post-harvest 1.3 Agri-marketing 1.4 Farm Equipment
2. Place	**May include:** 2.1 Stock room/storage areas/warehouse 2.2 Field/farm/orchard
3. Time	**May include:** 3.1 Fertilizer and pesticides application 3.2 Feed mixing and feeding 3.3 Harvesting and hauling
4. Tools, materials and outfits	**May include** 4.1 Tools 4.1.1 Wrenches 4.1.2 Screw driver 4.1.3 Pliers 4.2 Outfit 4.2.1 Masks 4.2.2 Gloves 4.2.3 Boots 4.2.4 Overall coats 4.2.5 Hat 4.2.6 Eye goggles
5. Emergency procedures	**May include:** 5.1 Location of first aid kit 5.2 Evacuation 5.3 Agencies contract 5.4 Farm emergency procedures
6. Hazards	**May include:** 6.1 Chemical 6.2 Electrical 6.3 Falls

EVIDENCE GUIDE

1. Critical Aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Determined areas of concern for safety measures 1.2 Applied appropriate safety measures according to industry requirements 1.3 Prepared tools, materials and outfit needed 1.4 Performed proper disposal of used materials 1.5 Cleaned and stored tools, materials and outfit in designated facilities
2. Method of Assessment	**Competency in this unit must be assessed through:** 2.1 Practical demonstration 2.2 Third Party Report
3. Resource Implications	3.1 Farm location 3.2 Tools, equipment and outfits appropriate in applying safety measures
4. Context of Assessment	4.1. Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : USE FARM TOOLS AND EQUIPMENT

UNIT CODE : AFF321202

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to use farm tools and equipment. It includes selection, operation and preventive maintenance of farm tools and equipment.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Select and use farm tools	1.1 Appropriate farm tools are identified according to requirement/use 1.2 Farm tools are checked for faults and defective tools reported in accordance with farm procedures 1.3 Appropriate tools are safely used according to job requirements and manufacturers conditions	1.1 Types and uses of farm tools 1.2 Characteristics of functional tools 1.3 Checking tools for defects/faults 1.4 Segregation and reporting defective tools 1.5 Uses of tools and equipment	1.1 Identifying farm tools for the work 1.2 Checking the conditions of tools 1.3 Reporting defective tools 1.4 Using tools
2. Select and operate farm equipment	2.1 Identify appropriate ***farm equipment*** 2.2 Instructional manual of the farm tools and equipment are carefully read prior to operation 2.3 ***Pre-operation check-up*** is conducted in line with manufacturers manual 2.4 Faults in farm equipment are identified and reported in line with farm procedures 2.5 Farm equipment used according to its function 2.6 Safety procedures are followed.	2.1 Types and operations of farm equipment 2.2 Standards operating procedures of farm equipment 2.3 Instructional manual of equipment 2.4 Pre-operation check-up 2.5 Equipment Specification 2.6 Procedures in calibrating and use of equipment 2.7 Equipment faults identification and reporting 2.8 Operation of equipment 2.9 Codes and Regulations on	2.1 Identifying appropriate farm equipment for the work 2.2 Reading instructional manual. 2.3 Conducting pre-operation check-up 2.4 Identifying faults/defects of farm equipment 2.5 Reporting on defective farm equipment 2.6 Operating farm equipment 2.7 Following safety procedures

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
		environmental protection 2.10 Safety and keeping of equipment every after use 2.11 Safety measures	
3. Perform preventive maintenance	3.1 Tools and equipment are cleaned immediately after use in line with farm procedures 3.2 Routine check-up and maintenance are performed 3.3 Tools and equipment are stored in designated areas in line with farm procedures	3.1 Cleaning procedures of tools and equipment 3.2 Maintenance procedures of farm equipment 3.3 Storage of tools and equipment 3.4 Designated storage areas	3.1 Cleaning tools and equipment 3.2 Performing routinary check-up of tools and equipment 3.3 Maintaining farm equipment 3.4 Storing tools and equipment

RANGE OF VARIABLES

VARIABLE	RANGE
1. Farm equipment	**May include:** 1.1 Engine 1.2 Pumps 1.3 Generators 1.4 Sprayers
2. Farm tools	**May include:** 2.1 Sickle 2.2 Cutters 2.3 Weighing scales 2.4 Hand tools 2.5 Measuring tools 2.6 Garden tools
3. Pre-operation check-up	**May include:** 3.1 Tires 3.2 Brake fluid 3.3 Fuel 3.4 Water 3.5 Oil 3.6 Lubricants 3.7 Battery

EVIDENCE GUIDE

1. Critical Aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Correctly identified appropriate farm tools and equipment 1.2 Operated farm equipment according to manual specification 1.3 Performed preventive maintenance
2. Method of Assessment	**Competency in this unit must be assessed through:** 2.1 Direct observation 2.2 Practical demonstration 2.3 Third Party Report
3. Resource Implications	3.1 Service/operational manual of farm tools and equipment 3.2 Tools and equipment 3.3 Farm implements
4. Context of Assessment	4.1. Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : PERFORM ESTIMATION AND CALCULATIONS

UNIT CODE : AFF321203

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to perform basic workplace calculations.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Perform estimation	1.1 Job requirements are identified from written or oral communications 1.2 Quantities of materials and resources required to complete a work task are estimated 1.3 The time needed to complete a work activity is estimated 1.4 Accurate estimate for work completion are made 1.5 Estimate of materials and resources are reported to appropriate person	1.1 Job requirements/ labor needs 1.2 Calculation of quantities of materials and resources required 1.3 Calculation of time for job completion 1.4 Preparation of estimate report 1.5 Basic mathematical operations 1.6 Percentage and ratios 1.7 Unit Conversion	1.1 Identifying job requirements/ 1.2 Estimating quantities of materials and resources required 1.3 Estimating time for job completion 1.4 Performing basic calculation 1.5 Compute percentage 1.6 Convert English to metric systems of measurement 1.7 Preparing estimate report
2. Perform basic workplace calculation	2.1 ***System and units of measurement*** to be followed are ascertained 2.2 Calculation needed to complete work tasks are performed using the ***four basic mathematical operation*** 2.3 Calculate whole fraction, percentage and mixed when are used to complete the instructions 2.4 Number computed is checked following work requirements	2.1 Four basic mathematical operation 2.2 System and units of measurement 2.3 Fraction, percentage and ratio 2.4 Material takeoff 2.5 Materials costing	2.1 Compute bill of materials 2.2 Compute project cost

RANGE OF VARIABLES

VARIABLE	RANGE
1. Four basic mathematical operation	**May include:** 1.1 Addition 1.2 Subtraction 1.3 Multiplication 1.4 Division
2. System of measurement	**May include:** 2.1 English 2.2 Metric
3. Units of measurement	**May include:** 3.1 Area 3.2 Volume 3.3 Weight 3.4 Length

EVIDENCE GUIDE

1. Critical Aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Performed estimation 1.2 Performed basic workplace calculation 1.3 Applied corrective measures as maybe necessary
2. Method of Assessment	**Competency in this unit must be assessed through:** 1.4 Practical demonstration 1.5 Written examination
3. Resource Implications	1.6 Relevant tools and equipment for basic calculation 1.7 Recommended data
4. Context of Assessment	4.1. Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

CORE COMPETENCY

UNIT OF COMPETENCY : OPERATE SEAWEED NURSERY

UNIT CODE : AFF622305

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitude to operate seaweed nursery. It includes conducting pre-nursery activities, sourcing out propagules, planting propagules, maintaining seaweed nursery, harvesting propagules and carrying-out post-nursery activities.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Conduct pre-nursery activities	1.1 Feasible nursery site is selected based on industry standards 1.2 Test planting is conducted based on Bureau of Fisheries and Aquatic Resources-Fisheries Office Order (BFAR FOO) 1.3 ***Necessary documents*** are secured for nursery operation following industry requirements 1.4 ***Capital*** and other resources are accessed based on nursery requirements 1.5 Simple project proposal is prepared for assistance 1.6 Nursery structure is installed according to plan and design.	1.1 Site selection criteria: • Bureau of Fisheries and Aquatic Resources-Fisheries Office Order (BFAR-FOO) • Fisheries Administrative Order (FAO) • SEAFDEC • University of the Philippines-Marine Science Institute (UP-MSI) • Seaweed Industry Association of the Philippines (SIAP) endorsed literature • HACCP • Presence of healthy wild seaweeds and other aquatic plants 1.2 Test planting 1.3 Guidelines for test-plot 1.4 Necessary documents	1.1 Selecting feasible nursery site 1.2 Conducting test planting 1.3 Securing necessary documents 1.4 Accessing capital and other resources 1.5 Preparing simple project proposal 1.6 Installing nursery structure

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
		1.5 Capital and other resources 1.6 Components of simple project proposal 1.7 Different tools, materials and equipment for nursery installation 1.8 Nursery installation 1.9 Nursery expansion 1.10 Occupational Health and Safety Standards 1.11 Good Aquaculture Practices (GAqP) 1.12 FAO 1.13 FOO 1.14 Personal Protective Equipment (PPEs) **Values:** • Patience • Perseverance • Commitment • Cost consciousness • Honesty • Teamwork • Time management	
2. Source out propagules	2.1 ***Seaweed species*** is identified according to seasonality 2.2 Seaweed propagules are acclimatized for temperature and salinity requirements 2.3 ***Healthy seaweed propagules*** are acquired based on cross examination 2.4 Seaweed propagules are acquired	2.1 Seaweed species 2.2 Basic seaweed taxonomy 2.3 Acclimatization method 2.4 Temperature and salinity requirements 2.5 Characteristics of healthy seaweeds propagules	2.1 Identifying seaweed species 2.2 Acclimatizing seaweed propagules 2.3 Handling and transporting of propagules 2.4 Acquiring seaweed propagules 2.5 Conducting cross examination

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	according to planting scheduled 2.5 Quantity of delivered seedlings are checked following industry procedures	2.6 Cross examination procedures 2.7 Physical appearance of good quality seedlings 2.8 Planting schedule 2.9 Proper use of tools and equipment 2.10 Basic mathematical computation 2.11 Knowledge on Republic Act (R.A) 8550 (fisheries code) and local fisheries ordinances 2.12 OSHS 2.13 Good Aquaculture Practice Standards (GAqP) **Values:** • Safety and health consciousness • Resourcefulness • Diligence • Time consciousness • Cost-consciousness • Quality-consciousness • Quality and consciousness • Personal integrity in doing routine management practices • Perseverance in executing routine works	2.6 Communication skills 2.7 Observation skills 2.8 Computation skills

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
		• Ability to work with others harmoniously • Honesty	
3. Plant propagules	3.1 Propagules are cut according to the required weight 3.2 Seaweed propagules are tied in planting lines based on culture method 3.3 Planting lines are installed to nursery structures following GAqP 3.4 Required ***floaters*** are installed following GAqP	3.1 Propagules required weight: • 100 grams • 200 grams 3.2 Cutting techniques 3.3 Tying techniques 3.4 Installation of planting lines 3.5 Weight estimation 3.6 Boat operation 3.7 Navigation 3.8 Kinds of floaters 3.9 Floaters installation 3.10 Use of weighing scale 3.11 GAqP	3.1 Estimating weight 3.2 Cutting propagules 3.3 Tying propagules 3.4 Installing planting lines and floaters 3.5 Navigation skills 3.6 Swimming skills 3.7 Diving skills 3.8 Practicing GAqP
4. Maintain seaweed nursery	4.1 Weekly growth rate is computed and recorded using Daily Growth Rate (DGR) formula 4.2 ***Water quality*** monitoring is done using the appropriate ***measuring instrument*** 4.3 ***Foreign materials*** are removed and disposed following GAqP and marine pollution act 4.4 Nursery structures and set-up are maintained according to industry practices 4.5 ***Pests and diseases*** are monitored through ocular and cross examination 4.6 ***Prevention and control measures*** are identified and implemented	4.1 DGR formula and computation 4.2 Foreign materials 4.3 Water quality monitoring • Using measuring instruments 4.4 Seaweed nursery patrolling 4.5 Monitoring techniques 4.6 Waste management • Removal and disposal • Cleaning techniques 4.7 Nursery structure and set-up • Knot tying techniques • Adjusting techniques and procedures • Replacement of detached propagules	4.1 Computing DGR 4.2 Monitoring water quality 4.3 Cleaning seaweed propagules 4.4 Disposing waste and foreign materials 4.5 Maintaining nursery structures and set-up 4.6 Monitoring and preventing pests and diseases 4.7 Patrolling seaweed nursery 4.8 Recording skills 4.9 Visual analysis skills

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	4.7 Seaweed nursery is patrolled following industry procedures	• Repair nursery structure • Submerging of nursery structure 4.8 Different diseases of seaweeds 4.9 Disease surveillance, monitoring and reporting 4.10 Signs and symptoms of diseases 4.11 Different prevention and control measures against pests and diseases 4.12 Different grazers 4.13 Marine Pollution Act 4.14 GAqP 4.15 5S 4.16 PPEs	
5. Harvest propagules	5.1 ***Harvesting criteria data*** are recorded and monitored based on industry practices 5.2 ***Tools, materials and equipment*** are prepared in accordance with ***industry standards*** 5.3 Propagules are pruned following prescribed cutting techniques 5.4 Boat is operated based on industry practices	5.1 Harvesting criteria data 5.2 Pruning techniques 5.3 Cutting techniques 5.4 Preparation of harvesting tools, materials and equipment 5.5 Boat operation	5.1 Monitoring harvesting criteria data 5.2 Recording harvesting criteria data 5.3 Preparing tools, materials and equipment 5.4 Pruning skills 5.5 Boat operation and navigation skills 5.6 Swimming skills 5.7 Diving skills
6. Carry-out post-nursery activities	6.1 Propagules are packed according to established farm practices 6.2 Propagules are dispersed according to seaweed farmer's purpose	6.1 Packing techniques for propagules 6.2 Dispersal of propagules 6.3 Segregation of matured seaweed	6.1 Packing propagules 6.2 Dispersing propagules 6.3 Segregating matured seaweeds

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	6.3 Matured seaweed cuttings are segregated for drying 6.4 ***Handling of propagules*** during transportation is performed based on industry practices 6.5 ***Propagules production data*** are recorded based on industry requirements 6.7 Tools, materials and equipment are cleaned and stored in accordance with HACCP and OSHS 6.8 Waste management is practiced in accordance with environmental regulations	6.4 Handling and transport of seaweed propagules 6.5 Propagules production data 6.6 Waste management 6.7 Record keeping 6.8 Codes and regulations relating to seaweeds 6.9 Solid waste management	6.4 Handling and transporting seaweed propagules 6.5 Recording propagules production data 6.6 Cleaning and storing tools, materials and equipment 6.7 Disposing wastes

RANGE OF VARIABLES

VARIABLE	RANGE
1. Necessary documents	**Necessary documents include:** 1.1 Fisherfolk registration 1.2 Boat registration 1.3 Letter of application 1.4 Site sketch plan 1.5 Health certificate of transboundary movement of live seaweeds for aquaculture purposes 1.6 LGU applicable permits/licenses
2. Capital	**Capital may include:** 2.1 Start-up 2.2 Expansion
3. Seaweed species	**Seaweed species may include:** 3.1 *Kappaphycus spp.* 3.2 *Eucheuma spp.* 3.3 *Gracilaria spp.*
4. Healthy seaweed propagules	**Healthy seaweed propagules include:** 4.1 Clean 4.2 Shiny 4.3 Young 4.4 Plenty of thalli
5. Floaters	**Floater may include:** 5.1 High-density polyethylene (HDPE) plastic floats 5.2 Empty pet bottles
6. Water quality	**Water quality includes:** 6.1 Salinity 6.2 pH 6.3 Temperature 6.4 Food Nutrients 6.5 Presence of Phosphorous 6.6 Nitrite and Nitrates 6.7 Turbidity
7. Measuring instruments	**Measuring instruments may include:** 7.1 Dissolved Oxygen (DO) Meter 7.2 Thermometer 7.3 pH meter 7.4 Secchi disc 7.5 Ammonia, nitrite and nitrate test kits
8. Foreign materials	**Foreign materials may include:** 8.1 Drift wood 8.2 Sticks 8.3 Unwanted vegetation 8.4 Garbage 8.5 Mud 8.6 Plastics 8.7 Barnacles
9. Pests and diseases	**Pests and diseases may include:** 9.1 Diseases 9.1.1 Fungal infection 9.1.2 Bacterial infection

VARIABLE	RANGE
	9.1.3 Environmental diseases 9.1.4 Ice-ice 9.2 Grazer 9.2.1 Sea turtle 9.2.2 Sea urchin 9.2.3 Star fish 9.2.4 Siganids 9.3 Barnacles 9.4 Oysters 9.5 Brittle star
10. Harvesting criteria data	**Harvesting criteria data may include:** 10.1 Seaweed maturity 10.1.1 Planting date 10.1.2 Estimated period of harvest 10.2 Seaweed quality 10.2.1 Fully-grown 10.2.2 Presence of branchlets 10.2.3 Severe presence of disease(s) 10.3 Anticipated abnormal weather and tidal conditions
11. Tools, materials and equipment	**Tools, materials and equipment may include:** 11.1 Equipment 11.1.1 Water quality checker 11.1.2 Depth gauge 11.1.3 Global Positioning System (GPS) 11.1.4 500k capacity hanging weighing scale 11.1.5 15pax capacity motorized boat 11.1.6 3pax capacity non-motorized wooden boat with katig 11.1.7 Two-way radio 11.1.8 Transistor radio 11.1.9 PPEs • Gloves • Goggles • Face mask • Snorkel • Boots • Paddle • Flippers • Hat • Life vest 11.2 Tools 11.2.1 Floaters 11.2.2 Knives/Scissors 11.2.3 Anchor 11.2.4 Stainless steel table knife 11.2.5 4” scissor 11.2.6 Rechargeable flashlight 11.2.7 Battery flashlight 11.3 Materials 11.3.1 Seedling 11.3.2 Bond Paper 11.3.3 Pencil

VARIABLE	RANGE
	11.3.4 Eraser 11.3.5 Ruler 11.3.6 100pp record book 11.3.7 Clean sacks 11.3.8 50k capacity native bags 11.3.9 Native baskets 11.3.10 1000m soft ties 11.3.11 #10 (5mm) utility ropes 11.3.12 20L capacity pails 11.3.13 ordinary dippers 11.3.14 5x5m canvass/cover 11.3.15 Bamboo
12. Handling of propagules	**Handling of propagules may include:** 12.1 Stocking 12.2 Piling 12.3 Covering of sargasum/leaves 12.4 Sprinkling 12.5 Loading and unloading
13. Propagules production data	**Propagules production data may include:** 13.1 Location 13.2 Date harvested 13.3 Weight 13.4 Species

EVIDENCE GUIDE

1. Critical aspects of competency	**Assessment requires evidence that the candidate:** 1.1 Conducted pre-nursery activities 1.2 Sourced out propagules 1.3 Planted propagules 1.4 Maintained seaweed nursery 1.5 Harvested propagules 1.6 Carried out post-nursery activities
2. Resource Implications	**The following resources should be provided:** 2.1. Motorized/non-motorized banca 2.2. Floating farm house 2.3. Farm tools (basket, knives, scissors, waterproof flashlight, ropes, soft ties, nets, ballpeen hammer "maso", goggles) 2.4. Writing device 2.5. Logbooks 2.6. Tools/instruments 2.7. References (field guides, manuals)
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1. Direct Observation 3.2. Demonstration 3.3. Oral questioning 3.4. Written test 3.5. Third-party report
4. Context of Assessment	4.1. Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : GROW-OUT SEAWEED

UNIT CODE : AFF622306

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitude required to conduct pre-cropping activities, prepare grow out farm, plant seaweed propagules, maintain seaweed farm, carry out seaweed health management and harvest mature seaweed.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Conduct pre-cropping activities	1.1 Feasible grow-out site is selected based on industry standards 1.2 Test planting is conducted based on BFAR FOO 1.3 ***Necessary documents*** are secured for seaweed farming following industry requirements 1.4 ***Capital*** and other resources are accessed based on farming requirements 1.5 Simple project proposal is prepared for assistance	1.1 Site selection criteria: • BFAR-FOO • FAO • SEAFDEC • University of the Philippine-Marine Science Institute (UP-MSI) • SIAP endorsed literature • HACCP • Presence of healthy wild seaweeds and other aquatic plants 1.2 Different tools, materials and equipment for site selection 1.3 Guidelines for test-plot 1.4 Capital and other resources 1.5 Maintenance of linkages/ partnerships 1.6 Drawing techniques 1.7 Parts of project proposal 1.8 Occupational Health and Safety Standards 1.9 Good Aquaculture Practices (GAqP) 1.10 Republic Act 8550	1.1 Demonstrating proper handling of tools and equipment 1.2 Selecting grow-out site 1.3 Conducting test-planting 1.4 Securing necessary documents 1.5 Accessing capital and other resources 1.6 Preparing simple project proposal Coordinating skills 1.7 Drawing skills 1.8 Mathematical skills

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
		Values: • Patience • Perseverance • Commitment • Cost consciousness • Honesty • Teamwork • Time management	
2. Prepare grow out farm	2.1 Boat and engine are inspected and tested for functionality 2.2 Defective boat is reported to immediate authority following standard workplace procedures 2.3 ***Farm tools materials and equipment*** are prepared according to work requirements. 2.4 Farm structure is installed and set-up in accordance to ***culture method*** selected 2.5 ***Measurement activities*** are done according to farm plan 2.6 ***Grazer*** are ***controlled*** following established farm practices	2.1 Basic inspection procedures for boat and engine: • Gas • Leaks 2.2 Different Types of farm tools, materials and equipment 2.3 Installation of farm structure 2.4 Different culture methods 2.5 Measurement activities 2.6 Different seaweed grazers 2.7 Control measures for grazers	2.1 Inspecting and testing boat and engine 2.2 Reporting defective boat 2.3 Preparing tools, materials and equipment 2.4 Installing farm structure 2.5 Performing measurement activities 2.6 Eliminating and controlling grazers 2.7 Small engine repair skills 2.8 Using hand tools 2.9 Diving 2.10 Swimming 2.11 Calibrating skill 2.12 Reading and interpreting manual 2.13 Safe keeping of equipment every after use (housekeeping skill) 2.14 Reading and interpreting, design lay-out and systems of grow-out areas

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
			2.15 Mathematical Skills
3. Plant seaweed propagules	3.1 ***Seaweed species*** to be planted is identified according to seasonality 3.2 Seaweed propagules are acclimatized for temperature and salinity requirements 3.3 ***Healthy seaweeds*** are acquired based on cross examination 3.4 Seaweed propagules are acquired according to planting schedule 3.5 Seaweed propagules are planted in accordance with culture method.	3.1 Acclimatization methods for seaweeds 3.2 Characteristics of healthy seaweeds propagules 3.3 Seaweed species 3.4 Temperature and salinity requirements 3.5 Cross examination procedures 3.6 Acquisition of propagules 3.7 Planting schedule 3.8 Planting culture method	3.1 Identifying seaweed species 3.2 Acclimatizing seaweed propagules 3.3 Handling skills 3.4 Inspection skills 3.5 Mathematics skills 3.6 Acquiring healthy seaweeds 3.7 Acquiring seaweed propagules 3.8 Planting seaweed propagules
4. Maintain seaweed farm	4.1 Monitor and compute growth rate using Daily Growth Rate (DGR) formula 4.2 ***Water quality*** monitoring is done using the appropriate ***measuring instrument*** 4.3 Seaweed farm is protected through patrolling 4.4 ***Foreign materials*** on farm structures and seaweeds are removed in accordance to the Good Aquaculture Practices (GAQP)	4.1 Daily growth rate formula (DGR) and computation 4.2 Types of foreign materials 4.3 Water quality 4.4 Different measuring instruments 4.5 Seaweed farm patrolling 4.6 Comply with fisheries and Environmental Laws, Rules and Regulations 4.7 Monitoring procedures 4.8 GAQP for seaweeds	4.1 Monitoring and computing DGR 4.2 Monitoring water quality 4.3 Patrolling seaweed farm 4.4 Removal of foreign materials Calculation to determine salinity of water 4.5 Monitoring skills 4.6
5. Carry out seaweed health management	5.1 Seaweed sample collection is done for laboratory analysis 5.2 Disease ***sign and symptoms*** are observed and monitored through cross examination 5.3 ***Prevention and control measures***	5.1 Different diseases of seaweeds 5.2 Disease surveillance, monitoring and reporting 5.3 Disease investigation protocol	5.1 Performing seaweed sampling 5.2 Identifying disease signs and symptoms 5.3 Calculating disease treatment and pest control

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	are implemented based on result of monitoring.	5.4 Different prevention and control measures against diseases 5.5 Seaweed sampling methods	5.4 Monitoring disease sign and symptoms 5.5 Implementing preventive and control measures
6. Harvest mature seaweed	6.1 ***Harvesting criteria*** are recorded and monitored based on industry practices 6.2 Decision for harvesting operation is made based on ***harvesting criteria*** 6.3 ***Tools, materials and equipment*** are prepared in accordance to ***industry standards***. 6.4 ***Harvesting techniques*** are carried out according to ***farming/ culturing methods*** and GAqP 6.5 Boat is operated based on instructional manual	6.1 Harvesting criteria: • Seaweed maturity • Seaweed quality • Weather and tidal conditions • Prevailing prices 6.2 Decision making for harvesting operation 6.3 Seaweed species 6.4 Seaweed diseases 6.5 Foreign matter attachments 6.6 Harvesting techniques for grow-outs and nursery farms such as • Untying of cultivation ropes • Pulling of cultivation ropes • Cutting of soft ties 6.7 Quality of seaweed crops 6.8 Awareness on culturing method • floating long lines • fixed-bottom • raft 6.9 Handling management • boat capacity • covering of seaweed crop 6.10 Operation of boat 6.11 Awareness in navigational lane 6.12 Recording harvesting criteria data	6.1 Recording and monitoring harvesting criteria data 6.2 Making decision for harvesting operation 6.3 Preparing different tools, materials and equipment 6.4 Applying harvesting techniques 6.5 Operating boat 6.6 Inter-personal communication skills 6.7 Workplace safety skills 6.8 Simple repair & Troubleshooting skills

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
		6.13 Coordinating skills 6.14 Interpersonal communication skills 6.15 First Aid 6.16 5S 6.17 SSOP 6.18 GAqP 6.19 BFAR regulations 6.20 Sanitation Standard Operating Procedure (SSOP) 6.21 HACCP 6.22 Different harvesting tools, materials and equipment 6.23 Handling, preventive maintenance and troubleshooting of tools and equipment against: 6.24 Possible defects and failure 6.25 Enough fuel 6.26 Free from foreign materials (e.g. animal wastes, human wastes, greases and oils, earth matter, other metallic, glass and plastic materials) **Values:** • Resourcefulness • Efficiency • Safety consciousness • Time management • Teamwork • Environment consciousness • Honesty • Organized • Cleanliness	
7. Complete seaweed grow-out operation	7.1 ***Management of harvested seaweed*** crops is performed in accordance with GAqP and waste	7.1 Seaweed farmer's beneficiary form (planting and production monitoring)	7.1 Managing harvested seaweed 7.2 Disposing wastes

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	management standards 7.2 Wastes are disposed according to environmental procedures 7.3 ***Seaweed production data*** are recorded based on industry practice 7.4 Harvested seaweeds are ***labeled*** based on industry practices 7.5 ***Handling of seaweed crops*** during transport is performed based on industry practices 7.6 Tools, materials and equipment are cleaned and stored in accordance to HACCP and OSHS	7.2 Management of harvested seaweed crop 7.3 Proper waste disposal 7.4 Handling of seaweed crops 7.5 Seaweed production data 7.6 Labeling of seaweed crops 7.7 Computation of growth rate 7.8 Computation of volume of harvest & profit 7.9 OSHS 7.10 Good housekeeping 7.11 4Rs (reduce, reuse, recycle and recover) 7.12 HACCP 7.13 BFAR regulations 7.14 Waste management standards 7.15 Cleaning and storing tools, materials and equipment **Values:** • Resourcefulness • Efficiency • Safety consciousness • Time management • Teamwork • Environment consciousness • Honest • Risk taker • Assertive • Persistent • Opportunity seeker	7.3 Recording seaweed production data 7.4 Labeling handled seaweed 7.5 Transporting and handling of harvested seaweeds 7.6 Cleaning and storing of tools, materials, and equipment

RANGE OF VARIABLES

VARIABLE	RANGE
1. Necessary documents	**Necessary documents include:** 1.1 Fisherfolk registration 1.2 Boat registration 1.3 Letter of application 1.4 Site sketch plan 1.5 Health certificate of transboundary movement of live seaweeds for aquaculture purposes 1.6 LGU applicable permits/licenses
2. Capital	**Capital may include:** 2.1 Start-up 2.2 Expansion
3. Farm tools, materials and equipment	**Farm tools, materials and equipment include:** 3.1. Tools 3.1.1 Ball hammer 3.1.2 Floaters 3.1.3 Stainless steel table knife 3.1.4 4" scissor 3.1.5 Rechargeable flashlight 3.1.6 Battery flashlight 3.1.7 Transistor radio 3.1.8 Seed bin 3.1.9 Anchors 3.1.10 Sinkers 3.2. Materials 3.2.1 Clean sacks 3.2.2 50 k capacity native bags 3.2.3 Native baskets 3.2.4 1000m soft ties 1roll 3.2.5 #10 (5mm) utility ropes 3.2.6 20L cap. pails 3.2.7 ordinary dippers 3.2.8 100pp record book 3.2.9 5x5m canvass/cover 3.2.10 Straw 3.2.11 Sticks 3.2.12 Bamboo 3.2.13 Ropes 3.2.14 Sampling plastic bags with and without holes 3.2.15 Cheese cloth or "Katsa" 3.2.16 Labelling pen 3.2.17 PPEs • Gloves • Goggles • Face mask • Snorkel • Boots • Paddle • Flippers

	• Hat • Life vest 3.3. Equipment 3.3.1 500 K capacity hanging weighing scale 3.3.2 15pax cap. motorized boat 3.3.3 3pax cap. non-motorized boat with katig 3.3.4 Two-way radio
4. Culture methods	**Culture methods include:** 4.1 Shallow 4.1.1 Fixed/Line method 4.1.2 Floating raft method 4.1.3 Bottom stake method 4.1.4 Stationary method 4.1.5 Floating Cage method 4.1.6 Bamboo raft method 4.1.7 Plot method 4.2 Deep sea 4.2.1 Floating raft method 4.2.2 Bamboo raft method
5. Measurement activities	**Measurement activities includes:** 5.1 Measuring total area of grow-out farm 5.2 Measuring length of ropes, bamboos and lines 5.3 Measuring distance between monolines and propagules 5.4 Measuring biomass
6. Grazers	**Grazers include:** 6.1 Sea turtle 6.2 Sea urchin 6.3 Star fish 6.4 Siganids 6.5 Barnacles 6.6 Oysters 6.7 Brittle star
7. Controlling of grazers	**Controlling of grazers includes:** 7.1 Use of nets 7.2 Buffer plants 7.3 Hand picking
8. Seaweed species	**Seaweed species include:** 8.1 *Kappaphycus spp.* 8.2 *Eucheuma spp.* 8.3 *Gracilaria spp.*

9. Healthy seaweeds	**Healthy seaweeds include the following:** 9.1 Clean 9.2 Shiny 9.3 Young 9.4 Plenty of thalli
10. Water quality	**Water quality includes:** 10.1 Salinity 10.2 pH 10.3 Temperature 10.4 Food Nutrients 10.5 Presence of Phosphorous 10.6 Nitrite and Nitrates 10.7 Turbidity
11. Measuring instruments	**Measuring instruments includes:** 11.1 Dissolved Oxygen (DO) Meter 11.2 Thermometer 11.3 PH meter 11.4 Secchi Disc 11.5 Ammonia, nitrite and Nitrate test Kits *Refractometer*
12. Foreign materials	**Foreign materials may include:** 12.1 Animal wastes and human wastes 12.2 Domestic waste 12.3 Soft ties 12.4 Greases and oils 12.5 Earth matters *Other metallic, plastic and glass materials*
13. Signs and symptoms of disease infection	**Signs and symptoms of disease infection include:** 13.1 Cottony growth 13.2 Lesions such as mechanical damage cause by boats, grazers, human, etc. 13.3 Whitist 13.4 Pale 13.5 Fragmentation 13.6 Discoloration 13.7 Mud envelop thallus 13.8 Enlarged thallus 13.9 Pit or holes on thallus 13.10 Presence of epiphytes, algal parasites and fouling 13.11 Dark color thallus
14. Prevention and control measures	**Prevention and control measures may include:** 14.1 Removal of infected seaweed 14.2 Total harvest for drying 14.3 Crop rotation 14.4 Water depth zoning 14.5 Sanitize nets, equipment and tools (sun drying, application of 10% chlorine, washing freshwater, soap, isopropyl alcohol) 14.6 Test plant 14.7 Daily farm visit (manual removal of pest and grazers) 14.8 Disinfect seed stocks to eliminate detrimental organism (application of red pepper, vinegar, garlic)

	14.9 Avoid throwing of trash and farm structures to the water 14.10 Proper selection of healthy seaweeds for planting 14.11 Maintain two (2) or more farming areas 14.12 Ice-ice control - Proper spacing among propagules, transfer of healthy seaweed in another area, position farm structures parallel to current, removal of infected thallus 14.13 Epiphyte and ice-ice control - Pruning of infected thalli, transfer of culture area 14.14 Grazing control – fencing
15. Harvesting criteria	**Harvesting criteria includes:** 15.1 Seaweed maturity o planting date o estimated period of harvest 15.2 Seaweed quality o fully-grown o presence of branchlets o severe presence of disease(s) Anticipated *abnormal weather and tidal conditions*
16. Harvesting techniques	**Harvesting techniques may include:** 16.1 Untying of cultivation ropes 16.2 Pulling of cultivation ropes *Cutting of soft ties*
17. Farming/Culturing methods	**Farming/Culturing methods include:** 17.1 Floating long lines 17.2 Fixed-bottom *Raft*
18. Management of harvested seaweed crops	**Management of harvested seaweed crops include:** 18.1 Washing of seaweed with seawater 18.2 Removal of ties, debris, macro-epiphytes, and foreign materials
19. Seaweed production data	**Seaweed production data includes:** 19.1 Location 19.2 Date harvested 19.3 Weight 19.4 Species
20. Handling of seaweed crops	**Handling of seaweed crops may include:** 20.1 Stocking 20.2 Covering of sargasum/ banana leaves 20.3 Sprinkling 20.4 Loading and unloading
21. Labelling of seaweed crops	**Labelling of seaweed crops includes:** 21.1 Date of harvest 21.2 Weight

EVIDENCE GUIDE

1. Critical aspects of competency	**Assessment requires evidence that the candidate:** 1.1 Conducted pre-cropping activities 1.2 Prepared grow out farm 1.3 Stocked healthy seaweed cuttings 1.4 Planted seaweed propagules 1.5 Maintained seaweed farm 1.6 Conducted cross examination and applied disease prevention and control measures 1.7 Conducted disease surveillance, monitoring and reporting 1.8 Applied health management practices in seaweed farms 1.9 Applied good seaweed farming practices 1.10 Harvested mature seaweeds
2. Resource Implications	**The following resources should be provided:** 2.1 Actual/ simulated seaweed farm 2.2 All supplies, materials and equipment needed during design, construction and operations of seaweeds farms should be readily available at the farm site such as: o Knives, bolo o Ball hammer o Floaters o Straw o Sticks o Goggles/snorkel, flippers o Paddle o Bamboo o Ropes o Screens o Anchors/Sand bags o Sinkers o Banca/boat o Booties o Life vest o First Aid 2.3 Measuring instruments : meter tape, 2.4 PPE
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Direct/Actual observation and questioning 3.2 Demonstration 3.3 Written exam 3.4 Oral questioning
4. Context of Assessment	4.1. Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : PRODUCE RAW DRIED SEAWEED

UNIT CODE : AFF622307

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to dry the newly harvested seaweeds, pack and store dried seaweeds.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Dry the newly harvested seaweeds	1.1 ***Tools, materials, equipment and facilities*** are prepared and cleaned following workplace procedures 1.2 Appropriate ***drying techniques*** are selected based on production requirements 1.3 Harvested seaweeds are cleaned and dried according to ***Philippine National Standards (PNS)*** on dried raw seaweeds 1.4 Seaweeds samples are collected for moisture content analysis 1.5 Housekeeping is practiced following 5S of Good housekeeping	1.1 Proper use of tools and equipment 1.2 Drying techniques and procedures 1.3 Moisture content of seaweeds 1.4 Seaweed sampling 1.5 PNS-BAFPS 85-2010 1.6 3R's 1.7 5S 1.8 OSHS **Values:** • Safety and health consciousness • Resourcefulness • Diligence • Time consciousness • Cost-consciousness • Personal integrity in doing routine management practices • Perseverance in executing routine works • Ability to work with others harmoniously • Environmental consciousness	1.1 Preparing tools, materials, equipment, and facilities 1.2 Selecting drying techniques 1.3 Demonstrating drying techniques 1.4 Analyzing moisture content 1.5 Cleaning and drying of seaweeds 1.6 Sampling seaweeds 1.7 Handling tools 1.8 Practicing PNS, 5S, OSHS and HACCP
2. Pack the dried seaweeds	2.1 ***Tools, materials and equipment*** are prepared for packing purposes	2.1 Proper selection of packing materials 2.2 Good practices of sorting and	2.1 Selecting appropriate packing materials

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	2.2 Dried seaweeds are cleaned to remove ***foreign materials*** complying with PNS 2.3 Dried seaweeds are packed following PNS 2.4 Packed seaweeds are weighed according to industry practice 2.5 Packed dried seaweeds are ***labeled*** for traceability	packing procedures 2.3 Proper use and calibration of weighing scale 2.4 Labeling for traceability 2.5 Computation of total weight	2.2 Sorting of dried seaweeds 2.3 Tying and packing skills 2.4 Labeling skills 2.5 Recording skills 2.6 Mathematical skills 2.7 Using weighing scale
3. Store the dried seaweeds	3.1 ***Area*** for storage of dried seaweeds is selected following industry requirement 3.2 Dried seaweeds are properly stacked/ piled by species 3.3 Stacked dried seaweeds are monitored following industry standard operating procedures 3.4 Storage area is maintained according to industry standard operating procedures	3.1 Proper selection of storage area 3.2 Systems of stacking/piling 3.3 Proper use of record book 3.4 Maintenance of storage area 3.5 Monitoring procedures	3.1 Selecting appropriate storage area 3.2 Demonstrating proper way of piling/stacking 3.3 Monitoring stacked dried seaweeds 3.4 Labeling skills 3.5 Recording skills 3.6 Maintaining storage area

RANGE OF VARIABLES

VARIABLE	RANGE
1. Tools, materials, equipment and facilities	**Tools, materials, equipment and facilities include:** 1.1 Tools: o Knife o Scissor 1.2 Materials: o Bamboo o Net o Wood o Rattan baskets o Sacks o Canvass 1.3 Equipment: o MC Analyzer 1.4 Facilities o Solar dryer (green house) o Elevated wooden flat form
2. Drying techniques	**Drying techniques include:** 2.1 Hanging method 2.2 Elevated flat form
3. Philippine National Standards (PNS)	**Philippine National Standards (PNS) include:** 3.1 Moisture content 3.2 Clean anhydrous seaweeds 3.3 Impurities 3.4 Sand and salt 3.5 Color 3.6 Sampling
4. Tools, materials and equipment for packing	**Tools, materials and equipment include:** 4.1 Tools: o Needle 4.2 Materials o Ropes o straws o sacks (Polypropylene sacks) 4.3 Equipment: o weighing scale

5. Foreign materials	**Foreign materials include:** 5.1 Plastic 5.2 Sand 5.3 Stones 5.4 "Junk weeds" 5.5 Shells 5.6 Corals 5.7 Soft ties
6. Label	**Label includes:** 6.1 Species 6.2 Source (area) o *Date of harvest
7. Area	**Appropriate area includes:** 7.1 Clean 7.2 Dry 7.3 Well-ventilated

EVIDENCE GUIDE

1. Critical aspects of competency	**Assessment requires evidence that the candidate:** 1.1 Carried-out appropriate drying techniques 1.2 Performed proper selection of packing materials 1.3 Observed good practices of sorting and packing 1.4 Carried-out the proper way of piling/ stacking 1.5 Selected appropriate area for storage 1.6 Practiced PNS for dried seaweeds
2. Resource Implications	**The following resources should be provided:** 2.1 Storage room 2.2 Tool room 2.3 Solar dryer (elevated flat form, green house) 2.4 Writing device 2.5 Farm supplies 2.6 Logbooks 2.7 PNS manual 2.8 Packing materials (Polypropylene sacks) 2.9 Weighing scale 2.10 Moisture Analyzer
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Direct Observation 3.2 Demonstration 3.3 Oral questioning 3.4 Written test
4. Context of Assessment	4.1. Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : MARKET SEAWEED

UNIT CODE : AFF622308

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes in monitoring prevailing seaweed price, applying marketing strategies and trading seaweed.

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Monitor prevailing seaweed price	1.1 Major producing and trading areas of seaweeds are determined 1.2 ***Seaweed information*** is sourced through coordination with other farmers and cooperatives/ associations 1.3 Seaweed price is monitored through the assistance of BFAR and ***seaweeds industry***	1.1 Major producing and trading areas of seaweeds 1.2 Seaweed industry stakeholders 1.3 Seaweed information 1.4 Supply and demand of seaweed local and international 1.5 Source of information and sharing of price bulletin (txt, call, tv, e-mail, internet, social media) 1.6 Monitoring methods of price 1.7 Logistical handling management 1.8 Interpersonal communication 1.9 Recording procedures of prices 1.10 Communication devices 1.11 Weighing devices **Values:** • Resourceful • Persevering • Honest • Organized • Systematic	1.1 Determining major producing and trading areas of seaweeds 1.2 Sourcing of seaweed information 1.3 Monitoring seaweed price Coordinating skills 1.4 Monitoring skills 1.5 Communication skills

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Apply marketing strategies	2.1 Reputable ***buyers*** are determined 2.2 Collected information is use in strategizing to optimize sales and profit 2.3 ***Selling points*** for seaweed are presented to prospect buyers 2.4 Desired sales terms and conditions are established 2.5 Alliance with other sellers and cooperatives/ associations is established for volume consolidation	2.1 Different buyers of seaweeds 2.2 List of reputable buyers 2.3 Cooperative/Associations operations 2.4 Allowance for moisture content (reseco) 2.5 Redrying seaweed 2.6 Practical methods of moisture content analysis 2.7 Pricing factors: • Moisture content • Quality • Volume • Location 2.8 Selling points 2.9 PNS on Seaweed **Values:** • Harmonious relationship with buyers • Honest • Organized • Systematic	2.1 Determining reputable buyers 2.2 Using collected information in market strategies 2.3 Establishing desired sales terms and conditions 2.4 Establishing alliance with other sellers and cooperative/ association Research skills 2.5 Writing and oral communication skills 2.6 Analytical skills 2.7 File keeping skills
3. Sell seaweeds	3.1 Seaweeds are prepared for selling purposes 3.2 Negotiation with buyers is performed 3.3 Seaweeds are delivered following marketing agreement 3.4 Simple record keeping is done following industry practice	3.1 Preparation procedures for seaweeds marketing 3.2 Simple record keeping 3.3 Different delivery modes 3.4 Knowledge on shipping terms and transport requirements 3.5 Negotiation procedures 3.6 Compliance to local ordinances and regulations	3.1 Preparing seaweeds 3.2 Negotiating with buyers 3.3 Performing simple book keeping 3.4 Negotiation skills (selling skills) 3.5 Simple book keeping skills 3.6 Interpersonal skills 3.7 Mathematical skills

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
		3.7 Seaweed Product Standards. 3.8 Preparation and keeping records 3.9 Computing for seaweeds/ harvest, sales proceeds, cash flow, inputs and output) **Values** • Harmonious relationship with buyers • Honest • Organized • Systematic • Courteous • Patient • Persevering	

RANGE OF VARIABLES

VARIABLE	RANGE
1. Seaweed information	**Seaweed information includes:** 1.1 Local demand and supply 1.2 International demand and supply 1.3 Location of producing and trading areas 1.4 Prevailing price of seaweeds
2. Seaweeds industry	**Seaweeds industry includes:** 2.1 Farmers 2.2 Processors 2.3 Traders 2.4 Exporters
3. Buyers	**Buyers include:** 3.1 Seaweed traders 3.2 Farmer traders 3.3 Agent/Middle-man 3.4 Consolidators 3.5 Processors 3.6 Exporters
4. Selling points	**Selling points includes:** 4.1 Volume of harvest 4.2 Premium quality of seaweed 4.3 Economic impact to the community 4.4 Environmental benefits

EVIDENCE GUIDE

1. Critical aspects of competency	**Assessment requires evidence that the candidate:** 1.1 Monitored prevailing seaweed price 1.2 Applied marketing strategies 1.3 Sold seaweeds
2. Resource Implications	**The following resources should be provided:** 2.1 Ledger 2.2 Cell phone 2.3 Calculator 2.4 Writing device 2.5 Water transport 2.6 Weighing device
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Demonstration 3.2 Observation 3.3 Third-party 3.4 Written exam 3.5 Oral questioning 3.6 Portfolio
4. Context of Assessment	4.1. Competency maybe assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

SECTION 3 TRAINING ARRANGEMENTS

These standards are set to provide technical and vocational education and training (TVET) providers with information and other important requirements to consider when designing training programs for **SEAWEED PRODUCTION NCII.**

They include information on curriculum design; training delivery; trainee entry requirements; tools and equipment; training facilities; and trainer's qualification.

3.1 CURRICULUM DESIGN

TESDA shall provide the training on the development of competency-based curricula to enable training providers develop their own curricula with the components mentioned below.

Delivery of knowledge requirements for the basic, common and core units of competency specifically in the areas of mathematics, science/technology, communication/language and other academic subjects shall be contextualized. To this end, TVET providers shall develop a Contextual Learning Matrix (CLM) to include Technology, Science, Math, English/Communication, and Safety to Environment. Includes also green technology, issues on health and drugs and cater to person with disabilities (PWD's).

Course Title: **SEAWEED PRODUCTION** **NC Level** **NC II**

Nominal Training Duration:

20 hrs	Basic Competencies
72 hrs	Common Competencies
560 hrs	Core Competencies
Total 652 hrs	

Course Description:

This course is designed to enhance the knowledge, desirable attitudes and skills of a seaweed nursery operator, seaweed farmer/grower or seaweed trader to operate seaweed nursery, grow-out seaweed, produce raw dried seaweed and market seaweed. These competencies are required to an individual who will be engaged in seaweed production at economic scale, handling at least one-fourth (1/4) to one (1) hectare of seaweed farm.

To obtain this, all units prescribed for this qualification must be achieved.

BASIC COMPETENCIES
20 HRS

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
1. Participate in workplace communication	1.1 Obtain and convey workplace information	• Describe Organizational policies	• Group discussion	• Oral evaluation	4 Hours
		• Read: o Effective communication	• Lecture	• Written examination	
		o Written communication			
		o Communication procedures and systems			
		• Identify: o Different modes of communication			
		o Medium of communication			
		o Flow of communication			
		o Available technology relevant to the enterprise and the individual's work responsibilities			
		• Prepare different Types of question	• Demonstration	• Observation	
		• Gather different sources of information			
		• Apply storage system in establishing workplace information			
		• Demonstrate Telephone courtesy			
		• Describe Communication procedures and systems	• Group discussion	• Oral evaluation	

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
	1.2 Complete relevant work related documents	• Read: o Meeting protocols	• Lecture	• Written examination	
		o Nature of workplace meetings	• Lecture	• Written examination	
		o Workplace interactions			
		o Barriers of communication			
		• Complete work related documents	• Demonstration	• Observation	
		• Read instructions on work related forms/documents	• Lecture	• Written examination	
		• Practice:	•		
		o Estimate, calculate and record routine workplace measures	• Demonstration	• Observation	
		o Basic mathematical processes of addition, subtraction, division and multiplication			
		• Demonstrate office activities in: o workplace meetings and discussions scenario	• Role play	• Oral evaluation • Observation	
		• Perform workplace duties scenario following simple written notices	• Role play	• Oral evaluation • Observation	
		• Follow simple spoken language	• Demonstration	• Observation	
		• Identify the different Non-verbal communication	• Lecture	• Written examination	

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
		• Demonstrate ability to relate to people of social range in the workplace	• Demonstration	• Observation	
		• Gather and provide information in response to workplace requirements			
	1.3 Participate in workplace meeting and discussion	• Identify: o types of workplace documents and forms	• Lecture	• Written examination	
		o kinds of workplace report			
		o Available technology relevant to the enterprise and the individual's work responsibilities			
		• Read and follow instructions in applying basic mathematical concepts			
		• Follow simple spoken language	• Demonstration	• Observation	
		• Gather and provide information in response to workplace requirements			
2. Work in a team environment	2.1 Describe and identify team role and responsibility in a team.	• Describe the team role and scope	• Group discussion	• Oral evaluation	4 Hours
		• Read o Definition of Team	• Lecture	• Written examination	
		o Difference between team and group			
		o Objectives and goals of team			
		• Identify different sources of information			

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
	2.2 Describe work as a team	• Describe team goals and objectives	• Group discussion	• Oral evaluation	
		• Perform in setting team goals and expectations scenario	• Role play	• Oral evaluation • Observation	
		• Identify ○ individual role and responsibility	• Lecture	• Written examination	
		• Practice Interacting effectively with others	• Group discussion	• Oral evaluation	
		• Read: ○ Fundamental rights at work including gender sensitivity ○ Understanding individual competencies relative to teamwork ○ Types of individuals ○ Role of leaders	• Lecture	• Written examination	
3. Practice career professionalism	3.1 Integrate personal objectives with organizational goals	• Describe performance evaluation	• Group discussion	• Oral evaluation	6 Hours
		• Read: ○ Work values and ethics (Code of Conduct, Code of Ethics, etc.) ○ Understanding personal objectives ○ Understanding organizational goals	• Lecture	• Written examination	
		• Demonstrate Intra and Interpersonal skills at work	• Demonstration	• Observation	

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
		• Demonstrate personal commitment in work			
	3.2 Set and meet work priorities	• Describe company policies, operations, procedures and standards	• Group discussion	• Oral evaluation	
		• Read:	• Lecture	• Written examination	
		○ Time Management			
		○ Basic strategic planning concepts			
		○ Resource utilization and management			
		• Apply managing goals and time	• Demonstration	• Observation	
		• Practice: ○ economic use of resources and facilities	• Demonstration	• Observation	
		○ time management			
	3.3 Maintain professional growth and development	• Describe company recognition and incentives	• Group discussion	• Oral evaluation	
		• Read:	• Lecture	• Written examination	
		○ Career development opportunities			
		○ Information on relevant licenses and or certifications			
		○ personal career development needs			
		• Determine personal career development needs	• Group discussion	• Oral evaluation	
4. Practice occupational	4.1 Identify hazard and risks	• Describe OHS procedures, practices and regulations	• Group discussion	• Oral evaluation	6 Hours
		• Read	• Lecture		

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
health and safety procedures		○ OHS indicators		• Written examination	
		○ Organizational contingency practices			
		• Practice hazards/risks identification and control			
	4.2 Evaluate hazard and risks	• Describe effects of safety hazards	• Group discussion	• Oral evaluation	
		• Read	• Lecture	• Written examination	
		○ Threshold Limit Value –TLV			
		• Practice reporting safety hazards	• Role play	• Observation	
		• Demonstrate evaluating hazards and risks using communication equipment	• Demonstration	• Observation	
	4.3 Control hazards and risks	• Describe: ○ Organization safety and health protocol	• Group discussion	• Oral evaluation	
		○ Company emergency procedure practices			
		• Practice personal hygiene	• Demonstration	• Observation	
		• Practice drills on responding to emergency	• Demonstration • Simulation	• Observation	
	4.4 Maintain occupational health and safety awareness	• Identify emergency-related drills information	• Lecture	• Written examination	
		• Practice occupational safety and health standards on personal records in the workplace	• Role play	• Observation	
		• Practice emergency related drills in the workplace	• Demonstration • Simulation	• Observation	

COMMON COMPETENCIES
72 HRS

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
1.Apply safety measures in farm operations	1.1 Determine areas of concern for safety measures	• Identify work tasks in farm operations	• Lecture • Discussion • Incomplete worksheet • Power point presentation • Video presentation	• Written examination • Interview • Oral questioning • Demonstration	**(Total-7 hrs)** **1 hr**
		• Discuss safety measures in a workplace during farm operations	• Lecture • Discussion • Incomplete worksheet • Power point presentation • Video presentation • Role playing	• Written examination • Interview • Oral questioning • Demonstration	**1 hr**
		• Explain farm operations situations and period when to observe safety	• Lecture • Discussion • Incomplete worksheet • Power point presentation • Video presentation • Role playing	• Written examination • Interview • Oral questioning • Demonstration	**1 hr**

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
		• Identify appropriate tools	• Lecture	• Written	**2 hrs**
		• materials and outfits to be used	• Discussion • Incomplete worksheet • Power point presentation • Video presentation	• examination • Interview • Oral questioning • Demonstration	
	1.2 Apply appropriate safety measures	• Prepare tools, materials and outfits for the farm operation	• Lecture • Discussion • Power point presentation • Video presentation • Demonstration •	• Written examination • Interview • Oral questioning • Demonstration	**2 hrs**
		• Enumerate uses and functions of tools and materials	• Discussion • Power point presentation • Video presentation • Demonstration	• Written examination • Interview • Oral questioning • Demonstration	**(Total -11 hrs.)** **1 hr**
		• Explain procedures of wearing personal protective equipment	• Discussion • Power point presentation • Video presentation	• Written examination • Interview • Oral questioning •	**1 hr**

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
			• Incomplete worksheet		
		• Discuss topics on effectivity, shelf life and expirations of materials to be used.	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning •	**1 hr**
		• Identify the emergency procedures	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning •	**2 hrs**
		• Identify hazards in a farm workplace	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning	**2 hrs**
		• Use tools and materials	• Discussion • Power point presentation • Video presentation	• Written examination • Interview • Oral questioning	**2 hrs**

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
			• Incomplete worksheet • Demonstration • Hands-on	• Demonstration	
		• Wear personal protective equipment	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration	• Written examination • Interview • Oral questioning • Demonstration	**0.5 hr**
		• Prepare report on hazards in the workplace	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning • Demonstration	**1 hr**
		• Report on hazards in the workplace	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Role playing	• Written examination • Interview • Oral questioning • Demonstration	**0.5 hr**

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
	1.3Safekeep/dispose of tools, materials and outfit	• Explain cleaning and storing procedures of the used tools and outfit	• Discussion • Power point presentation • Video presentation • Incomplete worksheet •	• Written examination • Interview • Oral questioning •	**(Total – 6 hrs)** **1 hr**
		• State labelling and storing	• Discussion	• Written	**1 hr**
		• procedures for unused materials	• Power point presentation • Video presentation • Incomplete worksheet	• examination • Interview • Oral questioning •	
		• Explain proper wastes disposal	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning •	**1 hr**
		• Clean and store used tools and outfit	• Discussion • Power point presentation • Video presentation	• Written examination • Interview • Oral questioning • Demonstration	**1 hr**

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
			• Incomplete worksheet • Demonstration • Hands-on		
2.Use farm tools		• Label and store unused materials	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	**1 hr**
		2. Dispose waste materials	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	**1 hr**

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
	2.1 Select and use farm tools	• Identify farm tools	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration	• Written examination • Interview • Oral questioning • Demonstration	**(Total -6 hrs)** **1 hr**
		• Describe faults and defective tools	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration	• Written examination • Interview • Oral questioning • Demonstration	**1 hr**
		• Discuss using of tools and equipment relating to manufacturer's manual	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	**1 hr**

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
	2.2 Select and operate farm equipment	• Check farm tools for faults and defects	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	**1 hr**
		• Use tools and equipment relating to manufacturer's manual	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	**2 hrs**
		• Identify farm equipment	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning	**(Total -19 hrs)** **1 hr**
		• Explain importance of reading manufacturer's manual	• Discussion • Power point presentation	• Written examination • Interview	**1 hr**

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
			• Video presentation • Incomplete worksheet	• Oral questioning •	
		• Discuss pre-operation check and its importance	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning •	**1 hr**
		• Identify different types of faults in farm equipment	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning •	**1 hr**
		• Enumerate reporting procedures	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Role playing	• Written examination • Interview • Oral questioning • Demonstration	**1 hr**
		• Enumerate procedures in using farm equipment	• Discussion	• Written examination	**1 hr**

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
			• Power point presentation • Video presentation • Incomplete worksheet	• Interview • Oral questioning •	
		• Discuss safety procedures for farm operation	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning •	**1 hr**
		• Read manufacturer's manual	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration	• Written examination • Interview • Oral questioning • Demonstration	**1 hr**
		• Conduct pre-operation check-up	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration	• Written examination • Interview • Oral questioning • Demonstration	**1 hr**

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
			• Hands-on		
		• Report identified faults	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	**1 hr**
		• Operate farm equipment	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on • Field visit	• Written examination • Interview • Oral questioning • Demonstration	**8 hrs**
		• Follow safety procedures	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	**1 hr**

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
	2.3Perform preventive maintenance	• Enumerate cleaning procedures for tools and equipment	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning • Demonstration	**(Total -7 hrs)** **1 hr**
		• Discuss significance of routine check-up and maintenance	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning • Demonstration	**1 hr**
		• Explain procedures in storing tools and equipment	• Discussion • Power point presentation • Video presentation • Incomplete worksheet	• Written examination • Interview • Oral questioning •	**1 hr**

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
		• Clean tools and equipment	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	**2 hrs**
		• Perform routine check –up and maintenance	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	**1 hr**
		• Store tools and equipment	• Discussion • Power point presentation • Video presentation • Incomplete worksheet • Demonstration • Hands-on	• Written examination • Interview • Oral questioning • Demonstration	**1 hr**

Unit of Competency	Learning Outcome	Learning Activities	Methodology	Assessment Method	Nominal Duration
3.Perform estimation and basic calculation	3.1Perform estimation	• Identify job requirements and work task/activity	• Lecture • Discussion	• Written exam • Oral questioning	**(Total -8 hrs)** **1 hr**
		• Identify materials and resources of job requirements	• Lecture • Discussion	• Written exam • Oral questioning	**1 hr**
		• Estimate time to complete work task/activity	• Lecture • Discussion • Demonstration • Video presentation	• Written exam • Oral questioning	**2 hrs**
	3.2 Perform basic workplace calculation	• Estimate quantities of materials and resources	• Lecture • Discussion • Demonstration	• Written exam • Oral questioning	**2 hrs**
		• Prepare and submit bill of materials	• Lecture • Discussion • Demonstration	• Written exam • Oral questioning • Demonstration	**2 hrs**
		• Describe different types of calculation	• Lecture • Discussion	• Written exam • Oral questioning	**(Total -8 hrs)** **1 hr**
		• Discuss different methods of calculation	• Lecture • Discussion	• Written exam • Oral questioning	**1 hr**

CORE COMPETENCIES
560 HRS

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
1. Operate seaweed nursery	1.1. Conduct Pre-nursery activities	1. Identify feasible nursery site	• Lecture • Discussion • Farm visit	• Written exam • Oral questioning	**(Total -73 hrs)** 8 hrs
		2. Explain test planting procedures	• Lecture • Discussion	• Written exam • Oral questioning	2 hrs
		3. Identify necessary documents for seaweed operation	• Lecture • Discussion • Video presentation	• Oral questioning • Written exam	2 hrs
		4. Identify capital and other resources required in nursery operation	• Lecture • Discussion	• Oral questioning • Written exam	2 hrs
		5. Identify different parts of project proposal template	• Lecture • Discussion	• Written exam • Oral questioning	1 hr
		6. Describe nursery structure and installation	• Lecture • Video presentation • Farm visit	• Written exam • Oral questioning	8 hrs
		7. Select feasible nursery site	• Demonstration • Lecture • Field visit	• Demonstration • Oral questioning	8 hrs

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
		8. Conduct test planting	• Demonstration • Discussion • Lecture • Field visit	• Demonstration • Oral questioning • Written exam	8 hrs
		9. Secure necessary documents	• Role playing • Lecture • Discussion • Hands-on	• Demonstration • Written exam	4 hrs
		10. Access capital and other resources	• Role playing • Lecture	• Written exam	2 hrs
		11. Prepare simple project proposal	• Hands-on • Lecture	• Demonstration	4 hrs
		12. Install nursery structure according to plan and design	• Hands-on	• Demonstration • Oral questioning	24 hrs
	1.2. Source out propagules	1. Identify different seaweed species	• Lecture • Video presentation • Discussion	• Written exam • Oral questioning	**(Total -14 hrs)** 2 hrs
		2. Explain the principles and methods of acclimatization	• Lecture • Discussion • Video presentation	• Written exam • Oral questioning	2 hrs
		3. Differentiate heathy and unhealthy seaweed	• Lecture • Demonstration • Video presentation	• Oral questioning • Written exam	2 hrs

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
		4. Discuss planting schedule relating to acquisition	• Lecture • Discussion	• Written exam • Oral questioning	1 hr
		5. Discuss checking procedures of propagules delivery	• Lecture • Discussion	• Written exam	1 hr
		6. Select seaweed species according to seasonality	• Demonstration • Lecture • Discussion	• Oral questioning • Demonstration	2 hrs
		7. Acclimatize seaweed propagules	• Lecture • Demonstration	• Oral questioning • Demonstration	2 hrs
		8. Select and acquire healthy seaweed using gross examination	• Lecture • Demonstration	• Oral questioning • Demonstration • Written exam	1 hr
		9. Check quantity of delivered propagules	• Lecture • Discussion	• Written exam • Demonstration	1 hr
	1.3. Plant propagules	1. Explain cutting procedures	• Lecture • Discussion • Demonstration	• Written exam	**(Total -23 hrs)** 1 hr
		2. Describe different tying techniques	• Lecture • Discussion • Demonstration	• Written exam • Oral questioning	2 hrs
		3. Discuss installation procedures of planting lines	• Video presentation • Discussion • Lecture	• Written exam • Oral questioning	4 hrs

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
		4. Explain installation procedures of floaters	• Lecture • Video presentation	• Written exam • Oral questioning	2 hrs
		5. Cut propagules according to required weight	• Demonstration • Discussion • Lecture	• Demonstration • Oral questioning	2 hrs
		6. Tie seaweed propagules in planting lines	• Simulation • Discussion • Lecture	• Demonstration • Oral questioning	4 hrs
		7. Install planting lines and floaters	• Demonstration • Field visit • Discussion	• Demonstration • Oral questioning	8 hrs
	1.4. Maintain seaweed nursery	1. Identify different water quality parameters	• Lecture • Discussion	• Written exam • Oral questioning	**(Total -24 hrs)** 4 hrs
		2. Explain monitoring procedures of water quality	• Lecture • Discussion	• Written exam • Oral questioning	1 hr
		3. Identify measuring instruments and their uses	• Lecture • Discussion • Video presentation	• Written exam • Oral questioning	1 hr
		4. Identify different foreign materials	• Lecture • Discussion	• Written exam • Oral questioning	1 hr
		5. Discuss the maintenance procedures of nursery structures	• Lecture • Discussion	• Written exam • Oral questioning	1 hr

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
		6. Identify different pests and diseases	• Lecture • Video presentation • Discussion	• Written exam • Oral questioning	2 hrs
		7. Explain different prevention and control measures for pests and diseases	• Lecture • Discussion	• Written exam • Oral questioning	1 hr
		8. Discuss the importance of securing seaweed nursery farm	• Lecture • Discussion	• Written exam • Oral questioning	1 hr
		9. Compute DGR	• Demonstration • Lecture • Discussion	• Demonstration • Oral questioning	1 hr
		10. Monitor water quality using measuring instrument	• Demonstration • Lecture • Discussion	• Demonstration • Oral questioning	2 hrs
		11. Remove and dispose foreign materials	• Demonstration • Lecture • Discussion	• Demonstration • Oral questioning	1 hr
		12. Maintain nursery structure and set-up	• Simulation • Lecture • Discussion	• Demonstration • Oral questioning • Written exam	2 hrs
		13. Monitor pests and diseases through ocular and gross examination	• Demonstration • Lecture • Discussion	• Demonstration • Oral questioning • Written exam	2 hrs

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
		14. Implement prevention and control of pests and diseases	• Video presentation • Lecture • Discussion	• Demonstration • Oral questioning • Written exam	2 hrs
		15. Protect seaweed nursery farm through patrolling	• Farm visit • Discussion • Lecture	• Demonstration • Oral questioning	2 hrs
	1.5. Harvest propagules	1. Explain harvesting criteria	• Lecture • Discussion	• Written exam • Oral questioning	**(Total -27 hrs)** 1 hr
		2. Identify and prepare harvesting tools, materials and equipment	• Lecture • Discussion	• Written exam • Oral questioning	1 hr
		3. Discuss different pruning techniques of seaweeds	• Lecture • Discussion	• Written exam • Oral questioning	1 hr
		4. Discuss total harvesting of seaweeds	• Lecture • Discussion	• Written exam • Oral questioning	1 hr
		5. Explain boat operation	• Lecture • Discussion	• Written exam • Oral questioning	1 hr
		6. Monitor and record harvesting criteria for decision making	• Lecture • Video presentation	• Demonstration • Written exam • Oral questioning	2 hrs
		7. Prune seaweeds using harvesting tools, materials and equipment	• Lecture • Demonstration	• Demonstration • Oral questioning	4 hrs

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
		8. Carry-out total harvest of seaweeds using harvesting tools, materials and equipment	• Lecture • Demonstration • Farm visit	• Demonstration • Oral questioning	8 hrs
		9. Operate motorized and non-motorized boat	• Lecture • Demonstration • Farm visit	• Demonstration • Oral questioning • Written exam	8 hrs
	1.6. Carry-out post-nursery activities	1. Identify suitable packaging materials	• Lecture • Discussion • Video presentation	• Oral questioning • Written questioning	**(Total -45 hrs)** 1 hr
		2. Explain handling of propagules and matured seaweeds for transport and dispersal	• Lecture • Discussion • Video presentation	• Oral questioning • Written exam	1 hr
		3. Discuss farmer's purpose	• Lecture • Discussion	• Oral questioning • Written exam	1 hr
		4. Describe matured part of seaweed plants for segregation	• Lecture • Discussion • Video presentation	• Written exam • Oral questioning	1 hr
		5. Explain propagules production data	• Lecture • Discussion • Video presentation	• Written exam • Oral questioning	1 hr
		6. Discuss cleaning and storing of tools, materials and equipment relating to HACCP and OSHS	• Lecture • Discussion • Video presentation	• Written exam • Oral questioning	4 hrs

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
		7. Explain waste management with reference to environmental laws	• Lecture • Discussion • Video presentation	• Written exam • Oral questioning	4 hrs
		8. Segregate mature seaweeds	• Lecture • Demonstration • Video presentation	• Oral questioning • Demonstration	4 hrs
		9. Pack propagules	• Lecture • Demonstration • Video presentation • Farm visit	• Oral questioning • Demonstration • Written exam	8 hrs
		10. Handle propagules and matured seaweeds for transport and dispersal	• Demonstration • Discussion • Farm visit	• Oral questioning • Demonstration • Written exam	8 hrs
		11. Record propagules production data	• Demonstration • Discussion • Lecture	• Oral questioning • Demonstration • Written exam	4 hrs
		12. Clean and store tools, materials and equipment	• Demonstration • Discussion • Lecture	• Oral questioning • Demonstration • Written exam	4 hrs
		13. Segregate and dispose wastes	• Demonstration • Discussion • Lecture	• Oral questioning • Demonstration • Written exam	4 hrs

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
2. Grow-out seaweed	2.1. Conduct pre-cropping activities	1. Describe feasible grow-out site using the site selection criteria	• Lecture • Discussion • Video presentation	• Written exam • Oral Questioning	**(Total -35 hrs)** 2 hrs
		2. Explain test planting procedures	• Lecture • Discussion	• Written exam • Oral Questioning	1 hr
		3. Identify different necessary documents	• Lecture • Discussion	• Written exam • Oral Questioning	1 hr
		4. Discuss different capital and other resources of farming requirements	• Lecture • Discussion	• Written exam • Oral Questioning	2 hrs
		5. Identify different parts of simple project proposal	• Lecture • Discussion	• Written exam • Oral Questioning	1 hr
		6. Select feasible grow-out site	• Lecture • Discussion • Demonstration • Farm visit	• Written exam • Oral Questioning • Demonstration	8 hrs
		7. Conduct test planting in grow-out site	• Lecture • Discussion • Demonstration • Farm visit	• Written exam • Oral Questioning • Demonstration	8 hrs
		8. Secure necessary document for seaweed farming	• Lecture • Discussion • Role playing	• Written exam • Oral Questioning • Demonstration	4 hrs

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
		9. Access capital and other resources required for grow-out seaweed farming	• Lecture • Discussion • Role playing	• Written exam • Oral Questioning • Demonstration	4 hrs
		10. Accomplish project proposal template for assistance	• Lecture • Discussion • Demonstration	• Written exam • Oral Questioning • Demonstration	4 hrs
	2.2. Prepare grow out farm	1. Identify OH& S	• Lecture • Discussion	• Written exam • Oral questioning	**(Total -71 hrs)** 2 hrs
		2. Identify uses and function of different tools and materials	• Lecture • Discussion • Video presentation	• Written exam • Oral questioning	4 hrs
		3. Identify different measurement activities	• Lecture • Demonstration	• Oral questioning • Written examination	2 hrs
		4. Describe different culture method	• Lecture • Demonstration • Video presentation	• Oral questioning • Written examination	4 hrs
		5. Discuss underwater structure/bottom formations	• Lecture • Demonstration • Video presentation	• Oral questioning • Written examination	2 hrs

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
		6. Explain farm structure, installation, and culture method	• Lecture • Demonstration • Video presentation	• Oral questioning • Written examination	4 hrs
		7. Explain inspection procedures of engine and boat	• Lecture • Demonstration	• Oral questioning • Written examination	2 hrs
		8. Identify different grazers of seaweed and its breeding season, and occurrence of epiphytes	• Lecture • Demonstration • Video presentation	• Oral questioning • Written examination	3 hrs
		9. Inspect and test engine and boat	• Lecture • Demonstration • Farm visit	• Oral questioning • Written examination	8 hrs
		10. Prepare farm tools and materials	• Lecture • Demonstration • Discussion	• Oral questioning • Written examination	4 hrs
		11. Conduct measurement activities for installation of farm structure	• Lecture • Demonstration • Video presentation	• Oral questioning • Written examination	4 hrs
		12. Install and set-up farm structure	• Lecture • Demonstration • Farm visit	• Oral questioning • Written examination	24 hrs

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
		13. Control grazers	• Lecture • Demonstration • Farm visit	• Oral questioning • Written examination • Demonstration	8 hrs
	2.3. Plant seaweed propagules	1. Identify seaweed species	• Lecture • Discussion • Video presentation	• Written exam • Oral question	**(Total -31 hrs)** 2 hrs
		2. Explain conditioning/acclimatization methods of seaweeds	• Lecture • Discussion	• Written exam •	2 hrs
		3. Differentiate healthy from unhealthy seaweeds through gross examination	• Lecture • Discussion • Video presentation	• Oral question • Written exam	2 hrs
		4. Explain acquisition of propagules relating to planting schedules	• Lecture • Discussion • Photo presentation	• Direct observation • Written exam	1 hr
		5. Explain different culture methods for planting seaweed	• Lecture • Discussion	• Written exam • Oral questioning	4 hrs
		6. Acquire healthy seaweed propagules	• Lecture • Discussion • Role playing	• Written exam • Oral questioning • Demonstration	4 hrs

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
		7. Acclimatize seaweed propagules	• Lecture • Discussion • Demonstration • Farm visit	• Written exam • Oral questioning • Demonstration	8 hrs
		8. Plant selected seaweed species	• Lecture • Discussion • Demonstration • Farm visit	• Written exam • Oral questioning • Demonstration	8 hrs
	2.4. Maintain seaweed farm	1. Explain procedures of water quality monitoring	• Lecture • Discussion	• Written exam • Oral questioning	**(Total -25 hrs)** 2 hrs
		2. Discuss the importance of patrolling to protect seaweed farm	• Lecture • Discussion	• Written exam • Oral questioning	1 hr
		3. Identify different foreign materials on farm structures and seaweeds	• Lecture • Discussion	• Written exam • Oral questioning	1 hr
		4. Discuss the procedures of removing foreign materials relating to GAqP	• Lecture • Discussion	• Written exam • Oral questioning	1 hr
		5. Monitor and compute growth rate (note: apply also to nursery)	• Lecture • Discussion • Demonstration • Farm visit	• Written exam • Oral questioning • Demonstration	8 hrs
		6. Monitor water quality using measuring instrument	• Lecture • Discussion • Demonstration	• Written exam • Oral questioning • Demonstration	2 hrs

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
		7. Protect seaweed farm through patrolling	• Lecture • Discussion • Demonstration	• Written exam • Oral questioning • Demonstration	2 hrs
		8. Remove and dispose foreign materials from farm structures and seaweeds	• Lecture • Discussion • Demonstration • Farm visit	• Written exam • Oral questioning • Demonstration	8 hrs
	2.5. Carry out seaweed health management	1. Know how the disease develops	• Lecture	• Oral questioning • Written examination	**(Total -8 hrs)** 1 hr
		2. Know the different diseases of seaweeds in farms	• Lecture	• Oral questioning • Written examination	1 hr
		3. Know the process of disease surveillance, monitoring, preventive and control measures; disease investigation process	• Lecture	• Oral questioning • Written examination	1 hr
		4. Identify and recognize environmental parameters (temperature, pH, salinity, turbidity, water quality, etc.) affecting seaweed health	• Lecture	• Oral questioning • Written examination	1 hr
		5. Identify the factors that disrupt the normal function of seaweeds	• Lecture	• Oral questioning • Written examination	1 hr

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
		6. Identify the seaweed species to be use for crop rotation; know the technological practices of crop rotation	• Lecture	• Oral questioning • Written examination	1 hr
		7. Know the water depth where seaweed can grow best; know when to apply water depth zoning	• Lecture	• Oral questioning • Written examination	1 hr
		8. Identify where and when is the right season to plant and to grow seaweeds best	• Lecture	• Oral questioning • Written examination	1 hr
	2.6. Harvest mature seaweed	1. Explain harvesting criteria, harvesting techniques and farming/culturing methods	• Lecture • Discussion	• Written exam • Oral questioning	**(Total -40 hrs)** 4 hrs
		2. Identify different harvesting tools and materials	• Lecture • Discussion • Photo presentation	• Written exam • Oral questioning	2 hrs
		3. Explain boat operation	• Lecture • Discussion	• Written exam • Oral questioning	1 hr
		4. Monitor seaweed harvesting criteria	• Lecture • Discussion • Demonstration • Farm visit	• Written exam • Oral questioning • Demonstration	8 hrs

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
		5. Make decision for harvesting operation to be conducted	• Lecture • Discussion • Video presentation	• Written exam • Oral questioning • Demonstration	1 hr
		6. Prepare tools, materials and equipment	• Lecture • Discussion • Demonstration • Farm visit	• Written exam • Oral questioning • Demonstration	8 hrs
		7. Operate boat	• Lecture • Discussion • Demonstration • Farm visit	• Written exam • Oral questioning • Demonstration	8 hrs
		8. Harvest mature seaweeds using harvesting techniques	• Lecture • Discussion • Demonstration • Farm visit	• Written exam • Oral questioning • Demonstration	8 hrs
	2.7. Complete seaweed grow-out operation	1. Discuss management of harvested seaweed	• Lecture • Discussion • Video presentation	• Written exam • Oral questioning	**(Total -35 hrs)** 4 hrs
		2. Know disposal of foreign material of seaweed following environmental regulations	• Lecture • Discussion • Video presentation	• Written exam • Oral questioning	2 hrs
		3. Identify different seaweed production data	• Lecture • Discussion	• Written exam • Oral questioning	2 hrs

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
		4. Explain procedures of labelling of seaweed sack	• Lecture • Discussion • Video presentation	• Written exam • Oral questioning	2 hrs
		5. Discuss handling of seaweed crops during transport	• Lecture • Discussion • Video presentation	• Written exam • Oral questioning	2 hrs
		6. Discuss cleaning and storing of tools, materials and equipment	• Lecture • Discussion	• Written exam • Oral questioning	1 hr
		7. Manage harvested seaweed	• Lecture • Discussion • Demonstration • Farm visit	• Written exam • Oral questioning • Demonstration	8 hrs
		8. Dispose collected foreign materials	• Lecture • Discussion • Demonstration • Video presentation	• Written exam • Oral questioning • Demonstration	1 hr
		9. Record seaweed production data	• Lecture • Discussion • Demonstration	• Written exam • Oral questioning • Demonstration	2 hrs
		10. Label pack seaweed	• Lecture • Discussion • Demonstration • Photo presentation	• Written exam • Oral questioning • Demonstration	1 hr

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
		11. Handle seaweed crops during transport	• Lecture • Discussion • Demonstration • Farm visit	• Written exam • Oral questioning • Demonstration	8 hrs
		12. Clean and store tools, materials and equipment with reference to HACCP, OSHS and 5S of Good Housekeeping	• Lecture • Discussion • Demonstration • Video presentation	• Written exam • Oral questioning • Demonstration	2 hrs
3. Produce raw dried seaweed	3.1. Dry the newly harvested seaweeds	1. Explain PNS-BAFPS 85-2010	• Lecture • Discussion	• Written exam • Oral questioning	**(Total -42 hrs)** 4 hrs
		2. Identify uses and functions of different tools, materials and equipment	• Lecture • Discussion • Video presentation	• Oral questioning • Written exam	2 hrs
		3. Describe the drying techniques	• Lecture • Discussion • Video presentation	• Oral questioning • Written exam	2 hrs
		4. Explain sampling procedure and principles of seaweed moisture content analysis	• Lecture • Discussion	• Oral questioning • Written exam	2 hrs
		5. Explain 5S (set in order, sort, shine, standardize, sustain) of good housekeeping	• Lecture • Discussion • Demonstration	• Oral questioning • Written exam • Observation	2 hrs

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
		6. Prepare tools, materials and equipment	• Lecture • Discussion • Demonstration	• Demonstration • Oral questioning • Written exam	2 hrs
		7. Install and set up drying structure	• Lecture • Demonstration • Video presentation	• Demonstration • Oral questioning	8 hrs
		8. Clean and dry seaweeds	• Lecture • Hands-on • Field visit	• Written exam • Demonstration • Oral questioning	8 hrs
		9. Collect seaweeds samples	• Hands-on • Field visit	• Written exam • Demonstration • Oral questioning	8 hrs
		10. Practice 5S	• Hands-on • Video presentation	• Written exam • Demonstration • Oral questioning	4 hrs
	3.2. Pack the dried seaweeds	1. Identify uses and functions of tools, materials and equipment	• Lecture • Discussion	• Oral questioning • Written exam	**(Total -10 hrs)** 2 hrs
		2. Identify and describe packing materials	• Lecture • Discussion	• Oral questioning	1 hr
		3. Select packing materials	• Lecture Demonstration	• Oral questioning • Demonstration	1 hr

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
		4. Describe good practices of sorting and packing	• Lecture • Practical demonstration • Discussion	• Oral questioning • Written exam	1 hr
		5. Explain labelling procedures	• Lecture • Discussion • Video presentation	• Written exam • Oral questioning	1 hr
		6. Calibrate the weighing scale	• Lecture • Discussion • Hands-on	• Oral questioning • Demonstration	0.5 hr
		7. Weigh and record weight of packed seaweeds	• Lecture • Discussion • Hands-on	• Written exam • Demonstration	1 hr
		8. Tie the sack	• Lecture • Practical demonstration • Discussion	• Direct observation	0.5 hr
		9. Label the sack	• Discussion • Lecture • Hands-on	• Written exam • Demonstration	0.5 hr
		10. Compute for the total weight	• Lecture • Demonstration • Discussion	• Written exam • Demonstration	0.5 hr
		11. Record the necessary information	• Lecture • Discussion	• Written exam	1 hr
	3.3. Store the dried seaweeds	1. Describe appropriate storage area	• Lecture • Video presentation	• Written exam • Oral questioning	**(Total -10 hrs)** 1 hr

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
		2. Explain systems of stacking/ piling	• Lecture • Demonstration • Discussion	• Written exam • Oral questioning	1 hr
		3. Explain monitoring procedures	• Lecture • Discussion	• Written exam • Oral questioning	1 hr
		4. Describe the characteristics of well-maintained storage area	• Lecture • Discussion	• Written exam • Oral questioning	1 hr
		5. Select storage area	• Lecture • Discussion	• Oral questioning	1 hr
		6. Stack/pile dried seaweeds	• Lecture • Video presentation • Demonstration	• Written exam • Demonstration • Oral questioning	2 hrs
		7. Maintain the storage area	• Lecture • Discussion • Demonstration	• Oral questioning • Demonstration	1 hr
		8. Monitor the seaweeds being stored	• Lecture • Discussion • Practical demonstration	• Oral questioning • Demonstration	1 hr
		9. Prepare record book	• Lecture • Discussion	• Written exam	1 hr
4. Market seaweed	4.1. Monitor prevailing seaweed price	1. Identify major producing and trading areas of seaweeds	• Lecture • Discussion	• Written exam • Oral questioning	**(Total -11 hrs)** 1 hr

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
		2. Identify seaweed industry stakeholders	• Lecture	• Written exam • Oral questioning	1 hr
		3. Identify information on seaweed industry	• Lecture • Video presentation • Literature search	• Written exam • Oral questioning	1.5 hrs
		4. Know supply and demand of seaweed in local and international market	• Lecture • Video presentation • Literature search	• Written exam • Oral questioning	1.5 hrs
		5. List of information and sharing of price bulletin (text, call, tv, e-mail, internet)	• Lecture • Video presentation • Literature search	• Written exam • Oral questioning	1 hr
		6. Identifies monitoring methods of price	• Lecture	• Written exam • Oral questioning	2 hrs
		7. Coordinate with farmers for seaweed information	• Discussion • Role playing	• Demonstration	2 hrs
		8. Monitor and record seaweed price	• Lecture • Hands-on	• Demonstration	1 hr
	4.2. Apply marketing strategies	1. Describes the seaweed PNS	• Lecture • Discussion	• Written and Oral exam	**(Total -18 hrs)** 8 hrs

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
		2. Identify the pricing factors	• Lecture • Discussion	• Written and Oral exam	4 hrs
		3. Choose marketing strategy using collected information.	• Lecture • Discussion	• Written exam • Interview	2 hrs
		4. Establish sales terms and conditions.	• Lecture • Hands-on	• Written exam • Demonstration	2 hrs
		5. Present selling points to buyers	• Lecture • Role playing	• Demonstration	2 hrs
	4.3. Trade seaweeds	1. Explain negotiation procedures	• Lecture • Discussion	• Written exam • Oral questioning	**(Total -18 hrs)** 2 hrs
		2. Identifies different delivery mode	• Lecture • Discussion	• Written exam • Oral questioning	0.5 hr
		3. Describes shipping terms and transport requirements	• Lecture • Discussion	• Written exam • Oral questioning	0.5 hr
		4. Select billing and collecting methods of payment	• Lecture • Discussion	• Written exam • Oral questioning	0.5 hr
		5. Compute for seaweeds yield/harvest, cash flow, inputs and output	• Lecture • Discussion	• Written exam • Oral questioning	0.5 hr
		6. Prepare seaweeds for selling	• Lecture • Discussion	• Demonstration • Oral questioning	2 hrs
		7. Negotiate with buyers	• Lecture • Role playing	• Demonstration • Oral questioning	4 hrs

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
		8. Handle and deliver seaweeds	• Demonstration • Video presentation Field visit	• Demonstration	4 hrs
		9. Operate banca	• Demonstration • Video presentation Field visit	• Demonstration	4 hrs

3.2 TRAINING DELIVERY

1. The delivery of training shall adhere to the design of the curriculum. Delivery shall be guided by the principles of competency-based TVET.

    a. Course design is based on competency standards set by the industry or recognized industry sector; (**Learning system is driven by competencies written to industry standards**)

    b. Training delivery is learner-centered and should accommodate individualized and self-paced learning strategies;

    c. Training can be done on an actual workplace setting, simulation of a workplace and/or through adoption of modern technology.

    d. Assessment is based in the collection of evidence of the performance of work to the industry required standards;

    e. Assessment of competency takes the trainee's knowledge and attitude into account but requires evidence of actual performance of the competency as the primary source of evidence.

    f. Training program allows for recognition of prior learning (RPL) or current competencies;

    g. Training completion is based on satisfactory completion of all specified competencies not on the specified nominal duration of learning.

2. The competency-based TVET system recognizes various types of delivery modes, both on-and off-the-job as long as the learning is driven by the competency standards specified by the industry. The following training modalities and their variations/components may be adopted singly or in combination with other modalities when designing and delivering training programs

2.1 School/Institution- Based:

- Dual Training System (DTS) / Dualized Training Program (DTP) which contain both in-school and in-industry training or fieldwork components.

- Supervised Industry Training (SLIT) or on-the-job training (OJT) is an approach in training designed to enhance the knowledge and skills of the trainee through actual experience in the workplace to acquire specific competencies as prescribed in the training regulations. It is imperative that the deployment of trainees in the workplace is adhered to training programs agreed by the institution and enterprise and status and progress of trainees are closely monitored by the training institutions to prevent opportunity for work exploitation.

- Project-based instruction is an authentic instructional model or strategy in which students plan, implement and evaluate projects that have real world applications.

2.2 Enterprise-Based:

- Formal Apprenticeship – Training within employment involving a contract between an apprentice and an enterprise on an approved apprenticeable occupation.

- Informal Apprenticeship - is based on a training (and working) agreement between an apprentice and a master craftsperson wherein the agreement may be written or oral and the master craftsperson commits to training the apprentice in all the skills relevant to his or her trade over a significant period of time, usually between one and four years, while the apprentice commits to contributing productively to the work of the business. Training is integrated into the production process and apprentices learn by working alongside the experienced craftsperson.

- Enterprise-based Training- where training is implemented within the company in accordance with the requirements of the specific company. Specific guidelines on this mode shall be issued by the TESDA Secretariat.

2.3 Community-Based – refers to a short program conducted or coordinated by NGOs, LGUs, training centers and other TVET providers which are intended to address the specific needs of a community. Such programs are usually conducted in informal settings such as barangay hall, basketball courts and other available venues in a community.

3.3 TRAINEE ENTRY REQUIREMENTS

Trainees or students wishing to enroll in this course should possess the following requirements:

- Able to read and write
- Able to communicate, both orally and in writing
- Able to perform simple computations
  *Have basic swimming skills

Note: * Options of training institutions

3.4 TOOLS AND EQUIPMENT

SEAWEED PRODUCTION NC II

List of tools, equipment and materials for the training of a maximum of 25 trainees for SEAWEED PRODUCTION NC II are as follows:

A. School equipment, tools and materials

1 unit Digital light projection
1 unit System unit (computer)
1 White board
1 set White board marker and eraser
1 unit Audio system
1 lot Internet connection
References

- Books
- Charts
- Slides
- Manuals
- Codes and regulations

B. Farm tools, equipment and materials

FULL QUALIFICATION

TOOLS		EQUIPMENT		MATERIALS	
QTY	**Description**	**QTY**	**Description**	**QTY**	**Description**
25 pcs	Knives	1	Refractometer (ppt)	1 roll	PE Rope #18(9mm) 200m/roll
13 pcs	stainless steel table knife	1	Thermometer	1 roll	PE Rope #16(8 mm)
		1	Depth gauge/ improvised measuring device	4 rolls	PE Rope #10 (5mm) 200m/roll
10 pcs	Basket (big)	1	Global Positioning System	5 rolls	PE rope #7
10 pairs	Swimming fins	1 unit	Moisture Analyzer	14 rolls	PE Rope #5 (2.5mm) 200m/roll
5 pcs	Bolo	1 pc	DDO Meter	3 rolls	Soft tie straw (600g)
		1 pc	PH meter (portable)	50 m	Straw (for tying)
5 pcs	Cross cut saw	1 unit	Weighing scale	1,500 kg	Seedlings/ Seaweed cuttings
2 pcs	Hand trowel	1 unit	Weighing scale (capacity 200 kg)	3 pcs	5x5m Canvass/ cover
		2 units	500 K capacity hanging weighing scale	5pcs	100pp Record book
2pcs	Shovel	2 sets	2-way radio	1 ream	Bond paper
1 pc	Hack saw	2 units	transistor radio	25 pcs	Pencil
4 pcs	Curve chisel 1"	2 units	Motorized Boat / Banca (Capacity of 10 passengers)	0.25 m3	Sand
4 pcs	Claw hammer	2 units	Non-motorized boat with katig (Capacity of 3 passengers)	0.25 m3	Gravel
1 pcs	Grinding stone	3 units	Engine (5-7 hp)	5 bags	Cement
10 pcs	Rushguard	3 units	Engine (Diesel)	1 bundle	Monofilament net
		1 pc	Cellphone	13 pcs	50 K capacity native baskets
3 pcs	Battery Flashlight	5	Dummy mobile phone	100 pcs	Empty sacks
3 pcs	rechargeable flashlight			20 pcs	Wooden stake 1m
2 pcs	Paddle			10 pcs	Bamboo (10 m)

TOOLS		EQUIPMENT		MATERIALS	
QTY	**Description**	**QTY**	**Description**	**QTY**	**Description**
10 pcs	Measuring tape			2 pcs	Steel bar (12 mm)
13 pairs	4” scissors			30 liters	Fuel
6 pcs	Paddle			2 liters	Lubricants
1 set	Ammonia and Nitrate test kit			10 pcs	Empty cans (20 Liters)
5 pcs.	Improvised Needle			2 kgs	Mono nylon # 200
5 units	calculator			4 pcs	Hard rock (medium)
5 sets	Cleaning tools			2000 pcs	Sticks (wooden) (2 inches dia. , 1mts. Length)
500 pcs	HDPE Floaters			100 pcs.	Full length Bamboo (raft method)
2pcs	20L Capacity Pails			1 roll	Polarex Screens
2pcs	Ordinary dippers			25 pcs.	Rattan Basket\Buri
12 pcs.	Fabricated Steel Anchors (Deep Sea)			10 pcs	Basket (big)
12 pcs.	Sinkers (Boulders)			3 pcs	5x5m canvass/ cover
20	Anchor			1 bail	Net (recycled)
				1 box	Pentelpen
				1 box	Ballpen
				2 packs	Garbage bag
				4 units	Wooden pallet (4 ft.x4 ft.)
				1 roll	Canvass
				25 pcs	Sampling bags
				5 pcs	Ledger
				1 set	White board marker
				1 pc	Eraser
				25 sets	PPEs * *gloves, goggles, face mask, snorkel, boots, paddle, flippers/swimming fins, hat, life vest and booties

NOTE: Access to and use of equipment /facilities can be provided through cooperative arrangements or MOA with other partner-farms/companies.

COC 1: OPERATE SEAWEED NURSERY

TOOLS		EQUIPMENT		MATERIALS	
QTY	**Description**	**QTY**	**Description**	**QTY**	**Description**
25 pcs	Knives	1	Refractometer (ppt)	1 roll	PE Rope #18(9mm) 200m/roll
13 pcs	stainless steel table knife	1 pc	Thermometer	4 rolls	PE Rope #10 (5mm) 200m/roll
10 pcs	Basket (big)	1unit	Depth gauge/ improvised measuring device	14 rolls	PE Rope #5 (2.5mm) 200m/roll
10 pairs	Swimming fins	1 unit	Global Positioning System	3 rolls	Soft tie straw (600g)
4 pcs	Ball Hammer	1unit	Motorized boat (Capacity of 15 passengers)	500 pcs	HDPE Floaters
5 pcs	Bolo	2units	Non-motorized boat with katig (Capacity of 10 passengers)	10 pcs	Bamboo (10 m)
5 pcs	Cross cut saw	1 unit	Weighing scale	1,500 kg	Seedlings
2 pcs	Hand trowel	2 units	500 K capacity hanging weighing scale	2pcs	Pails (20L capacity)
2pcs	Shovel	2 sets	2-way radio	2pcs	ordinary dippers
1 pc	Hack saw	2 units	Transistor radio	3 pcs	5x5m canvass/ cover
4 pcs	Curved chisel 1"			5pcs	100pp record book
4 pcs	Claw hammer			1 ream	Bond paper
1 pcs	Grinding stone			25 pcs	Pencil
10 pcs	Rushguard			0.25 m3	Sand
3 pcs	Battery Flashlight			0.25 m3	Gravel
3 pcs	rechargeable flashlight			5 bags	Cement
2 pcs	Paddle			1 bundle	Monofilament net
10 pcs	Measuring tape			13pcs	Native baskets (50 K capacity)

TOOLS		EQUIPMENT		MATERIALS	
QTY	Description	QTY	Description	QTY	Description
13 pairs	4” scissors			100 pcs	Empty sacks
				20 pcs	Wooden stake 1m
				2 pcs	Steel bar (12 mm)
				30 liters	Fuel
				2 liters	Lubricants
				10 pcs	Empty cans (20 Liters)
				2 kgs	Mono nylon # 200
				25 sets	PPEs * *gloves, goggles, face mask, snorkel, boots, paddle, flippers/swimming fins, hat, life vest and booties

COC 2 GROW-OUT SEAWEED

TOOLS		EQUIPMENT		MATERIALS	
QTY	Description	QTY	Description	QTY	Description
25 pcs	Knives	1 unit	Refractometer (ppt)	1 roll	PE Rope #18(9mm) 200m/roll
4 pcs	Ball Hammer	1 pc	Thermometer	4 rolls	PE Rope #10 (5mm) 200m/roll
5 pcs	Bolo	1 pc	DDO Meter	14 rolls	PE Rope #5 (2.5mm) 200m/roll
5 pcs	Cross cut saw	1 unit	Depth gauge/ improvised measuring device	1 roll	PE Rope #16(8 mm)
1 pcs	Grinding stone	1 unit	Global Positioning System	5 rolls	PE rope #7
2 pcs	hand trowel	1 pc	PH meter (portable)	20 mtrs.	PE Ropes #16(8mm)
2pcs	Shovel	3 units	Motorized/non-motorized Boat / Banca (Capacity of 10 passengers)	1roll	#10 (5mm) utility ropes
1 pc	Hack saw	3 units	Engine (5-7 hp)	50 mtrs.	Straw (for tying)

10 pcs	Rushguard	3 units	Engine (Diesel)	3 rolls	Soft tie straw (600g)
6 pcs	Paddle	1 pc	Cellphone	500 pcs	HDPE Floaters
4 pcs	Curve chisel 1"	2 units	500 K capacity hanging weighing scale	10 pcs	Bamboo (10 m)
4 pcs	Claw hammer	2units	3pax cap. non-motorized boat with katig	1,500 kg	Seedlings/ Seaweed cuttings
20 pcs	Anchor	2sets	2-way radio	1 ream	Bond paper
10 pcs	Measuring tape	2 units	transistor radio	25 pcs	Pencil
1 set	Ammonia and Nitrate test kit			5pcs	100pp record book
13 pcs	stainless steel table knife			0.25 m3	Sand
13 pairs	4” scissors			0.25 m3	Gravel
3 pcs	rechargeable flashlight			5 bags	Cement
3 pcs	battery flashlight			1 bundle	monofilament net
2pcs	20L Capacity Pails			100 pcs	Empty sacks
2pcs	ordinary dippers			20 pcs	Wooden stake 1m
				2 pcs	Steel bar (12 mm)
				30 liters	Fuel
				2 liters	Lubricants
				10 pcs	Empty cans (20 Liters)
				2 kgs	Mono nylon # 200
				4 pcs	Hard rock (medium)
				2000 pcs	Sticks (wooden)
					(2 inches dia. , 1mts. Length)
				100 pcs.	Full length Bamboo (raft method)
				1 roll	Polarex Screens

				12 pcs.	Fabricated Steel Anchors (Deep Sea)
				12 pcs.	Sinkers (Boulders)
				25 pcs.	Rattan Basket\Buri
				1 roll	Polarex Screens
				10 pcs	Basket (big)
				25pcs	clean sacks
				13pcs	50 K capacity native baskets
				3 pcs	5x5m canvass/ cover
				25 sets	PPEs * *gloves, goggles, face mask, snorkel, rubber boots, paddle, flippers, hat, life vest

COC 3 PRODUCE RAW DRIED SEAWEEDS

TOOLS		EQUIPMENT		MATERIALS	
QTY	**Description**	**QTY**	**Description**	**QTY**	**Description**
5 pairs	Scissor	1 unit	Moisture Analyzer	50 pcs	Sacks
5 pairs	Knife	1 unit	Weighing Scale (500 kilos capacity)	5 pcs	Rattan Basket (50 kgs. Capacity)
5 pcs.	Improvised Needle			1 pc	Canvass (5mx30m)
2 units	Calculator			1 bail	Net (recycled)
5 sets	Cleaning tools			1 roll	Soft tie Straw
				50 pcs	Sack
				1 box	Pentelpen
				5 pcs	Logbook
				1 box	Ballpen
				2 packs	Garbage bag
				4 units	Wooden pallet (4 ft.x4 ft.)
				1 roll	Canvass

COC 4 MARKET SEAWEED

TOOLS		EQUIPMENT		MATERIALS	
QTY	**Description**	**QTY**	**Description**	**QTY**	**Description**
5 units	Calculator	5 units	Dummy mobile phone	5 pcs	Ledger
		2 units	Motorized/non-motorized Boat / Banca (Capacity of 10 passengers)	25 pcs	Writing device
		2 sets	2 way-radio	25 pcs	Sampling bags
		2 units	Radio transistor	1 set	White board marker
		1 unit	Weighing scale (capacity 200 kg)	1 pc	Eraser

NOTE: Access to and use of equipment /facilities can be provided through cooperative arrangements or MOA with other partner-farms/companies.

3.5 TRAINING FACILITIES

Based on a class size of 25 students/trainees.

SPACE REQUIREMENT	SIZE IN METERS	AREA IN SQ. METERS	TOTAL AREA IN SQ. METERS	GRAND TOTAL AREA IN SQ. METERS
A. Building (permanent)				**98**
Lecture room	5x6		30	
Laboratory area	3x4		12	
Tool room & S/M storage area	4 x 4	16	16	
Learning resource area	5 x 6	30	30	
Wash area/comfort room (male & female)	2.5 x 4	10	10	
B. Experimental Farm Area				**3,850**
• Seaweed Farm			2,500	
• Nursery area (Seaweed nursery area)			1,250	
• Drying area	10x10		100	
Total workshop area				**3, 948**

NOTE: Access to and use of equipment /facilities can be provided through cooperative arrangements or MOA with other partner- farms/companies.

3.6 TRAINER'S QUALIFICATIONS FOR SEAWEED PRODUCTION NC II

- Must be a holder of National TVET Trainer Certificate (NTTC) level I in Seaweed Production NC II or holder of bachelor's degree relevant to the qualification (e.g. Marine Biology or Fisheries) with National Certificate on Trainer's Methodology I (TMI)
- At least two (2) years industry experience for the last five (5) years

3.7 INSTITUTIONAL ASSESSMENT

Institutional Assessment is undertaken by trainees in a structured learning program to determine their achievement of units of competencies. It is administered by the trainer/assessor at end of each learning module.

The result of the institutional assessment may be considered as evidence for the assessment for national certification.

As a matter of policy, graduates of programs registered with TESDA under these training regulations are required to undergo mandatory national competency assessment upon completion of the program.

SECTION 4 ASSESSMENT AND CERTIFICATION ARRANGEMENTS

Competency Assessment is the process of collecting evidence and making judgments whether competency has been achieved. The purpose of assessment is to confirm that an individual can perform to the standards expected at the workplace as expressed in relevant competency standards.

The assessment process is based on evidence or information gathered to prove achievement of competencies. The process may be applied to a full qualification or an employable unit(s) of competency in partial fulfillment of the requirements of the national qualification.

4.1 NATIONAL ASSESSMENT AND CERTIFICATION ARRANGEMENTS

4.1.1 The Full National Qualification of **SEAWEED PRODUCTION NC II** shall be acquired through the accumulation of Certificates of Competency in the following clusters/units of competencies:

COC 1 Operate seaweed nursery
COC 2 Grow-out seaweed
COC 3 Produce raw dried seaweed
COC 4 Market seaweed

4.1.2 Upon accumulation and submission of all the above COCs acquired, an individual shall be issued the corresponding National Certificate signed by the TESDA Director General. Certificates of Competency (COCs) shall be issued to candidates who have been assessed as competent in any of the above COCs (COC 1, COC 2, COC 3, COC 4).

4.1.3 Assessment shall focus on the core units of competency. The basic and common units shall be integrated or assessed concurrently with the core units.

4.1.4 Recognition of Prior Learning (RPL). Candidates who have gained competencies through education, informal training, work or life experiences may apply for recognition in a particular qualification through competency assessment.

4.1.5 The following are qualified to apply for assessment:

4.1.5.1. Graduating students/trainees of WTR-registered programs, graduates of NTR programs or graduates of formal/non-formal/informal including enterprise-based trainings related to seaweed production.

4.1.5.2. Industry workers in seaweed production.

4.1.6 Re-assessment shall focus only on the specific area/s where the candidate has not satisfactorily achieved the required level of competence AND must be undertaken within two (2) years during the period of validity of the Training Regulations.

4.1.7 A candidate who fails the assessment for two (2) consecutive times shall be advised to go through a refresher course before taking another assessment.

4.2 Competency Assessment Requisite

4.2.1 **Self-Assessment Guide**. The self-assessment guide (SAG) is accomplished by the candidate prior to actual competency assessment. SAG is a pre-assessment tool to help the candidate and the assessor determine what evidence is available, where gaps exist, including readiness for assessment.

This document can:

a) Identify the candidate's skills and knowledge
b) Highlight gaps in candidate's skills and knowledge
c) Provide critical guidance to the assessor and candidate on the evidence that need to be presented
d) Assist the candidate to identify key areas in which practice is needed or additional information or skills that should be gained prior

4.2.2 **Accredited Assessment Center.** Only Assessment Center accredited by TESDA is authorized to conduct competency assessment. Assessment centers undergo a quality assured procedure for accreditation before they are authorized by TESDA to manage the assessment for National Certification.

4.2.3 **Accredited Competency Assessor**. Only accredited competency assessor is authorized to conduct assessment of competence. Competency assessors undergo a quality assured system of accreditation procedure before they are authorized by TESDA to assess the competencies of candidates for National Certification.

4.2.3.1 Qualification of Competency Assessors

For Trainer-Assessor

- Holder of National TVET Trainer Certificate Level I (NTTC) on Seaweed Production NC II
- Have at least two (2) years relevant industry experience for the last five (5) years
- Have assisted in the actual conduct of assessment to at least two (2) candidates.

For Industry-Assessor

- Holder of National Certificate in Seaweed Production NC II
- Holder of Certificate of Competency (COC) in Conduct Competency Assessment under the Trainers Methodology Level I (TM I)
- Have at least two (2) years relevant industry experience for the last five (5) years
- Have assisted in the actual conduct of assessment to at least two (2) candidates.

COMPETENCY MAP FOR AGRICULTURE, FORESTRY AND FISHERY SECTOR
SEAWEED PRODUCTION NC II

ANNEX A

BASIC COMPETENCIES

Receive and respond to workplace communication	Work with others	Demonstrate work values	Practice housekeeping procedures (5S)	Participate in workplace communication	Work in team environment	Practice career professionalism	Practice occupational health and safety procedures	Lead workplace communication	Lead small teams
Develop and practice negotiation skills	Solve problems related to work activities	Use mathematical concepts and techniques	Use relevant technologies	Utilize specialized communication skills	Develop teams and individuals	Apply problem-solving techniques in the workplace	Plan and organize work	Collect analyze and organize information	

COMMON COMPETENCIES

Apply safely measures in farm operation	Use farm tools and equipment	Perform estimation and basic calculation

CORE COMPETENCIES

Produce Vegetables	Service and Repair Business Machines	Perform Post Harvest Operations of Major Lowland and Semi Temperate Vegetables Crops	Operate and Maintain Mechanical Grain Dryer	Test & Analyze Physico-Chemical Properties of Foods, Agri Products, Water & Wastewater	Raise Small Ruminants	Service Tractor's Rear Axle, Front Axle & Brake System	Service Tractor's Hydraulic System	Profile the Market	Produce Fruit Bearing Crops
Perform Landscaping Activities	Perform Post Harvest Operations of Major Tropical Fruits	Perform On Farm Grain Post Harvest	Test & Analyze Microbiological Properties of Foods, Agri Products, Water & Wastewater	Service, Repair & Maintain Crop Post Harvest Equipment	Service Tractor's Clutch & Transmission System	Operate Tilapia Hatchery	Develop Marketing Plan	Produce Cut Flowers	Operate Seaweed Nursery
Grade and Classify Grain	Control Pest of Stored Grains and Products	Service, Repair & Maintain Crop Production	Assess Farm Resources	Service, Repair & Maintain Small Diesel Engines	Operate Fish Nursery	Produce Grain Crops	Raise Poultry	Produce Biogas Byproducts	Analyze Foods and Agricultural products

Raise large Ruminants	Service Tractor's Electrical System	Service Tractor's Steering System	Perform Fish or Shrimp Grow Out Operations	Promote Products & Services	Raise swine	Operate and Maintain Rice Mill Equipment	Assist in Aquaculture Operations	Service, Repair & Maintain Small Gasoline Engines	Service Tractor's Electrical System
Produce Fuel Byproducts	Prepare and Maintain Aquaculture Facilities	Market Agri Products	Manage Farm	Assist in Horticulture Operations	Grow-out Seaweed	Operate catfish Hatchery	Produce Compost	Produce Handpaper	Produce raw dried seaweed
Market seaweed									

GLOSSARY OF TERMS

AGAR	a gelatinous substance derived from a polysaccharide that accumulates in the cell walls of agarophyte red algae. Used as an ingredient in desserts throughout Asia and also as a solid substrate to contain culture medium for microbiological work
AQUACULTURE	regulation and cultivation of water plants and animals for human use or consumption
BIENNIAL	having a period of 2 years, or a lasting or living for 2 years
BIFURCATE	having two branches or peaks; forked
BRACKISH	somewhat salty, as the water of some marshes near the sea
CALCAREOUS	of, like, or containing calcium carbonate, calcium, or lime
DESSICATION	becoming completely dried out
EURYHALINE	species which can tolerate a wide range of salinity
FILAMENTOUS **GALACTANS**	slender and threadlike a class of polysaccharides which includes agar and carrageenan
INFRALITTORAL	the region of shallow water closest to the shore; in marine environments, usually excluding the intertidal zone; seaweeds here might only be exposed at the lowest tides
INFLORESCENCE	a group or cluster of flowers arranged on a stem that is composed of a main branch or a complicated arrangement of branches
OFF-BOTTOM FARMING	stake-and-line method, usually used for *Spinosum* and done on tidal flats.
PREDATION	feeding on other animals
SALINITY	level of salt in water
THALLUS	the nonvascular plant body of a thallophyte, showing no clear distinction of holdfast, stipe, or blade

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