COMPETENCY STANDARDS

MANGO PRODUCTION

LEVEL II

AGRICULTURE, FORESTRY AND FISHERY SECTOR

TECHNICAL EDUCATION AND SKILLS DEVELOPMENT AUTHORITY
East Service Road, South Luzon Expressway (SLEX), Fort Bonifacio, Taguig City

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 skill 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 Competency Standards (CS) serve as basis for the:

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

Each CS has 3 sections:

Section 1   **Definition of Competency Standards** - refers to the group of competencies that describes the different functions of the qualification.

Section 2   **The Competency Standards** - gives the specifications of competencies required for effective work performance.

Section 3   **Training Arrangements** - contains information and requirements in designing training program for competency standards. It includes trainee entry requirements, trainer's qualification and list of tools, materials and equipment.

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COMPETENCY STANDARDS FOR
MANGO PRODUCTION LEVEL II

Section 1   COMPETENCY STANDARDS DESCRIPTION

MANGO PRODUCTION LEVEL II COMPETENCY STANDARDS

The **MANGO PRODUCTION LEVEL II** consists of competencies that a person must achieve to produce mango which include performing mango nursery operations, planting mango, caring and maintaining of mango orchard and carrying-out harvest and postharvest operations.

The unit of competency comprising this competency standards includes the following:

Code	BASIC COMPETENCIES
400311210	Participate in workplace communication
400311211	Work in team environment
400311212	Solve/address general workplace problems
400311213	Develop career and life decisions
400311214	Contribute to workplace innovation
400311215	Present relevant information
400311216	Practice occupational safety and health policies and procedures
400311217	Exercise efficient and effective sustainable practices in the workplace
400311218	Practice entrepreneurial skills in the workplace

Code	COMMON COMPETENCIES
AFF 321201	Apply safety measures in farm operations
AFF 321202	Use farm tools and equipment
AFF 321203	Perform estimation and calculations
AFF 321206	Process farm wastes
SOC 413206	Perform record keeping

Code	CORE COMPETENCIES
AFF XXXX	Perform mango nursery operations
AFF XXXX	Plant mango
AFF XXXX	Care and maintain mango orchard
AFF XXXX	Carry-out harvest and postharvest operations

A person who has achieved this Competency Standards is competent to be:

- Mango Grower
- Mango Farmer
- Mango Nursery Operator

SECTION 2 **COMPETENCY STANDARDS**

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

BASIC COMPETENCIES

UNIT OF COMPETENCY : PARTICIPATE IN WORKPLACE COMMUNICATION

UNIT CODE : **400311210**

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 AND ATTITUDE	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 verbal and nonverbal communication 1.2 Different modes of communication 1.3 Medium of communication in the workplace 1.4 Organizational policies 1.5 Communication procedures and systems 1.6 Lines of Communication 1.7 Technology relevant to the enterprise and the individual's work responsibilities 1.8 Workplace etiquette	1.1 Following simple spoken language 1.2 Performing routine workplace duties following simple written notices 1.3 Participating in workplace meetings and discussions 1.4 Preparing work-related documents 1.5 Estimating, calculating and recording routine workplace measures 1.6 Relating/ Interacting with people of various levels in the workplace 1.7 Gathering and providing basic information in response to workplace requirements

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE AND ATTITUDE	REQUIRED SKILLS
			1.8 Basic business writing skills
			1.9 Interpersonal skills in the workplace
			1.10 Active-listening skills
2. Perform duties following workplace instructions	2.1 Written notices and instructions are read and interpreted in accordance with organizational guidelines	2.1 Effective verbal and non-verbal communication	2.1 Following simple spoken instructions
	2.2 Routine written instruction are followed based on established procedures	2.2 Different modes of communication	2.2 Performing routine workplace duties following simple written notices
	2.3 Feedback is given to workplace supervisor based instructions/ information received	2.3 Medium of communication in the workplace	2.3 Participating in workplace meetings and discussions
	2.4 **Workplace interactions** are conducted in a courteous manner	2.4 Organizational/ Workplace policies	2.4 Completing work-related documents
	2.5 Where necessary, clarifications about routine workplace procedures and matters concerning conditions of employment are sought and asked from **appropriate sources**	2.5 Communication procedures and systems	2.5 Estimating, calculating and recording routine workplace measures
	2.6 Meetings outcomes are interpreted and implemented	2.6 Lines of communication	2.6 Relating/ Responding to people of various levels in the workplace
		2.7 Technology relevant to the enterprise and the individual's work responsibilities	2.7 Gathering and providing information in response to workplace requirements
		2.8 Effective questioning techniques (clarifying and probing)	2.8 Basic questioning/querying
		2.9 Workplace etiquette	2.9 Skills in reading for information
			2.10 Skills in locating

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE AND ATTITUDE	REQUIRED SKILLS
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 Errors in recording information on forms/ documents are identified and acted upon 3.4 Reporting requirements to supervisor are completed according to organizational guidelines	3.1 Effective verbal and non-verbal communication 3.2 Different modes of communication 3.3 Workplace forms and documents 3.4 Organizational/ Workplace policies 3.5 Communication procedures and systems 3.6 Technology relevant to the enterprise and the individual's work responsibilities	3.1 Completing work-related documents 3.2 Applying operations of addition, subtraction, division and multiplication 3.3 Gathering and providing information in response to workplace requirements 3.4 Effective record keeping skills

RANGE OF VARIABLES

VARIABLES	RANGE
1. Appropriate sources	May include: 1.1. Team members 1.2. Supervisor/Department Head 1.3. Suppliers 1.4. Trade personnel 1.5. Local government 1.6. Industry bodies
2. Medium	May include: 2.1. Memorandum 2.2. Circular 2.3. Notice 2.4. Information dissemination 2.5. Follow-up or verbal instructions 2.6. Face-to-face communication 2.7. Electronic media (disk files, cyberspace)
3. Storage	May include: 3.1. Manual filing system 3.2. Computer-based filing system
4. Workplace interactions	May include: 4.1. Face-to-face 4.2. Telephone 4.3. Electronic and two-way radio 4.4. Written including electronic means, memos, instruction and forms 4.5. Non-verbal including gestures, signals, signs and diagrams
5. Forms	May include: 5.1. HR/Personnel forms, telephone message forms, safety reports

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 workplace communication equipment/systems 1.3 Made use of relevant terms as an aid to transfer information effectively 1.4 Conveyed information effectively adopting formal or informal communication
2. Resource Implications	**The following resources should be provided:** 2.1 Fax machine 2.2 Telephone 2.3 Notebook 2.4 Writing materials 2.5 Computer with Internet connection
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Demonstration with oral questioning 3.2 Interview 3.3 Written test 3.4 Third-party report
4. Context for Assessment	4.1. Competency may be assessed individually in the actual workplace or through an accredited institution

UNIT OF COMPETENCY   :   WORK IN A TEAM ENVIRONMENT

UNIT CODE   :   400311211

UNIT DESCRIPTOR   :   This unit covers the skills, knowledge and attitudes to identify one's roles and responsibilities as a member of a team.

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE AND ATTITUDE	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 Group structure 1.2 Group development 1.3 Sources of information	1.1 Communicating with others, appropriately consistent with the culture of the workplace 1.2 Developing ways in improving work structure and performing respective roles in the group or organization
2. Identify one's role and responsibility within a team	2.1 Individual roles and responsibilities within the team environment are identified 2.2 Roles and objectives of the team is identified from available *sources of information* 2.3 Team parameters, reporting relationships and responsibilities are identified based on team discussions and appropriate external sources	2.1 Team roles and objectives 2.2 Team structure and parameters 2.3 Team development 2.4 Sources of information	2.1 Communicating with others, appropriately consistent with the culture of the workplace 2.2 Developing ways in improving work structure and performing respective roles in the group or organization
3. Work as a team member	3.1 Effective and appropriate forms of communications are used and interactions undertaken with team members based on company practices. 3.2 Effective and appropriate contributions made to	3.1 Communication Process 3.2 Workplace communication protocol 3.3 Team planning and decision making 3.4 Team thinking	3.1 Communicating appropriately, consistent with the culture of the workplace 3.2 Interacting effectively with others 3.3 Deciding as an individual and as

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE AND ATTITUDE	REQUIRED SKILLS
	complement team activities and objectives, based on **workplace context** 3.3 Protocols in reporting are observed based on standard company practices. 3.4 Contribute to the development of team work plans based on an understanding of team's role and objectives	3.5 Team roles 3.6 Process of team development 3.7 Workplace context	a group using group think strategies and techniques 3.4 Contributing to Resolution of issues and concerns

RANGE OF VARIABLES

VARIABLE	RANGE
1. Role and objective of team	May include but not limited to: 1.1. Work activities in a team environment with enterprise or specific sector 1.2. Limited discretion, initiative and judgement maybe demonstrated on the job, either individually or in a team environment
2. Sources of information	May include but not limited to: 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 but not limited to: 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 Worked 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
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 Role play involving the participation of individual member to the attainment of organizational goal 3.2 Case studies and scenarios as a basis for discussion of issues and strategies in teamwork 3.3 Socio-drama and socio-metric methods 3.4 Sensitivity techniques 3.5 Written Test
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 **:** **SOLVE/ADDRESS GENERAL WORKPLACE PROBLEMS**

UNIT COD **:** **400311212**

UNIT DESCRIPTOR **:** This unit covers the knowledge, skills and attitudes required to apply problem-solving techniques to determine the origin of problems and plan for their resolution. It also includes addressing procedural problems through documentation, and referral.

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE AND ATTITUDE	REQUIRED SKILLS
1. Identify routine problems	1.1 Routine **problems or procedural problem** areas are identified 1.2 Problems to be investigated are defined and determined 1.3 Current conditions of the problem are identified and documented	1.1 Current industry hardware and software products and services 1.2 Industry maintenance, service and helpdesk practices, processes and procedures 1.3 Industry standard diagnostic tools 1.4 Malfunctions and resolutions	1.1 Identifying current industry hardware and software products and services 1.2 Identifying current industry maintenance, services and helpdesk practices, processes and procedures. 1.3 Identifying current industry standard diagnostic tools 1.4 Describing common malfunctions and resolutions. 1.5 Determining the root cause of a routine malfunction

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE AND ATTITUDE	REQUIRED SKILLS
2. Look for solutions to routine problems	2.1 Potential solutions to problem are identified 2.2 Recommendations about possible solutions are developed, **documented**, ranked and presented to *appropriate person* for decision	2.1 Current industry hardware and software products and services 2.2 Industry service and helpdesk practices, processes and procedures 2.3 Operating systems 2.4 Industry standard diagnostic tools 2.5 Malfunctions and resolutions. 2.6 Root cause analysis	2.1 Identifying current industry hardware and software products and services 2.2 Identifying services and helpdesk practices, processes and procedures. 2.3 Identifying operating system 2.4 Identifying current industry standard diagnostic tools 2.5 Describing common malfunctions and resolutions. 2.6 Determining the root cause of a routine malfunction
3. Recommend solutions to problems	3.1 Implementation of solutions are *planned* 3.2 Evaluation of implemented solutions are planned 3.3 Recommended solutions are documented and submit to appropriate person for confirmation	3.1 Standard procedures 3.2 Documentation produce	3.1 Producing documentation that recommends solutions to problems 3.2 Following established procedures

RANGE OF VARIABLES

VARIABLE	RANGE
1. Problems/Procedural Problem	May include but not limited to: 1.1 Routine/non – routine processes and quality problems 1.2 Equipment selection, availability and failure 1.3 Teamwork and work allocation problem 1.4 Safety and emergency situations and incidents 1.5 Work-related problems outside of own work area
2. Appropriate person	May include but not limited to: 2.1 Supervisor or manager 2.2 Peers/work colleagues 2.3 Other members of the organization
3. Document	May include but not limited to: 3.1 Electronic mail 3.2 Briefing notes 3.3 Written report 3.4 Evaluation report
4. Plan	May include but not limited to: 4.1 Priority requirements 4.2 Co-ordination and feedback requirements 4.3 Safety requirements 4.4 Risk assessment 4.5 Environmental requirements

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Determined the root cause of a routine problem 1.2 Identified solutions to procedural problems. 1.3 Produced documentation that recommends solutions to problems. 1.4 Followed established procedures. 1.5 Referred unresolved problems to support persons.
2. Resource Implications	2.1. Assessment will require access to a workplace over an extended period, or a suitable method of gathering evidence of operating ability over a range of situations.
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Case Formulation 3.2 Life Narrative Inquiry 3.3 Standardized test The unit will be assessed in a holistic manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual workplace and will include walk through of the relevant competency components.
4. Context for Assessment	4.1 Competency may be assessed individually in the actual workplace or simulation environment in TESDA accredited institutions.

UNIT OF COMPETENCY :   DEVELOP CAREER AND LIFE DECISIONS

UNIT CODE   :   400311213

UNIT DESCRIPTOR   :   This unit covers the knowledge, skills, and attitudes in managing one's emotions, developing reflective practice, and boosting self-confidence and developing self-regulation.

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE AND ATTITUDE	REQUIRED SKILLS
1. Manage one's emotion	1.1 ***Self-management strategies*** are identified 1.2 Skills to work independently and to show initiative, to be conscientious, and persevering in the face of setbacks and frustrations are developed 1.3 Techniques for effectively handling negative emotions and ***unpleasant situation*** in the workplace are examined	1.1 Self-management strategies that assist in regulating behavior and achieving personal and learning goals (e.g. Nine self-management strategies according to Robert Kelley) 1.2 Enablers and barriers in achieving personal and career goals 1.3 Techniques in handling negative emotions and unpleasant situation in the workplace such as frustration, anger, worry, anxiety, etc.	1.1 Managing properly one's emotions and recognizing situations that cannot be changed and accept them and remain professional 1.2 Developing self-discipline, working independently and showing initiative to achieve personal and career goals 1.3 Showing confidence, and resilience in the face of setbacks and frustrations and other negative emotions and unpleasant situations in the workplace
2. Develop reflective practice	2.1 Personal strengths and achievements, based on self-assessment strategies and teacher feedback are contemplated 2.2 Progress when seeking and responding to feedback from	2.1 Basic SWOT analysis 2.2 Strategies to improve one's attitude in the workplace 2.3 Gibbs' Reflective Cycle/Model (Description, Feelings, Evaluation,	2.1 Using the basic SWOT analysis as self-assessment strategy 2.2 Developing reflective practice through realization of limitations, likes/ dislikes; through

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE AND ATTITUDE	REQUIRED SKILLS
	teachers to assist them in consolidating strengths, addressing weaknesses and fulfilling their potential are monitored 2.3 Outcomes of personal and academic challenges by reflecting on previous problem solving and decision making strategies and feedback from peers and teachers are predicted	Analysis, Conclusion, and Action plan)	showing of self-confidence 2.3 Demonstrating self-acceptance and being able to accept challenges
3. Boost self-confidence and develop self-regulation	3.1 Efforts for continuous self-improvement are demonstrated 3.2 Counter-productive tendencies at work are eliminated 3.3 Positive outlook in life are maintained.	3.1 Four components of self-regulation based on Self-Regulation Theory (SRT) 3.2 Personality development concepts 3.3 Self-help concepts (e. g., 7 Habits by Stephen Covey, transactional analysis, psycho-spiritual concepts)	3.1 Performing effective communication skills – reading, writing, conversing skills 3.2 Showing affective skills – flexibility, adaptability, etc. 3.3 Self-assessment for determining one's strengths and weaknesses

RANGE OF VARIABLES

VARIABLE	RANGE
1. Self-management strategies	**May include but not limited to:** 1.1 Seeking assistance in the form of job coaching or mentoring 1.2 Continuing dialogue to tackle workplace grievances 1.3 Collective negotiation/bargaining for better working conditions 1.4 Share your goals to improve with a trusted co-worker or supervisor 1.5 Make a negativity log of every instance when you catch yourself complaining to others 1.6 Make lists and schedules for necessary activities
2. Unpleasant situation	**May include but not limited to:** 2.1 Job burn-out 2.2 Drug dependence 2.3 Sulking

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Express emotions appropriately 1.2 Work independently and show initiative 1.3 Consistently demonstrate self-confidence and self-discipline
2. Resource Implications	**The following resources should be provided:** 2.1. Access to workplace and resource s 2.2. Case studies
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1. Demonstration or simulation with oral questioning 3.2. Case problems involving work improvement and sustainability issues 3.3. Third-party report
4. Context for Assessment	4.1. Competency assessment may occur in workplace or any appropriately simulated environment

UNIT OF COMPETENCY : **CONTRIBUTE TO WORKPLACE INNOVATION**

UNIT CODE : **400311214**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to make a pro-active and positive contribution to workplace innovation.

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify opportunities to do things better.	1.1 **Opportunities for improvement** are identified proactively in own area of work. 1.2 **Information** are gathered and reviewed which may be relevant to ideas and which might assist in gaining support for idea.	1.1 Roles of individuals in suggesting and making improvements. 1.2 Positive impacts and challenges in innovation. 1.3 Types of changes and responsibility. 1.4 Seven habits of highly effective people.	1.1 Identifying opportunities to improve and to do things better. Involvement. 1.2 Identifying the positive impacts and the challenges of change and innovation. 1.3 Identifying examples of the types of changes that are within and outside own scope of responsibility
2. Discuss and develop ideas with others	2.1 **People who could provide input** to ideas for improvements are identified. 2.2 Ways of approaching people to begin sharing ideas are selected. 2.3 Meeting is set with relevant people. 2.4 Ideas for follow up are review and selected based on feedback. 2.5 **Critical inquiry method** is used to discuss and develop ideas with others.	2.1 Roles of individuals in suggesting and making improvements. 2.2 Positive impacts and challenges in innovation. 2.3 Types of changes and responsibility. 2.4 Seven habits of highly effective people.	2.1 Identifying opportunities to improve and to do things better. Involvement. 2.2 Identifying the positive impacts and the challenges of change and innovation. 2.3 Providing examples of the types of changes that are within and outside own scope of responsibility 2.4 Communicating ideas for change through small group discussions and meetings.

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Integrate ideas for change in the workplace	3.1 Critical inquiry method is used to integrate different ideas for change of key people. 3.2 Summarizing, analyzing and generalizing skills are used to extract salient points in the pool of ideas. 3.3 **Reporting skills** are likewise used to communicate results. 3.4 **Current Issues and concerns** on the systems, processes and procedures, as well as the need for simple innovative practices are identified.	3.1 Roles of individuals in suggesting and making improvements. 3.2 Positive impacts and challenges in innovation. 3.3 Types of changes and responsibility. 3.4 Seven habits of highly effective people. 3.5 Basic research skills.	3.1 Identifying opportunities to improve and to do things better. Involvement. 3.2 Identifying the positive impacts and the challenges of change and innovation. 3.3 Providing examples of the types of changes that are within and outside own scope of responsibility. 3.4 Communicating ideas for change through small group discussions and meetings. 3.5 Demonstrating skills in analysis and interpretation of data.

RANGE OF VARIABLES

VARIABLES	RANGE
1. Opportunities for improvement	May include: 1.1 Systems. 1.2 Processes. 1.3 Procedures. 1.4 Protocols. 1.5 Codes. 1.6 Practices.
2. Information	May include: 2.1 Workplace communication problems. 2.2 Performance evaluation results. 2.3 Team dynamics issues and concerns. 2.4 Challenges on return of investment 2.5 New tools, processes and procedures. 2.6 New people in the organization.
3. People who could provide input	May include: 3.1 Leaders. 3.2 Managers. 3.3 Specialists. 3.4 Associates. 3.5 Researchers. 3.6 Supervisors. 3.7 Staff. 3.8 Consultants (external) 3.9 People outside the organization in the same field or similar expertise/industry. 3.10 Clients
4. Critical inquiry method	May include: 4.1 Preparation. 4.2 Discussion. 4.3 Clarification of goals. 4.4 Negotiate towards a Win-Win outcome. 4.5 Agreement. 4.6 Implementation of a course of action. 4.7 Effective verbal communication. See our pages: Verbal Communication and Effective Speaking. 4.8 Listening. 4.9 Reducing misunderstandings is a key part of effective negotiation. 4.10 Rapport Building. 4.11 Problem Solving. 4.12 Decision Making. 4.13 Assertiveness. 4.14 Dealing with Difficult Situations.

VARIABLES	RANGE
5. Reporting skills	May include: 5.1 Data management. 5.2 Coding. 5.3 Data analysis and interpretation. 5.4 Coherent writing. 5.5 Speaking.

EVIDENCE GUIDE

1.	Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1 Identified opportunities to do things better. 1.2 Discussed and developed ideas with others on how to contribute to workplace innovation. 1.3 Integrated ideas for change in the workplace. 1.4 Analyzed and reported rooms for innovation and learning in the workplace.
2.	Resource Implications	The following resources should be provided: 2.1 Pens, papers and writing implements. 2.2 Cartolina. 2.3 Manila papers.
3.	Methods of Assessment	Competency in this unit may be assessed through: 3.1 Psychological and behavioral Interviews. 3.2 Performance Evaluation. 3.3 Life Narrative Inquiry. 3.4 Review of portfolios of evidence and third-party workplace reports of on-the-job performance. 3.5 Sensitivity analysis. 3.6 Organizational analysis. 3.7 Standardized assessment of character strengths and virtues applied.
4.	Context for Assessment	4.1 Competency may be assessed individually in the actual workplace or simulation environment in TESDA accredited institutions.

UNIT OF COMPETENCY : **PRESENT RELEVANT INFORMATION**

UNIT CODE : **400311215**

UNIT DESCRIPTOR : This unit of covers the knowledge, skills and attitudes required to present data/information appropriately.

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Gather data/ information	1.1 Evidence, facts and information are collected 1.2 Evaluation, terms of reference and conditions are reviewed to determine whether data/information falls within project scope	1.1 Organisational protocols 1.2 Confidentiality 1.3 Accuracy 1.4 Business mathematics and statistics 1.5 Data analysis techniques/proced ures 1.6 Reporting requirements to a range of audiences 1.7 Legislation, policy and procedures relating to the conduct of evaluations 1.8 Organisational values, ethics and codes of conduct	1.1 Describing organisational protocols relating to client liaison 1.2 Protecting confidentiality 1.3 Describing accuracy 1.4 Computing business mathematics and statistics 1.5 Describing data analysis techniques/ procedures 1.6 Reporting requirements to a range of audiences 1.7 Stating legislation, policy and procedures relating to the conduct of evaluations 1.8 Stating organisational values, ethics and codes of conduct

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Assess gathered data/ information	2.1 Validity of data/ information is assessed 2.2 Analysis techniques are applied to assess data/ information. 2.3 Trends and anomalies are identified 2.4 ***Data analysis techniques*** and procedures are documented 2.5 Recommendations are made on areas of possible improvement.	2.1 Business mathematics and statistics 2.2 Data analysis techniques/ procedures 2.3 Reporting requirements to a range of audiences 2.4 Legislation, policy and procedures relating to the conduct of evaluations 2.5 Organisational values, ethics and codes of conduct	2.1 Computing business mathematics and statistics 2.2 Describing data analysis techniques/ procedures 2.3 Reporting requirements to a range of audiences 2.4 Stating legislation, policy and procedures relating to the conduct of evaluations 2.5 Stating organisational values, ethics and codes of conduct
3. Record and present information	3.1 Studied data/information are recorded. 3.2 Recommendations are analysed for action to ensure they are compatible with the project's scope and terms of reference. 3.3 Interim and final reports are analysed and outcomes are compared to the criteria established at the outset. 3.4 Findings are presented to stakeholders.	3.1 Data analysis techniques/ procedures 3.2 Reporting requirements to a range of audiences 3.3 Legislation, policy and procedures relating to the conduct of evaluations 3.4 Organisational values, ethics and codes of conduct	3.1 Describing data analysis techniques/ procedures 3.2 Reporting requirements to a range of audiences 3.3 Stating legislation, policy and procedures relating to the conduct of evaluations 3.4 Stating organisational values, ethics and codes of conduct practices

RANGE OF VARIABLES

VARIABLES	RANGE
1. Data analysis techniques	May include but not limited to: 1.1. Domain analysis 1.2. Content analysis 1.3. Comparison technique

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Determine data / information 1.2 Studied and applied gathered data/information 1.3 Recorded and studied studied data/information These aspects may be best assessed using a range of scenarios what ifs as a stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations that may have happened.	
2. Resource Implications	**Specific resources for assessment** 2.1 Evidence of competent performance should be obtained by observing an individual in an information management role within the workplace or operational or simulated environment.	
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Written Test 3.2 Interview 3.3 Portfolio The unit will be assessed in a holistic manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual workplace and will include walk through of the relevant competency components.	
4. Context for Assessment	4.1 In all workplace, it may be appropriate to assess this unit concurrently with relevant teamwork or operation units.	

UNIT OF COMPETENCY : PRACTICE OCCUPATIONAL SAFETY AND HEALTH POLICIES AND PROCEDURES

UNIT CODE   **: 400311216**

UNIT DESCRIPTOR   : This unit covers the knowledge, skills and attitudes required to identify OSH compliance requirements, prepare OSH requirements for compliance, perform tasks in accordance with relevant OSH policies and procedures

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify OSH compliance requirements	1.1 Relevant ***OSH requirements, regulations, policies and procedures*** are identified in accordance with workplace policies and procedures 1.2 OSH activity non-conformities are conveyed to ***appropriate personnel*** 1.3 ***OSH preventive and control requirements*** are identified in accordance with OSH work policies and procedures	1.1. OSH preventive and control requirements 1.2. Hierarchy of Controls 1.3. Hazard Prevention and Control 1.4. General OSH principles 1.5. Work standards and procedures 1.6. Safe handling procedures of tools, equipment and materials 1.7. Standard emergency plan and procedures in the workplace	1.1. Communication skills 1.2. Interpersonal skills 1.3. Critical thinking skills 1.4. Observation skills
2. Prepare OSH requirements for compliance	2.1 OSH work activity material, tools and equipment requirements are identified in accordance with workplace policies and procedures 2.2. Required OSH materials, tools and equipment are acquired in accordance with	2.1. Resources necessary to execute hierarchy of controls 2.2. General OSH principles 2.3. Work standards and procedures 2.4. Safe handling procedures of tools, equipment and materials 2.5. Different OSH control measures	2.1. Communication skills 2.2. Estimation skills 2.3. Interpersonal skills 2.4. Critical thinking skills 2.5. Observation skills 2.6. Material, tool and equipment identification skills

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	workplace policies and procedures 2.3. Required OSH materials, tools and equipment are arranged/ placed in accordance with OSH work standards		
3. Perform tasks in accordance with relevant OSH policies and procedures	3.1 Relevant OSH work procedures are identified in accordance with workplace policies and procedures 3.2 Work Activities are executed in accordance with OSH work standards 3.3 **Non-compliance work activities** are reported to *appropriate personnel*	3.1. OSH work standards 3.2. Industry related work activities 3.3. General OSH principles 3.4. OSH Violations Non-compliance work activities	3.1 Communication skills 3.3 Interpersonal skills 3.4 Troubleshooting skills 3.5 Critical thinking skills 3.6 Observation skills

RANGE OF VARIABLES

VARIABLE	RANGE
1. OSH Requirements, Regulations, Policies and Procedures	May include: 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 Permit to Operate 1.6 Philippine Occupational Safety and Health Standards 1.7 Department Order No. 13 (Construction Safety and Health) 1.8 ECC regulations
2. Appropriate Personnel	May include: 2.1 Manager 2.2 Safety Officer 2.3 EHS Offices 2.4 Supervisors 2.5 Team Leaders 2.6 Administrators 2.7 Stakeholders 2.8 Government Official 2.9 Key Personnel 2.10 Specialists 2.11 Himself
3. OSH Preventive and Control Requirements	May include: 3.1 Resources needed for removing hazard effectively 3.2 Resources needed for substitution or replacement 3.3 Resources needed to establishing engineering controls 3.4 Resources needed for enforcing administrative controls 3.5 Personal Protective equipment
4. Non OSH-Compliance Work Activities	May include non-compliance or observance of the following safety measures: 4.1 Violations that may lead to serious physical harm or death 4.2 Fall Protection 4.3 Hazard Communication 4.4 Respiratory Protection 4.5 Power Industrial Trucks 4.6 Lockout/Tag-out 4.7 Working at heights (use of ladder, scaffolding) 4.8 Electrical Wiring Methods 4.9 Machine Guarding 4.10 Electrical General Requirements 4.11 Asbestos work requirements 4.12 Excavations work requirements

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:**
	1.1. Convey OSH work non-conformities to appropriate personnel
	1.2. Identify OSH preventive and control requirements in accordance with OSH work policies and procedures
	1.3. Identify OSH work activity material, tools and equipment requirements in accordance with workplace policies and procedures
	1.4. Arrange/Place required OSH materials, tools and equipment in accordance with OSH work standards
	1.5. Execute work activities in accordance with OSH work standards
	1.6. Report OSH activity non-compliance work activities to appropriate personnel
2. Resource Implications	**The following resources should be provided:**
	2.1 Facilities, materials tools and equipment necessary for the activity
3. Methods of Assessment	**Competency in this unit may be assessed through:**
	3.1 Observation/Demonstration with oral questioning
	3.2 Third party report
4. Context for Assessment	4.1 Competency may be assessed in the work place or in a simulated work place setting

UNIT OF COMPETENCY : **EXERCISE EFFICIENT AND EFFECTIVE SUSTAINABLE PRACTICES IN THE WORKPLACE**

UNIT CODE : **400311217**

UNIT DESCRIPTOR : This unit covers knowledge, skills and attitude to identify the efficiency and effectiveness of resource utilization, determine causes of inefficiency and/or ineffectiveness of resource utilization and Convey inefficient and ineffective environmental practices

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify the efficiency and effectiveness of resource utilization	1.1 Required resource utilization in the workplace is measured using appropriate techniques 1.2 Data are recorded in accordance with workplace protocol 1.3 Recorded data are compared to determine the efficiency and effectiveness of resource utilization according to established *environmental work procedures*	1.1. Importance of Environmental Literacy 1.2. Environmental Work Procedures 1.3. Waste Minimization 1.4. Efficient Energy Consumptions	1.1 Recording Skills 1.2 Writing Skills 1.3 Innovation Skills
2. Determine causes of inefficiency and/or ineffectiveness of resource utilization	2.1 Potential causes of inefficiency and/or ineffectiveness are listed 2.2 Causes of inefficiency and/or ineffectiveness are identified through deductive reasoning 2.3 Identified causes of inefficiency and/or ineffectiveness are validated thru established environmental procedures	2.1 Causes of environmental inefficiencies and ineffectiveness	2.1 Deductive Reasoning Skills 2.2 Critical thinking 2.3 Problem Solving 2.4 Observation Skills
3. Convey inefficient and ineffective environmental practices	3.1 Efficiency and effectiveness of resource utilization are reported to *appropriate personnel* 3.2 Concerns related resource utilization are	3.1 Appropriate Personnel to address the environmental hazards 3.2 Environmental corrective actions	3.1 Written and Oral Communication Skills 3.2 Critical thinking 3.3 Problem Solving 3.4 Observation Skills

		discussed with appropriate personnel 3.3 Feedback on information/ concerns raised are clarified with appropriate personnel		3.5 Practice Environmental Awareness

RANGE OF VARIABLES

VARIABLE	RANGE
1. Environmental Work Procedures	May include: 1.1 Utilization of Energy, Water, Fuel Procedures 1.2 Waster Segregation Procedures 1.3 Waste Disposal and Reuse Procedures 1.4 Waste Collection Procedures 1.5 Usage of Hazardous Materials Procedures 1.6 Chemical Application Procedures 1.7 Labeling Procedures
2. Appropriate Personnel	May include: 2.1 Manager 2.2 Safety Officer 2.3 EHS Offices 2.4 Supervisors 2.5 Team Leaders 2.6 Administrators 2.7 Stakeholders 2.8 Government Official 2.9 Key Personnel 2.10 Specialists 2.11 Himself

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Measured required resource utilization in the workplace using appropriate techniques 1.2 Recorded data in accordance with workplace protocol 1.3 Identified causes of inefficiency and/or ineffectiveness through deductive reasoning 1.4 Validate the identified causes of inefficiency and/or ineffectiveness thru established environmental procedures 1.5 Report efficiency and effectives of resource utilization to appropriate personnel 1.6 Clarify feedback on information/concerns raised with appropriate personnel
2. Resource Implications	**The following resources should be provided:** 2.1 Workplace 2.2 Tools, materials and equipment relevant to the tasks 2.3 PPE 2.4 Manuals and references
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Demonstration 3.2 Oral questioning 3.3 Written examination
4. Context for Assessment	4.1 Competency assessment may occur in workplace or any appropriately simulated environment 4.2 Assessment shall be observed while task are being undertaken whether individually or in-group

UNIT OF COMPETENCY : **PRACTICE ENTREPRENEURIAL SKILLS IN THE WORKPLACE**

UNIT CODE : **400311218**

UNIT DESCRIPTOR : This unit covers the outcomes required to apply entrepreneurial workplace best practices and implement cost-effective operations

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS

1. Apply entrepreneurial workplace best practices	1.1 **Good practices** relating to workplace operations are observed and selected following workplace policy.
	 1.2 Quality procedures and practices are complied with according to workplace requirements.
	 1.3 Cost-conscious habits in **resource utilization** are applied based on industry standards.
		1.1 Workplace best practices, policies and criteria
		 1.2 Resource utilization
		 1.3 Ways in fostering entrepreneurial attitudes:
		   1.3.1 Patience
		   1.3.2 Honesty
		   1.3.3 Quality-consciousness
		   1.3.4 Safety-consciousness
		   1.3.5 Resourcefulness
			1.1 Communication skills
			 1.2 Complying with quality procedures

2. Communicate entrepreneurial workplace best practices	2.1 Observed good practices relating to workplace operations are communicated to **appropriate person**.
	 2.2 Observed quality procedures and practices are communicated to appropriate person
	 2.3 Cost-conscious habits in resource utilization are communicated based on industry standards.
		2.1 Workplace best practices, policies and criteria
		 2.2 Resource utilization
		 2.3 Ways in fostering entrepreneurial attitudes:
		   2.3.1 Patience
		   2.3.2 Honesty
		   2.3.3 Quality-consciousness
		   2.3.4 Safety-consciousness
		   2.3.5 Resourcefulness
			2.1 Communication skills
			 2.2 Complying with quality procedures
			 2.3 Following workplace communication protocol

3. Implement cost-effective operations	3.1 Preservation and optimization of workplace resources is implemented in accordance with enterprise policy 3.2 Judicious use of workplace tools, equipment and materials are observed according to manual and work requirements. 3.3 Constructive contributions to office operations are made according to enterprise requirements. 3.4 Ability to work within one's allotted time and finances is sustained.	3.1 Optimization of workplace resources 3.2 5S procedures and concepts 3.3 Criteria for cost-effectiveness 3.4 Workplace productivity 3.5 Impact of entrepreneurial mindset to workplace productivity 3.6 Ways in fostering entrepreneurial attitudes: • Quality-consciousness • Safety-consciousness	3.1 Implementing preservation and optimizing workplace resources 3.2 Observing judicious use of workplace tools, equipment and materials 3.3 Making constructive contributions to office operations 3.4 Sustaining ability to work within allotted time and finances

RANGE OF VARIABLES

VARIABLE	RANGE
1.Good practices	May include: 1.1 Economy in use of resources 1.2 Documentation of quality practices
2.Resources utilization	May include: 2.1 Consumption/ use of consumables 2.2 Use/Maintenance of assigned equipment and furniture 2.3 Optimum use of allotted /available time

EVIDENCE GUIDE

1. Critical aspects of competency	**Assessment requires evidence that the candidate:** 1.1 Demonstrated ability to identify and sustain cost-effective activities in the workplace 1.2 Demonstrated ability to practice entrepreneurial knowledge, skills and attitudes in the workplace.

2. Resource Implications	The following resources should be provided:
	2.1 Simulated or actual workplace
	2.2 Tools, materials and supplies needed to demonstrate the required tasks
	2.3 References and manuals
	    2.3.1 Enterprise procedures manuals
	    2.3.2 Company quality policy

3. Methods of Assessment	**Competency in this unit should be assessed through:** 3.1 Interview 3.2 Third-party report
4. Context of Assessment	4.1 Competency may be assessed in workplace or in a simulated workplace setting 4.2 Assessment shall be observed while tasks are being undertaken whether individually or in-group

COMMON COMPETENCIES

UNIT OF COMPETENCY : **APPLY SAFETY MEASURES IN FARM OPERATIONS**

UNIT CODE : **AFF321201**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to perform safety measures effectively and efficiently. It includes identifying areas, tools, materials, time and place 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 ensure a safe work requirement	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 2.6 Identifying and reporting of

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	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	hazards in workplace area.
3. Safe keep /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.	Resource Implications	**The following resources should be provided:** 2.1 Farm location 2.2 Tools, equipment and outfits appropriate in applying safety measures
3.	Method of Assessment	**Competency in this unit must be assessed through:** 3.1 Practical demonstration 3.2 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 : **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	2.1 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
		2.9 Codes and Regulations on 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	**Farm equipment include:** 1.1 Engine 1.2 Pumps 1.3 Generators 1.4 Sprayers
2. Farm tools	**Farm tools includes:** 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	**Pre-operation check–up includes:** 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. Resource Implications	**The following resources should be provided:** 2.1 Service/operational manual of farm tools and equipment 2.2 Tools and equipment 2.3 Farm implements
3. Method of Assessment	**Competency in this unit must be assessed through:** 3.1 Direct observation 3.2 Practical demonstration 3.3 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 : PERFORM ESTIMATION AND BASIC CALCULATION

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/ labor 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 take-off 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. Resource Implications	**The following resources should be provided:** 2.1 Relevant tools and equipment for basic calculation 2.2 Recommended data
3. Method of Assessment	**Competency in this unit must be assessed through:** 3.1 Practical demonstration 3.2 Written examination
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 : **PERFORM MANGO NURSERY OPERATIONS**

UNIT CODE : **AFFXXXXX**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to perform nursery operations for agricultural crops including establishing nursery shed, preparation and handling of planting materials, preparation of growing media, transplanting germinated seedlings   and handling of nursery tools and equipment.

ELEMENTS	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range Statement	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Prepare nursery tools, farm implements and simple equipment	1.1 ***Tools, farm implements and simple equipment*** are prepared according work requirements. 1.2 Basic pre-operative checking of tools, farm implements and equipment is performed in accordance with manufacturer's manual and GAP standard. 1.3 Tools with wear and corrosions are segregated and treated according to maintenance plan and procedures.	1.1 Preparation of different tools, farm implements and simple equipment 1.2 Mango varieties 1.3 Basic pre-operative checking 1.4 Manufacturer's manual 1.5 GAP standard 1.6 Treatment defective tools 1.7 Maintenance plan and procedures 1.8 Safety on mango nursery preparation	1.1 Preparing tools, farm implements and equipment 1.2 Performing basic pre-operative checking 1.3 Segragating defective tools 1.4 Treating defective tools 1.5 Applying maintenance plan and procedures 1.6 Employ safety measures
2. Maintain nursery facilities	2.1 Nursery sanitation is maintained according to GAP standard. 2.2 Repair and maintenance of nursery facilities are performed to maximize their efficiency and effectiveness.	2.1 Nursery sanitation 2.2 GAP on nursery sanitation 2.3 Repair and maintenance of nursery facilities 2.4 Preventive measures against inclement weather 2.5 OSHS	2.1 Maintaining nursery sanitation 2.2 Performing repair and maintenance of nursery facilities 2.3 Applying preventive measures 2.4 Practicing OSHS

ELEMENTS	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range Statement	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	2.3 Preventive measures are applied for inclement weather. 2.4 Safety measures are practice according to OSHS.		
3. Handle seeds/ planting material	3.1 *Planting materials* are determined according to kinds and varieties. 3.2 *Quality seeds* are selected according to prescribed characteristics. 3.3 Planting materials are treated following standard protocol.	3.1 Kinds of mango planting materials 3.2 Selection of quality seeds 3.3 Treatment of planting materials	3.1 Determining planting materials 3.2 Selecting quality seeds 3.3 Treating planting materials
4. Prepare growing media	4.1 Growing *media* are prepared according to prescribed mixture and crop requirement. 4.2 Growing media are placed in prescribed *containers* according to crop requirements. 4.3 Containers are arranged and labelled according to varieties/species. 4.4 Seedbed is prepared based on crop species.	4.1 Types of growing media 4.2 Preparation of growing media 4.3 Prescribed mixture 4.4 Crop species and requirement 4.5 Different containers 4.6 Arrangement and labelling of containers 4.7 Preparation seedbed	4.1 Preparing growing media 4.2 Placing growing media 4.3 Arranging containers 4.4 Labelling containers 4.5 Preparing seedbed
5. Conduct propagation activities	5.1 Nursery shed is set-up according to plant requirement 5.2 *Quality seedlings are selected based on prescribed characteristics.* 5.3 Propagation materials are selected according to propagation activity.	5.1 Establishment of nursery shed 5.2 Selection of quality seedlings 5.3 Selection of propagation materials 5.4 Propagation activity 5.5 Plant propagation techniques	5.1 Setting-up nursery shed 5.2 Selecting quality seedlings 5.3 Selecting propagation materials 5.4 Performing plant propagation techniques

ELEMENTS	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range Statement	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	5.4 ***Plant propagation techniques*** are performed based on recommended practices. 5.5 Germinated seedlings are maintained until fully established. 5.6 Pricking and thinning of seedlings are performed based on recommended practices.	5.6 Maintenance of germinated seedlings 5.7 Prickling and thinning of seedlings	5.5 Maintaining germinated seedlings 5.6 Performing prickling and thinning of seedlings

RANGE OF VARIABLES

VARIABLE	SCOPE

1. Tools, farm implements and simple equipment	Tools, farm implements and simple equipment may include:
	1.1. Tools:
	    1.1.1. Digging tools
	    1.1.2. Propagation tools
	    1.1.3. Measuring tools
	1.2. Farm implements and simple equipment:
	    1.2.1. Water pumps
	    1.2.2. Hand tractor
	    1.2.3. Plow
	    1.2.4. Harrow
	    1.2.5. Sprayer

2. Planting materials	Planting materials may include the following: 2.1. Seeds 2.2. Grafted material
3. Quality seeds	Characteristics of quality seeds include the following: 3.1. Damage free 3.2. Viability 3.3. Free from mixture
4. Growing media	Growing may include the following: 6.1. Garden soil 6.2. Peat moss 6.3. Saw dust 6.4. Coco coir 6.5. Rice hull/carbonized rice hull 6.6. Compost 6.7. River sand 6.8. Animal manure 6.9. Wood cuttings 6.10. Fern slabs 6.11. Drift wood
5. Containers	Containers may include the following: 7.1. Polyethylene bags 7.2. Clay pots 7.3. Plastic containers 7.4. Seed tray 7.5. Seed box 7.6. Coconut husk 7.7. Wired basket
6. Quality seedlings	Include but not limited to the following: 8.1. Healthy 8.2. Vigorous growth 8.3. Height 8.4. Age 8.5. Number of leaves

7. Plant propagation techniques	Plant propagation techniques may include:
	9.1. Sexual (Seeds)
	9.2. Asexual
	    9.2.1 Grafting
	    9.2.2 Budding
	    9.2.3 Inarching

EVIDENCE GUIDE

1. Critical Aspects of Competency	**Assessment requires evidence that the candidate:**
	1. Selected planting materials.
	2. Conducted seed testing
	3. Prepared growing medium.
	4. Performed plant propagation techniques
2. Resource Implications	**The following resources should be provided:**
	2.1 Shed/ Greenhouse
	2.2 Writing instruments
	2.3 Nursery tools/ implements/ equipment
	2.4 Nursery supplies
	2.5 Logbooks
	2.6 Irrigation system and parts
	2.7 References (NSIC catalogue, GAP, OSHS, HACCP manuals, etc.)
3. Methods of Assessment	**Competency in this unit may be assessed through:**
	3.1. Direct observation with oral questioning
	3.2. Demonstration with oral questioning
	3.3. Written test
4. Context of Assessment	4.1 Competency may be assessed individually in the actual workplace or through accredited institution

UNIT OF COMPETENCY **:** **PLANT MANGO**

UNIT CODE **:** **AFF XXXX**

UNIT DESCRIPTOR **:** This unit covers the knowledge, skills and attitudes required to conduct activities related to land preparation and planting of mango. This unit also includes proper handling of seeds/seedlings/saplings for planting and transplanting, proper use of tools and equipment, conduct land preparation and field lay-out.

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range Statement	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Prepare land for planting	1.1 ***Tools, materials and equipment*** are prepared for land clearing 1.2 Land is cleared according to prescribed methods of land preparation 1.3 ***Debris*** are removed and disposed according to waste management standards. 1.4 Soil samples are collected for analysis based on standard procedure 1.5 ***Land preparation*** is conducted according to crop requirement. 1.6 Basal ***fertilizer*** is applied based on crop requirement 1.7 Safety procedures for land preparation are followed according to OSHS	1.1 Preparation of tools, materials and equipment 1.2 Land clearing 1.3 Removal and disposal of debris 1.4 Soil sampling 1.5 Land preparation 1.6 Application of basal fertilizer 1.7 OSHS on land preparation	1.1 Preparing tools, materials and equipment 1.2 Clearing land 1.3 Removing and disposing debris 1.4 Collecting soil samples 1.5 Conducting land preparation 1.6 Applying basal fertilizer 1.7 Following safety procedures for fertilizer application
2. Conduct field lay-out	2.1 Tools and materials are prepared for field lay-out. 2.2 Field lay-out plan is interpreted according to the recommended planting system.	2.1 Preparation of tools and materials 2.2 Interpretation of field lay-out plan 2.3 Planting system	2.1 Preparing tools and materials 2.2 Interpreting field lay-out plan 2.3 Laying-out field 2.4 Communication skills

	2.3 Field is laid-out according to recommended *planting system*		2.5 Following planting system
3. Dig holes	3.1 Diggings of holes are performed based on crop requirement. 3.2 Top soil is separated to be used in covering the hole after planting. 3.3 Basal fertilizer application is performed based on recommended amount.	3.1 Digging of holes 3.2 Separation of top soil 3.3 Application of basal fertilizer 3.4 Recommended amount of fertilizer	3.1 Digging holes 3.2 Separating top soil 3.3 Applying basal fertilizer 3.4 Mathematical skills
4. Perform direct seeding	4.1 Seeds are planted according to recommended rate, distance and depth 4.2 Replanting are done according to recommended practices for a particular crop 4.3 Safety procedures are followed according to Occupational Safety and Health Standards (OSHS) and Good Agricultural Practices (GAP)	4.1 Planting technique of seeds 4.2 Rate, distance and depth 4.3 Replanting 4.4 OSHS 4.5 GAP on direct seeding	4.1 Planting seeds 4.2 Performing replanting 4.3 Practicing OSHS and GAP
5. Transplant seedlings	5.1 Handling of seedlings from nursery is performed based on prescribed practices. 5.2 Transplanting of seedlings is done based on crop practices 5.3 Re-bagging is done for a particular crop requirement 5.4 Replanting is done based on planting protocol. 5.5 Safety procedures are followed according to Occupational Safety and Health Standards (OSHS) and Good Agricultural Practices (GAP)	5.1 Handling of seedlings 5.2 Transplanting seedlings 5.3 Re-bagging procedure 5.4 Replanting procedure 5.5 OSHS 5.6 GAP	5.1 Handling seedlings 5.2 Transplanting seedlings 5.3 Re-bagging seedlings 5.4 Replanting seedlings 5.5 Practicing OSHS 5.6 Practicing GAP

RANGE OF VARIABLES

VARIABLE	SCOPE
1. Tools, materials and equipment	Tools, materials and equipment may include the following: 1.1. Bolo 1.2. Scythe 1.3. Spade or shovel 1.4. Garden hoe 1.5. Rake 1.6. Grasscutter 1.7. Compost 1.8. Hand tractors and attachments
2. Debris	Debris may include the following: 2.1. Stones 2.2. Sticks 2.3. Unwanted vegetation 2.4. Other garbage
3. Land preparation	Land preparation may include the following: 3.1. Plowing 3.2. Harrowing 3.3. Leveling 3.4. Furrowing
4. Fertilizer	Include the following: 4.1 Organic 4.2 Inorganic
5. Planting system	Planting system may include the following: 5.1 Square 5.2 Quincunx or diagonal 5.3 Hexagonal or triangular

EVIDENCE GUIDE

1. Critical Aspects of Competency	1.1 Carry-out land clearing
	1.2 Conducted proper soil sampling/collection
	1.3 Performed appropriate land preparation
	1.4 Laid out site for planting
	1.5 Dug holes
	1.6 Sown seeds
	1.7 Planted and transplanted seeds/seedlings/saplings
2. Resource Implications	The following resources should be provided:
	2.1. Tool room and farm house
	2.2. Farm tools/ implements/ equipment
	2.3. Farm supplies
	2.4. Logbooks
	2.5. References (lay-out plan, fertilizer and pesticide manual/ catalogue, protocols, field guides, OHSP and GAP manuals)
	2.6. Production guide
3. Methods of Assessment	Competency in this unit may be assessed through:
	3.1. Direct Observation with oral questioning
	3.2. Demonstration with oral questioning
	3.3. Written test
4. Context of Assessment	4.1. Competency may be assessed individually in the actual workplace or through accredited institution

UNIT OF COMPETENCY : **CARE AND MAINTAIN MANGO ORCHARD**

UNIT CODE : **AFF XXXXX**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to apply pest control, measure, apply fertilizer and water mango trees, perform pruning and perform physical growth-enhancing practices.

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range Statement	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Apply pest control measure	1.1 *Pests* incidence is monitored based on prescribed procedure. 1.2 *Equipment* services are sourced out according to work requirements. 1.3 *Tools, materials and supplies* are prepared according to specific pest control measure 1.4 Appropriate *pest control measures* are followed based on GAP 1.5 Safety measures are observed and practiced according to Occupational Health and Safety (OHS) procedures.	1.1 Different pests of mango 1.2 Equipment, tools and materials for care and maintenance of mango 1.3 Types of pest control measures 1.4 Good Agricultural Practices on care and maintenance of plant 1.5 OSHS on care and maintenance of plant	1.1 Monitoring pest incidence 1.2 Preparing tools, materials and supplies 1.3 Sourcing of equipment services 1.4 Following appropriate pest control measures 1.5 Applying GAP 1.6 Practicing OSHS 1.7 Communication skills
2. Apply fertilizer	2.1 *Fertilizers* are selected based on farming schemes. 2.2 Fertilizer rates are computed based on crop requirements. 2.3 *Method of fertilizer application* is employed based on crop stage and requirements. 2.4 Preventive measures are applied to avoid	2.1 Types of fertilizers 2.2. Farming schemes 2.3 Computation of fertilizer rates 2.4 Crop requirements 2.5 Methods of fertilizer application 2.6 Different mango plant stages 2.7 Avoidance of cross contamination 2.8 GAP on fertilizer application 2.9 OSHS on fertilizer application	2.1 Selecting fertilizers 2.2 Computing fertilizer rates 2.3 Mathematical skills 2.4 Employing methods of fertilizer application 2.5 Applying preventive measures 2.6 Applying GAP on fertilizer application 2.7 Applying OSHS on fertilizer application 2.8 Communication skills

	cross contamination based on GAP. 2.5 Safety procedures are followed according to Occupational Safety and Health Standards		
3. Water crops	3.1. Soil moisture content is determined based on soil field capacity 3.2. Water management is employed following the required method and schedule 3.3. Good Agricultural Practices is observed.	3.1 Soil moisture content 3.2 Soil field capacity 3.3 Water management 3.4 Good Agricultural Practices on water management	3.1 Determining soil moisture content 3.2 Employing water management 3.3 Practicing GAP on water management
4. Perform pruning	4.1. Pruning method is performed according to mango plant requirement. 4.2. Tools and materials for pruning are prepared according to work requirements. 4.3. Safety procedures is followed according to Occupational Safety and Health Standards and PNS:PAES 101	4.1 Types of pruning method 4.2 Preparation of pruning tools and materials 4.3 OSHS on pruning activities 4.4 PNS:PAES 101	4.1 Performing pruning method 4.2 Preparing pruning tools and materials 4.3 Following OSHS on pruning activities
5. Perform physical growth-enhancing practices	5.1. Tools and materials for cultivation are prepared according to PNS:PAES 101. 5.2. Flower induction activities are performed based on established farm practices 5.3. Equipment for cultivation services are sourced out according to PNS:PAES 101. 5.4. Cultivation methods are carried-out based on crop requirement.	5.1 Preparation of cultivation tools and materials 5.2 Sourcing-out of cultivation equipment services 5.3 PNS:PAES 101 5.4 Flower induction activities 5.5 Cultivation methods for mango plant 5.6 Rejuvenating activities for mango plant 5.7 Cultural practices 5.8 Growth training techniques for mango plant	5.1 Preparing cultivation tools and materials 5.2 Sourcing out equipment services for cultivation 5.3 Applying PNS:PAES 101 5.4 Performing flower induction activities 5.4 Carrying-out cultivation methods 5.5 Performing rejuvenating activities 5.6 Performing growth training techniques

	5.5. Mango orchard rejuvenation is performed according to established cultural practices. 5.6. **Growth training techniques** are applied based on established farm practices. 5.7. Mulching techniques are carried out based on crops. 5.8. Safety procedures are followed according to Occupational Safety and Health Standards.	5.9 Mulching techniques for mango plant 5.10 OSHS	5.7 Carrying-out mulching techniques 5.8 Applying OSHS

RANGE OF VARIABLES

VARIABLE	RANGE
1. Pests	Pests may include: 1.1. Weeds 1.2. Insects • Mango leaf hopper • Mango tip borer • Twig cutters • Pulp weevil • Mango fruit fly • Mealy bugs • Capsid bug • Mango cecid fly • Scale insect 1.3. Diseases • Anthracnose • Stem end rot • Scab • Gummosis • Sooty mold 1.4. Birds
2. Equipment	Equipment may include : 2.1. Knapsack/ power sprayers 2.2. Carabao pulled implements
3. Tools, materials and supplies	Tools, materials and supplies may include: Tools 3.1. Measuring devices 3.2. Insect traps 3.3. Pruning shears 3.4. Shovel 3.5. Measuring cup 3.6. Hoe 3.7. Shovel 3.8. Pruning shear 3.9. Pruning saw 3.10. Bolo Materials and supplies 3.11. Pesticides (biopesticides or synthetic) 3.12. Safety gears 3.13. Paper/plastic sleeves 3.14. Fertilizer 3.15. Pail 3.16. Paint 3.17. Paint brush 3.18. Mango fruit bag

VARIABLE	RANGE

4. Pest control measures	Pest control measures may include:
	4.1. Wrapping or bagging fruits
	4.2. Pruning and burning infected branch and stem
	4.3. Disposal of fallen, damaged fruits
	4.4. Removal of infested fruits, flowers and leaves
	4.5. Biological methods
	4.6. Cultural methods
	    • Soil cultivation to kill hiding weevil
	    • Irrigation
	    • Avoid dumpy soils
	4.7. Spray recommended chemicals
	4.8. Integrated Pest Management (IPM)
	4.9. Orchard sanitation

5. Fertilizers	Fertilizers include the following: 5.1. Organic 5.2. Inorganic
6. Method of fertilizer application	Method of fertilizer application may include the following: 6.1. Basal 6.2. Sidedress 6.3. Localized 6.4. Foliar/Spray 6.5. Broadcast
7. Growth training techniques	Growth training techniques may include the following: 7.1. Hardening 7.2. Pricking 7.3. Thinning

EVIDENCE GUIDE

1. Critical Aspects of Competency	**Assessment requires evidence that the candidate:** 1.1. Performed pruning 1.2. Controlled weed population 1.3. Monitored pests through recording and reporting of pests incidence. 1.4. Practiced pest control measures 1.5. Applied fertilizer with appropriate method 1.6. Applied proper irrigation/watering of mango plant 1.7. Performed flower induction activities 1.8. Carried out cultivation practices 1.9. Performed rejuvenating activities 1.10. Performed growth training technique 1.11. Carried out mulching techniques 1.12. Followed Occupational Health and Safety Standards
2. Resource Implications	**The following resources should be provided:** 2.1. Farm or plantation area 2.2. Storage shed 2.3. Farm tools/ implements/ equipment 2.4. Farm supplies 2.5. Logbooks 2.6. Irrigation system and parts 2.7. References (fertilizer and pesticide manual/ catalogue, protocols, field guides, etc.)
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1. Direct Observation with oral questioning 3.2. Demonstration with oral questioning 3.3. Written examination
4. Context of Assessment	4.1. Competency may be assessed individually in the actual workplace or through accredited institution

UNIT OF COMPETENCY : CARRY-OUT HARVEST AND POSTHARVEST OPERATIONS

UNIT CODE : AFFXXX

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to perform harvest and postharvest operations of mango including maintaining quality of produce for distribution. This unit also includes proper use of tools and equipment required to perform the activities.

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range Statement	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Perform pre – harvest operations	1.1 Crop maturity is identified according to parameters affecting *physiological growth* and *physical indicators*. 1.2 Records of mango *agronomic history* is verified and referenced for maturity. 1.3 *Obstructions* from the field are removed for efficient harvesting 1.4 *Harvesting and tools materials* are readied according to farm plan. 1.5 Temporary shed are prepared according to farm plan. 1.6 *Records* regarding crops to be harvested are checked	1.1 Identification of mango maturity 1.2 Physiological growth 1.3 Physical indicators 1.4 Agronomic history 1.5 Removal of obstructions from the field 1.6 Preparation of harvesting tools and materials 1.7 Preparation of temporary shed 1.8 Records of crops 1.9 Communication skills 1.10 OSHS on pre-harvesting activities	1.1 Identifying crop maturity using parameters 1.2 Verifying agronomic history 1.3 Referencing agronomic history for maturity 1.4 Preparing harvesting tools and materials 1.5 Preparing temporary shed 1.6 Checking records of crops 1.7 Practicing OSHS
2. Perform harvesting activity	2.1 Appropriate *harvesting methods* are implemented based on best cultural practices for each crop using suitable tools. 2.2 Mangoes are handled according to the *postharvest treatment.*	2.1 Harvesting methods 2.2 Handling harvesting tools 2.3 Best cultural practices 2.4 Handling of mangoes 2.5 Postharvest treatment 2.6 Harvesting techniques	2.1 Implementing appropriate harvesting methods 2.2 Handling mangoes 2.3 Using harvesting tools 2.4 Applying postharvest treatment

	2.3 **Characteristics affecting harvest** quality and maturity indices are checked according to established farm practices.	2.7 Checking for maturity indices 2.8 Checking for characteristics affecting harvest quality 2.9 GAP on harvesting activities 2.10 OSHS on harvesting	2.5 Applying harvesting techniques 2.6 Checking maturity indices 2.7 Checking characteristics affecting harvest quality 2.8 Practicing GAP 2.9 Employing OSHS
3. Perform postharvest operation	3.1 **Postharvest operations** are employed based on established farm practices. 3.2 Use of **postharvest equipment** is monitored avoiding **damage** to crop in line with manufacturer's manual. 3.3 Handling and **packaging** are done according to variety and destination. 3.4 Harvest is **stored and stacked** in cool dry place prior to distribution in line with enterprise procedures	3.1 Postharvest operations 3.2 Monitoring of postharvest equipment 3.3 Manufacturer's manual 3.4 Postharvest damages 3.5 Handling and packaging of harvest 3.6 Variety of mangoes 3.7 Destination of harvest 3.8 Storage and packaging of harvest 3.9 OSHS on postharvest operation 3.10 HACCP and GMP 3.11 Physical analysis of crop for quality standards	3.1 Employing postharvest operations 3.2 Monitoring postharvest equipment 3.3 Following manufacturer's manual 3.4 Handling and packaging of harvest 3.5 Storing and stacking harvest 3.6 Practicing OSHS 3.7 Applying HACCP and GMP
4. Monitor and control storage pest and diseases	4.1 Storage pests and diseases are identified using **references** on pest and diseases. 4.2 Identified **storage pests and diseases** are logged and reported to immediate authority. 4.3 Storage pests and diseases are controlled following industry standards.	4.1 Storage pests 4.2 References of storage pests and diseases of mangoes 4.3 Logging and reporting the occurrence of storage pests and diseases 4.4 Control of storage pests and diseases 4.5 OSHS	4.1 Identifying storage pests and diseases 4.2 Logging and reporting occurrence of pests and diseases 4.3 Controlling pests and diseases 4.4 Applying OSHS

RANGE OF VARIABLES

VARIABLE	SCOPE
1. Physiological growth	Physiological growth may include the following: 1.1 Days after flower induction 1.2 Days after fruit setting
2. Physical indicators	Physical indicators may Include the following: 2.1. Powdery deposit or "bloom" on the surface of the skin 2.2. Flesh is turning yellow 2.3. Fruit has flattened shoulders at the stem end 2.4. The pedicels of fruits turn dark green to brown in color 2.5. 75% mature fruit samples sink when submerged in 1% salt solution

3. Agronomic history	Agronomic history include the following:
	3.1 Nursery source
	3.2 Variety of mango
	3.3 Planting calendar
	    3.3.1 Days after planting
	    3.3.2 Days at flowering
	    3.3.3 Days at fruit set

4. Obstructions	Obstructions may include the following: 4.1. Weeds 4.2. Dead branches 4.3. Stakes and wedges
5. Harvesting tools and materials	May include the following: 5.1. Picking poles 5.2. Scythes 5.3. Scissors 5.4. Shears 5.5. Collecting baskets with liners 5.6. Harvesting crates with liner 5.7. Container with clean water with preservative 5.8. Sacks 5.9. Twines 5.10. Labels and markers
6. Records	Include the following: 6.1. Crop history 6.2. Farm calendar 6.3. Farm records
7. Harvesting methods	Harvesting methods may include: 7.1 Handpicking 7.2 Picking pole
8. Postharvest treatments	May include the following: 8.1 Hot water treatment 8.2 Vapor heat treatment 8.3 Chemical treatment 8.4 Modified hot water treatment 8.5 Extended hot water treatment 8.6 Irradiation

9. Characteristics affecting harvest	Characteristics affecting harvest may include:
	9.1. Continued occurrence of physiological changes
	9.2. High in water content
	9.3. Susceptible to attack by pathogens and insects
10. Postharvest operation	Postharvest operation include the following:
	10.1. Washing
	10.2. Cleaning
	10.3. Sorting
	10.4. Treatment
	10.5. Grading
	10.6. Fermenting
	10.7. Drying
	10.8. Blanching
11. Postharvest equipment	Postharvest equipment may include following:
	11.1. Hot water treatment machine
	11.2. Sorter
	11.3. Weighing scale
12. Damages	Damages may include the following:
	12.1. Bruising
	12.2. Wounding
	12.3. Abrasion
13. Packaging	Packaging may Include:
	13.1. Crates (wooden, plastics and styro)
	13.2. Paper wrap
	13.3. Carton box
	13.4. PEB(Polyethylene bags)
	13.5. Styro
	13.6. Sacks/bags
14. Storage and stacking	Storage and stacking includes:
	14.1. On-farm storage
	14.2. Off-farm storage
15. References	References may include:
	15.1. Pictorial guide
	15.2. Posters
	15.3. Pamphlets
16. Storage pests and diseases	Storage pests and diseases may include:
	16.1. Insect pest
	16.2. Rodents
	16.3. Fungi
	16.4. Bacteria

EVIDENCE GUIDE

1. Critical Aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Prepared field and materials/tools used for harvesting and postharvest 1.2 Identified and applied maturity indices 1.3 Harvested and handled mango frutis 1.4 Maintained quality of mango fruits during distribution and storage applying consideration for optimum condition 1.5 Monitored storage pest and diseases 1.6 Practiced safety measures

2. Resource Implications	The following resources should be provided:
	2.1 Facilities and equipment appropriate for harvest and postharvest of mango fruits
	2.2 Supplies and materials contingent to machines
	2.3 Farm house
	   2.3.1 Packing area
	   2.3.2 Storage facilities
	2.4 Farm tools/ implements/ equipment
	2.5 Writing instruments
	2.6 Farm supplies
	2.7 Logbooks
	2.8 PPE
	2.9 References (catalogue, protocols, field guides, GAP, OHSS manuals)

3. Method of Assessment	Competency in this unit may be assessed through: 3.1 Direct observation with oral questioning 3.2 Demonstration with oral questioning 3.3 Written examination
4. Context of Assessment	4.1 Competency may be assessed individually in the actual workplace or through TESDA accredited institution

SECTION 3. TRAINING ARRANGEMENTS

3.1   TRAINEE ENTRY REQUIREMENTS

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

- Able to communicate, both orally and in writing
- Able to communicate, verbal or non-verbal; and
- Able to perform basic arithmetic operation

3.2   TRAINER QUALIFICATIONS FOR AGRICULTURE, FORESTRY AND FISHERY SECTOR

Trainers who will deliver the training on MANGO PRODUCTION LEVEL II should have the following:

- Must have training certificate on Mango Production Level II
- Must be practicing trainer or attended 80 hours of trainer's training within the last three (3) years
- Must have 2 years industry experience relevant to the area within the last five years*

*Note: Consider iWER guidelines in converting training/seminar to industry experiences

3.3 LIST OF TOOLS, MATERIALS AND EQUIPMENT

Recommend list of tools, materials and equipment for the training of 25 trainees for Mango Production Level II.

TOOLS		EQUIPMENT		MATERIALS	
QTY.		QTY		QTY.	
25 pcs.	• Budding knife	5 units	• Soil moisture and pH meter	25 pcs.	• Calculator
12 pcs.	• Bolo	5 units	• Wheel barrow	5 units	• Puncher
5 pcs.	• Pruning saw	1 unit	• Comb-tooth harrow*	10 m	• Agri bag/plastics
5 pcs.	• Hedge shear	1 unit	• Hand tractor*	1000 pcs.	• PE bag with different sizes
5 pcs.	• Kitchen knife	5 units	• Knapsack sprayer	10 sacks	• Growing media (50 kg.)
5 pcs.	• Cutter	5 units	• Hand sprayer	1 bot.	• Rooting hormone
5 pcs.	• Pliers	1 unit	• Power sprayer*	5 pcs.	• Basin
25 pcs.	• Pruning shears	2 units	• Grass cutter*	10 pcs.	• Broomstick
5 pcs.	• Steel bar	1 unit	• Post harvest treatment equipment*	25 pcs.	• Pail-12Li.
5 pcs.	• Pick mattock			25 pcs.	• Basket
5 pcs.	• Hole digger			20 m.	• Fish net

				5 pcs.	• Strainer
5 pcs.	• Garden hoe			5 pcs.	• Strainer
5 pcs.	• Shovel			10 kilos	• Plastic sheet
25 pcs.	• Wooden crates			10 kilos	• Fertilizers
25 pcs.	• Plastic crates			1 kilo	• Flower inducer
25 pcs.	• Styro crates			2 pcs.	• Board marker
25 pcs.	• Scythe			1 unit	• White board
13 pcs.	• Harvesting pole			1 pc.	• Eraser
2 pcs.	• Ladder			1 bot.	• Pesticides
25 pcs.	• Hand trowel			1 roll	• Rope
2 pcs.	• Measuring cups			1 box	• Rubber band
12 pcs.	• Sprinklers			1 box	• Detergent soap
1 pc.	• Tools cabinet			1bundle	• Bamboo stick
1 pc.	• Plow			1 ream	• Bond paper
25 pcs.	• Scissors			1 box	• Clips
5 pcs.	• Rake			1 set	• First aid supplies
1 unit	• Soil auger			5 pcs.	• Permanent pens
				1 roll	• Mulching materials
				1 roll	• String
				1 roll	• Plastic twine
				5 pcs.	• Brush
				1 pc.	• Measuring tape
				5 pcs.	• Meter stick
				2 pcs.	• Sharpening stone
				25 units	• PPE
				25 pcs.	• Hard Hat

*Acquisition through outsourcing or rental