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MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP

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Facilitator Guide



Sector
Agriculture

Sub-Sector
Agriculture Crop Production

Occupation
Plantation Crops Cultivation

Reference ID: **AGR/Q0503, Version 3.0**
NSQF Level 4

Coconut Grower cum Primary Processor

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Published by
Agriculture Skill Council of India
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First Edition, March 2023
This book is sponsored by Agriculture Skill Council of India (ASCI)

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Skilling is building a better India If We have to move India towards development then Skill Devleopment should be our mission

Shri Narendra Modi
Prime Minister of India

Acknowledgements

We are thankful to all organizations and individuals who have helped us in preparation of this facilitator guide. Our gratitude is also due to all organizations and individuals who have helped us in review of the content and provided valuable inputs for improving quality, coherence and content presentation. This facilitator guide will lead to successful roll out of the skill development initiatives, helping greatly our stakeholders particularly trainees, trainers and assessors.

It is expected that this publication would meet the complete requirements of QP/NOS based training delivery. We welcome the suggestions from users, industry experts and other stakeholders for any improvement in future.

About this Guide

This Trainer guide is intended to empower the trainer/facilitator to prepare the participant to become 'Coconut Grower cum Primary Processor' as per the Qualification Pack (QP).
The objective of the guide is to provide an approach map for interacting with the trainees undergoing training on the job role. The aim of the course is to provide both theoretical and practical knowledge to the trainees, and also to guide them.
The guide is neither a substitute nor complete road map, but an aid to help you to pass on the knowledge on all the aspects to the trainees in a systematic manner. It is expected that the trainer is fully conversant with all the contents of the handbook. The guide is just to indicate that how to proceed for covering a topic and includes some additional information that may be necessary for the trainer to develop better comprehension. Facilitator with the help of this guide will be able to build among participants

- **Knowledge and Understanding:** Satisfactory operational learning and comprehension to play out the required chore
- **Performance Criteria:** Pick up the required aptitudes through hands on preparing and play out the required operations inside the predetermined measures
- **Professional Skills:** Capacity to settle on operational choices relating to the zone of work

The guide will also help them learn more by field visits and providing hands on training it is expected that irrespective of the region, knowledge on all aspects of poultry farm will be imparted to trainees.

Symbols Used

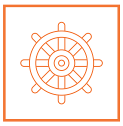

Notes

Objectives


Do

Ask


Explain


Elaborate


Field Visit

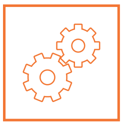

Exercise


Team Activity


Facilitation Notes


Learning Outcomes


Say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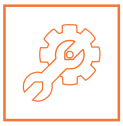
Activity

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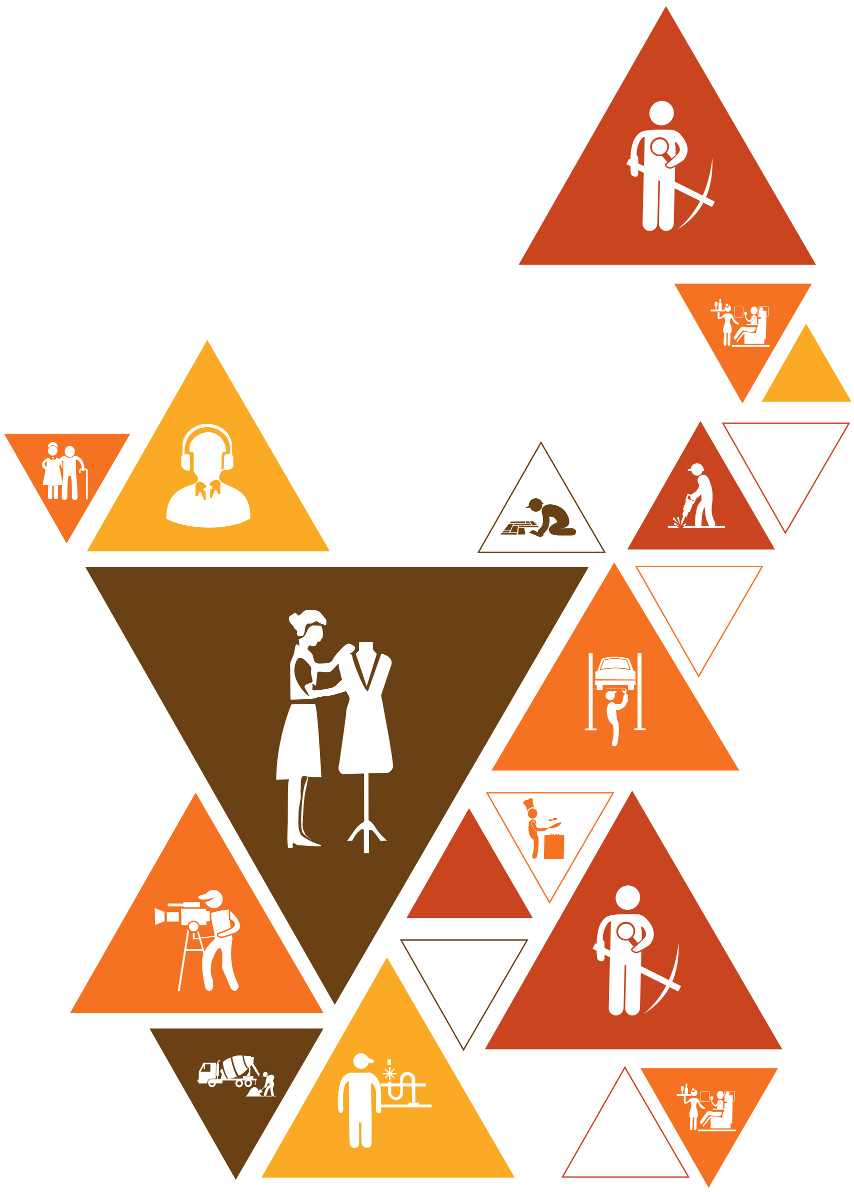

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1. Introduction

Unit 1.1 - Scope of Coconut Grower in Agriculture Industry and its sub-sectors

Terminal Outcomes

After the completion of this module, the participants will be able to:

1. Discuss the job role of a Coconut Grower cum Primary Processor.

Key Learning Outcomes

After the completion of this module, the participants will be able to:

1. Describe the size and scope of the agriculture Industry and its sub-sectors.
2. Discuss the role and responsibilities of a Coconut Grower cum Primary Processor.
3. Identify various employment opportunities for a Coconut Grower cum Primary Processor.

UNIT 1.1: The Size and Scope of the Agriculture Industry and its Sub-Sectors

Unit Objectives

After the completion of this unit, the participants will be able to:

1. Explain the size and scope of the agriculture industry and its sub-sectors.
2. Explain the role and responsibilities of a Coconut Grower cum Primary Processor.
3. Identify various employment opportunities for a Coconut Grower cum Primary Processor.

Resources to be Used

- Training Kit (Trainer Guide, Presentations), participants handbook, Whiteboard, Marker, Projector, Laptop
- Template giving idea about area, production, productivity of various coconut growing states in India, various branches of agriculture, plantation crops, present status of coconut industry and future scope, Nutritive value of coconut, coconut board and its activity, role and responsibility of coconut grower cum primary processor, employment opportunity.

Team Activity

Purpose : Introductory module. Participants should understand size and scope of the agriculture industry and its sub-sectors, their role and responsibilities as Coconut Grower cum Primary Processor, Role of coconut development board, awareness about employment opportunities for a Coconut Grower cum Primary Processor

Methodology :

1. Welcome all the participants.
2. Ask them to introduce themselves by telling their name, village name, experience, experience of working in coconut farm or industry
3. Explain them power point presentation prepared on above mentioned purpose on projector
4. Elaborate role and responsibilities as Coconut Grower cum Primary Processor and employment opportunity which will get developed through this training program.
5. During presentation after completion of unit, ask them questions given in exercise related to unit.
6. Ask the participants to share their experience related to coconut cultivation or processing
7. Ask them to read participants handbook for better understanding

Expected outcome :

- Knowledge enhancement, effective communication.
- Analyzing efficiency of every participant should be improved.
- Awareness about agriculture industry, coconut industry, employment and business opportunity.
- Understanding about purpose of training and clarity about their role and responsibilities.

Say

- Thanks everyone for their participation.
- Describe the objective of the activity.
- Discuss with the participants about their understanding.

Ask

- Ask participants about their knowledge related to present status of agriculture industry as well as coconut industry in India.
- Ask participants if they aware about coconut development board and its schemes.
- Ask them various types of questions given in exercise.
- Ask them to read participants hand book and ask questions if they have doubts.

Explain

- Agriculture Industry in short and coconut industry in specific and its present status in India.
- The purpose of the coconut cultivation, business and employment generation opportunities.
- Role of coconut development board and other government incentives.
- Nutritional value in coconut and its medicinal properties.

Elaborate

- Day to day need of coconut for home consumption and industry.
- Coconut products, by products, their uses and their demand from industry.
- Employment opportunities for a Coconut Grower cum Primary Processor.

Activity for participants

- Visit a nearby coconut plantation. Take your own observations
- Discuss with coconut grower about variety, cultivation practices, yield and market.
- Write problem faced by coconut grower and efforts taken by him to solve the same.
- Write various schemes from which the coconut grower got benefited

Notes for Facilitation

- Explain the design template first to yourself and give them the general idea about how to and what to observe in the picture.
- Read recent Horticulture database from National Horticulture Board, import export information and information of Coconut development board.
- Focus on information mentioned in participants handbook and you tube video attachments given in participants handbook.
- Analyze the participants. Constantly motivate each student to participate in discussion.
- Invite any successful coconut grower cum primary processor to share his experiences.

Exercise

Key solutions to PHB exercise

A. Short Questions

1. Identification of mother palm, raising of nursery, knowledge about nutrition and irrigation for quality nut production. Knowledge about pest and diseases, integrated approach for their management. Use of machinery for cultivation, harvesting and primary processing.

2. Coconut is an important multipurpose perennial crop of the tropics. India being the largest coconut producing country in the world comprises of a 34.73% of global production. The Coconut Palm provides food security and livelihood opportunities to more than 12 million people in India. It is also a fibre-yielding crop for more than 15,000 coir-based industries which provides employment to nearly 6 lakhs people.

3. To start own nursery or to work in coconut nursery having knowledge of coconut cultivation. Consultancy for establishment and management of coconut farm. Coconut waste can be utilized for composting and can be sold back to coconut growers. Crude oil can be removed from dried coconut and oil based various products can be made. Employment opportunity to start or work in a coir and coco peat production industry.

B. State whether True or False (T/F)

1. False
2. True
3. True

C. Fill in the Blanks

1. 57.8%
2. Crude oil

D. Multiple Choice Questions

1. a) 12 million
2. b) Charcoal

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2. Process of Preparing for Coconut Cultivation

AGR/N0515

Terminal Outcomes

After the completion of this module, the participants will be able to:

1. Describe the process of selecting the site for coconut cultivation.
2. Describe the process of arranging the necessary resources.
3. Demonstrate the process of raising the seedlings in the nursery.

Key Learning Outcomes

After the completion of this module, the participants will be able to:

Theory	Practical
1. Explain various parameters to assess while selecting a site for coconut cultivation. 2. State the suitable soil and climate conditions for coconut cultivation. 3. Explain various varieties of seeds such as tall, dwarf and hybrid. 4. List various resources required for coconut cultivation. 5. Explain the use of relevant tools and implements for coconut cultivation. 6. Explain the importance of protecting the nursery bed from direct sunlight with the help of artificial shading. 7. State the water requirements of different types of seedlings. 8. Explain various practices to be followed for optimum nutrition management and protection of seedlings from pests and disease. 9. Explain the criteria for selecting the seedlings based on the germination period. 10. State the appropriate conditions for storing the resources required for raising seedlings and the harvested seedlings.	1. Demonstrate the process of preparing the nursery bed in the recommended dimensions. 2. Demonstrate the process of treating the planting material with the appropriate pesticide, insecticide or fungicide. 3. Demonstrate how to sow seeds in the seedbed at the recommended depth and spacing. 4. Demonstrate the process of carrying out nutrition, disease and pest management of seedlings. 5. Demonstrate the use of the appropriate tools to harvest the seedlings. 6. Demonstrate the process of discarding the diseased and damaged seedlings in an environment-friendly manner.

UNIT 2.1: Site Selection, Varieties and Tools

Unit Objectives

After the completion of this unit, the participants will be able to:

1. Explain various parameters to assess while selecting a site for coconut cultivation.
2. State the suitable soil and climate conditions for coconut cultivation.
3. Explain various varieties of seeds such as tall, dwarf and hybrid.
4. List various resources required for coconut cultivation.
5. Explain the use of relevant tools and implements for coconut cultivation.
6. Demonstrate the process of preparing the nursery bed in the recommended dimensions.

Resources to be Used

- Training Kit (Trainer Guide, Presentations), participants handbook, Whiteboard, Marker, Projector, Laptop
- Template giving idea about Site selection which includes latitude and altitude, soil, temperature, rainfall, Humidity and wind, Sunshine, Resources in Coconut Cultivation, Varieties of coconut, Tools, implements and their use, etc.
- Coconut Orchard, Seed nut of various varieties for identification, tools and implements.

Team Activity

Purpose: Module is giving idea about selection of site on the basis of soil and climatic factors. Participants should be able to decide variety, location, etc. Participants can be able to purchase varieties, tools, implements required for orchard management.

Methodology:

1. Arrange the session in coconut orchard or nursery unit in village, so that participants can watch daily occurring operations in Coconut orchard and nursery.
2. Welcome all the participants.
3. Ask them few questions from previous module as revision.
4. Explain them power point presentation prepared on above mentioned purpose on projector.
5. Discuss problems occur in problematic soils and adverse climatic condition and elaborate procedure to overcome the specific problem.
6. Show them nuts of various varieties, discuss about their character, yield and suitability.
7. Identify varieties which can be cultivated in their local area.
8. Show them different tools and implements and demonstrate their safe and scientific use in coconut orchard.
9. During presentation after completion of unit, ask them questions given in exercise related to unit.
10. Ask the participants to share their experience related to site selection, varieties of coconut, tools and implements.

11. Ask them to read participants handbook for better understanding.

Expected outcome:

- Knowledge enhancement, effective communication.
- Analyzing efficiency of every participant should be improved.
- Awareness about site selection, problems occur in problematic soils and adverse climatic condition and control measures.
- Identification of varieties suitable for their region, tools and implements required in coconut orchard.

Say

- Thanks everyone for their participation.
- Describe the objective of the activity.
- Suggest to read practical handbook for more clarity about the topic discussed.
- Discuss with the participants about their understanding.

Ask

- Ask participants about their knowledge related to site selection for coconut, coconut varieties
- Ask participants if they aware about problematic soil and adverse climatic conditions affecting plant health and yield.
- Ask them various types of questions given in exercise.
- Ask them to read participants hand book and ask questions if they have doubts.

Explain

- The various parameters to be assessed while selecting a site for coconut cultivation.
- The suitable soil and climate conditions for coconut cultivation, improved and hybrid varieties.
- Long term benefits for selection of site and variety for cultivation as coconut can't be grafted.
- Benefits of various tools and implements which will ease the work of labour saving time and money.

Elaborate

- Impact of good soil condition on growth of coconut.
- Adverse effect of selection of problematic soil for coconut plantation as coconut is perennial crop. Mistakes can't be rectified easily as soil amendments are costly.
- Impact of good agro climatic condition on growth of coconut
- Adverse effect of selection of problematic agro climatic condition for coconut plantation as coconut is perennial crop.

Activity for participants

- Visit nearby coconut orchard or nursery and write varieties they have their performance.
- Write adverse effect of problematic agro climatic condition faced by coconut grower if any.
- Write characters of tall, dwarf and hybrid varieties which you observe in the nursery or orchard.
- Write the rates of various tools, implements and inputs used in coconut nursery or orchard.

Notes for Facilitation

- Explain the design template first to yourself and give them the general idea about how to and what to observe in the picture.
- Read recent information about adverse effect of soil and climate and remedies suggested by various organizations, improved as well as hybrid varieties and their characters, tools and implements available for coconut plantation
- Focus on information mentioned in participants handbook and you tube video attachments given in participants handbook
- Analyze the participants. Constantly motivate each student to participate in discussion.
- Invite any successful coconut grower cum primary processor to share his experiences

Exercise

Key solutions to PHB exercise

A. Short Questions

1. Coconut is grown in different soil types such as laterite, coastal sandy, alluvial and also in reclaimed soils of the marshy lowlands. In heavy rainfall areas, well drained types of soil and in poor rainfall areas, deep fine soils are essential. Clayey, black cotton soils, subject to water logging; Shrink and crack during dry periods are not suitable. Laterite soils – should be deep up to 1 m or below without a rock or hard pan. Alluvial, red sandy and silt loams are also suitable provided they are well drained. Alkaline, saline soils are not suitable. Ideal pH is 5.2 to 7.0.
2. Coconut palms are plated by digging pit from 1 to 1.2 m3 depending upon soil type hence pick-axe, spade, crow bar, ghamela are basic tools required in an orchard. For commercial scale plantation, JCB can be hired to clean the land and dig the pits. Depending upon orchard size, tools can be purchased or hired. For small orchard, sickles can be purchased for manual weeding and Gatur sprayer can be used for spraying. For big orchards, Power operated machinery like weeder, power sprayer can be purchased through subsidy. Light-weight aluminum ladder can be used to clean the crown and harvest the fruits are early years of growth. Later on, after 15 years of age, climber type harvesters or ladders developed by various research organisations can be purchased and used.
3. Chowghat orange dwarf (COD), CGD, Malayan Green Dwarf (MGD), Malayan Yellow Dwarf (MYD), Malayan Orange Dwarf (MOD), Ganga Bondam.

B. State whether True or False (T/F)

1. True
2. False
3. True

C. Fill in the Blanks

1. Water
2. 1 to 1.2 m^3

D. Multiple Choice Questions

1. a) *Kera Madhura*
2. c) CARI-2

UNIT 2.2: Raising Seedlings in Nursery

Unit Objectives

After the completion of this unit, the participants will be able to:

1. Explain importance of protecting the nursery bed from direct sunlight with the help of artificial shading.
2. Explain various basic water requirements of different types of seedlings.
3. Explain various practices to be followed for optimum nutrition management and protection of seedlings from pests and disease.
4. Explain criteria for selecting the seedlings based on the germination period.
5. State various appropriate conditions for storing the resources required for raising seedlings and the harvested seedlings.
6. Demonstrate the process of treating the planting material with the appropriate pesticide, insecticide or fungicide.
7. Demonstrate how to sow seeds in the seedbed at the recommended depth and spacing.
8. Demonstrate the process of carrying out nutrition, disease and pest management of seedlings.
9. Demonstrate the use of the appropriate tools to harvest the seedlings.
10. Demonstrate the process of discarding the diseased and damaged seedlings in an environment-friendly manner.

Resources to be Used

- Training Kit (Trainer Guide, Presentations), Whiteboard, Marker, Projector, Laptop
- Template giving idea about various varieties of seeds such as tall, dwarf and hybrid
- Open field for measurement, seed nuts of various varieties, coconut seedlings, manures and fertilizers, relevant tools and implements such as trowel measuring tape, rope, rakes, sickle, spade, rose cane, pick axe, etc
- Coconut nursery with shade, polybag nursery, nut storage facility, ideal coconut seedling

Team Activity

Purpose : Module is giving idea about nursery raising for seedling. Participants should be able to decide ideal mother palm, seed nut if they want to start nursery. Participants can be able to identify high yielding trees suitable as mother palm, harvesting of mature nuts suitable as seed, storage of seed nuts, preparation of nursery, poly bag nursery, shed for protection, water management, pest and disease management, selection of coconut seedling for planation.

Methodology :

1. Arrange the session in coconut orchard or nursery unit in village
2. Welcome all the participants.
3. Ask them few questions from previous module as revision.

4. Take a visit in Nursery and show practically mother palm, its record maintained by nursery owner
5. Explain them power point presentation prepared on above mentioned purpose on projector
6. Show process of selection of seed nut, harvesting, storage and the process of raising nursery in bed and polybag, Sow seeds in the seedbed at the recommended depth and spacing
7. Practically show intercultural operations like counting germination percentage, survival percentage, making shade to new seedling, irrigation, Identification of diseases and pest in nursery and perform plant protection practices
8. Explain identification of ideal coconut seedling and practically show removal of coconut seedling for sale and explain aftercare till planting.
9. During presentation after completion of unit, ask them questions given in exercise related to unit.
10. Ask to repeat the procedure of selection of mother palm, seed nut, seedling, care during removal of seedling, pest and diseases in nursery
11. Ask the participants to share their experience related to site selection, varieties of coconut, tools and implements
12. Ask them to read participants handbook for better understanding

Expected outcome :

- Knowledge enhancement, effective communication
- Analyzing efficiency of every participant should be improved
- Awareness about nursery activities of coconut, identification of mother palm, seed nut, storage of nut, bed preparation, protection of bed, irrigation and nutrient management, Identification of diseases and pest in nursery and perform plant protection practices
- Knowledge of new technology like polybag nursery, selection of seedling for planting

Say

- Thanks everyone for their participation
- Describe the objective of the activity
- Suggest to read practical handbook for more clarity about the topic discussed
- Discuss with the participants about their understanding

Ask

- Ask participants about their knowledge related to nursery activity in coconut
- Ask participants if they aware about various practices followed in nursery, ask them to share their experience if they earlier visited in any coconut nursery
- Ask them various types of questions given in exercise
- Ask them to read participants hand book and ask questions if they have doubts.

Explain

- The various parameters to be assessed while selecting a site for coconut nursery
- Importance of mother palm selection, seed nut identification, polybag nursery, storage of seed
- Intercultural practices in nursery and Importance record keeping
- Identification of ideal coconut seedling and aftercare till planting

Elaborate

- Procedure for selection of mother palm, seed nut, storage of seed nuts, record keeping
- Importance of preparation of nursery, poly bag nursery, shed for protection, water management, pest and disease management
- Impact of selection of coconut seedling and adverse effect of wrong selection.
- Importance of polybag nursery technology and its benefits
- Procedure for discarding diseased and damaged seedlings in an environment-friendly manner

Activity for participants

- Write your own observation by visiting a nursery producing coconut seedling
- Try to identify mother palm, seed nut for sowing and ideal seedling for transplanting
- Try to identify pest and diseases observed in nursery
- Write the difference between seedling raised in field and in polybag

Notes for Facilitation

- Explain the design template first to yourself and give them the general idea about how to and what to observe in the picture.
- Read recent information about nursery business, demand and supply of seedling, poly bag nursery, nutrition and water management suggested by various institutes, pest and diseases of coconut at nursery stage and control, etc.
- Focus on information mentioned in participants handbook and you tube video attachments given in participants handbook
- Analyze the participants. Constantly motivate each student to participate in discussion.
- Invite any successful coconut grower cum primary processor to share his experiences

Exercise

Key solutions to PHB exercise

A. Short Questions

1. A perennial source of water is required for maintenance of coconut palms and irrigation is essential for obtaining good coconut yield. Sprinkler / Micro Jet Sprinkler / Hose irrigation Systems are well suited for irrigating coconut nurseries. After sowing the seed nuts should be irrigated thoroughly to saturation levels. The seed beds should be irrigated regularly to ensure that the soil is moist.

   During summer months, the beds may be irrigated on alternate days. About 10 mm of water should be applied at every irrigation. The seed beds can be covered with suitable mulch after the cessation of monsoon rain. Coconut leaves, straw or green leaves are used. This is done to conserve moisture and to check weed growth. Keep the nursery beds free of weeds by periodic weeding.
2. The Bud rot affected seedlings are to be removed and the surrounding seedlings treated with 1% Bordeaux mixture. Seed nuts dip with Copper oxychloride 0.25%.

   White grub can be controlled by application of Phorate 10g @15g/ seedling.
3. Standards for Selection of Coconut Seedling are as follows:

Seedling Characters	Standards
Age of the seedling	12 months
Number of leaves	6 and above
Girth at collar region	Dwarfs – more than 8 cm; Hybrids/talls – more than 10 cm
Height	Dwarfs – more than 80 cm; Hybrids/talls – more than 100 cm
Petiole colour	Dwarfs – should exhibit petiole colour of parent; Hybrids – Green/Brown/intermediate shades of parents
Disease and pest incidence	Absent

B. State whether True or False (T/F)

1. False
2. False
3. True

C. Fill in the Blanks

1. 60x45
2. Alternate

D. Multiple Choice Questions

1. d) Both a and b
2. c) Sandy soils

3. Process of Transplanting the Seedlings and Maintaining the Coconut Crop

Unit 3.1 - Field Preparation and Nutrient Management

Unit 3.2 - Pest and Disease Management

Unit 3.3 - Resource Optimization, Waste Management and Inclusion of People

AGR/N0516

Terminal Outcomes

After the completion of this module, the participants will be able to:

1. Describe the process of preparing the field for transplanting seedlings.
2. Demonstrate the process of transplanting the seedlings.
3. Demonstrate the process of performing nutrient, weed and integrated pest and disease management.
4. Demonstrate the process of performing irrigation management.
5. Demonstrate various practices for effective resource optimisation.
6. Demonstrate various waste management practices.
7. Discuss ways to promote diversity and inclusion at the workplace.

Key Learning Outcomes

After the completion of this module, the participants will be able to:

Theory	Practical
1. Explain the importance of removing all roots, debris and waste material from the field before tilling. 2. State the recommended soil moisture levels required for tilling. 3. Explain the importance of applying mulch during field preparation to prevent weed growth. 4. Explain the importance of checking the soil's macro and micronutrient levels through an authorised lab. 5. State the appropriate quantity of fertilisers to be applied to the soil and the recommended fertilisation schedule. 6. Explain the importance of checking the crop regularly to identify the signs of pests and disease infestation. 7. State the recommended practices to be followed to control pests such as adopting the natural enemies of coconut crop pests. 8. Explain the importance of applying the recommended pesticides or insecticides as per the prescription. 9. Explain the importance of maintaining the weed, pest and insect calendar. Explain the benefits of resource optimisation.	1. Demonstrate how to remove all roots, debris and waste material from the field. 2. Demonstrate the process of tilling the field to the required depth. 3. Demonstrate the process of applying mulch in the field to prevent weed growth. 4. Demonstrate how to create drains in the field for effective drainage of water. 5. Show how to prepare pits of the recommended depth and width for the healthy growth of seedlings. 6. Show how to fill the pits with the mixture of topsoil and compost up to the recommended level. 7. Demonstrate the process of transplanting the seedlings in the pits and applying soil cover on the roots. 8. Demonstrate the process of carrying out gene stacking as per the requirement. 9. Demonstrate the process of applying fertilisers to the soil and water the seedlings with the recommended quantity. Demonstrate the use of a pH meter. 10. Demonstrate the process of applying lime or gypsum to the soil in the recommended quantity. 11. Demonstrate the process of applying the lab-recommended organic or inorganic fertilisers to the soil in the recommended quantity. 12. Demonstrate the process of applying the recommended weedicides/ herbicides as per the instructions from the relevant agricultural university or agriculture department. 13. Demonstrate the process of carrying out mechanical weeding according to the size

Theory	Practical
10. Explain the importance of recycling and disposing different 11. types of waste as per the applicable regulations. 12. Explain the importance of inclusion of all genders and People with Disability (PwD) at the workplace.	of the coconut farm and the extent of weed infestation. 14. Demonstrate the process of applying the recommended pesticides/insecticides as per the prescription to remove and control pests and diseases. 15. Prepare a sample record of pesticides and insecticides used in the field. 16. Demonstrate the process of applying mulch, coconut husk or coir pith to the soil to conserve soil moisture and prevent irrigation water from evaporating. 17. Demonstrate various practices to optimise the usage of various resources such as water and electricity. 18. Demonstrate the process of recycling and disposing different types of waste appropriately. 19. Demonstrate appropriate verbal and non-verbal communication that is respectful of genders and disability.

UNIT 3.1: Field Preparation and Nutrient Management

Unit Objectives

After the completion of this unit, the participants will be able to:

1. Explain the importance of removing all roots, debris and waste material from the field before tilling.
2. State the recommended soil moisture levels required for tilling.
3. Explain the importance of applying mulch during field preparation to prevent weed growth.
4. Explain the importance of checking the soil's macro and micronutrient levels through an authorized lab.
5. Demonstrate how to remove all roots, debris and waste material from the field.
6. Demonstrate the process of tilling the field to the required depth.
7. Demonstrate the process of applying mulch in the field to prevent weed growth.
8. Demonstrate how to create drains in the field for effective drainage of water.
9. Show how to prepare pits of the recommended depth and width for the healthy growth of seedlings.
10. Show how to fill the pits with the mixture of topsoil and compost up to the recommended level.
11. Demonstrate the process of transplanting the seedlings in the pits and applying soil cover on the roots.
12. Demonstrate the process of carrying out gene stacking as per the requirement.
13. Demonstrate the process of applying fertilizers to the soil and water the seedlings with the recommended quantity. Demonstrate the use of a pH meter.
14. Demonstrate the process of applying lime or gypsum to the soil in the recommended quantity.
15. Demonstrate the process of applying the lab-recommended organic or inorganic fertilizers to the soil in the recommended quantity.
16. Demonstrate the process of applying the recommended weedicides/ herbicides as per the instructions from the relevant agricultural university or agriculture department.
17. Demonstrate the process of carrying out mechanical weeding according to the size of the coconut farm and the extent of weed infestation.

Resources to be Used

- Training Kit (Trainer Guide, Presentations), Participants hand book, Whiteboard, Marker, Projector, Laptop
- Template giving idea about preparing the field for transplanting seedlings
- An ideal open field where coconut seedlings can be planted. Machineries for cleaning the field, removal of debris, digging the drainage trench, mulch as well as implements and tools for coconut plantation, etc.

Team Activity

Purpose : Module is giving idea about transplanting the seedlings in the main field and maintaining the coconut orchard for commercial production. Participants should be able to understand pre cultivation practices for coconut which includes field preparation for cleaning of land, tillage operations, mulching for controlling weed growth, removal of debris, application of macro and micro nutrient in soil for increasing fertility. Participants should be able to know plantation practices like layout, digging of pits, planting and replanting. Participants should be able to manage macro and micro nutrients for newly planted seedling as well as coconut palm of various stages, different manures, fertilizers and preparation of vermicompost using coconut leaves, fertilizer application through micro- irrigation technique.

Methodology :

1. Arrange the session in coconut orchard and also in open field where new coconut plantation is expected
2. Welcome all the participants.
3. Ask them few questions from previous module as revision.
4. In an old plantation, discuss with participants about spacing, layout, nutrient management
5. In a open field, discuss with participants about field preparation for cleaning of land, tillage operations, mulching for controlling weed growth, removal of debris, application of macro and micro nutrient in soil for increasing fertility and practically involved them in above mentioned operations
6. Put a layout on the field and dig the pit at recommended depth and width for transplanting seedlings. Demonstrate mixing soil with nutrients, planting coconut seedling and filling pit, staking, shade, mulching.
7. Display various manure and chemical fertilizer for identification and demonstrate intercultural operations like preparation of vermicompost using coconut leaves, fertilizer application through micro- irrigation technique
8. Show them how to check the soil's pH level using a pH meter and adjust it by applying lime or gypsum in the recommended quantity
9. Apply the lab-recommended organic or inorganic fertilizers to the soil in the recommended quantity and as per the prescribed schedule
10. Adopt the recommended cultural practices to enhance the level of soil nutrients
11. Explain them power point presentation prepared on above mentioned purpose on projector.
12. During presentation after completion of unit, ask them questions given in exercise related to unit.
13. Ask to repeat the procedure of preparation of field, transplanting coconut seedling in field in proper layout and nutrient management practices.
14. Ask the participants to share their experience related to improving soil fertility, planting of coconut in filed, application of nutrients to plant, etc.
15. Ask them to read participants handbook for better understanding.

Expected outcome :

- Knowledge enhancement, effective communication.
- Analyzing efficiency of every participant should be improved.

- Awareness about preparation of field, transplanting coconut seedling in field in proper layout and nutrient management practices.
- Awareness about weed control, drainage and operations for health growth of seedling.

Say

- Thanks everyone for their participation.
- Describe the objective of the activity.
- Suggest to read practical handbook for more clarity about the topic discussed.
- Discuss with the participants about their understanding.

Ask

- Ask participants about their knowledge related transplanting young coconut seedling in field
- Ask to revise procedure for dose calculation of nutrient, method of application, weed management
- Ask them various types of questions given in exercise
- Ask them to read participants hand book and ask questions if they have doubts.

Explain

- The importance of applying mulch during field preparation to prevent the growth of weeds.
- The importance of creating drains in the field for effective drainage of water and adverse impact of poor drainage on plant growth.
- The importance of checking the soil's macro and micronutrient levels through an authorised soil-testing lab.
- The appropriate quantity of fertilisers to be applied to the soil and the recommended fertilisation schedule.

Elaborate

- The requirement of soil moisture levels required for tilling the field and taking the measurement of the recommended depth required for transplanting coconut seedlings.
- The process of transplanting coconut seedlings and the immediate care to be provided to the transplanted seedlings and aftercare.
- The procedure of soil testing, checking the pH level and soil amendments.
- The process of applying different types of organic or inorganic fertilisers to the soil.

Activity for participants

- Visit a nearby coconut orchard and write his experience about establishment of orchard.
- Identify various manures and fertilizers, tools and implements available in that orchard.
- Ask the grower to write relation of application of manure and fertilizer with yield.
- Write the detail of soil testing report available with coconut grower and amendments suggested, if any.

Notes for Facilitation

- Explain the design template first to yourself and give them the general idea about how to and what to observe in the picture.
- Read recent information about coconut plantation, cleaning land, plantation aftercare, nutrient application and its impact on yield of coconut, use of bio-fertilizer which helps to reduce use of chemical fertilizer, deficiency symptoms and control measures.
- Focus on information mentioned in participants handbook and you tube video attachments given in participants handbook.
- Analyze the participants. Constantly motivate each student to participate in discussion.
- Invite any successful Coconut Grower cum Primary Processor to share his experiences.

Exercise

Key solutions to PHB exercise

A. Short Questions

1. The weathered coconut leaves collected from the garden should be kept for two weeks after sprinkling with Cow dung slurry. Cow dung should be used at the rate of one tenth of the weight of the leaves. Afterwards earth worms (Eudrilids spp.) are to be introduced at the rate of one kg for one tonne of the material. Care should be taken to provide sufficient moisture for the decomposing material by frequent sprinkling of water. Adequate shade also should be provided to avoid direct sunlight. Vermicompost will be ready in about 2½ - 3 months with on an average, 70 per cent recovery.
2. Spacing and pit size of coconut varies as per the variety and soil type respectively. Hence planting density, digging of pit for planting, time of planting, planting system, replanting or under planting are need to be checked while transplanting the coconut seedlings.
3. Importance of checking soil macro and micro nutrient is given below

   Soil Analysis leads to more informed fertiliser decisions, reducing risks in the soil such as soil erosion, soil infertility and degraded lands and increasing farm profitability in the long-term.

   Soil macro nutrients are N, P, K and micro nutrients are zinc, iron, copper, manganese.

   Reveals the amount of plant-available macro-nutrients in the soil and where soil nutrients are in the soil profile. Identifies nutrients that could be yield-limiting.

   Consequently, it also provides a farm management tool with a potential benefit to the farmer of increased yields, reduced operating costs and superior environmental risk management and it also includes improved crop maturity and quality, higher tolerance to disease and pest damage, and increased growth.

   To determine how to get the best crop yields and how to use fertilizer and other nutrient sources most efficiently.

B. State whether True or False (T/F)

1. True.
2. False
3. True

C. Fill in the Blanks

1. Laterite
2. Underplanting

D. Multiple Choice Questions

1. a) 3 to 5 years
2. d) All of these

UNIT 3.2: Pest and Disease Management

Unit Objectives

After the completion of this unit, the participants will be able to:

1. Explain the importance of checking the crop regularly to identify the signs of pests and disease infestation.
2. State the recommended practices to be followed to control pests such as adopting the natural enemies of coconut crop pests.
3. Explain the importance of applying the recommended pesticides or insecticides as per the prescription.
4. Explain the importance of maintaining the pest and insect calendar.
5. Demonstrate the process of applying the recommended pesticides/insecticides as per the prescription to remove and control pests and diseases.
6. Prepare a sample record of pesticides and insecticides used in the field.

Resources to be Used

- Training Kit (Trainer Guide, Presentations), Participants hand book Whiteboard, Marker, Projector, Laptop
- Template giving idea about pest and disease management in coconut
- Coconut plantation, sprayer, insecticide, fungicide, lenses, measuring cylinder, etc

Team Activity

Purpose : Module is giving idea about transplanting the seedlings in the main field and maintaining the coconut orchard for commercial production. Participants should be able to identify pest and diseases, their life cycle, nature of damage and application of integrated pest and disease management strategies.

Methodology :

1. Arrange the session in coconut orchard having new as well as old plantation
2. Welcome all the participants.
3. Ask them few questions from previous module as revision.
4. Show participants how to monitor the crop regularly to identify the signs of pest and disease infestation such as rhinoceros beetle, black-headed caterpillar, red palm weevil, termites, bud rot, leaf rot, stem bleeding, etc.
5. Determine the stage of pest and disease infestation along with the mode of transmission
6. Follow the recommended practices to control pests such as adopting the natural enemies of coconut crop pests
7. Apply the recommended pesticides/insecticides as per the prescription to remove and control pests and disease
8. Maintain the record of pesticides and insecticides used in the field
9. Explain power point presentation prepared on above mentioned purpose on projector

10. During presentation after completion of unit, ask them questions given in exercise related to unit.
11. Ask again the symptoms of major pest and diseases and control measure as revision
12. Ask them to read participants handbook for better understanding

Expected outcome :

- Knowledge enhancement, effective communication
- Analyzing efficiency of every participant should be improved
- Identification of pest and diseases of coconut, their life cycle.,
- Awareness about integrated pest and disease management

Say

- Thanks everyone for their participation
- Describe the objective of the activity
- Suggest to read practical handbook for more clarity about the topic discussed
- Discuss with the participants about their understanding

Ask

- Ask participants about their knowledge related pest and diseases in coconut
- Ask to revise procedure for dose calculation of pesticide and fungicide preparation, method of application
- Ask them various types of questions given in exercise
- Ask them to read participants hand book and ask questions if they have doubts.

Explain

- The importance of checking the crop regularly to identify the signs of pests and disease infestation
- The recommended practices to be followed to control coconut pests such as adopting the natural enemies of the crop
- The importance and process of applying the recommended pesticides or insecticides as per the prescription
- The importance and process of maintaining the pest and insect calendar

Elaborate

- Symptoms by showing damages in coconut planation cause by various pest and disease
- How to identify causal organism or pest to decide control measure
- Calculation of dose, preparation of chemicals for spraying and spraying operation
- How to use of natural enemies of pest and bio control measures in coconut plantation

Activity for Participants

- Visit a nearby coconut orchard and identify pest and disease infestation if any
- Practice calculation of dose of pesticide and fungicide
- Identify the natural enemies of pest available in your area
- Try to develop a pest and disease calendar with the help of existing coconut grower in your area

Notes for Facilitation

- Explain the design template first to yourself and give them the general idea about how to and what to observe in the picture.
- Read recent information about pest and diseases of coconut, bio control agents, IPDM
- Take knowledge of different sprayers and technologies available for IPDM in coconut
- Focus on information mentioned in participants handbook and you tube video attachments given in participants handbook
- Analyze the participants. Constantly motivate each student to participate in discussion.
- Invite any successful coconut grower cum primary processor to share his experiences

Exercise

Key solutions to PHB exercise

A. Short Questions

1. Integrated pest management approach is necessary for the management of Eriophyid mite

- Root feeding of Azadirachtin 50,000 ppm @ 7.5 ml + 7.5 ml water or Azadirachtin 10,000 ppm @ 10 ml + 10 ml water was recommended.
- Drenching of Eriophyid smash (Azadirachtin 0.03 per cent plus micronutrients) at the rate of 250 ml in 20 lit. of water per palm at interval of three months is recommended for the management of coconut Eriophyid mite.
- Spraying of 20 % palm oil Sulphur (0.5 %) emulsion on the petiolar end of buttons for effective suppression.
- Application of talc-based preparation of Hirsutella thompsonii @ 20 g / l/ palm containing 1.6 x 108 cfu with a frequency of three sprayings per year reduced mite population significantly
- Spraying of 20 % palm oil sulphur (0.5 %) emulsion on the petiolar end of buttons for effective suppression.

2. The earliest symptoms are the yellowing of one or two younger leaves surrounding the spindle. The spindle withers and droops down. The tender leaf base and soft tissue of the crown rot into a slim mass of decayed material emitting a foul smell. The diseases kill the palm if not controlled at the early stages.

Management :

- In early stages of the diseases, when the spindle leaf starts withering, cut and remove all affected tissues of the crown and apply Bordeaux paste and protect it from rain by providing a polythene covering till normal shoot emerge.
- Burn all diseases affected tissues removed from all palm.
- As a prophylactic measure, spray 1 per cent Bordeaux mixture on spindle leaves and crown of affected palms as well as neighboring palms before the onset of monsoon.
- Leaf axil filling with sevidol 8G, 25 g mixed with 200 g sand is recommended to prevent re palm weevil infestation of affected palms.
- Dwarf varieties of coconut are sensitive to copper injury. Hence, Bordeaux mixture spraying should not be done. Instead, place small perforated sachets containing 2-3 g of Indofil M-45 in the top two or three leaf axils to control bud rot diseases.

3. The strategy is to contain the disease in its present geographical limits and managing the disease by improving the condition of affected palms and increasing the yield through proper manuring and other agronomic practices. Eradication of the disease in mildly affected areas by cutting and removal of affected palms.

- In the heavily disease affected, remove all the severely affected uneconomic adult palms (those yielding less than 10 nuts per palm per year) and all diseased palms in the prehearing age. Adopt improved management practices in the affected gardens to enhance the yield of palms.

- Apply the recommended dose of NPK, 3kg magnesium sulphate and 50 kg organic manure per palm. Control of leaf rot disease which is usually noticed in root (wilt) affected palms. Replanting with progenies of disease-free palms located in hot spot areas.

B. State whether True or False (T/F)

1. True
2. False
3. True

C. Fill in the Blanks

1. Stem bleeding
2. Coconut eriophyid mite

D. Multiple Choice Questions

1. a) *Ganoderma lucidum*
2. a) Rhinoceros beetle

UNIT 3.3: Resource Optimization, Waste Management and Inclusion of People

Unit Objectives

After the completion of this unit, the participants will be able to:

1. Explain the benefits of resource optimisation.
2. Explain the importance of recycling and disposing different types of waste as per the applicable regulations.
3. Explain the importance of inclusion of all genders and People with Disability (PwD) at the workplace.
4. Demonstrate the process of applying mulch, coconut husk or coir pith to the soil to conserve soil moisture and prevent irrigation water from evaporating.
5. Demonstrate various practices to optimise the usage of various resources such as water and electricity.
6. Demonstrate the process of recycling and disposing different types of waste appropriately.
7. Demonstrate appropriate verbal and non-verbal communication that is respectful of genders and disability.

Resources to be Used

- Training Kit (Trainer Guide, Presentations), Participants hand book, Whiteboard, Marker, Projector, Laptop
- Template giving idea about Resource Optimization, Waste Management and Inclusion of People
- Coconut plantation with intercropping, various products using various coconut part, etc

Team Activity

Purpose : Module is giving idea about Resource Optimization, Waste Management and Inclusion of People. Participants should be able to identify ideal intercrop with age of coconut, layout of multiple cropping system. Participants should identify products prepare by various parts of coconut, their importance use and market. To gain knowledge about gender identity refers to one's concept of their own gender.

Methodology :

1. Arrange the session in coconut orchard having intercropping.
2. Arrange various by products prepared from various parts of coconut.
3. Welcome all the participants.
4. Ask them few questions from previous module as revision.
5. Explain participants about root system of coconut and scope for maximum resource utilization by doing intercropping.
6. Check the impact on palm growth as well as inter crop growth.
7. Ask coconut grower to explain operation performed and benefit received.

8. Ask participants to record details of cropping system and prepare a model suitable for their own location
9. Explain in detail about all Byproducts of coconut waste available in market made up of husk, shell, leaves, stem, coir, etc.
10. Discuss idea about ways to promote diversity and inclusion at the workplace.
11. Quote examples of empathizing persons with disabilities (PwD) and its necessity, importance and ethical way to adopt gender-neutral behaviour at work.
12. Explain power point presentation prepared on above mentioned purpose on projector.
13. During presentation after completion of unit, ask them questions given in exercise related to unit.
14. Ask again the symptoms of major pest and diseases and control measure as revision.
15. Ask them to read participants handbook for better understanding.

Expected outcome :

- Knowledge enhancement, effective communication.
- Analyzing efficiency of every participant should be improved.
- Awareness about effective resource optimization like mixed cropping, intercropping.
- Awareness about effective waste management and byproduct preparation.
- Awareness about promoting persons with Disabilities and adopting gender-neutral behaviour at work.

Say

- Thanks everyone for their participation.
- Describe the objective of the activity.
- Suggest to read practical handbook for more clarity about the topic discussed.
- Discuss with the participants about their understanding.

Ask

- Ask participants about their effective resource optimization like mixed cropping, intercropping.
- Ask to identify suitable crop for mixed or intercropping in coconut.
- List suitable examples of work process which can easily perform by PwD.
- Ask them various types of questions given in exercise.
- Ask them to read participants hand book and ask questions if they have doubts.

Explain

- The benefits and ways of resource optimisation.
- Advantages and dis-advantages of multistoried cropping system on the basis of selection of crop, intensity of light age per growth of coconut palm.
- Various products which can be prepared from coconut plant parts and their economic benefit.
- The importance of following the recommended inclusive practices for PwD and all genders at work.

Elaborate

- Layout procedure of lakhi baug designed by DBSKKV, Dapoli.
- The procedure of making coir pith compost and coconut leaves vermicompost.
- The various examples of effective waste management having scope in their local area.
- The procedure which can be performed without gender biasness e.g. coconut climbing with ladder which earlier was considered a man work.
- The various examples of coordinated work with co-workers to achieve the work objective in time.

Activity

- Visit nearby coconut based multistoried cropping system and write your observations.
- List out how to recycle the waste appropriately and dispose non-recyclable waste in an environment-friendly manner.
- Ask the participants to perform stepwise procedure for preparation of coir pith compost and coconut leaves vermicompost.
- Ask participants to share his experiences working with PwD and all genders at work.

Notes for Facilitation

- Explain the design template first to yourself and give them the general idea about how to and what to observe in the picture.
- Read recent information about wastage in coconut plantation and their conversion in various byproducts to earn economic benefits and employment generation.
- Read benefits of coir pith compost and coconut leaves vermicompost on coconut palm health.
- Focus on information mentioned in participants handbook and you tube video attachments given in participants handbook.
- Analyze the participants. Constantly motivate each student to participate in discussion.
- Invite any successful coconut grower cum primary processor to share his experiences.

Exercise

A. Short Questions

Key solutions to PHB exercise

1. Mushroom Cultivation Using Coconut By-products: Coconut bunch waste, leaf stalk, mixtures of leaf stalk + coir pith in 1:1 ratio and bunch waste + coir pith in 1:1 ratio were found to be better substrates for mushroom cultivation. On an average, mushroom yields of 590 and 570 g can be obtained per kg dry weight of leaf stalk and bunch waste in a cropping period of 73 and 60 days, respectively. Polybag method of cultivation could be followed using 3 per cent spawn applied by multilayering technique. Spawn run and cropping can be done in a low-cost mushroom shed built exclusively with coconut materials such as plaited coconut leaves and coconut wood inside an adult coconut garden. Spraying of 1 per cent urea and 1 per cent super phosphate helps to reduce the interval between flushes. *Pleurotuseous, Pleurotus flabellatus, Pleurotus florida* and *Pleurotus sajorcaju* are the suitable mushroom species for cultivation using coconut by-products.
2. On the basis of economic returns obtained per hectare, Chili, Dolichus bean, ridge gourd, cucumber, snake gourd and bitter gourd, tomato gave attractive yield. Four intercrops viz., turmeric, banana, pineapple and tapioca has recommended in coconut plantation in Konkan region of Maharashtra for getting more economic returns. Considering the performance of different medicinal crops as an intercrop and market demand, the arrowroot, lemongrass, shatavari, adulsa and citronella have been recommended as a intercrop in coconut plantation for Konkan region of Maharashtra. On the basis of mixed cropping experiment on spices, DBSKKV has propagated the 'LakhiBaug' concept. That is intercropping of spices particularly Cinnamon, Nutmeg and Black pepper in the coconut orchard.
3. By integrating people with disabilities into your pool of employees, you will gain a competitive advantage, productivity and increase workplace diversity, improve your bottom line, have higher retention rates, and expand your market to new consumers. Some of the benefits of inclusion for children with or without disabilities are friendship skills, peer models, problem solving skills, positive self-image, and respect for others.

B. State whether True or False (T/F)

1. True
2. True
3. True

C. Fill in the Blanks

1. Coconut husk
2. Monocrop

D. Multiple Choice Questions

1. a) 30 %
2. b) Increase workplace diversity

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4. Process of Carrying out Harvesting, Post-Harvest Processing and Marketing Activities

AGR/N0520

Terminal Outcomes

After the completion of this module, the participants will be able to:

1. Demonstrate the process of harvesting the coconuts.
2. Demonstrate the process of carrying out post-harvest activities.
3. Describe the process of preparing the storage area and storing the produce.
4. Describe the process of marketing the produce.

Key Learning Outcomes

After the completion of this module, the participants will be able to:

Theory	Practical
1. State the maturity indicators for varieties of coconuts. 2. Explain the criteria for sorting and grading the harvested coconuts. 3. Describe the process of de-husking coconuts, extracting and drying copra under the sun or mechanically. 4. Explain how to extract coconut oil from copra manually. 5. Explain the importance of ensuring a hygienic and ventilated storage area for storing the produce. 6. State the recommended temperature and humidity for storing the produce. 7. Describe the process of identifying the market demand for produce, connecting with potential buyers and negotiating with them. 8. State the appropriate transport medium for delivering the produce. 9. Explain the importance of maintaining the record of sales and payments.	1. Demonstrate the use of relevant tools and equipment for harvesting coconuts. 2. Demonstrate the process of harvesting the coconuts ensuring minimum loss and damage to them. 3. Prepare a sample record of harvested coconuts. 4. Demonstrate the process of carrying out sorting and grading of coconuts on appropriate quality parameters such as size and appearance. 5. Describe the process of de-husking the coconuts, extracting and drying copra mechanically. 6. Demonstrate the process of extracting coconut oil from copra mechanically. 7. Show how to clean the storage area before storing the produce. 8. Demonstrate the process of applying the relevant treatment in the storage area to remove any pests, insects and rodents. 9. Show how to pack the coconuts and copra in netted polythene or gunny bags. 10. Demonstrate the use of the relevant e-payment method such as Aadhar Enabled Payment System (AEPS), Unified Payment Interface (UPI), Unstructured Supplementary Service Data (USSD) payment, etc. 11. Show how to calculate the benefit cost (B:C) ratio. 12. Prepare a sample record of sales and payments.

UNIT 4.1: Harvesting of Coconuts

Unit Objectives

After the completion of this unit, the participants will be able to:

1. Explain the maturity indicators for varieties of coconuts.
2. Explain the criteria for sorting and grading the harvested coconuts.
3. Demonstrate the use of relevant tools and equipment for harvesting coconuts.
4. Demonstrate the process of harvesting the coconuts ensuring minimum loss and damage to them.
5. Demonstrate the process of carrying out sorting and grading of coconuts on appropriate quality parameters such as size and appearance.

Resources to be Used

- Training Kit (Trainer Guide, Presentations), Participants handbook, Whiteboard, Marker, Projector, Laptop.
- Template giving idea about the process of harvesting the coconuts.
- Coconut farm, different types of ladder and gadgets, different types of nuts for identification, professional coconut climber for demonstration, Sickle and other relevant tools and implements for harvesting, book in which yield record is maintained.

Team Activity

Purpose: Module is giving idea about Harvesting of coconuts. Participants should be able to identify ideal stage of harvesting, care during harvesting, duration of harvesting, methods of harvesting, harvesting gadgets available, sorting and grading of harvested nuts.

Methodology:

1. Arrange the session in coconut orchard with availability of coconut climber as well as ladder.
2. Arrange harvested nuts of different stages to identify maturity and use.
3. Welcome all the participants.
4. Ask them few questions from previous module as revision.
5. Explain importance of timely harvesting to participants, present lacuna and solutions.
6. Describe in detail care during harvesting, duration of harvesting, methods of harvesting.
7. Demonstrate the use of relevant tools and equipment for harvesting coconuts.
8. Demonstrate the process of harvesting the coconuts ensuring minimum loss and damage to them.
9. Ask participants to record details of harvesting and use of nut harvested at different stages.
10. Prepare a sample record of harvested coconuts.
11. Demonstrate the process of carrying out sorting and grading of coconuts on appropriate quality parameters such as size and appearance.

12. Explain power point presentation prepared on above mentioned purpose on projector.
13. During presentation after completion of unit, ask them questions given in exercise related to unit.
14. Revise again the process of harvesting along with sorting and grading.
15. Ask them to read participants handbook for better understanding.

Expected outcome :

- Knowledge enhancement, effective communication.
- Analyzing efficiency of every participant should be improved.
- Awareness about harvesting stage, duration and process of harvesting.
- Awareness about use of different type of ladder, gadgets for harvesting.

Say

- Thanks everyone for their participation.
- Describe the objective of the activity.
- Important practice to identify maturity of nut as shelf life and quality is depend on harvesting.
- Sorting and grading of all harvested commodities increases their prices.

Ask

- Difference between harvesting of tall varieties and dwarf varieties.
- Difference between tender nut, mature nut and seed nut.
- Suggest to read practical handbook for more clarity about the topic discussed.
- Discuss with the participants about their understanding.

Explain

- The maturity indicators for varieties of coconuts.
- The use of the relevant harvesting tools and equipment such as tree climbers.
- The process of harvesting coconuts ensuring minimum loss and damage to them.
- Sorting and grading of all types of coconut and its significance.

Elaborate

- The procedure of identification of maturity of nut.
- The procedure and care while using ladder and harvesting the nuts and cleaning the crown.

Activity

Visit a coconut orchard and watch the harvesting procedure in coconut.
Ask participants to judge maturity, duration of harvesting, climbing up and down operation with various methods, bringing down coconut frond with care from palm.
Ask the participants to climb on the palm with the help of ladder and perform harvesting of nuts, cleaning the crown, pollination, tapping and insecticide application.

Notes for Facilitation

- Explain the design template first to yourself and give them the general idea about how to and what to observe in the picture.
- Read recent information gadgets available for harvesting coconut palm, care to be taken while climbing up by using ladder, use of safety belt, insurance, record keeping, etc.
- Focus on information mentioned in Training manual and you tube video attachments given in manual.
- Analyze the participants. Constantly motivate each student to participate in discussion.
- Ask participants to share his experiences of harvesting coconut from palm.

Exercise

Key solutions to PHB exercise

A. Short Questions

1. Various types of climbing devices like tractor-operated, self-propelled, manually operated and some robotic-type (electronic) devices have been developed and tested for harvesting coconut by both the government and private sector. A much simpler manual device which consists of movable supports for legs and hands and lifts alternately while the other one is gripped for climbing is presently available in market and used by professionals for harvesting of coconut. In some part of the country, knife is attached to bamboo pole and it is used for harvesting by standing on ground. In Malaysia & Thailand, monkeys are trained and used for harvesting.
2. Coconuts are harvested at different stages of maturity for specific uses.
   - For tender nut purpose, harvesting is done when the nuts are 6–8 months old.
   - For snowball tender nut and coconut chips purpose, 8–9 and 9–10 months old nuts are harvested, respectively.
   - For the production of copra and other kernel-based products, only fully mature coconuts are harvested. The nuts reach full maturity in 11–12 months after the inflorescence is opened. At this stage, the output of copra and oil as well as brown fiber would be the maximum.
3. Harvesting of coconuts is a skilled job and is generally performed by experienced climbers by climbing up to the top of the tree. Climbing is usually done with the help of a ladder, 3–4 m long. On reaching the top of the ladder, the climber invariably uses a rope ring at the feet or ankles for the next stage of climbing. The climber uses another rope ring for the hands also in some places. Climbing is also done by cutting notches on the trunk at convenient spaces, which is not a desirable practice because of the injury caused to the stem. Tied-on-husks are also used as steps for climbing. Another method involves the use of a rope loop which encircles the trunk and the climber. Various climbing devices have also been developed to reduce the drudgery involved in the climbing process for harvesting of coconuts.

B. State whether True or False (T/F)

1. True
2. True
3. True

C. Fill in the Blanks

1. Coconut
2. Tender nut

D. Multiple Choice Questions

1. d) All of the above
2. a) Skilled laborers

UNIT 4.2: Post-Harvest Activities

Unit Objectives

After the completion of this unit, the participants will be able to:

1. Explain the process of de-husking coconuts, extracting and drying copra under the sun or chemically.
2. Explain how to extract coconut oil from copra manually.
3. Describe the process of de-husking the coconuts, extracting and drying copra mechanically.
4. Demonstrate the process of extracting coconut oil from copra mechanically.
5. Show how to pack the coconuts and copra in netted polythene or gunny bags.

Resources to be Used

- Training Kit (Trainer Guide, Presentations), Whiteboard, Marker, Projector, Laptop.
- Template giving idea about grading and sorting of nut and various post-harvest activities.
- Coconut processing farm, harvested nuts, dehusker, shelling machine, copra dryer, oil chakki or mill, copra moisture meter, Skilled labour for processing.

Team Activity

Purpose: Module is giving idea about post-harvest operations in coconuts. Participants should be able to do de-husking, splitting, removal of copra. Participants should be able to dry copra with different methods and de-shelling after drying, Participants should be able to understand importance of moisture level and use of copra moisture meter, Participant should be able to extract oil from coconut and measurement of yield of oil.

Methodology :

1. Arrange the session in coconut processing unit.
2. Welcome all the participants.
3. Ask them few questions from previous module as revision.
4. Describe the process of de-husking the coconuts, extracting and drying copra mechanically.
5. Demonstrate the process of extracting coconut oil from copra mechanically.
6. Show how to pack the coconuts and copra in netted polythene or gunny bags.
7. Explain power point presentation prepared on above mentioned purpose on projector.
8. During presentation after completion of unit, ask them questions given in exercise related to unit.
9. Revise again the process of post-harvest activity up to drying of copra for oil.
10. Ask them to read participants handbook for better understanding.

Expected outcome :

- Knowledge enhancement, effective communication
- Analyzing efficiency of every participant should be improved.

- Awareness about Sorting and grading, dehusking, splitting, copra drying, deshelling.
- Awareness about use of copra moisture meter to judge quality of copra and oil extraction methods.

Say

- Thanks everyone for their participation.
- Describe the objective of the activity.
- Processing will avoid wastage, increase shelf life and increase returns from coconut.
- Maintain record book and write questions and notes if any.

Ask

- Importance of sorting and grading of coconut.
- Importance of drying of copra and various method of drying copra.
- Various industries in which copra and oil can be used.
- Suggest to read practical handbook for more clarity about the topic discussed.

Explain

- The criteria for sorting and grading the harvested coconuts and its importance.
- The significance of dehusking, extracting and drying copra under the sun or mechanically.
- Difference between extraction coconut oil from copra manually or mechanically.
- Importance of record book and writing of record book.

Elaborate

- The procedure of sorting and grading of coconut, dehusking, deshelling, splitting.
- The procedure of copra drying with various methods.
- The procedure of using copra moisture meter and oil extraction in Chakki, (cottage scale).
- The procedure of oil extraction followed in commercial unit.

Activity

Watch the presentation again to understand the process of carrying out post-harvest activities.
Visit a nearby processing unit and check how to sort and grade coconut, various process of carrying out post-harvest activities, oil extraction, etc.
Ask the participants to sort and grade coconuts, dehusk, deshell & splitting of nut, copra drying.
Extract oil at home and check its shelf life and difference between commercially available oil.

Notes for Facilitation

- Explain the design template first to yourself and give them the general idea about how to and what to observe in the picture.
- Read recent information about sorting and grading of coconut, various process of carrying out post-harvest activities, oil extraction, oil quality, etc.
- Focus on information mentioned in Training manual and you tube video attachments given in manual.
- Analyze the participants. Constantly motivate each student to participate in discussion.
- Ask participants to share experiences on various process of carrying out post-harvest activities.

Exercise

Key solutions to PHB exercise

A. Short Questions

1. De-husking: Traditionally coconut is de-husked manually using a spike. An easy-to-operate simple coconut de-husking tool which is particularly useful for domestic purpose has been developed. It consists of mainly a stationary wedge, a movable wedge, a lever and a pedestal having a base.

   A power-operated semi-automatic coconut de-husking machine has been designed and fabricated.

   Coconut Splitting: Generally coconut splitting is done by taking coconut in hand and then hitting it at centre two make two splits. Water is collected in a vessel. It is risky and also cumbersome if it is to be done in an industry. To solve the problem of splitting of coconuts by holding it in hand, a manually operated splitting device is developed. Knife of the machine is made of spring steel and is kept at a bevel angle of 25 degrees. As the cutting blade is made of spring steel, it does not require frequent sharpening. Nut is split manually by the impact force and the nut water is collected at the bottom.

   Copra Drying: The common practice of making copra is by sun drying the fresh coconut kernel on cement floor or on sand floor for 7–9 days. Though it is a traditional process, the endosperm of coconut is exposed while drying and so can be contaminated with dirt. Prolonged drying, especially during monsoon, also results in microbial infection. The energy-efficient dryers developed produce dust and microbial contamination-free copra in a short period.

   i) Small Holders' Copra Dryer

   ii) Shell-Fired Copra Dryer

   iii) Forced Circulation Copra Dryer

   iii) Solar Tunnel Dryer

   Solar Cum Electrical Dryer with Agricultural Waste as Third Source of Energy.

2. In most of the coconut-producing countries, copra crushing is a traditional industry. In rural areas, copra is still crushed in chakki for domestic consumption. As a cottage industry, oil extraction is still done in the chakki in the rural areas of India. The chakki is a fixed wooden or stone mortar inside which wooden pestle is made to revolve. The pestle is attached to a long pole which is moved round by a pair of bullocks or even by men. Copra is crushed as a result of the friction caused by the revolving pestle. The pressure on the pestle is regulated by levers and weights. Usually only 100 kg of copra can be crushed with chakki in 8 hrs.

3. Power-driven chakki or rotary mills, expellers and hydraulic presses are used for crushing on a commercial scale Power-driven chakki or rotary mills are used in medium establishments for oil extraction from copra. In principle, they are similar to chakkies, but here, the mortar itself revolves against the pestle. Both the pestle and mortar are made of cast iron. The rotaries are worked in pairs and are driven either by steam, oil engine or electric motor. The crushing capacity of a rotary mill varies from 200 to 300 kg of copra day shift. About 1 kg of gum acacia is added to every quintal of copra as a binding agent to facilitate the extraction of oil. Two expellers usually constitute a unit since double crushing gives the maximum extraction. The extraction takes place within a steel cage or barrel by means of a hardened steel worm or screw so arranged on a revolving shaft as to produce increasing pressure as the copra is pushed from one end of the

cage to the other. The oil escapes through the openings built on the barrel and the cake through an adjustable pressure orifice at the end of the barrel.

B. State whether True or False (T/F)

1. True
2. False
3. True

C. Fill in the Blanks

1. 62–63%
2. 10-12 %

D. Multiple Choice Questions

1. a) 1 kg
2. b) 32

UNIT 4.3: Storage and Marketing of Produce

Unit Objectives

After the completion of this unit, the participants will be able to:

1. Explain the importance of ensuring a hygienic and ventilated storage area for storing the produce.
2. Explain the recommended temperature and humidity for storing the produce.
3. Explain the process of identifying the market demand for produce, connecting with potential buyers and negotiating with them.
4. Explain the appropriate transport medium for delivering the produce.
5. Explain the importance of maintaining the record of sales and payments.
6. Prepare a sample record of harvested coconuts.
7. Show how to clean the storage area before storing the produce.
8. Demonstrate the process of applying the relevant treatment in the storage area to remove any pests, insects and rodents.
9. Demonstrate the use of the relevant e-payment method such as Aadhar Enabled Payment System (AEPS), Unified Payment Interface (UPI), Unstructured Supplementary Service Data (USSD) payment, etc.
10. Show how to calculate the benefit cost (B:C) ratio.
11. Prepare a sample record of sales and payments.

Resources to be Used

- Training Kit (Trainer Guide, Presentations), Participants Handbook, Whiteboard, Marker, Projector, Laptop.
- Template giving idea about the process of preparing the storage area and storing the produce.
- Template giving various ways to promote the process of marketing the produce, marketing channels, concept of marketing, skills required, Knowledge of selling methods, record keeping of produce, coconut market place.
- Storage area, various types of stored coconut, insecticide, fungicide for treatment, polythene / alkathene-lined gunny bags or netted polythene bags, resource person working in storage.
- Market area, various registered maintain in market, resource person having Idea about market.

Team Activity

Purpose: Module is giving idea about post-harvest operations in coconuts. Participants should be able to understand importance of storage of coconuts for increasing quality of copra and yield of oil. Participant has to learn maintaining temperature, humidity and cleanliness of storage area as well as use of insecticide and fungicide to avoid pest and disease infestation. Participants should be able to understand importance of maintaining record and their use in doing business. Creating awareness in participants about marketing of coconut and develop marketing skills.

Methodology:

1. Arrange the session in coconut processing unit.
2. Welcome all the participants.
3. Ask them few questions from previous module as revision.
4. Take a visit in storage area and show various packaging materials for storing copra.
5. Show the good quality and damaged copra available in storage area and explain reason.
6. Show how the temperature, humidity is maintained and pest and disease control is followed.
7. Visit to market place and show live marketing of coconut, copra, oil, grades and prices, etc.
8. Explain concept and skills of marketing, selling method available, record keeping of produce.
9. Explain power point presentation prepared on above mentioned purpose on projector.
10. During presentation after completion of unit, ask questions given in exercise related to unit.
11. Revise again the process of storage of produce and marketing of produce.
12. Ask them to read participants handbook for better understanding.

Expected outcome:

- Knowledge enhancement, effective communication.
- Awareness about maintaining hygiene and ventilation in coconut storage area.
- Awareness about concept of marketing, skills required for marketing, record keeping.
- Awareness about coconut market, their functioning, channels of marketing, etc.

Say

- Thanks everyone for their participation.
- Describe the objective of the activity.
- Faulty storage facility will lead to huge losses of coconut.
- Observe body language of coconut seller and buyer in the market.

Ask

- Importance of maintaining hygiene and ventilation in coconut storage area.
- To list out various industries where coconut or products required.
- Ask to tell their observations from storage area and market of coconut.
- Ask to tell their understanding about record keeping and writing various registers.

Explain

- The importance of ensuring a hygienic and ventilated storage area for storing the coconut produce.
- The importance of maintaining recommended temperature and humidity for storing the produce.
- The process of identifying the market demand for coconut produce, connecting with potential buyers and negotiating with them.
- The importance and process of maintaining the manual and electronic record of sales and payments.

Elaborate

- The procedure of cleaning the storage and maintaining temperature, humidity and ventilation.
- The procedure of pest control to be performed before, during and after the storage.
- The procedure of marketing coconut in various types of market and industries, considering their demand and quality of coconut you have.
- The procedure of record keeping, making receipts, transport, delivery, online marketing, payment including e-payment process, calculation of B:C.

Activity

Watch the presentation to understand the process of preparing the storage area and storing the produce, maintaining hygiene and ventilation in storage area of coconut, pest control practices.
Ask the participants to visit coconut storage area and write their observations and discussed issues and their solutions.
Watch the presentation to understand process of coconut marketing, record keeping, how to identify markets, knowledge of market rates, communication skills in market, requirement of coconut in various industries.
Ask the participants to design their marketing strategy and calculate B:C

Notes for Facilitation

- Explain the design template first to yourself and give them the general idea about how to and what to observe in the picture.
- Read recent information about coconut storage, pest control practices for godown, problem in storage and their solution.
- Read recent information about how to identify markets, knowledge of market rates of coconut, communication skills in market, requirement of coconut in various industries.
- Focus on information mentioned in Training manual and you tube video attachments given in manual.
- Analyze the participants. Constantly motivate each student to participate in discussion.
- Ask progressive coconut farmer to share his experiences about storage, marketing, transport, record keeping, experience about e marketing and e payment, coconut requirement calendar.

Exercise

Key solutions to PHB exercise

A. Short Questions

1. Coconut grower with the knowledge of cultivation can grow coconut and by experience enhance quality and yield of coconut. But for sale of nuts, it is essential for him to acquire few skills of marketing.

- **Confidence :** Many of the time after approaching to the retailer you may get negative response regarding purchase of your produce. Don't get nervous, you have to take continuous follow up in the market for your produce. This will develop confidence about you in the purchaser and consumer.
- **Listening Ability or Patience :** Be patient, listen carefully consumer demand and supply material accordingly. Listen to their complaints and suggestions; this will help you to improve your business.
- **No Compromise in Quality :** Coconut grower must grade his produce according to various grades. It is essential to supply good quality produce to consumer for which he has paid. Never supply low grade produce by taking money for higher grade.
- **Communication :** Always be in touch with your consumers, retailer or processor. Ask for the order regularly. Keep records of order and rate, quantity, quality of produce, packaging demands
- **Incentives :** It is always essential to promote good work. If any agent, retailer, processor giving you timely payment, order or more order, always give him appropriate consideration through gifts or incentives.

2. For a grower, record keeping is a key to improve his business. It is a way to keep watch on additional expenditure as well as lacuna in the business.

- **Farm Record :** It is very much essential to number the palm and maintain register for farm operations. Record of input application, quantity, period and labour used will always be helpful to relate profit with expenditure. Grower can take decision about standardization of package of practices, quality of input used, use of machinery against labour in relation to yield and quality improvement of output.
- **Purchase and Sale Record :** It is essential to have record of yield, rate for different grades, payment received contact of consumer, agreement records for smooth functioning of the business.

3. All the produce available in the market can't be sale with the same method. It is always essential to have knowledge of various selling methods and way of implementing the same.

- **Direct Sale :** Grower can sale is produce directly to the consumer. Direct sale will improve the profit margin of grower. Consumer will also get quality produce in reasonable cost. Relationship of grower and consumer and trust in business is more important in this method.
- **Contract Farming :** Growers has to make contract for purchase of his produce with middle man or wholesaler or processor. Sometimes purchaser may provide technical knowhow to improve quality and yield of coconut of growers.
- **Cooperative Farming :** All coconut growers can come together to sale their produce.

This will improve their negotiation value as well as reduce transportation and marketing charges. It is possible to grade, to give treatment, packaging, transport, storage through cooperative society.

B. State whether True or False (T/F)

1. True
2. True
3. True

C. Fill in the Blanks

1. Seasoning
2. High

D. Multiple Choice Questions

1. d) All of above.
2. a) 4.5 g per m^3 (2.5 g ai/m^3)

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5. Process of Carrying out Primary Processing of Coconut and Prepare Value-Added Products

AGR/N0535

Terminal Outcomes

After the completion of this module, the participants will be able to:

1. Describe the process of preparing desiccated coconut.
2. Describe the process of extracting coconut oil traditionally and mechanically.
3. Demonstrate the process of preparing Tender Coconut Water (TCW).
4. Demonstrate the process of carrying out the processing of tender coconut.
5. Demonstrate the process of extracting snow ball tender nut.
6. Demonstrate the process of preparing fruit juice, blended tender coconut water, coconut water beverages, Nata de Coco, coconut vinegar and coconut chips.
7. Demonstrate the process of extracting and using coconut milk.

Key Learning Outcomes

After the completion of this module, the participants will be able to:

Theory	Practical
1. Explain different types of raw coconut products, such as nut, coconut water, kernel, copra, husk, and toddy. 2. Explain different uses of raw coconut products. 3. Describe different methods of drying copra, such as sun drying, smoke drying, kiln drying and indirect hot air drying. 4. State the optimum moisture content required in copra for processing. 5. List different raw products that can be obtained from coconut. 6. Explain how to avoid undesirable flavour changes in desiccated coconut due to oxidative rancidity of the oil. 7. Explain the use of residual coconut for different purposes, e.g. cattle feed. 8. Explain the use of coconut oil and desiccated coconut for making fats for baking and confectionery. 9. Explain the characteristics of top quality desiccated coconut, i.e. white, free from foreign matter, uniform in granulation against the applicable standard, and expressed oil with a free fatty acid content of less than 0.1 %. 10. List a variety of coconut products available to the chocolate and confectionery trade. 11. Explain different elements found in TCW, such as vitamins, minerals, proteins, amino acids, sugars, enzymes and other biological growth factors.	1. Demonstrate how to dry copra following appropriate drying methods, such as sun drying, smoke drying, kiln drying and indirect hot air drying. 2. Show how to remove the nut from the hard shell and pare off the thin brown rind, following the recommended practices to prevent contamination by flecks of brown. 3. Show how to wash the pared nuts free of milk and skin residues. 4. Demonstrate how to shred the nuts using the shredding machine to obtain the milled product of the required degree of fineness. 5. Demonstrate the process of carrying out steam or hot water treatment of the ground meat to destroy salmonella and lipases and reduce bacteria count to the recommended levels. 6. Show how to dry the pasteurized meat on a wire mesh belt using hot air to reduce the moisture content to the recommended levels. 7. Demonstrate the process of carrying out sieving to obtain different grades of the desiccated coconut, such as extra fine, macaroon (fine), medium and coarse. 8. Demonstrate how to separate coconut meat from the coconut shell to obtain copra, following the recommended practices. 9. Demonstrate how to chop the copra into small pieces of recommended size and heat them at the recommended temperature for an appropriate duration.

Theory	Practical
12. Explain the benefits of TCW as a natural isotonic beverage with therapeutic properties and appropriate electrolyte levels.	10. Show how to squeeze coconut oil out from the cooked copra using the expeller and filter it using the filter press. 11. Show how to crack the coconut shells and separate the coconut meat. 12. Show how to chop the fresh coconut meat and slice it into thin flakes of the desired size. 13. Show how to cook the thin flakes of coconut meat in a cooker, heating them at the recommended temperature for an appropriate duration 14. Demonstrate the process of using the oil expeller to extract the coconut oil from the heat-treated cooked coconut meat. 15. Demonstrate how to extract Tender Coconut Water (TCW) following the recommended practices ensuring hygiene. 16. Demonstrate the process of packing the TCW in pouches and aluminium cans using the appropriate technology to retain its flavour for the appropriate period before consumption. 17. Demonstrate how to prepare a solution of citric acid and potassium metabisulphite using them in the recommended quantity. 18. Demonstrate the process of carrying out the processing of tender coconut in citric acid and potassium metabisulphite solution for the recommended duration to facilitate their storage for appropriate duration and transportation. 19. Show how to create a groove on the shell of the coconut using an appropriate tool before scooping out the globular tender.

Theory	Practical
	20. Show how to extract round soft kernel/snow ball tender nut from the coconut shell using the appropriate tool, ensuring to maintain the kernel and water intact in it. 21. Demonstrate the process of packing the snow ball tender nut in the appropriate LDPE film packaging and storing it at the recommended temperature. 22. Demonstrate how to prepare fruit juice blended tender coconut water beverage using the selected fruits, following the recommended practices. 23. Demonstrate the process of carrying out pasteurisation and filtration activities. 24. Demonstrate the process of carrying out bottling of coconut water to be used as a carbonated/ noncarbonated beverage. 25. Show how to prepare the culture solution by mixing coconut water with sugar and acetic acid at a stipulated proportion. 26. Demonstrate how to inoculate the culture solution with Acetobacter and xylinium, using a culture liquid. 27. Demonstrate the process of harvesting the white-coloured jelly that forms on the top of the culture medium and cut into pieces of appropriate size. 28. Show how to clean the jelly using pure water to remove all acids and maintain it in flavoured sugar syrup for the appropriate duration and pack it in glass bottles.

Theory	Practical
	29. Demonstrate the process of carrying out fortification of coconut water with sugar and fermentation by inoculation of yeast and then mother vinegar, oxidation and acidification. 30. Demonstrate how to prepare vinegar from coconut water by using vinegar generators. 31. Demonstrate how to prepare intermediate moisture coconut kernel by removing the moisture content of the mature coconut kernel by osmotic dehydration using osmotic mediums, such as sugar syrup. 32. Demonstrate how to prepare coconut chips by dehydrating the intermediate moisture coconut kernel and adding different flavours using the required flavour essence in the osmotic medium. 33. Show how to use appropriate packing material, such as laminated aluminium pouches, to pack coconut chips and optimise their shelf life. 34. Demonstrate how to extract oil protein-water emulsions, i.e. coconut milk, by squeezing freshly grated coconut kernel. 35. Show how to use coconut milk directly or by diluting it with water to make various preparations, such as desserts, puddings, cocktails, cakes, cookies, coconut jam, etc. 36. Demonstrate the process of carrying out can packaging of coconut milk in preserve it in the form of cream, milk and dehydrated whole milk.

UNIT 5.1: Products of Coconut

Unit Objectives

After the completion of this unit, the participants will be able to:

1. Explain different types of raw coconut products, such as nut, coconut water, kernel, copra, husk, and toddy.
2. Explain different uses of raw coconut products.
3. Describe different methods of drying copra, such as sun drying, smoke drying, kiln drying and indirect hot air drying.
4. State the optimum moisture content required in copra for processing.
5. List different raw products that can be obtained from coconut.
6. Explain different elements found in TCW, such as vitamins, minerals, proteins, amino acids, sugars, enzymes and other biological growth factors.
7. Explain the benefits of TCW as a natural isotonic beverage with therapeutic properties and appropriate electrolyte levels.
8. Demonstrate how to dry copra following appropriate drying methods, such as sun drying, smoke drying, kiln drying and indirect hot air drying.
9. Show how to remove the nut from the hard shell and pare off the thin brown rind, following the recommended practices to prevent contamination by flecks of brown.
10. Show how to wash the pared nuts free of milk and skin residues.
11. Demonstrate how to shred the nuts using the shredding machine to obtain the milled product of the required degree of fineness.
12. Demonstrate the process of carrying out sieving to obtain different grades of the desiccated coconut, such as extra fine, macaroon (fine), medium and coarse.
13. Demonstrate how to separate coconut meat from the coconut shell to obtain copra, following the recommended practices.
14. Show how to crack the coconut shells and separate the coconut meat.
15. Demonstrate how to prepare fruit juice blended tender coconut water beverage using the selected fruits, following the recommended practices.
16. Demonstrate how to prepare vinegar from coconut water by using vinegar generators.
17. Demonstrate how to prepare intermediate moisture coconut kernel by removing the moisture content of the mature coconut kernel by osmotic dehydration using osmotic mediums, such as sugar syrup.
18. Demonstrate how to prepare coconut chips by dehydrating the intermediate moisture coconut kernel and adding different flavours using the required flavour essence in the osmotic medium.

Resources to be Used

- Training Kit (Trainer Guide, Presentations), Participants Handbook, Whiteboard, Marker, Projector, Laptop.
- Template and video giving idea about the process of preparing raw coconut products, such as nut, coconut water, kernel, copra, husk, and toddy.
- Template and video giving idea about the process of extraction of coconut milk and milk based products.
- Arrange visit to processing unit where tender coconut water is extracted and packed. Coconut orchard, selection of tender nut, harvester, sickle, vessels, scooping tool (video), plastic pouches and aluminum can containing TCW, etc.

Team Activity

Purpose : Module is giving idea about the process of preparing raw coconut products. Participants should be able to know different nutritionally rich products available from tender coconut and their shelf life. Participant has to learn different manufacturing processes, packaging techniques, treatments for storage. Participants should be able to know procedure for extraction of raw copra, making coconut milk and further value addition.

Methodology :

1. Arrange the session in coconut processing unit.
2. Arrange the various products prepared from raw coconut in different packaging forms.
3. Welcome all the participants.
4. Ask them few questions from previous module as revision.
5. Take a visit in processing unit and show various products prepared from tender or raw coconut to participants, discuss their use and scope in market.
6. Demonstrate how to extract Tender Coconut Water (TCW) following the recommended practices ensuring hygiene.
7. Demonstrate the process of packing the TCW in pouches and aluminium cans using the appropriate technology to retain its flavour for the appropriate period before consumption.
8. Demonstrate how to prepare a solution of citric acid and potassium metabisulphite using them in the recommended quantity.
9. Demonstrate the process of carrying out the processing of tender coconut in citric acid and potassium metabisulphite solution for the recommended duration to facilitate their storage for appropriate duration and transportation.
10. Show how to create a groove on the shell of the coconut using an appropriate tool before scooping out the globular tender.
11. Show how to extract round soft kernel/snow ball tender nut from the coconut shell using the appropriate tool, ensuring to maintain the kernel and water intact in it.
12. Demonstrate the process of packing the snow ball tender nut in the appropriate LDPE film packaging and storing it at the recommended temperature.
13. Demonstrate how to prepare fruit juice blended tender coconut water beverage using the selected fruits, following the recommended practices.
14. Demonstrate the process of carrying out pasteurisation and filtration activities.

15. Demonstrate the process of carrying out bottling of coconut water to be used as a carbonated/ noncarbonated beverage.
16. Show how to prepare the culture solution by mixing coconut water with sugar and acetic acid at a stipulated proportion.
17. Demonstrate how to inoculate the culture solution with Acetobacter and xylinium, using a culture liquid.
18. Demonstrate the process of harvesting the white-coloured jelly that forms on the top of the culture medium and cut into pieces of appropriate size.
19. Show how to clean the jelly using pure water to remove all acids and maintain it in flavoured sugar syrup for the appropriate duration and pack it in glass bottles.
20. Demonstrate the process of carrying out fortification of coconut water with sugar and fermentation by inoculation of yeast and then mother vinegar, oxidation and acidification.
21. Demonstrate how to prepare vinegar from coconut water by using vinegar generators.
22. Demonstrate how to prepare intermediate moisture coconut kernel by removing the moisture content of the mature coconut kernel by osmotic dehydration using osmotic mediums, such as sugar syrup.
23. Demonstrate how to prepare coconut chips by dehydrating the intermediate moisture coconut kernel and adding different flavours using the required flavour essence in the osmotic medium.
24. Show how to use appropriate packing material, such as laminated aluminium pouches, to pack coconut chips and optimise their shelf life.
25. Demonstrate how to extract oil protein-water emulsions, i.e. coconut milk, by squeezing freshly grated coconut kernel.
26. Show how to use coconut milk directly or by diluting it with water to make various preparations, such as desserts, puddings, cocktails, cakes, cookies, coconut jam, etc.
27. Demonstrate the process of carrying out can packaging of coconut milk in preserve it in the form of cream, milk and dehydrated whole milk
28. Explain power point presentation prepared on above mentioned purpose on projector
29. During presentation after completion of unit, ask questions given in exercise related to unit.
30. Ask them to read participants handbook for better understanding

Expected outcome :

- Knowledge enhancement, effective communication
- Awareness about consumption of tender coconut water and its nutritional value.
- Knowledge about various value added products prepared from tender coconut by using water and copra
- Knowledge about coconut milk extraction and preparation of various products from milk

Say

- Thanks everyone for their participation
- Describe the objective of the activity
- Tender Coconut consumption either water or copra or products will enrich our health
- Raw Coconut based products has increasing demand in the market

Ask

- Various raw coconut based products they have consumed and what is its health benefit.
- Various products prepared by using tender water or raw copra.
- Benefits of *Toddy* and *Neera* and difference between them.
- Various products where coconut milk and milk based products can be used

Explain

- Different elements found in TCW, such as vitamins, minerals, proteins, amino acids, sugars, enzymes and other biological growth factors and its therapeutic properties
- Various treatments given to increase the shelf life of product
- Collection method of toddy and neera and new technology available for increasing shelf life
- Different forms of coconut milk and its use in industry

Elaborate

- The process of preparing Tender Coconut Water (TCW)
- The process of extracting snow ball tender nut
- The process of preparing fruit juice blended tender coconut water and packaging
- The process of extraction of oil protein-water emulsions, i.e. coconut milk, by squeezing freshly grated coconut kernel, its storage and value addition.

Activity

Watch the presentation to understand the processing of tender coconut and various value added products prepared from raw copra or water, its packaging and storage.

Ask the participants to visit coconut processing unit and write their observations and discussed issues and their solutions.

Ask the participants to consume various products of coconut and share their experience about taste, price, packing, advertisement and other details.

Notes for Facilitation

- Explain the design template first to yourself and give them the general idea about how to and what to observe in the picture.
- Read recent information about technology available for processing and value addition in tender coconut, *toddy, neera,* coconut milk, etc, Its packaging, storage condition, other relevant requirements, season-wise demand for various products in market.
- Focus on information mentioned in Training manual and you tube video attachments given in manual
- Analyze the participants. Constantly motivate each student to participate in discussion
- Ask progressive Coconut Farmer cum Primary Processor to share his experiences about process of preparing tender coconut water and ball, various products and their requirements in various industries.

Exercise

A. Short Questions

1. Drying is an important postharvest operation in the processing of coconut for the extraction of oil.

   a. Sun drying of Copra: The conventional system of copra drying is by spreading the split coconuts on an open surface for sun drying. This operation takes 6–8 days, and quality deterioration due to deposition of dirt and dust of wet kernel is unavoidable. Moreover, if the atmosphere is cloudy and the temperature goes down during the initial days of drying, the copra will get infested with mould. Copra obtained by this method is often of poor quality because of prolonged exposure to atmosphere resulting in microbial infection.

   b. Artificial drying of Copra: During rainy season, with restricted sunshine, drying by artificial method is the only possible solution for making good-quality copra. The direct-type kiln dryers are not desirable as the copra becomes inferior in quality due to the smoking and improper drying. To obtain good-quality copra, particularly during rainy season, a suitable dryer using indirect heating for drying is essential. Average capacity of indirect dryer is 2000 nuts in 20-25 hours and it is suitable for smallholders.
2. Coconut toddy is obtained from the inflorescence before the flower fully develop. Sweet toddy is the unfermented fresh juice obtained by tapping. Toddy on fermentation becomes an alcoholic drink.
3. Different types of raw coconut products, such as nut, coconut water, kernel, copra, husk, and toddy. Mature nut yield desiccated coconut, coconut oil.

B. State whether True or False

1. True
2. True
3. False

C. Fill in the Blanks

1. Meat
2. Toddy

D. Multiple Choice Questions

1. a) 2000
2. d) All of the above

UNIT 5.2: Processing of Coconut

Unit Objectives

After the completion of this unit, the participants will be able to:

1. Explain how to avoid undesirable flavour changes in desiccated coconut due to oxidative rancidity of the oil.
2. Explain the use of residual coconut for different purposes, e.g. cattle feed.
3. Explain the use of coconut oil and desiccated coconut for making fats for baking and confectionery.
4. Explain the characteristics of top quality desiccated coconut, i.e. white, free from foreign matter, uniform in granulation against the applicable standard, and expressed oil with a free fatty acid content of less than 0.1 %.
5. List a variety of coconut products available to the chocolate and confectionery trade.
6. Demonstrate the process of carrying out steam or hot water treatment of the ground meat to destroy salmonella and lipases and reduce bacteria count to the recommended levels.
7. Show how to dry the pasteurized meat on a wire mesh belt using hot air to reduce the moisture content to the recommended levels.
8. Demonstrate how to chop the copra into small pieces of recommended size and heat them at the recommended temperature for an appropriate duration.
9. Show how to squeeze coconut oil out from the cooked copra using the expeller and filter it using the filter press.
10. Demonstrate the process of using the oil expeller to extract the coconut oil from the heat-treated cooked coconut meat.
11. Demonstrate how to extract Tender Coconut Water (TCW) following the recommended practices ensuring hygiene.
12. Demonstrate the process of packing the TCW in pouches and aluminium cans using the appropriate technology to retain its flavour for the appropriate period before consumption.
13. Demonstrate how to prepare a solution of citric acid and potassium metabisulphite using them in the recommended quantity.
14. Demonstrate the process of carrying out the processing of tender coconut in citric acid and potassium metabisulphite solution for the recommended duration to facilitate their storage for appropriate duration and transportation.
15. Show how to create a groove on the shell of the coconut using an appropriate tool before scooping out the globular tender.
16. Show how to extract round soft kernel/snow ball tender nut from the coconut shell using the appropriate tool, ensuring to maintain the kernel and water intact in it.
17. Demonstrate the process of packing the snow ball tender nut in the appropriate LDPE film packaging and storing it at the recommended temperature.
18. Demonstrate the process of carrying out pasteurisation and filtration activities.
19. Demonstrate the process of carrying out bottling of coconut water to be used as a carbonated/ noncarbonated beverage.
20. Show how to prepare the culture solution by mixing coconut water with sugar and acetic acid at a stipulated proportion.
21. Demonstrate how to inoculate the culture solution with Acetobacter and xylinium,

using a culture liquid.

22. Demonstrate the process of harvesting the white-coloured jelly that forms on the top of the culture medium and cut into pieces of appropriate size.

Resources to be Used

- Training Kit (Trainer Guide, Presentations), Participants Handbook, Whiteboard, Marker, Projector, Laptop
- Template and video giving idea about the process of preparing mature coconut products, such as desiccated coconut, virgin coconut oil, coconut flour, coconut cake, coconut product for chocolate and confectionery, nut for drying, already dried nut, graded commercial copra, etc
- Template and video giving idea about Coconut based by-Products.
- Arrange visit to processing unit where mature coconut is processed, dried and packed, stored.
- Arrange visit to oil mill or chakki, nut, dried nut, moisture meter, implement for removing copra from nut, shredder, water, vessel, burner with cylinder, solar drier, smoke drier, Cooker, oil expeller, oil filter, air tight container

Team Activity

Purpose : Module is giving idea about the process of preparing mature coconut products. Participants should be able to know extraction of desiccated copra, oil and flour, cake, etc. Participant has to learn different manufacturing processes, packaging techniques, treatments for storage. Participants should be able to know procedure for preparation of coconut based by-Products

Methodology :

1. Arrange the session in coconut processing unit
2. Arrange the various products prepared from mature coconut in different packaging forms
3. Welcome all the participants.
4. Ask them few questions from previous module as revision.
5. Take a visit in processing unit and show various products prepared from mature coconut to participants, discuss their use and scope in market
6. Demonstrate how to dry copra following appropriate drying methods, such as sun drying, smoke drying, kiln drying and indirect hot air drying.
7. Show how to remove the nut from the hard shell and pare off the thin brown rind, following the recommended practices to prevent contamination by flecks of brown.
8. Show how to wash the pared nuts free of milk and skin residues.
9. Demonstrate how to shred the nuts using the shredding machine to obtain the milled product of the required degree of fineness.
10. Demonstrate the process of carrying out steam or hot water treatment of the ground meat to destroy salmonella and lipases and reduce bacteria count to the recommended levels.
11. Show how to dry the pasteurized meat on a wire mesh belt using hot air to reduce

the moisture content to the recommended levels.

12. Demonstrate the process of carrying out sieving to obtain different grades of the desiccated coconut, such as extra fine, macaroon (fine), medium and coarse.
13. Demonstrate how to separate coconut meat from the coconut shell to obtain copra, following the recommended practices.
14. Demonstrate how to chop the copra into small pieces of recommended size and heat them at the recommended temperature for an appropriate duration.
15. Show how to squeeze coconut oil out from the cooked copra using the expeller and filter it using the filter press.
16. Show how to crack the coconut shells and separate the coconut meat.
17. Show how to chop the fresh coconut meat and slice it into thin flakes of the desired size.
18. Show how to cook the thin flakes of coconut meat in a cooker, heating them at the recommended temperature for an appropriate duration
19. Demonstrate the process of using the oil expeller to extract the coconut oil from the heat-treated cooked coconut meat.
20. Explain power point presentation prepared on above mentioned purpose on projector
21. During presentation after completion of unit, ask questions given in exercise related to unit.
22. Ask them to read participants handbook for better understanding

Expected outcome:

- Knowledge enhancement, effective communication
- Awareness about consumption of mature coconut and its products like desiccated copra, oil, etc.
- Knowledge about various value added products prepared from mature coconut by using copra
- Knowledge about preparation of various coconut bye products

Say

- Thanks everyone for their participation
- Describe the objective of the activity
- Desiccated Coconut is the commercial product having demand all over the world in the confectionary and other food industries, as one of the main subsidiary ingredients of fillings for chocolate, candies and liquorice of all sorts. It is also used uncooked and as decoration for cakes, biscuits and ice cream and toasted for short eats.
- Not only copra or oil but shell, husk, stem, leaf based product from coconut has tremendous demand in market and this demand is also increasing day by day.

Ask

- Knowledge about preparation of virgin coconut oil and its medicinal benefits
- Various products prepared by using copra and desiccated copra which they consumed.
- Reasons of development of rancidity in oil.
- Various bye products from coconut they produced and/or use

Explain

- The importance of different grades of desiccated copra
- The process of removing nut from shell and separation of testa and How to understand optimum moisture level for dried copra
- The process of extracting coconut oil traditionally and mechanically, difference between both methods and difference in quality
- How to avoid undesirable flavour changes in desiccated coconut due to oxidative rancidity of oil

Elaborate

- The process of making desiccated copra by deshelling, pairing, washing, sterilizing, disintegrating and desiccating
- The process of extraction of virgin coconut oil and its packaging and storage
- The process mentioning temperature, duration, procedure of using oil expeller and filter
- The process of preparing coconut flour and cake

Activity

Watch the presentation to understand the processing of mature coconut and various value added products prepared from mature coconut, its packaging and storage
Ask the participants to visit coconut processing unit for understanding process of desiccation and oil extraction and write their observations, discussed issues and their solutions
Ask the participants to consume various products of coconut and share their experience about taste, price, packing, advertisement and other details
Ask the participants to prepare virgin coconut oil at home

Notes for Facilitation

- Explain the design template first to yourself and give them the general idea about how to and what to observe in the picture.
- Read recent information about technology available for processing and value addition in mature coconut, desiccated copra, coconut oil, coconut flour, coconut cake, etc, their packaging, storage condition, other relevant requirements, season-wise demand for various products in market.
- Focus on information mentioned in Training manual and you tube video attachments given in manual
- Analyze the participants. Constantly motivate each student to participate in discussion
- Ask progressive coconut farmer cum primary processor to share his experiences about process of preparing desiccated copra, coconut oil, various products, bye products and their requirements in various industries.

Exercise

A. Short Questions

1. Moist White Sweetened Coconut, Toasted Coconut, Creamed Coconut, Tenderized Coconut are available to trade for chocolate and confectionary.
2. Coconut palm provides raw materials for the handicraft industry. A variety of handicraft pieces are manufactured in the country. Wood, shell, fibre/husk and leaf midribs are the main coconut-based materials utilized by the artisans to manufacture various objects of artistic and utility value. Various coconut based bye products are shell powder, shell charcoal, activated carbon, shell products, wall panels, floor tiles furniture, doors, windows, curios, handrails of staircases and handicrafts, etc. from coconut trunk, rafters, joists, purlins, beams, banister, etc from coconut wood. Coconut leaves are mainly used as thatch. It is also used for shading seedlings, mulching nursery beds, decoration etc. Coconut leaves are also used as a feed for elephants. The midribs of leaves are used for making brooms, baskets, fish traps, fancy articles and tongue cleaners. Coir geotextiles and coir pith, etc.
3. Activated Carbon is a non-graphite form of carbon which could be produced from any carbonaceous material. Coconut shell based activated carbon is considered superior to those obtained from other sources due to its small macro pore structure which renders it more effective for the adsorption of gas/vapour and for the removal of colour and odour of compounds. It is widely used in the refining and bleaching of vegetable oils and chemical solutions, water purification, recovery of solvents and other vapours, recovery of gold, and in gas masks for protection against toxic gases. On an average 3 tons of coconut shell charcoal would yield 1 ton of activated carbon. Coconut shell based activated carbon is reported to be superior in quality and commands a good price in the international market. The world demand for activated carbon is estimated at 1.2 million tons.

B. State whether True or False

1. True
2. True
3. True

C. Fill in the Blanks

1. Coconut leaves
2. Coconut oil

D. Multiple Choice Questions

1. c) Less than 3%
2. a) 5 mm

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6. Basic Entrepreneurial Activities for Small Enterprise

Unit 6.1 - Demand and Supply
Unit 6.2 - Agricultural Entrepreneurship / Business Opportunities.
Unit 6.3 - Basic Resources of Agriculture Production
Unit 6.4 - Preparing to be an Entrepreneur

AGR/N9908

Terminal Outcomes

After the completion of this module, the participants will be able to:

1. Explain the process of planning the agricultural enterprise/ business.
2. Explain the process of managing the agricultural production process.
3. Explain the process of managing the post-production and marketing processes.

Key Learning Outcomes

After the completion of this module, the participants will be able to:

Theory	Practical
1. Explain how to analyze the demand and supply of the relevant agricultural produce in the market. 2. Describe the process of identifying the target customers and assess their needs and expectations with respect to the quality and price of the product. 3. Explain how to identify various types of agricultural entrepreneurship/ business opportunities. 4. Explain how to prepare a basic business plan for agricultural entrepreneurship/ business activities. 5. State the appropriate sources of funding for the agricultural entrepreneurship/ businesses. 6. State the relevant government schemes and programs. 7. Explain the importance of ensuring compliance with the government structural reforms and framework, along with the applicable rules and regulations. 8. List various resources required for agricultural production. 9. Describe the process of planning agricultural production and the use of relevant technologies to enhance production. 10. Explain the importance of ensuring no cause adverse impact on the environment and produce during production. 11. State the recommended practices to be followed for efficient input resource management. 12. Describe the process of optimizing the production processes and output through the amalgamation of existing practices with smart technologies.	1. Demonstrate how to analyze the demand and supply of the relevant agricultural produce in the market. 2. Prepare a sample basic business plan for agricultural entrepreneurship/business activities. 3. Demonstrate how to calculate the costs incurred and determine the price of the product for profitability. 4. Prepare a sample marketing plan considering the 4Ps i.e., product, price, promotion, and place and 4As i.e., acceptability, affordability, accessibility, and awareness. 5. Demonstrate the process of using the relevant digital services such as ecommerce, e-payments, electronic recordkeeping, etc.

Theory	Practical
13. Explain the recommended sustainability practices to be followed during agricultural production to prevent and deal with deforestation, loss of biodiversity, soil degradation, etc. 14. Explain how to collect information related to the whole sale and retail price of agricultural produce. 15. Explain how to calculate the economics of the produce viz. production cost, price of the produce, B:C Ratio etc. 16. Explain the relevant government schemes with the provision of subsidies/funds for the promotion of agricultural produce. 17. Describe the process of selecting appropriate marketing channels for marketing agricultural produce, and the applicable requirements and constraints. 18. List the relevant buyers of different types of agricultural produce. 19. Explain how to identify and manage various risks to production and postproduction processes. 20. Explain how to undertake outreach programs to promote agricultural products and services, and expand agri-business. 21. Explain the 4Ps i.e., product, price, promotion, and place and 4As i.e., acceptability, affordability, accessibility, and awareness considered while preparing and executing a marketing plan. 22. Explain the use of the relevant digital services such as e-commerce, e-payments, electronic recordkeeping, etc. 23. Explain the importance of using efficient post-production logistics. 24. Explain the importance of maintaining various records accurately.	

UNIT 6.1: Demand and Supply

Unit Objectives

After the completion of this unit, the participants will be able to:

1. Demonstrate how to analyze the demand and supply of the relevant agricultural produce in the market.

Resources to be Used

Available objects such as participant's handbook, white board, duster, marker etc.
Power points slides, pictures/posters e.g., showing relevant visuals of statistical data of demand and supply.

Activity

Purpose: To acquaint the participants about different agricultural produce in market.

Resources: Projector, system facilitating power point presentations, microphone, camera, and round tables arranged in U shape for healthy discussion.

Methodology: Group discussion for about 15-20 minutes.

Expected outcomes:

- Knowledge enhancement

Prepare a group of 4-5 participants. Prepare a power point presentation on demand of various agricultural produce in their region.

Say

- Thank you to everyone for their participation.
- Discuss with the participants to share their feelings about this exercise and what new things they have learned in this exercise.

Ask

- Ask participants about whether they know which agricultural produce have more demand in their locality.

Explain

- Explain what market is.
- Explain the impact of technology on agricultural produce.

Elaborate

- Elaborate how does demand and supply determine the price of agricultural products.

Activity

- Plan this activity for 20-30 minutes. Ask participants to prepare a survey of demand and supply of agricultural produce in their region.

Notes for Facilitation

- Help the participants to complete all the tasks involved in the participant hand book.
- Where possible, display the work of group within the classroom.

Exercise

Key Solutions to PHB Exercises

A. Short Questions

1. Technology advancements in production, communication, and transportation have an effect on a number of demand and supply factors. What effects on supply and demand can we anticipate as these technologies develop in many of our product categories and geographical sectors? The focus of this page is on relating the trend of advancing technologies to the "implications" of those advances. The relationship is discussed in terms of determinants of demand and supply. Some of the implications may be viewed as negative, while other implications maybe considered positive.

2. Determinants of Supply
   - Resource or Input Costs
   - An increase in the cost of livestock feed will cause me to sell the livestock at an earlier time and at a lower weight thereby reducing my output of "pounds of livestock" is the example of input cost.
   - Production Technology
   - An advance in the technology used to produce a product will lead to an increase in the production of that product; as food processing became more automated,
   - What impact is production technology having on the quantity of the goods available in your market?
   - Taxes and Subsidies

   A supplier will reduce production if the cost of production rises as the result of a tax or other government-imposed cost on the production process A supplier will increase production if a government program subsidizes the producer's income or otherwise pays a portion of the supplier's production cost.

3. Consumer tastes and preferences - is the consumer interested in Product A or Product B. For example, will the consumer prefer a food product wherein the consumer can identify who, where, and how the underlying agricultural commodities were produced, or will the consumer be satisfied with a food product without knowing who, where or how it was produced? Number of buyers in the market - An increased number of interested buyers or consumers will lead to an increased demand for the product.

D. State whether True or False

1. False
2. True
3. True

C. Fill in the Blanks

1. Interested buyers or consumers
2. Increase

D. Multiple Choice Questions

1. c) Al of the above
2. c) Both a and b

UNIT 6.2: Agricultural Entrepreneurship / Business Opportunities

Unit Objectives

After the completion of this unit, the participants will be able to:

1. Prepare a sample basic business plan for agricultural entrepreneurship/business activities.

Resources to be Used

- Available objects such as participant's handbook, white board, duster, marker etc.
- Power points slides, pictures/posters e.g., showing relevant visuals various business in agriculture.

Activity

Purpose: To acquaint the participants about agricultural business.

Resources: Projector, system facilitating power point presentations, microphone, camera, and round tables arranged in U shape for healthy discussion.

Methodology: Group discussion for about 15-20 minutes.

Expected outcomes:

- Introduction to business opportunities in agriculture.
- Confidence building

Divide the participants in two groups and ask them to prepare a power point presentation on ideas related to agricultural business.

Say

- Thank you to everyone for their participation.
- Discuss with participants to share their ideas about agricultural entrepreneurship.

Ask

- Ask them whether they have visited any business setup.

Explain

- Explain participants about agriculture business is based on many factors like the size of the land, fertility of the land, type of soil, weather of the region etc.

Elaborate

- Elaborate points to keep in mind during the business planning.
- Elaborate relevant government schemes and programs for entrepreneurship.

Activity

Plan this activity for at least 20-30 minutes. Ask participants to choose an agriculture business idea they admire and create their own business plan for it as if they were starting it from scratch and prepare report.

Notes for Facilitation

- Help participants to prepare a sample business plan.
- Constantly motivate each participants for their business idea.

Exercise

Key Solutions to PHB Exercises

A. Short Questions

1. Insurance protection for food crops, oilseeds and annual horticultural/ commercial crops notified by state government. Uniform maximum premium for all farmers : Kharif season - 2% of sum insured, Rabi Season 1.5% of sum insured and Annual commercial/horticultural crops - 5% of sum insured.

2. Schemes for coconut cultivation
   - Production and distribution of quality planting materials
   - Expansion of area under coconut
   - Integrated farming in coconut holdings for productivity improvement
   - Technology mission on coconut
   - Replanting and rejuvenation of coconut garden
   - Coconut palm insurance schemes
   - Kera Suraksha insurance scheme

3. Different business opportunities in coconut farming are coconut farm business, organic coconut farming, coconut nursery, selling or renting machinery required for coconut farm, coconut leaf manure, coconut processing unit, coconut water and coconut juice-based products, coconut-based sweets and pastries, vegan coconut butter, desiccated coconut powder, virgin coconut oil, coconut vinegar, activated carbon from coconut shell, and toddy.

B. State whether True or False (T/F)

1. True
2. True
3. False

C. Fill in the Blanks

1. Two months
2. *Kera Suraksha*

D. Multiple Choice Questions

1. d) All of the above
2. c) Both a and b

UNIT 6.3: Basic Resources of Agriculture Production

Unit Objectives

After the completion of this unit, the participants will be able to:

1. Demonstrate how to calculate the costs incurred and determine the price of the product for profitability.

Resources to be Used

- Available objects such as participant's handbook, white board, duster, marker etc.
- Power points slides, pictures/posters e.g., showing relevant visuals

Activity

Purpose : To acquaint the participants about cost incurred in agriculture.

Resources : Projector, system facilitating power point presentations, microphone, camera, and round tables arranged in U shape for healthy discussion.

Methodology : Group discussion for about 15-20 minutes.

Expected outcomes :

- Knowledge enhancement
- Confidence building

Prepare a group of 4-5 participants. Ask them to prepare a presentation on different costing structure on agricultural business and different types of cost.

Say

- Thank you to everyone for their participation.
- Describe objectives of above activity.

Ask

- Ask participants about what cost is.
- What does product profitability mean?

Explain

- Explain the different types of cost.
- Explain how to do a product profitability analysis of any commodity.

Elaborate

- Elaborate how to calculate the costs incurred in agriculture production.

Activity

This pen and paper activity is for preparing participants to calculate prize of product. Plan this activity for at least 20-30 minutes.

- Guide participants to finalize the product prize by considering input factors involved in product preparation, add up all direct and indirect cost then subtract that number from your product revenue.

Notes for Facilitation

- Help participants to calculate the costs incurred and determine the price of the product.
- Assist all groups to systematically arrange collected information and analyze them when required.

Exercise

Key Solutions to PHB Exercises

A. Short Questions

1. Cover Crops

   By sowing cover crops off-season, farmers protect their fields from soil erosion. The technique also helps in building up the organic matter when cover crops are used for green manure, which decreases expenses on fertilizers. Besides, cover cropping tackles weeds and retains soil moisture.

   Zero Tillage

   The no-tilling approach suggests sowing right into the crop residue with the least soil and biota disturbance. Since planters or drillers incorporate seeds immediately after digging, no-till prevents soil compaction, minimizes operation time and fossil emissions, contributing to economic and ecological stability.

2. The basic resources for agriculture are sunlight, soil and water, besides the seeds and animal breeds, and human Endeavour. Another important input is the agro technique. Agricultural production is adversely affected if any of these factors is limited, or disturbed. Obviously, scientific study enables technological innovations to manipulate these factors to maximize production. Increasingly nowadays, application of science and technology also involves preventing or at least minimizing wasteful use of precious resources. Various resources are Soil, water, seeds and agro techniques

3. The effects of soil erosion go beyond the loss of fertile land. It has led to increased pollution and sedimentation in streams and rivers, clogging these waterways and causing declines in fish and other species. And degraded lands are also often less able to hold onto water, which can worsen flooding. Sustainable land use can help to reduce the impacts of agriculture and livestock, preventing soil degradation and erosion and the loss of valuable land to desertification. The health of soil is a primary concern to farmers and the global community whose livelihoods depend on well managed agriculture that starts with the dirt beneath our feet.

B. State whether True or False (T/F)

1. False
2. True
3. True

C. Fill in the Blanks

1. No tillage
2. Biodiversity hotspot

D. Multiple Choice Questions

1. d) Both a and b
2. a) Overgrazing

UNIT 6.4: Preparing to be an Entrepreneur

Unit Objectives

After the completion of this unit, the participants will be able to:

1. Prepare a sample marketing plan considering the 4Ps i.e., product, price, promotion, and place and 4As i.e., acceptability, affordability, accessibility, and awareness.
2. Demonstrate the process of using the relevant digital services such as e-commerce, e-payments, electronic recordkeeping, etc.

Resources to be Used

- Available objects such as participant's handbook, white board, duster, marker etc.
- Power points slides, pictures/posters e.g., showing relevant visuals of success story of entrepreneur.

Activity

Purpose : To acquaint the participants about 4Ps of marketing product, price, promotion, and place.

Resources : Projector, system facilitating power point presentations, microphone, camera, and round tables arranged in U shape for healthy discussion.

Methodology : Group discussion for about 15-20 minutes.

Expected outcomes :

- Knowledge enhancement on marketing plan.

Prepare 4 groups of participants. Allot each group the 4Ps and encourage them for group discussion after that tell them to prepare a sample marketing plan.

Say

- Thank you to everyone for their participation.
- Discuss with the participants to share what new things they have learned in this exercise.

Ask

- Ask them about importance of digital services.
- Ask them whether they know any e-payment method.

Explain

- Explain the process of using the various digital services used in day to day life.
- Explain participants about marketing plan and its purpose.

Elaborate

- Elaborate how digital service can be used in a wide variety of ways to address inefficiency in farming operations across crop type.
- Elaborate the types and process of e-commerce.

Activity

Plan this activity for at least 20-30 minutes. Ask participants to prepare a sheet of various e-commerce, e-payments, and electronic recordkeeping services. Also ask them to prepare report on commonly used e-payment method.

Notes for Facilitation

- Help the participants to complete all the tasks involved in the participant hand book.
- Motivate participants for digital payment.

Exercise

Key Solutions to PHB Exercises

A. Short Questions

1. Explain the 4 P's

i. Product - A product can be: A tangible good and an intangible service

Whatever your product is, it is critical that you have a clear understanding of what you are offering, and what its unique characteristics are, before you begin with the marketing process.

ii. Price

Once all the elements of Product have been established, the Price factor needs to be considered. The Price of a Product will depend on several factors such as profit margins, supply, demand and the marketing strategy.

iii. Promotion

Once you are certain about your Product and your Price, the next step is to look at ways to promote it. Some key elements of promotion are advertising, public relations, social media marketing, email marketing, search engine marketing, video marketing and more.

iv. Place

According to most marketers, the basis of marketing is about offering the right product, at the right price, at the right place, at the right time. For this reason, selecting the best possible location is critical for converting prospective clients into actual clients.

2. Types of E-commerce

Business to Business (B2B): Both the transacting parties are businesses.

Business to Consumer (B2C): Businesses sell electronically to end-consumers

Consumer to Consumer (C2C): Consumers come together to buy, sell or trade items to other consumers.

Consumer-to-Business (C2B): Consumers make products or services available for purchase to companies looking for exactly those services or products.

Business-to-Administration (B2A): Online transactions conducted between companies and public administration.

Consumer-to-Administration (C2A): Online transactions conducted between individuals and public administration.

3. Types of risk in agriculture business

i. Production risk derives from the uncertain natural growth processes of crops and livestock.

ii. Price or market risk refers to uncertainty about the prices producers will receive for commodities or the prices they must pay for inputs

iii. Financial risk results when the farm business borrows money and creates an obligation to repay debt.

iv. Institutional risk results from uncertainties surrounding Government actions.

v. Human or personal risk refers to factors such as problems with human health or personal relationships that can affect the farm business.

B. State whether True or False (T/F)

1. False
2. False
3. True

C. Fill in the Blanks

1. Single platform
2. Unified national market

D. Multiple Choice Questions

1. c) Pradhan Mantri Jan Dhan Yojana

2. d) All of the above

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Skill Development
Corporation
Transforming the skill landscape

ASCI
Agriculture Skill Council of India

7. Engagement in Collective Farming/ Activities

Unit 7.1 - Formation of PGs/ FIGs/ SHGs and its Operations

AGR/N9922

Terminal Outcomes

After the completion of this module, the participants will be able to:

1. Describe the process of creating PGs/ FIGs/ SHGs and preparing for its operations.
2. Demonstrate the process of conducting group meetings and training sessions.
3. Demonstrate the process of carrying out collective farming/activities.

Key Learning Outcomes

After the completion of this module, the participants will be able to:

Theory	Practical
1. Explain the process of preparing for the producer groups (PGs)/garmers Interest groups (FIGs)/ self-help groups (SHGs) operations such as fundraising, induction of subject matter experts (SMEs), investing in information and communication technology (ICT) products, etc. 2. Explain How to obtain access to the relevant government development programs and funds. 3. Explain the Process of commodity convergence with the relevant developmental programs. 4. Explain the Importance of planning optimal production to meet the market and household food security needs. 5. Explain the Importance of setting the group objectives and deciding the group income-generating enterprises/ activities, methods of operation, benefits, etc. 6. Explain the Importance of organizing the PG/FIG/ SHG meetings and training sessions to resolve common concerns and get information about the latest developments in the field of work. 7. Explain the Benefits of various capacity building exercises such as skill development and training programs. 8. Explain the Importance and process of conducting field trials to identify and resolve problems encountered by farmers in the field operations. 9. Explain the Concept of the group owned bank to provide quality seeds, fertilizers, pesticides, tools and equipment to the member farmers.	1. Role play to illustrate how to conduct the initial group meetings to introduce the members, discuss the group objectives, group income generating enterprises/ activities, methods of operation, etc. 2. Role play to illustrate how to organize field trials to identify and resolve problems encountered by group members in the field operations.

Theory	Practical
10. Explain the Process of using the group's credit facility. 11. Explain various core collective farming activities such as procuring inputs in bulk, large-scale farming, etc. 12. Explain the Concept and benefits of forming forward and backward linkages. 13. State the relevant value addition practices such as processing, packing, upgrading the quality, etc. 14. Explain the benefits of connecting with similar groups to address common problems on a large scale.	

UNIT 7.1: Formation of PGs/ FIGs/ SHGs and its Operations

Unit Objectives

After the completion of this unit, the participants will be able to:

1. Role play to illustrate how to conduct the initial group meetings to introduce the members, discuss the group objectives, group income generating enterprises/ activities, methods of operation, etc.
2. Role play to illustrate how to organize field trials to identify and resolve problems encountered by group members in the field operations.

Resources to be Used

- Available objects such as participant's handbook, white board, duster, marker etc.
- Power points slides, pictures/posters e.g., showing relevant visuals of bed preparation for sowing and fertilizer application.

Activity

Purpose:
To acquaint the participants about importance of group meetings.

Resources: Projector, system facilitating power point presentations, microphone, camera, and round tables arranged in U shape for healthy discussion.

Methodology: Group discussion for about 15-20 minutes.

Expected outcomes:
- Confidence building
- Group involvement

You can ask participants to prepare power point presentation on their basic idea of collective farming. Some participants will represent government scheme to promote collective farming activities. Another team can have a presentation on various Farmer Interest Group (FIG) in their area.
Discuss with the participants about group objectives, group income generating enterprises/ activities, methods of operation, etc. of any known Producer Group (PG).

Say

- Thank you to everyone for their participation.
- Describe the objectives of farmer interest group.

Ask

- Ask participants whether they have visited any farmer interest group working in agriculture field.
- Ask participants that whether they have observed how FIG helps in prosperity improvement of farmer.

Explain

- Explain the participants about various income generating activities carried out in collective farming which helps in improving living standard of farmer.
- Explain the participants how members of producer group can easily solve the issues while working in the field.

Elaborate

- There are multiple Producer Group, Farmer Interest Group and Self Help Group which are working together for different purpose. Ask participants to go through them and share their experience.
- Elaborate how problem solving capacity of different groups increasing due to collective activity.

Activity

You may plan this activity for 20-30 minutes.

- Based on participatory approach compare the pre and post covid effects on agriculture marketing and how group farming activity channelize different marketing options.
- For further details you can go for video link which are provided in participatory handbook.

Notes for Facilitation

- Indicate potential of various groups which are working under agriculture sector.
- Assist all groups to systematically arrange collected information and analyse them whenever required.
- Where possible arrange a group visit to display how group farming activities are performed.

Exercise

Key Solutions to PHB Exercises

A. Short Questions

1. Process for setting of producers group

- Understanding post farm-gate situation in the block
- Work on the Business Model and Business Opportunity
- Sharing the idea and confirmation with CLF/ GPLF
- Formation of Producers Groups
- Finalization and Submission of Business Plan to CLF
- Release of Fund to PG
- Monitoring

2. Importance of value addition in agriculture

- Agriculture deals a large group of crops having great medicinal, nutritional, health promoting values.
- India as second largest producer of fruits and vegetables, only 10 per cent of that produce is processed, but other developed and developing countries where 40-80 per cent produce is value added.
- Horticultural crops provide varied type of components, which can be effectively and gainfully utilized for value addition like pigment, amino acids, oleoresins, antioxidants, flavors, aroma etc.
- Post-harvest losses in horticultural produce are 5 to 30 per cent which amounts to more than 8000 crore rupees per annum. If we subject our produce to value addition the losses can be checked.
- Horticultural crops are right material for value addition because they are more profitable, has high degree of process ability and richness in health promoting compounds and higher potential for export.

3. Farmers in India remain poor as they are not able to obtain better prices inspite of the hard work they do in order to reap harvests. They are not in a position to determine the price for their own produce. The need of the hour is to establish commodity groups, farmers interest groups and farmers federation so that they gain the confidence to fix price for their produce. A Farmer Interest Group (FIG) is a self-managed, independent group of farmers with a shared goal and interest. The members work together to achieve this goal by pooling their existing resources, gaining better access to other resources and to share in the resulting benefits.

B. State whether True/False (T/F)

1. True
2. True
3. False

C. Fill in the Blanks

1. Farmer Interest Groups (FIG)
2. Group formation

D. Multiple Choice Questions

1. d) All of the above
2. d) Only a

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8. Hygiene and Cleanliness

Unit 8.1 - Personal Health and Hygiene at Workplace

AGR/N9903

Terminal Outcomes

After the completion of this module, the participants will be able to:

1. Discuss how to adhere to personal hygiene practices.
2. Demonstrate ways to ensure cleanliness around the workplace.

Key Learning Outcomes

After the completion of this module, the participants will be able to:

Theory	Practical
1. Explain the requirements of personal health, hygiene and fitness at work. 2. Describe common health-related guidelines laid down by the organizations/government at the workplace. 3. Explain the importance of good housekeeping at the workplace. 4. Explain the importance of informing the designated authority on personal health issues related to injuries and infectious diseases.	1. Demonstrate personal hygiene practices to be followed at the workplace. 2. Demonstrate the correct way of washing hands using soap and water, and alcohol-based hand rubs. 3. Demonstrate the steps to follow to put on and take off a mask safely. 4. Show how to sanitize and disinfect one's work area regularly. 5. Demonstrate adherence to the workplace sanitization norms. 6. Show how to ensure the cleanliness of the work area.

UNIT 8.1: Personal Health and Hygiene at Workplace

Unit Objectives

After the completion of this unit, the participants will be able to:

1. Demonstrate personal hygiene practices to be followed at the workplace.
2. Demonstrate the correct way of washing hands using soap and water, and alcohol-based hand rubs.
3. Demonstrate the steps to follow to put on and take off a mask safely.
4. Show how to sanitize and disinfect one's work area regularly.
5. Demonstrate adherence to the workplace sanitization norms.
6. Show how to ensure the cleanliness of the work area.

Resources to be Used

- Available objects such as participant's handbook, white board, duster, marker etc.
- Power points slides, pictures/posters e.g., showing relevant video of hand cleaning procedure.

Activity

Purpose: To acquaint the participants about personal hygiene practices.

Resources: Projector, system facilitating power point presentations, microphone, camera, and round tables arranged in U shape for healthy discussion.

Methodology: Group discussion for about 15-20 minutes.

Expected outcomes:

- Knowledge enhancement

This activity is on individual basis to elaborate procedure for hand wash. You have to show them proper method of hand cleaning then ask them to perform the same. In this activity you put glitter on hands of each participants. The glitter represent number of germs present on hand and ask participants to clear that all glitter.

Steps for washing our germy, glittery hands:

Ask your participants to suggest how long they should wash their hands
Have them demonstrate how they wash their hands
Talk about who they think does it the best
Sprinkle glitter into their hands
Ask them to rub their hands together to spread the glitter all over
Let them try to wash it all off and time how long it takes
Show early finishes any glitter they have missed
Send them back for more washing
Share ideas about what they have learned

The aim is to teach the participants that proper hand washing takes 20 to 30 seconds and requires covering all parts of your hand. Otherwise, germs will still be there. You can follow this by seeing how using soap makes a difference.

Say

- Thank you to everyone for their participation
- Discuss with the participants to share their feelings about this exercise and what new things they have learned in this exercise.

Ask

- Ask participants about the participants' personal hygiene routines.
- Ask participants about if they are familiar with various masks.

Explain

- Explain the importance of using a mask.
- Explain the purpose of workplace sanitization.

Elaborate

- Elaborate the steps to follow to put on and take off a mask safely.
- Elaborate the different practices to be followed to maintain cleanliness of the work area.

Activity

Plan this activity for 20-30 minutes. Ask participants to make their own hygiene displays, divide your participants into small groups, hand out poster paper and art supplies, and get your participants to make them. Give each group a "hygiene duty" to represent on their poster. When finished, groups can present their finished posters to the class. While explaining their posters, they'll be processing important information in their own language. This will help your participants to become more independent and take ownership of their personal hygiene.

Notes for Facilitation

- Help the participants to complete all the exercises involved in the participant hand book.
- You can ask participants to identify various hygiene practices and follow them in day to day life.

Exercise

K Key solutions to PHB exercise

A. Short Questions

1. Plant pests, diseases and weed seeds can easily spread from one property to another on clothing, shoes, equipment and vehicles. Always check your shoes, clothing, hair and hats for any seeds or plant material, paying special attention to your shoes as they can easily carry contaminated soil and weed seeds. There are also a range of other hygiene and biosecurity practices you can implement to reduce the risk of pests or disease impacting your farm.

2. Health related guidelines given by government

- Providing a statutory framework on Occupational Safety and Health in respect of all sectors of industrial activities including the construction sector, designing suitable control systems of compliance, enforcement and incentives for better compliance.
- Providing administrative and technical support services.
- Providing for a system of non-financial incentives for improvement in safety and health.
- Establishing and developing the research and development capability in emerging areas of risk and providing for effective control measures.
- Focusing on prevention strategies and monitoring performance through improved data collection system on work related injuries and diseases.
- Promoting inclusion of safety, health and environment, improvement at workplaces as an important component in other relevant national policy documents.
- Including safety and occupational health as an integral part of every operation.

3. Individual on the job must be able to wash hands, legs and face with soap/alcohol based sanitizer at reasonable intervals. Washing of the worn clothes with soap and sundry before using for the next time. The face should be covered with mask or three layers of cloth-piece. Follow the workplace sanitization norms including distancing from sick people.

B. State whether True or False (T/F)

1. True
2. True
3. False

C. Fill in the Blanks

1. Maintained
2. Vehicles

D. Multiple Choice Questions

1. d) Both a and b
2. d) All of the above

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9. Safety and Emergency Procedures

Unit 9.1 - Safety Guidelines and Checks
Unit 9.2 - Safety Hazards at Workplace

AGR/N9903

Terminal Outcomes

After the completion of this module, the participants will be able to:

1. Describe how to adhere to safety guidelines.
2. Show how to administer appropriate emergency procedures.

Key Learning Outcomes

After the completion of this module, the participants will be able to:

Theory	Practical
1. List the personal protective equipment (PPE) required at the workplace. 2. Describe the commonly reported hazards at the workplace. 3. Describe the hazards caused due to chemicals/pesticides/fumigants. 4. Describe the basic safety checks to be done before the operation of any equipment/machinery. 5. Describe the common first aid procedures to be followed in case of emergencies. 6. State measures that can be taken to prevent accidents and damages at the workplace. 7. Explain the importance of reporting details of first aid administered, to the reporting officer/doctor, in accordance with workplace procedures. 8. State common health and safety guidelines to be followed at the workplace.	1. Check various areas of the workplace for leakages, water-logging, pests, fire, etc. 2. Demonstrate how to safely use the PPE and implement it as applicable to the workplace. 3. Display the correct way of donning, doffing and discarding PPE such as face masks, hand gloves, face shields, PPE suits, etc. 4. Sanitize the tools, equipment and machinery properly. 5. Demonstrate the safe disposal of waste. 6. Demonstrate procedures for dealing with accidents, fires and emergencies. 7. Demonstrate emergency procedures to the given workplace requirements. 8. Demonstrate the use of emergency equipment in accordance with manufacturers' specifications and workplace requirements. 9. Demonstrate the administration of first aid. 10. Prepare a list of relevant hotline/ emergency numbers.

UNIT 9.1: Safety Guidelines and Checks

Unit Objectives

After the completion of this unit, the participants will be able to:

1. Demonstrate how to safely use the PPE and implement it as applicable to the workplace.
2. Display the correct way of donning, doffing and discarding PPE such as face masks, hand gloves, face shields, PPE suits, etc.
3. Sanitize the tools, equipment and machinery properly.
4. Demonstrate the administration of first aid.
5. Prepare a list of relevant hotline/ emergency numbers.
6. Demonstrate emergency procedures to the given workplace requirements.
7. Demonstrate the use of emergency equipment in accordance with manufacturers' specifications and workplace requirements.

Resources to be Used

- Available objects such as participant's handbook, white board, duster, marker etc.
- Power points slides, pictures/posters e.g., showing relevant images of different personal protective equipment.

Activity

Purpose : To acquaint the participants about ways to maintain workplace safety.

Resources : Projector, system facilitating power point presentations, microphone, camera, and round tables arranged in U shape for healthy discussion.

Methodology : Group discussion for about 15-20 minutes.

Expected outcomes :

- Knowledge about personal protective equipment
- Knowledge enhancement in first aid

Prepare the participants for healthy group discussion. Make a groups of 4-5 participants and allot them one personal protective equipment's (PPE). Ask them to discuss about their role, use and how it helps in protection.

Say

- Thank you to everyone for their participation.
- Describe the objective of above activity.

Ask

- Ask participants about their experience of using face mask.
- Ask participants whether they know any emergency numbers.
- Ask participants if they are aware of the first aid kit.

Explain

- Explain proper ways of donning, doffing and discarding various personal protective equipment (PPE).
- Explain the importance of sanitizing equipment and machinery at workplace.
- Explain different first aid treatment in emergencies.

Elaborate

- Elaborate how to sanitize the tools, equipment and machinery properly.
- Elaborate the use of various emergency equipment and emergency procedures at workplace.

Activity

This activity may be planned for 20-30 minutes. Ask participants about their experience of using first aid kit in emergency. Tell them to prepare a pictorial presentation of 5 slides on emergency equipment's and explain about the use of emergency equipment's.

Notes for Facilitation

- Assist all groups to systematically arrange collected information and analyse them when required.
- Constantly motivate each student to participate. Arrange award for group involvement, presentation skills, use of tools etc.

Exercise

Key Solutions to PHB Exercises

A. Short Questions

1. Follow these 10 tips to prevent an injury and protect your workforce.
    - Incorporate a Safety and Wellness Plan
    - Conduct Pre-Placement Physicals
    - Educate Farm Workers and Management Staff
    - Research Safety Vulnerabilities
    - Provide Protection Equipment
    - Have Adequate Staffing Level .
    - Don't Take Shortcuts
    - Inspect and Maintain Machinery and Equipment.
    - Monitor Safety Measures
    - Keep an Orderly Workplace

2. Safety can be improved on farm by increasing awareness of farming hazards and making a conscious effort to prepare for emergency situations including fires, vehicle accidents and electrical shocks from equipment and wires and chemical exposures.
    - Be especially alert to hazards that may affect.
    - Minimize hazards by carefully selecting the products to ensure safety.
    - Always use seat belts when operating tractors.
    - Read and follow instructions in equipment operator's manuals and on product labels.
    - Undertake basic safety checks before operation of all machinery and vehicles and hazards reported to the appropriate supervisor
    - There are two levels of personal protective equipment (PPE) depending on the hazardous substance activity
3. Different emergency numbers
    - Gas leakage - 1906
    - Tourist Helpline - 1363
    - Child Helpline - 1098
    - Disaster management - 104
    - Women Helpline - 181
    - Police - 100
    - Ambulance - 108
    - Fire brigade – 101

B. State whether True/False (T/F)

1. True
2. True
3. False

C. Fill in the Blanks

1. First-aid kit
2.Accidents

D. Multiple Choice Questions

1. a) 104
2. d) All of the above

UNIT 9.2: Hazards at Workplace

Unit Objectives

After the completion of this unit, the participants will be able to:

1. Check various areas of the workplace for leakages, water-logging, pests, fire, etc.
2. Demonstrate the safe disposal of waste.
3. Demonstrate procedures for dealing with accidents, fires and emergencies.

Resources to be Used

- Available objects such as participant's handbook, white board, duster, marker etc.
- Power points slides, pictures/posters e.g., showing relevant pictures of hazards at workplace.

Activity

Purpose: To acquaint the participants about waste disposal.

Resources: Projector, system facilitating power point presentations, microphone, camera, and round tables arranged in U shape for healthy discussion.

Methodology: Plan this activity for about 15-20 minutes.

Expected outcomes:

- Introduction and knowledge enhancement of waste disposal methods.

Make groups of 4-5 participants. Ask participants to prepare a presentation on various waste disposal methods after choose any participants and ask them to explain their respective group presentation and after completion of presentation on all methods find out which disposal method is economical.

Say

- Thank you to everyone for their participation.

Ask

- Ask participants about whether they have seen any leakage pest attack at workplace.
- Ask participants about whether they know how to use fire extinguisher.

Explain

- Explain different areas of the workplace for water-logging and fire.
- Explain the purpose of safe disposal of waste.

Elaborate

- Elaborate procedures of different methods of waste disposal.
- Elaborate procedures for dealing with accidents and other emergencies.

Activity

Plan this activity for 20-30 minutes. Plan a group activity in which one group is attacked by fire and the other participants assist them in escaping; you have assist them in completing this activity successfully. The purpose of this activity is to teach participants how to act in the situation when a fire attack.

Notes for Facilitation

- Indicate potential source of information to each of the group.
- Assist all groups to systematically arrange collected information and analyse them when required.
- You may invite fire brigade officer to give instructions on what to do if we get trapped in a fire.

Exercise

Key Solutions to PHB Exercises

A.Short Questions

1. first aid measures for pesticide poisoning
   - In case of skin contact, remove contaminant contacts and wash with clean water.
   - In case of inhalation, remove from site and provide good clean air site, keep the head and shoulder upright.
   - In case of unconscious and breathing stops, provide artificial respiration.
   - If pesticide is swallowed, induce vomiting by giving 2-3 liters salt water. Give milk after that.
   - Take the patient to doctor at the earliest.
   - Take the container along with patient to consult doctor.

2. Pesticide hazard

A pesticide is any substance that is used to prevent, destroy, or repel pests from causing damage. Most pesticides have a major site of action in the nervous and endocrine systems, making them potentially toxic to humans with serious direct or indirect adverse health effects.

3. Examples of acute health effects
   - Stinging eyes
   - Rashes
   - Blisters
   - Blindness
   - Nausea
   - Dizziness
   - Diarrhea and death

B. State whether True/False (T/F)

1. True
2. False
3. True

C. Fill in the Blanks

1. Acute effects
2.Pesticide

D. Multiple Choice Questions

1. d) Both a and b
2. d) Both a and b

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10. Employability Skills (60 Hours)

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11. Annexures

Annexure I

Training Delivery Plan

Training Delivery Plan			
Program Name:	Coconut Grower cum Primary Processor		
Qualification Pack Name & Ref. ID	AGR/Q0503 NSQF Level: 4		
Version No.	**3.0**	**Version Update Date**	24/02/2022
Pre-requisites to Training (If any)	10th Class (Pass) with 2 Years of experience relevant experience OR 10th Class (Pass and pursuing continuous regular schooling) OR 8th Class with 4 Years of experience relevant experience OR Certificate-NSQF (Level-4, Field Crop/ Vegetable) with 6 Months of experience relevant experience		
Training Outcomes	• Describe the process of preparing for coconut cultivation. • Demonstrate the process of transplanting the seedlings and main´taining the coconut crop. • Demonstrate the process of carrying out harvesting, post-harvest processing and marketing activities. • Demonstrate the process of carrying out primary processing of coconut and prepare valueadded products. • Explain the basic entrepreneurial activities for small enterprise. • Describe the process of undertaking employability and entrepreneurial practices. • Describe the process of engaging in collective farming/ activity. • Demonstrate various practices to maintain personal hygiene, cleanliness, and safety at the workplace.		

Sr. No	Module Name	Session Name	Session Objectives	NOS Reference	Methodology	Training Tools/ Aids	Duration
1	**Introduction to the role of a Friends of Coconut Tree T: 4:00 P: 0:00 (HH:MM)**	Introduction to the Role of Friends of Coconut	• Describe the size and scope of the agriculture industry and its sub-sectors. • Discuss the role and responsibilities. • Identify various employment opportunities.	NA	Classroom teaching	Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	T: 4:00
2	**Process of Preparing for Coconut Cultivation T:18:00 P:44:00 (HH:MM)**	Site selection, varieties and tools	• Demonstrate the preparation of nursery bed.	AGR/N0515 PC1,PC8, KU1,KU5, GS1,GS8	Field visit	PHB, Training Kit (Trainer Guide, Presentations), participants handbook, Whiteboard, marker, projector, laptop, template	T:2:00 P:6:00
		Raising seedlings in nursery	• Demonstrate the process of treating the planting material.	AGR/N0515 PC8,PC11, KU8, GS1,GS8	Team activity, demonstration	PHB, Training Kit (Trainer Guide, Presentations), whiteboard, marker, projector, laptop, template,	T:2:00 P:6:00

		Seed sowing depth	• Demonstrate how to sow seeds in the seedbed.	AGR/N0515 PC12, KU6, GS1,GS8	Field visit	PHB, Training Kit (Trainer Guide, Presentations), whiteboard, marker, projector, laptop, template, rakes, sickle, spade etc.	T:2:00 P:6:00
		Seed sowing spacing	• Recommended seed spacing	AGR/N0515 PC12, KU6, GS1,GS8	Field visit	Training Kit (Trainer Guide, Presentations), whiteboard, marker, projector, laptop, template, rakes, sickle, spade etc.	T:4:00 P:2:00
		Seedling nutrition	• Demonstrate the process of carrying out nutrition.	AGR/N0515 PC13, KU7,KU8 GS1,GS8	Group discussion, classroom teaching	PHB, Training Kit (Trainer Guide, Presentations), whiteboard, marker, projector, laptop, Template.	T:2:00 P:6:00
		Disease and pest management	• Disease and pest management of seedlings.	AGR/N0515 PC13, KU8, GS1,GS8	Group discussion, field visit	PHB, Training Kit (Trainer Guide, Presentations), whiteboard, marker, projector, laptop, Template.	T:2:00 P:6:00
		Harvesting tools	• Demonstrate the use of tools to harvest the seedlings.	AGR/N0515 PC14,PC15, KU5,KU9, KU10, GS1,GS8	Group activity, identification of different tools	PHB, Training Kit (Trainer Guide, Presentations), whiteboard, marker, projector, laptop, template, trowel, rakes, sickle, spade, etc.	T:2:00 P:6:00
		Discarding damaged seedling	• Demonstrate the process of discarding the diseased and damaged seedlings.	AGR/N0515 PC16, KU6,KU10, GS1,GS8	Field visit	PHB, Training Kit (Trainer Guide, Presentations), whiteboard, marker, projector, laptop, template.	T:2:00 P:6:00
3	**Process of Transplanting the Seedlings and Maintaining the Coconut Crop T:18 P:44 (HH:MM)**	Field Preparation and Nutrient Management	• Demonstrate how to remove material from the field. • Demonstrate tilling the field. • Demonstrate the application of mulch in the field. • Demonstrate how to create drains in the field. Show how to prepare pits. • Show how to fill the pits with mixture of soil and compost. • Demonstrate the transplanting the seedlings in the pits.	AGR/N0516 PC1,PC11, PC25,PC27, KU1,KU9, GS1,GS8	Field activity	PHB, Training Kit (Trainer Guide, Presentations), whiteboard, marker, projector, laptop, template	T:2:00 P:6:00

			• Demonstrate the process of carrying out gene stacking. • Demonstrate the application of fertilizer and water the seedlings. • Demonstrate the use of a pH meter.				
		Fertilizer management	• Demonstrate the application of lime or gypsum to the soil. • Demonstrate the application of lab-recommended organic or inorganic fertilizers.	AGR/N0516 PC11,PC16, KU10,KU11, GS1,GS8	Group discussion, demonstration	PHB, Training Kit (Trainer Guide, Presentations), whiteboard, marker, projector, laptop, template	T:3:00 P:5:00
		Weed management	• Demonstrate the process of applying the recommended weedicides/ herbicides. • Demonstrate mechanical weeding.	AGR/N0516 PC17,PC19 KU4, GS1,GS8	Group discussion, classroom teaching	PHB, Training Kit (Trainer Guide, Presentations), whiteboard, marker, projector, laptop, template	T:3:00 P:5:00
		Pest and disease management	• Demonstrate the application of pesticides/ insecticides.	AGR/N0516 PC20,PC23, KU12,KU14, GS1,GS8	Field activity	PHB, Training Kit (Trainer Guide, Presentations), participants hand book whiteboard, marker, projector, laptop, sprayer, insecticide, fungicide, lenses, measuring cylinder.	T:2:00 P:6:00
		Record maintenance	• Prepare a sample record of pesticides and insecticides	ARG/N0516 PC24, KU15, GS1,GS8	Power point presentation, individual activity	PHB, Training Kit (Trainer Guide, Presentations), whiteboard, marker, projector, laptop, template	T:2:00 P:6:00
		Resource optimization	• Demonstrate the process of applying mulch, coconut husk or coir pith. • Demonstrate practices to optimise the usage of resources.	AGR/N0516 PC28,PC30, KU16,KU17, GS1,GS8	Field activity	PHB, Training Kit (Trainer Guide, Presentations), whiteboard, marker, projector, laptop, template	T:2:00 P:6:00
		Recycling and disposing of waste	• Demonstrate the process of recycling and disposing.	AGR/NO516 PC31, KU18, GS1,GS8	Group discussion and debate competition	PHB, Training Kit (Trainer Guide, Presentations), whiteboard, marker, projector, laptop, template	T:2:00 P:6:00

		Verbal and non-verbal communication	• Demonstrate verbal and non-verbal communication.	AGR/N0516 PC32,PC33 KU19. GS1,GS8	Team activity, group discussion	PHB, Training Kit (Trainer Guide, Presentations), whiteboard, marker, projector, laptop, template	T:2:00 P:4:00
4.	**Process of carrying out harvesting, post-harvest processing and marketing activities T:18:00 P:44:00 (HH:MM)**	Harvesting of Coconuts	• Demonstrate the harvesting of coconuts.	AGR/N0520 PC1,PC4, KU1,KU4, GS1,GS9	Field visit	PHB, Training Kit (Trainer Guide, Presentations), participants hand book whiteboard, marker, projector, laptop, different types of ladder and gadgets, sickle and other relevant tools and implements for harvesting.	T:2:00 P:6:00
		Sorting and grading	• Demonstrate sorting and grading of coconuts.	AGR/N0520 PC5, KU4, GS1,GS9	Field activity	PHB, Training Kit (Trainer Guide, Presentations), participants hand book whiteboard, different types of nuts for identification	T:2:00 P:6:00
		Post-harvest activities	• Describe the process of de-husking, extracting and drying copra mechanically.	AGR/N0520 PC6,PC7 KU5, GS1,GS9	Field visit	PHB, Training Kit (Trainer Guide, Presentations), whiteboard, marker, projector, laptop, template, harvested nuts, shelling machine	T:2:00 P:6:00
		Coconut oil extraction	• Demonstrate the extraction of coconut oil from copra mechanically.	AGR/N0520 PC8, KU6, GS1,GS9	Field visit	PHB, whiteboard, marker, projector, laptop, template, copra dryer, oil chakki or mill, copra moisture meter, Skilled labour for processing.	T:3:00 P:5:00
		Coconut packaging	• Show how to pack the coconuts and copra.	AGR/N0520 PC11, GS1,GS9	Field visit	PHB, Training Kit (Trainer Guide, Presentations), whiteboard, marker, projector, laptop, template	T:3:00 P:5:00
		Record maintenance	• Prepare a sample record of harvested coconuts. • Prepare a sample record of sales and payments.	AGR/N0520 PC20, KU14, GS1,GS9	Classroom teaching, individual activity	PHB, Training Kit (Trainer Guide, Presentations), whiteboard, marker, projector, laptop, template	T:2:00 P:4:00

		Storage of produce	• Show how to clean the storage area. • Demonstrate the application of treatment in the storage area.	AGR/N0520 PC10, PC12,PC17 KU7,KU11 GS1,GS9	Group discussion, classroom teaching	PHB, Training Kit (Trainer Guide, Presentations), whiteboard, marker, projector, laptop, template various types of stored coconut, insecticide, fungicide for treatment, polythene / alkathene-lined gunny bags or netted polythene bags	T:2:00 P:6:00
		E-payment and B:C ratio	• Demonstrate the e-payment method. • Show how to calculate the benefit cost (B:C) ratio.	AGR/N0520 PC18,CS19, KU12,KU13 GS1,GS9	Group discussion, classroom teaching	PHB, Training Kit (Trainer Guide, Presentations), whiteboard, marker, projector, laptop.	T:2:00 P:6:00
5.	**Process of Carrying out Primary Processing of Coconut and Prepare Value-Added Products T:20:00 P:56:00 (HH:MM)**	Copra drying	• Demonstrate how to dry copra. • Show how to remove the nut from the hard shell. • Show how to wash the pared nuts free of milk and skin residues. • Demonstrate how to shred the nuts.	AGR/N0535 PC1,PC7, PC10, KU1,KU3, GS1,GS9	Field visit	PHB, Training Kit (Trainer Guide, Presentations), participants handbook, whiteboard, marker, projector, laptop, template and video	T:2:00 P:6:00
		Grades and moisture content	• Demonstrate the process sieving to obtain different grades of the desiccated coconut. • Demonstrate how to prepare intermediate moisture coconut kernel.	AGR/N0535 PC8, PC34,PC38 KU4, GS1,GS9	Demonstration, group discussion	PHB, Training Kit (Trainer Guide, Presentations), participants handbook, whiteboard, marker, projector, laptop, template	T:2:00 P:6:00
		Coconut meat and shell	• Demonstrate how to separate coconut meat from the coconut shell. • Show how to crack the coconut shells and separate the coconut meat.	AGR/N0535 PC9,PC13 GS1,GS9	Field visit	PHB, Training Kit (Trainer Guide, Presentations), participants handbook, whiteboard, marker, projector, laptop, template and video	T:2:00 P:6:00
		Coconut water beverages	• Demonstrate how to prepare fruit juice blended tender coconut water beverage.	AGR/N0535 PC22,PC29 KU16 GS1,GS9	Group discussion, individual activity	PHB, Training Kit (Trainer Guide, Presentations), participants handbook, whiteboard, marker, projector, laptop, template	T:2:00 P:6:00

		Vinegar and coconut chips	• Demonstrate how to prepare vinegar from coconut water. • Demonstrate how to prepare coconut chips.	AGR/N0535 PC39,PC44, KU19,KU20 GS1,GS9	Group discussion, classroom teaching	PHB, Training Kit (Trainer Guide, Presentations), participants handbook, whiteboard, marker, projector, laptop, template	T:2:00 P:4:00
		Processing of coconut	• Demonstrate the process of steam or hot water treatment of the ground meat. • Show how to dry the pasteurized meat on a wire mesh belt. • Demonstrate the process of using the oil expeller to extract the coconut oil. • Show how to create a groove on the shell of the coconut. • Show how to extract round soft kernel/snow ball tender nut. • Demonstrate the packing of snow ball tender nut.	AGR/N0535 PC23,PC26, KU5,KU7 GS1,GS95	Field visit	PHB, Training Kit (Trainer Guide, Presentations), participants handbook, whiteboard, marker, projector, laptop, template, , implement for removing copra from nut, shredder	T:2:00 P:6:00
		Copra and coconut oil	• Demonstrate how to chop the copra into small pieces. • Show how to squeeze coconut oil out from the cooked copra. • Demonstrate the process of pasteurization and filtration activities.	AGR/N0535 PC11, KU8,KU10, GS1,GS9	Group discussion, classroom teaching	PHB, Training Kit (Trainer Guide, Presentations), participants handbook, whiteboard, marker, projector, laptop, template	T:2:00 P:6:00
		Extraction and packing of tender coconut water	• Demonstrate how to extract Tender Coconut Water (TCW). • Demonstrate the packing the TCW in pouches and aluminium cans.	AGR/N0535 PC18,PC19, KU11,KU12, GS1,GS9	Group discussion, demonstration	PHB, Training Kit (Trainer Guide, Presentations), participants handbook, whiteboard, marker, projector, laptop, template	T:2:00 P:6:00
		Processing of tender coconut in citric acid	• Demonstrate the preparation of solution of citric acid and potassium metabisulphite. • Demonstrate processing of tender coconut in citric acid and potassium metabisulphite.	AGR/N0535 PC20,PC22, KU13,18 GS1,GS9	Group discussion, classroom teaching	PHB, Training Kit (Trainer Guide, Presentations), participants handbook, whiteboard, marker, projector, laptop, template	T:2:00 P:6:00

		Bottling of coconut water	• Demonstrate bottling of coconut water. • Show how to prepare the culture solution by mixing coconut water with sugar and acetic acid. • Demonstrate how to inoculate the culture solution with Acetobacter and xylinium, using a culture liquid. • Demonstrate the process of harvesting the white-coloured jelly.	AGR/N0535 PC30,PC33, PC45,PC47, KU21,KU22, GS1,GS9	Field visit	PHB, Training Kit (Trainer Guide, Presentations), participants handbook, whiteboard, marker, projector, laptop, template	T:2:00 P:4:00
6.	**Basic entrepreneurial activities for small enterprise T:12:00 P:22:00 (HH:MM)**	Demand and supply	• Demonstrate how to analyze the demand and supply.	AGR/N9908 PC1,PC13, KU1,KU11, GS1,GS8	Group discussion, classroom teaching	PHB, Projector, system facilitating power point presentations, microphone, camera, and round tables arranged in U shape for healthy discussion.	T:2:00 P:6:00
		Basic resources of agriculture production	• Demonstrate how to calculate the costs incurred and determine the price of the product for profitability.	AGR/N9908 PC17, KU15, GS1,GS8	Classroom teaching, group discussion	PHB, Projector, system facilitating power point presentations, microphone, camera, and round tables arranged in U shape for healthy discussion.	T:2:00 P:6:00
		Preparing to be an entrepreneur	• Prepare a sample marketing plan considering the 4Ps and 4As.	AGR/N9908 PC23,PC25, PC27, KU16,KU24, GS1,GS8	Group discussion and debate competition	PHB, Projector, system facilitating power point presentations, microphone, camera, and round tables arranged in U shape for healthy discussion.	T:2:00 P:6:00
		Digital services	• Demonstrate the use of digital services.	AGR/N9908 PC24, KU22, GS1,GS8	Group discussion, classroom teaching	PHB, Projector, system facilitating power point presentations, microphone, camera, and round tables arranged in U shape for healthy discussion.	T:4:00 P:4:00

7.	**Engagement in collective farming/ activities T:8:00 P:20:00 (HH:MM)**	Formation of PGs/ FIGs/ SHGs and its	• Role play to illustrate how to conduct the initial group meetings.	AGR/N9922 PC1,PC21, KU1,KU7, GS1,GS7	Field visit	Participant's handbook, white board, duster, marker, Power points slides, pictures/posters etc.	T:2:00 P:6:00
		Group income generation	• Group income generating enterprises/ activities, methods of operation, etc.	AGR/N9922 PC3,PC11, KU5, GS1,GS7	Group discussion, classroom teaching	Participant's handbook, white board, duster, marker, Power points slides, pictures/posters etc.	T:2:00 P:6:00
		Field trials	• Role play to illustrate how to organize field trials.	AGR/N9922 PC12,PC19, KU8,KU12, GS1,GS7	Group activity, discussion	Participant's handbook, white board, duster, marker, Power points slides, pictures/posters etc.	T:2:00 P:6:00
		Resolve problems in field operation	• Resolve problems encountered by group members in the field operations.	AGR/N9922 PC20,PC21, KU13,KU14, GS1,GS7	Group discussion	Participant's handbook, white board, duster, marker, Power points slides, pictures/posters etc.	T:2:00 P:2:00
8.	**Hygiene and cleanliness T:2:00 P:2:00 (HH:MM)**	Personal Health and Hygiene at Workplace	• Demonstrate personal hygiene practices. • Demonstrate the correct way of washing hands. • Demonstrate the steps to follow to put on and take off a mask. • Show how to sanitize and disinfect one's work area. • Demonstrate adherence to the workplace sanitization norms. • Show how to ensure the cleanliness of the work area.	AGR/N9903 PC1,PC4, KU1,KU7, GS1,GS9	Individual activity and discussion	Participant's handbook, white board, duster, marker, Power points slides, pictures/posters etc.	T:2:00 P:2:00
9.	**Safety and emergency procedures T:2:00 P:10:00 (HH:MM)**	Safety Guidelines and Checks	• Check various areas of the workplace for leakages, water-logging, pests, fire, etc. • Demonstrate how to safely use the PPE and implement. • Display the correct way of donning, doffing and discarding PPE.	AGR/N9903 PC5,PC15, KU8,KU17, GS1,GS9	Group discussion and demonstration	Participant's handbook, white board, duster, marker, Power points slides, pictures/posters etc.	T:1:00 P:5:00

			• Sanitize the tools, equipment and machinery. • Demonstrate the administration of first aid • Demonstrate emergency procedures. • Demonstrate the use of emergency equipment. • Prepare a list of relevant hotline/ emergency numbers.				
		Safety Hazards at Workplace	• Check various areas of the workplace for leakages, water-logging, pests, fire, etc. • Demonstrate the safe disposal of waste. • Demonstrate procedures for dealing with accidents, fires and emergencies.	AGR/N9903 PC16,PC20, KU11, GS1,GS9	Group discussion, classroom teaching	Participant's handbook, white board, duster, marker, Power points slides, pictures/posters etc.	T:1:00 P:5:00

10.	Employability Skills (60hrs)	Introduction to Employability Skills	• Describe importance of Employability Skills • Prepare a note on different industries, trends, required skills	DGT/VSQ/ N0102	Classroom lecture, Team Activity	White-Boardand, Markers, Chart Paper and Sketch pens, LCD Projector	1:30
		Constitutional Values: Citizenship	• Detail the principles of constitution of India • Identify thevariousenvironmentallysustainable practices		Classroom lecture, Team Activity	Laptop, PPT, White board Markers, note pad, pen etc.	1:30
		Becominga Professional inthe21st Century	• Discuss relevant 21stcentury skillsrequired foremployment • Practice criticalthinking anddecision makingskills		Classroom lecture, Team Activity	Laptop, PPT, White board Marers, note pad, pen etc.	2:30
		BasicSkills-I	• Read English textwith appropriatearticulation • Practice basic English words, sentences, punctuation • Demonstrate active listening and reading skills		Classroom lecture, Team Activity, Role play, video session	Laptop, PPT, White board Markers, note pad, pen etc.	5:00
		BasicSkills-II			Practical, demonstration, role play		5:00
		Career Development and Goal Setting	• Identify well-defined short- and long-term goals • Explain how to build a career pathway	DGT/VSQ /N0102	Class room lecture, discussion, demonstration, practical	Laptop, PPT, White board Markers, note pad, pen	2:00

			research • Discuss how to set career goals.				
		Communication Skills	• Explain the importance of communication at workplace • Demonstrate effective communication strategies • Demonstrate how to communicate effectively using verbal and nonverbal communication	DGT/V SQ /N010 2	Class room lecture, discussion, demonstration, practical	Laptop, PPT, White board Markers, note pad, pen, audio visual aids etc.	5:00
		Diversity and Inclusion	• Explain the need of diversity at workplace • Identify the various PwD policies applicable at workplace • Discuss the significance of the POSH Act	DGT/V SQ/ N0102	Class room lecture, Inter-active discussion	Laptop, PPT, White board Markers, note pad, pen, audio visual aids etc.	2:30
		Financial and Legal Literacy	• Discuss various financial institutions, products, and services • Explain the common components of salary such as Basic, PF, Allowances (HRA, TA, DA, etc.), tax deductions	DGT/V SQ/ N0102	Class room lecture, demonstrations, group discussion, practical	Laptop, PPT, White board Markers, note pad, pen, audio visual aids etc.	5:00
		Essential Digital Skills-I	• Detail the use and features of various MS Office tools, like MS Word, MS Excel, MS PowerPoint, etc. • Demonstrate how to operate digital devices • Create an e-mail id and follow e- mail etiquette to exchange e -mails • Describe the role of digital technology in day-to-day life and the workplace	DGT/V SQ/ N0102	Class room lecture, discussion, Demonstration, practical, learning by doing	Laptop, PPT, White board Markers, note pad, pen, audio visual aids etc.	6:00
		Essential Digital Skills-II	• Practice Digital skills		Demonstration, practical, learning		4:00

					by doing		
		Entrepreneurship	• Describe the types of entrepreneurship and enterprises • Describe the4Ps Of Marketing-Product,Price, Place and Promotion and Apply the mas Per requirement • Create a sample Business plan, For the selected business	DGT/VSQ /N0102	Class room lecture, discussion, Demonstration, practical	Laptop, PPT, White board Markers, note pad, pen, audio visual aids etc.	7:00
		Customer Service	• Identify types of customers and how to deal with them • Identify methods to get customer feedback and how to implement them • Explain various tools used to collect customer feedback • Discuss the significance of maintaining hygiene and dressing appropriately	DGT/ VSQ/N 0102	Class room lecture, activity, role play, video session	Laptop, PPT, White board Markers, note pad, pen, audio visual aids etc.	5:00
		Apprenticeships and Jobs	• Practice personal grooming strategies • Illustrate the use of online platforms for job hunting • Detail the concept of Apprenticeship • Demonstrate how to enroll for Apprenticeship programs. • Draft a professional Curriculum Vitae (CV) • Role play a mock interview	DGT/ VSQ/N 0102			8:00

Annexure II

Assessment Criteria

CRITERIA FOR ASSESSMENT OF TRAINESS

(For Updated 'Assessment Criteria', please refer to Qualification Pack of this Job role available at https://www.nqr.gov.in/)

Assessment Criteria for Coconut Grower cum Primary Processor	
Job Role:	**Coconut Grower cum Primary Processor**
Qualification Pack	**AGR/Q0503**
Sector Skill Council	**Agriculture Skill Council of India**

Sr. No.	Guidelines for Assessment
1.	Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2.	The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3.	Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.
4.	Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below).
5.	Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criterion.
6.	To pass the Qualification Pack, every trainee should score a minimum of 50% of aggregate marks to successfully clear the assessment.
7.	In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack.

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
AGR/N0515.Prepare for coconut cultivation	30	40	-	30	100	20
AGR/N0516.Transplant the seedlings and maintain the coconut crop	30	40	-	30	100	20
AGR/N0520.Carry out harvesting, post-harvest processing and marketing activities	30	40	-	30	100	25
AGR/N0535.Carry out primary processing of coconut and prepare value-added products	30	40	-	30	100	20
AGR/N9922.Engage in collective farming/activity	30	40	-	30	100	5
AGR/N9903.Maintain health and safety at the workplace	40	25	-	35	100	5
DGT/VSQ/N0102.Employability Skills (60 Hours)	20	30	-	-	50	5
Total	**210**	**255**	**-**	**185**	**650**	**100**

Annexure III

Annexure of QR Codes for Coconut Grower cum Primary Processor

Chapter No.	Unit No.	Topic	QR Code Links	QR code (s)
Chapter - 1 Introduction To the Role of a Coconut Grower cum	Unit 1.1 - Size and Scope of the Agriculture Industry and its sub-sectors.	Coconut Cultivation	https://youtu.be/TEbM1KmcVDA	Coconut Cultivation
Chapter - 2 Process of Preparing for Coconut Cultivation	Unit 2.1 - Site Selection, Varieties and Tools	Coconut Varieties	https://youtu.be/ly8av7Sjc30	Coconut Varieties
Chapter - 3 Process of Transplanting the Seedlings and Maintaining the Coconut Crop	Unit 3.1 - Field Preparation and Nutrient Management	Application of Organic Fertilizer	https://youtu.be/5Z9fxSW4X_I	Application of Organic Fertilizer
	UNIT 3.2: Pest and Disease Management	Major Insect pests of Plantation crop	https://youtu.be/kT-HyxzyW9A	Major Insect pests of Plantation crop
Chapter - 4 Process of carrying out Harvesting, Post-Harvest Processing and Marketing Activities	Unit 4.2 - Post-Harvest Activities	Coconut Processing	https://youtu.be/T3UuKgxZmDg	Coconut Processing
Chapter - 5 Process of carrying out Primary Processing of Coconut and Prepare Value-Added Products	Unit 5.1 - Products of Coconut Unit 5.2 - Processing of Coconut	Copra Dryer	https://youtu.be/Jh9sxmbALik	Copra Dryer
Chapter - 6 Basic Entrepreneurial Activities for Small Enterprise	Unit 6.2 - Agricultural Entrepreneurship / Business Opportunities Unit 6.3 - Basic Resources of Agriculture Production	Coconut Processing Factory	https://youtu.be/T3UuKgxZmDg	Coconut Processing Factory

Chapter No.	Unit No.	Topic	QR Code Links	QR code (s)
Chapter - 7 Engagement in Collective Farming/ Activities	Unit 7.1 - Formation of PGs/ FIGs/ SHGs and its Operations	Collective Farming: Self Help Group	https://youtu.be/IAebQOKH9T8	Collective Farming: Self Help Group
Chapter - 8 Hygiene and Cleanliness	Unit 8.1- Personal Health and Hygiene at Workplace	Work Health and Safety	https://youtu.be/LSfC4t4u5tI	Work Health and Safety
Chapter - 9 Safety and Emergency Procedures	Unit 9.1 - Safety Guidelines and Checks	Donning of Disposable Gloves	https://youtu.be/3I_kKVNrEMo	Donning of Disposable Gloves

Skill India

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