Natural Resource Conservation and Development.

Level - II

Learning Guide #54

Unit of Competence: Facilitate in Performing Ex-Situ Conservation Measures

Module Title: Facilitating in Performing Ex-Situ Conservation Measures

LG Code: AGR NRC2M12 1019.

TTLM Code: AGR NRC2 TTLM121019 V1.

LO.3. Carry out planting activities for Ex-situ conservation

Instruction Sheet	Learning Guide #54

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics –

- Occupational health and safety
- Gathering and organizing tools and equipment's
- Establishing plantation

This guide will also assist you to attain the learning outcome stated in the cover page.

Specifically, upon completion of this Learning Guide, **you will be able to –**

- Identify occupational health and safety
- Gather and organize tools and equipment's
- Establish plantation

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described in number 3 to 6.
3. Read the information written in the information "Sheet 1, Sheet 2, and Sheet 3".
4. Accomplish the "Self-check1, Self-check2, and Self-check3" **in page -** 3, 5, and 9 respectively.
5. If you earned a satisfactory evaluation from the "Self-check" proceed to "operation Sheet 1" **in page -10.**
6. Do the "LAP test" **in page – 11** (if you are ready).

Information Sheet-1	Occupational health and safety

3.1. Occupational health and safety

Introduction

Proactive exposure-specific medical assessment and surveillance programs are designed to help identify workplace health protection precautions and to detect the occurrence of occupational illnesses at early treatable stages.

Personnel in contact with animals or animal materials must be particularly cognizant about zoonotic diseases (e.g., highly pathogenic avian influenza, bovine tuberculosis, histoplasmosis, Newcastle disease, rabies, tularemia) and the appropriate precautionary measures including medical surveillance.

As a further example concerning proactive due diligence, agricultural workers and students who are directly involved with poultry should receive the current season's influenza vaccine to reduce the possibility of concurrent infection with avian and human influenza viruses. This strategy reduces the likelihood of further viral antigenic shift changes that would be detrimental to avian or human health.

In all cases:

- Inform your supervisor as soon as practical
- Seek proper medical attention at the closest hospital emergency department, clinic or medical practitioner, if required

Fill out an incident report, have it signed by your supervisor and file it with Environment, Health, and Safety

Drip-dry clothes that can be layered for warmth and protection

Strong high boots for snake infested areas

Lightweight jackets and long sleeved shirts with plenty of pockets

Sweater and water proof clothing if collecting during rainy season.

Self-Check – 1	Written Test

Name: _____ **Date:** _____

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page.

1. Define Occupational health and safety (3pts)

Note: **Satisfactory rating - 2 points** **Unsatisfactory - below 2 points**

Answer Sheet

Score = _____

Rating: _____

Information Sheet-2	Gathering and organizing tools and equipment

3.2. Gathering and organizing tools and equipment

- A digging hoes
- Auger to take undisturbed soil
- PH meter
- Clinometer
- Tape meter
- Pegs
- Range pole
- Rope
- Water level/ line level
- Knives
- Trowels
- Spades
- Forks
- Rakes
- Hoes
- Shovels
- Wheelbarrows
- hoses and hose fittings
- Tree-planters
- secateurs or snips
- Canvas
- safety helmet
- bags
- Refrigerator
- containers for holding seeds,

Self-Check – 2	Written Test

Name: _____ **Date:** _____

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page.

1. Write down tools and equipment used for planting activities (5pts)
2. Why do you organize tools and equipment? (3pts)

Note: **Satisfactory rating - 4 points** **Unsatisfactory - below 4 points**

Answer Sheet

Score = _____

Rating: _____

Information Sheet-3	Establishing plantation

3.1. Establishing plantation

Before establishing plantation, land is very important. Land evaluation is the assessment of suitability or potential of land for one or more specified land use type. In this context, it involves the determination of the suitability of an area for production of plantation establishment.

The important aspects of an area are worthy of consideration in land evaluation for forestry which is listed below.

1. Biophysical attributes of the site

Denotes the totality of biotic and abiotic factors that can affect the survival, development and growth of a given species.

E.g. Climate, Soil and Topography and Living organisms(pest)

2.Market and economic aspects

The economic transport distance of the product

- Timber plantations
- Size of plantation
- Shape of plantation
- Existing or planned roads:
- Objectives of plantation

SITE PREPARATION

Site or ground preparation includes clearing of the indigenous vegetation and cultivating of the ground before planting. The extent of ground preparation for tree planting depends on the climate of the area, on the vegetation, on the type of soil and on the species to be planted.

Objectives

The objectives of site preparation are:

1. To remove competing tree and grass vegetation from the site.
2. To create conditions which will enable the soil to catch and absorb rainfall. Surface runoff must be reduced to a minimum.
3. To provide good rooting conditions for the trees.
4. To minimise the risk of fire.
5. To facilitate mechanised tending operations after planting.

Methods for clearing land

- Manual methods
- Mechanised clearing methods
- Chemical methods

Pre-planting requirements

1.Mycorrhizal inoculation

Without mycorrhizal, newly planted seedlings, though not dying immediately, grow exceedingly slowly and have yellow, chlorotic needles, and sparse foliage. The symptoms are of acute nutrient deficiency, arising because roots without mycorrhizal are inefficient feeding organs.

***2.*Hardening off**

As the time for planting out approaches the amount of watering is often reduced. This is designed to slow down growth, reduce slush foliage, encourage woodiness, and generally make the seedling sturdier and better balanced.

Planting time and rules

Throughout the tropics the occurrence of the wet season determines when planting should be done. Evapotranspiration stress at planting is the main cause of death and is minimized by three practices.

1. planting seedlings when soil moisture levels have returned to field capacity; (after about 100 mm of steady rain has fallen)
2. plant on cloudy days;
3. use well-balanced plants which have been well watered just before leaving the nursery.

Planting the materials

Plants taken to the field should be vigorous and in sufficient numbers to represent the genetic variability of the accessions, thereby ensuring the continuity of the conserved materials. The plants should be arranged in such a way that they will not exchange pollen, thus preventing the populations from losing their original genotype. The exact site where each accession was planted should be recorded on a map; the accessions must be identified both in the field and as plants.

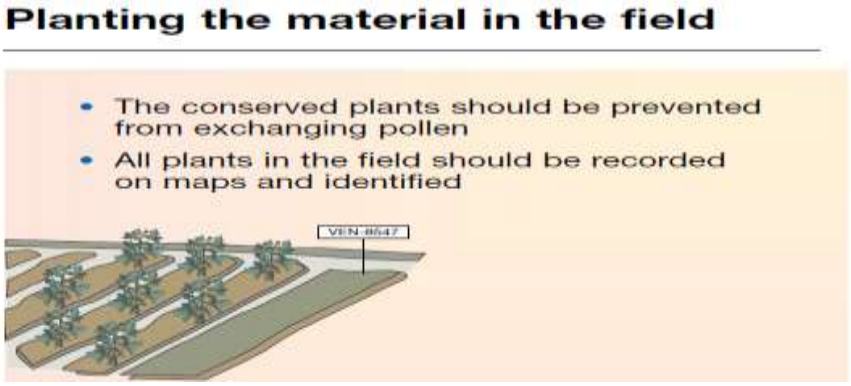
Reviewing and adjusting conservation activities should be taken in to consideration based on the outcome of ex-situ progress. It is better to insure the flexibility of conservation techniques. conservation techniques may fail in time and space so it needs to change the techniques during this time. An up-to-date, easy &appropriate conservation technique substitutes an old & prior one.

Planting procedures

Bare-rooted plants and stumps can be planted in a hole or slit dug with a spade, mattock, or even opened up with a crowbar, container plants are planted in a small pit.

For all planting the following general rules apply.

- Prepare area of plantation
- Obtain planting material (seedlings)
- Insert roots into the soil up to the root collar.
- Avoid damaging roots by breaking, bending, or crushing.
- Remove impervious containers before planting.
- Firm soil around the roots by heeling or foot pressure
- Apply water



Self-Check – 3	Written Test

Name: _____ **Date:** _____

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page.

1. What is land evaluation? (2pts.)
2. What factors should be considered during to establish plantation? (2pts)
3. Write down mechanisms of land clearing (3pts)
4. What planting rule would you follow during plantation? (3pts)

Note: **Satisfactory rating - 5 points** **Unsatisfactory - below 5 points**

Answer Sheet

Score = _____

Rating: _____

Operation Sheet 1	Establishing plantation.

Method of Establishing plantation.

Step 1. Select the appropriate site

Step 2. Carry out site preparation

Step 3. Prepare pit or bed to planting out

Step 4. Transport the plants/seeds to the planting site

Step 5. Carry out planting operation

Step 5. Arrange the plants in such a way that they will not exchange pollen

Step 6. Apply management practices

Step 7. prepare a consolidated report

LAP Test	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within ------hour.

Task 1. Establish plantation.

List of Reference Materials

1. Ashmore, S.E. 1997. Status report on the development and application of *in vitro* techniques for the conservation and use of plant genetic resources. IPGRI, Rome.
2. Evans, J. 1992. Plantation Forestry in the tropics. Clarendon press. Oxford, second edition
3. ICRAF.2002. Vegetative Tree Propagation in Agroforestry: Training Guidelines and References. Nairobi, Kenya.