



Basic Agricultural Production and Natural Resources Conservation Level-I Based on Version-3 March 2018 OS.

Training Module –Learning Guide 51-54

**Unit of Competence: Support natural resource
conservation work**

**Module Title: Supporting natural resource
conservation work**

TTLM Code: AGR BAN1 M13 TTLM 0919v1

October 2019



Module Title: Supporting natural resource conservation work

TTLM Code: AGR BAN1 M13 TTLM 0919v1

This module includes the following Learning Guides

LG 51: Prepare materials, tools and equipment for conservation and afforestation work

LG Code:-AGR BAN1 M13 LO1-LG-51

LG 52: Undertake conservation and afforestation work as directed

LG Code:-AGR BAN1 M13 LO2-LG-52

LG 53: Clean up and store on completion of conservation and afforestation work

LG Code:-AGR BAN1 M13 LO3-LG-53

LG 54: Complete documentation

LG Code:-AGR BAN1 M13 LO4-LG-54

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Instruction sheet

Learning Guide #51-

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

- Identifying and checking the required materials, tools and equipment according to the instruction.
- Minimizing damage when loading and unloading materials
- Selecting & checking suitable personal protective equipment (PPE)
- providing workplace information on conservation and afforestation
- Identifying and reporting OHS hazards

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:-

- Prepare materials, tools and equipment for conservation and afforestation work
- Undertake conservation and afforestation work as directed
- Clean up and store on completion of conservation and afforestation work
- Complete documentation

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described
3. Read the information written in the information "Sheet
4. Accomplish each "Self-check respectively.
5. If you earned a satisfactory evaluation from the "Self-check" proceed to the next or "Operation Sheet
6. Do the "LAP test"



Information Sheet-1	Identifying and checking the required materials, tools and equipment for conservation and afforestation work
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1.1 What is Natural Area?

Definition: A Natural Area defined as an area of unique scenic, historic, geologic, or ecological value and of sufficient size and character to allow its maintenance in a natural condition by the operation of physical and biological processes, usually without direct human intervention.

These areas are set aside to provide locations for scientific observation of natural systems, to protect outstanding examples of natural interest and beauty. Natural areas can serve as refuges for hunted, threatened, or imperiled species of plants and animals, such as demonstrated for geotropically migrant birds and large vertebrates.

1.1.1 The guidelines governing the administration of Natural Areas

- ✓ Human habitation will not be permitted, except that primitive type, backpack camping may be permitted in designated areas only.
- ✓ Access for all but essential administrative activities will be restricted to foot trails.
- ✓ Buildings and other improvements will be restricted to the minimum required for public health, safety, and interpretative aids.
- ✓ Timber harvesting will not be permitted except as may be required for maintenance of the public safety.
- ✓ Rights-of-way, leases, and mineral development will be prohibited, provided, however, that subsurface oil and gas rights may be leased where no surface use or disturbance of any kind will take place on the Natural Area.

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1.1.2 What is the importance of conserving or protecting natural areas?

It is important to preserve our natural area's because they provide us with resources that we use every day, the trees also help reduce the amount of greenhouse gasses in the atmosphere causing the Earth to maintain a stable climate.

Goal/aim:

- ✓ Protect the environment and enhance the state's high quality of life, including air and water quality, and the availability of water.
- ✓ Moreover, the Act contains specific requirements for the designation and protection of critical areas, as wetlands, areas with a critical recharging effect on aquifers used for potable water, fish and wildlife habitat conservation areas, frequently flooded areas and geologically hazardous areas.
- ✓ The Act requires jurisdictions to adopt policies and implementing regulations to ensure the protection of critical areas.

1.2 Identify materials, tools and equipment for conservation work

Before conducting any conservation work we need to identify all materials, tools and equipments and prepare a checklist so that all materials are present in the working area. Depending on the conservation work different tools and equipments can be used the following are some of them

• Secateurs

They are strong enough to prune hard branches of trees and shrubs, sometimes up to two centimetres thick. They are used in gardening, arboriculture, farming, flower arranging, and nature conservation where fine-scale habitat management is require



Bypass secateurs

Pruning tools

• Spade

A spade is a tool designed primarily for the purpose of digging or removing earth. With a metal tip, a spade can both break and move the earth in most situations, increasing efficiency. Small spade for clay soil; the other one for sandy soil and loamy soil



• Rake

A rake is a tool used to gather or loosen material or to grade or level a surface. There are two major kinds of rakes: an attachment for a tractor and a hand tool.



Field rake

Shovels

A shovel is a tool for digging, lifting, and moving bulk materials, such as soil, coal, gravel, snow, sand, or ore.



- **Augers**

An auger is a spiral shaped tool that moves materials or liquids from one area to another. When an auger is rotated, the materials or liquids move along the spiral to the desired location. A drill bit, which is the most commonly known auger, uses the design to remove the shavings and other debris from the hole while it is being drilled.

Hand Augers

A handheld auger is a tool, often made of steel that is used to bore a hole. Typically, handaugers are used to create holes in dirt, ice, or wood.



Edelman augers: clay, combination, sand and coarse sand type



Stony soil auger

- **Watering/spray equipment**



Watering Cans



Brass Hose Fittings Sprinkler System

1.3 Checking materials, tools and equipment

We check all materials, tools, and equipment with insufficient or faulty items reported to the supervisor.

A materials coordinator is chiefly responsible for the acquisition and inventory management of materials required for companies/conservation work. Materials coordinators can assume different duties and

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sometimes-different titles based on the type of the conservation work. These duties may also require different education or experience backgrounds depending on the nature of the acquired materials.

Before and after using the materials, tools and equipments for conservation work it is very important to check the equipment. This makes the equipment free from some things unpleasant, undesirable, damaging that happen unexpected during work operation in the work place. If the materials are damaged it is possible to report to the supervisor immediately for maintenance.

Preparing checklist is necessary for all materials, tools and equipment before conducting conservation work.

No	Description	Yes	No
1	Are all materials, tools & equipment available?		
2	Are they sharpened?		
3	Are the tools used for correct use?		
4	Are damaged tools departed from normal?		
5	Are the worn out tools replaced?		
6	Are dull tools sharpened?		

Self-Check -1	Written Test
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Name: _____

Date: _____

Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

1. What do mean by natural area? (3 points)
2. What is the important of conserving or protecting natural areas? (5 points)
3. What tools and equipment may be required for conservation work. (3 points)
4. Give some ways to improve natural area conservation in a certain area. (2 point)
5. Explain how you can crosscheck tools and equipments needed for conservation work (2 point)
6. To whom and how you report tools and equipments with faulty (2 point)

Note: Satisfactory rating - 10 points and above Unsatisfactory - below 10 points

You can ask your teacher for the copy of the correct answers.

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Answer sheet

Score = _____

Rating: _____

Operation Sheet-1

Identifying tools and equipment's for natural area conservation

Objectives:

- Understand how to identify different types of **natural area conservation** tools and equipment,
- Understand how to handle tool and exercise with it in the field.

Procedures when you Select and use appropriate hand tools and equipment

- Select hand tools and basic equipment that are appropriate to a specific afforestation tasks.
- Operate, care for and store basic tools and equipment in a safe and responsible manner.
- Be well positioned to extend their learning and practice into the use of more complex tools and equipment in other areas of agriculture.
- Be fully conversant with basic safety procedures and practices as well as good practices regarding the use and storage of basic tools and equipment.
- Have instilled a culture of maintenance and care for both the environment as well as towards afforestation practice
-

LAP Test

Practical Demonstration on Identifying natural area conservation tools and equipment

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions:

1. You are required to perform any of the following:

- 1.1 Request your teacher to arrange for you to visit field demonstration area. Then, assess whether the conservation field area is clean and all materials and equipment's are properly handled.
 - Request a set of Identifying natural area conservation tools and equipment then perform the following tasks in front of your teacher.
 - Describe the tools and equipments with their specific purpose to your teacher.
 - Prepare a report and submit what kind of problem you faced while you are identifying the tools and equipments.
- 1.2 Request your teacher for evaluation and feedback.



Information Sheet-2

Minimizing damage when loading and unloading materials

2.1 loading/unloading materials

Demonstrate correct manual handling:

- ✓ Be sure to bend your knees and lift with your legs as you loading material, be careful not to twist with heavy load.
- ✓ When using a shovel to move large quantities of material, position your body and your work. So you don't have to turn or twist.
- ✓ For example, if you're shovelling top soil into a wheel barrow facing your target, and in a position relative to the pile that allows you to scoop, lift and dump without twisting.

2.2 Minimize damage

Minimize damage to the load, to the worker and the vehicle by following the following lifting and handling procedures:

- ✓ Check the load to ensure it is within lifting capacity and can safely be handled without causing injury from strain, sharp edges, splinters or other conditions.
- ✓ Ensure the work area is clear of obstructions if the load is to be carried from one place to another.
- ✓ Stand close to the load with the feet apart, one foot behind and the other beside the load.
- ✓ Bend knees, grasp the load and lift by straightening the legs.
- ✓ Avoid reaching, bending forward to lift, twisting the back or bending sideways.
- ✓ Be able to see over or around the load before moving. Face the spot where the load is to be placed, bend the knees to lower the load, keeping the back as straight as possible and the load close to the body. Protect fingers from pinching before release of load.
- ✓ Do not try and lift or move objects beyond your capacity—ask for help. Co-ordinate lifting, moving and lowering by pre-arranged signals.

2.3 Basic Safety Procedures

The following rules apply for loading and unloading hazardous materials:

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- Secure packages, including palletized loads, against shifting within a vehicle during transportation. Securing can be accomplished through tying, blocking and bracing the load. Secure bottles of compressed gases to prevent damage to their valves.
- Load packages with orientation marks (up arrows) so that the marks remain pointed up.
- Do not allow any smoking or any source of ignition on or near the vehicle when loading/unloading flammable materials.
- Set the handbrake on the vehicle before loading/unloading.

Note: Avoid lifting from the floor whenever possible. If you must lift from the floor, do not bend at the waist. The techniques shown below help the worker to keep the spine in a safer position while lifting from the floor.



Lean the sack onto Your kneeling leg	side the sack up onto your kneeling leg	<i>Slide the sack onto the other leg</i>	<i>As you stand up, keep the sack close to your body</i>	<i>Hold it both of your hand</i>
Self-Check -3		Written Test		

Name: _____ Date: _____

Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

1. What are the basic safety procedures in loading/unloading materials? .(10)
2. How can you minimize damage? EXPLAIN briefly.(10)

Note: Satisfactory rating - 10 points and above Unsatisfactory - below 10 points

You can ask your teacher for the copy of the correct answers.

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Operation Sheet-2

Minimizing damage when loading and unloading materials

Purpose: at the end of this session trainees will be able to:-

- ✓ Apply understanding of manual handling and take care of workers during loading and unloading operation

1.1 Manual handling in loading and unloading

Workers loading and unloading materials should be instructed in safe procedures appropriate to the materials they handle. We can categorize this loading and unloading in two parts; these are loading and unloading of excavated soil materials and seedlings from the nursery site to planting sites.

Procedures of loading and unloading excavated soil and seedlings

- **Procedures for soil**

Step 1 Collection of excavated soil, stone and ruminants in a specific area

Step 2 Loading the collected soil, stones and ruminants

Step 3 cleaning the loading tools

Step 4 Transporting to the dumping site

Step 5 Unloading in the selected site

Step 6 cleaning the loading tools

Step 7 Store the tools that they used for loading and unloading in the store

Procedures for seedlings from nursery to planting site

Step 1 Identify correctly developed seedlings

Step 2 Arrange their sitting

Step 3 Transport the identified seedlings by bucket wheelbarrow to planting site

Step 4 Unload in the planting site



Precautions for loading excavated soil

- Before loading and unloading the excavated soil the loaders should understand the loading materials.
- Identify which type of loading tools are needed to load
- Use these identified tools for loading
- Load the soil
- Clean the loading tools after loading
- Put or return the tools at the former place
- Workers should always wear appropriate personal protective equipment

Precaution for loading seedlings

- The selected seeds prepared according to their species
- Use proper lifting techniques
- Load the prepared seeds
- Protect the loaded seeds from damage
- Unload the loaded seeds
- Identify the damaged
- Start plantation process

Criteria for loading and unloading excavated soil

- Collecting the loading materials
- Clean the tools
- Way of storing loading tools

Criteria for loading and unloading seedlings

- Loading the seedlings
- Transportation
- Unloading the seedlings

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Information Sheet-4	Selecting & checking suitable personal protective equipment (PPE)
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PPE is defined in the Regulations as ‘all equipment (including clothing affording protection against the weather) which is intended to be work or held by a person at work and which protects him against one or more risks to his health or safety.eg. Safety helmets, gloves, eye protection, high visibility clothing, safety footwear and safety harnesses.

Hearing protection and respiratory protective equipment provided for most work situations are not covered by these Regulations because other regulations apply to them. However, these items need to be compatible with any other PPE provided.

4.1 Protective equipment that must be available

These include:

- Rubber or leather gloves
- Overalls.
- Face mask and ear
- Steel capped boots/shoes
- sunscreen lotion
- sun hat
- safety goggles



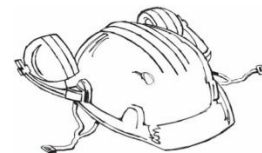
Gloves



Eye glass



Boot



Hat



Overalls

**Self-Check -3****Written Test**

Name: _____

Date: _____

Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

1. What are the main common personal protective that used in the natural area conservation?
Explain them briefly (10 pt)

Note: Satisfactory rating - 5 points and above Unsatisfactory - below 5 points

You can ask you teacher for the copy of the correct answers.



Information Sheet-5	Providing workplace information on conservation and afforestation
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5.1 Workplace Information

Effective communication in the work place plays important role in reducing damages and hazards through exchanging and sharing Information regarding the work using one of the following ways:

- ❖ Variable written and graphical instructions, work bulletins and OHS manuals.
- ❖ Industry or workplace codes of practice.
- ❖ Organization operating procedures. -
- ❖ Operation manuals, workplace guidelines / work shop manuals

Self-Check -5	Written Test
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Name: _____

Date: _____

Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

1. What kind of information is shared in the workplace? Explain (5)

Note: Satisfactory rating – 3 points and above Unsatisfactory - below 3 points

You can ask you teacher for the copy of the correct answers.

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Information Sheet-6	Identifying and reporting OHS hazards
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6.1 What is occupational health and safety (OHS)?

Occupational health and safety is a discipline with a broad scope involving many specialized fields. In its broadest sense, it should aim at:

- the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations;
- the prevention among workers of adverse effects on health caused by their working conditions;
- the protection of workers in their employment from risks resulting from factors adverse to health;
- the placing and maintenance of workers in an occupational environment adapted to physical and mental needs;
- the adaptation of work to humans

6.2 Hazards in the workplace

Many kinds of hazards are found in workplaces to mention some of them

- **Chemical hazards** are substances that can harm people's health when they are breathed in or absorbed through the skin, or when they irritate the skin such as Buried stumps and covered ditches..
- **Physical hazards** include electricity, noise, dust, temperature, lighting, solar radiation and vibration.
- **Biological hazards** such as snake, spider and insect bites, infectious diseases can also be present in workplaces
- **Lifting and moving loads such as** Manual handling and lifting, Moving machinery and vehicles, slippery or uneven surfaces can cause back injuries and other strain or sprain injuries.

**Self-Check -5****Written Test**

Name: _____

Date: _____

Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

1. What is OHS? (5)
2. List the main types of OHS hazard in natural area conservation (5pt)

Note: Satisfactory rating - 5 points and above Unsatisfactory - below 5 points

You can ask you teacher for the copy of the correct answers.



Instruction sheet

Learning Guide #52:- Undertake conservation and afforestation work as directed

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

- Following necessary instructions and directions
- Undertaking Conservation and afforestation work safely
- Carrying out interactions with other staff and clients in a positive and professional manner.
- Policy and procedures in relation conservation and afforestation
- Enterprise policy and procedures in relation to conservation and afforestation practices, handling and disposal of materials
- Reporting Problems or difficulties

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:-

- Prepare materials, tools and equipment for conservation and afforestation work
- Undertake conservation and afforestation work as directed
- Clean up and store on completion of conservation and afforestation work
- Complete documentation

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described
3. Read the information written in the information "Sheet
4. Accomplish each "Self-check respectively.
5. If you earned a satisfactory evaluation from the "Self-check" proceed to the next or "Operation Sheet
6. Do the "LAP test"



InformationSheet-1

Providing Instructions and directions for conservation work

Work instruction and guidelines that clearly describe activities to be conducted sequentially in the conservation area have to be prepared to simplify the conservation works, such as landscape, forests (natural and / or plantation), water, soil and other resources, and to ensure the successful accomplishment of the work.

Making most of the extensive, trial-and-error experience gained by conservation organizations while designing, implementing and appraising their conservation projects, the members of the Conservation Measures Partnership (CMP) have developed a set of project cycle or adaptive management open standards that are reflected in the work of all organizations and are, fundamental to effective conservation.

We have organized the main ingredients of these open standards - principles, tasks, and guidance - into seven steps that comprise the project management cycle. Including conceptualization, planning, implementation, analysis, adaptation, communication, and iteration.

A **project** is the implementation and management of one or more activities in an area of similar environmental and social characteristics.

1.1 The Open Standards

Conceptualize Project

- Define Initial Project Team regarding conservation work
- Define Scope(in terms of time required and area to be covered), Vision & Targets
- Identify Critical Threats (expected when we conduct conservation work)
- Complete Situation Analysis

Plan Actions & Monitoring

- ✓ Develop Strategic Plan
- ✓ Develop Monitoring Plan
- ✓ Develop Operational Plan
- ✓

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Implement Actions & Monitoring

- Develop Short-Term Work Plan
- Develop & Refine Project Budget
- Implement Plans

Analyze, Use and Adapt

- Prepare Data for Analysis
- Analyze Results
- Adapt Project Plan

Capture & Share Learning

- Document Learning
- Share Learning
- Create a Learning Environment

Self-Check -1	Written Test
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Name: _____

Date: _____

Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

1. What kind of instruction we provide to conservation work participants?

Note: Satisfactory rating - 15 points and above Unsatisfactory - below 15 points

You can ask you teacher for the copy of the correct answers.

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InformationSheet-2

Conservation work is undertaken in a safe and environmentally appropriate manner

2.1 Soil erosion

Soil erosion is the most dangerous ecological process observed in Ethiopia, degrading the precious soil resources which are the basis of agricultural production and food for the country's people and which provide numerous other ecosystem services. Soil erosion occurs mainly during the rainy season in the form of water erosion. Rills, gullies and brown rivers full of sediment show that a lot of soil is carried away and lost for agricultural production. Most soil erosion occurs on cultivated land in the form of sheet and rill erosion. However, it also occurs on grassland as gullies and even in forests if they are not properly managed.

Traditional conservation measures are not sufficient to control soil erosion. Cultivated land with contour (level) bunds, on hillsides with afforestation terraces, and on degraded hills with hillside closures.

Ethiopia has great climatic variety, from dry to wet, and also many different altitudes, from lowlands to highlands, the same conservation technologies cannot be applied everywhere. Therefore, it is necessary to know the characteristics of an area where soil and water conservation is to be implemented. Cultivated land requires conservation measures different from those required on grassland. Forests, in turn, require other measures

1.2 Agro-ecological zones

Conservation measures are different for different agro ecological zone. Therefore, it is important to know in which zone you are located when you carry out soil and water conservation.

Traditionally agro ecological zones can be categorized in to five major zones depending on rainfall and temperature and they are summarized in the table below:

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s/n	Agro-ecological zone	Altitude above sea level (m)	Annual rainfall (mm)
1	Wurch <ul style="list-style-type: none"> • Moist wurch • Wet wurch 	>3700	900 – 1400 >1400
2	Dega <ul style="list-style-type: none"> • Dry dega • Moist dega • Wet dega 	3700<3200>2300	<500 900 – 1400 >1400
3	Weynadega <ul style="list-style-type: none"> • Dry weynadega • Moist weynadega • Wet weynadega 	3200<2300>1500	<500 900 – 1400 >1400
4	Kola <ul style="list-style-type: none"> • Dry kola • Moist kola • Wet kola 	2300<1500>500	<500 900 – 1400 >1400
5	Bereha <ul style="list-style-type: none"> • Dry bereha • Moist bereha 	<500	<900 900 - 1400

Basically we can use the following three land use types to apply soil conservation measures namely:

- Cultivated land
- Grass land and
- Forest land

The definition and their specific suitable conservation measures are described below

CULTIVATED LAND: This refers to all land under cultivation or under temporary fallow, or land that will be used for cultivation in the immediate future.

- Alley Cropping
- Bench Terrace



- Broadbed and Furrow
- Conservation Tillage
- Graded Bund
- Graded Fanya Juu
- Grass Strip
- Level Bund
- Level Fanya Juu
- Mulch
- Trash Line

GRASSLAND: This refers to all land where the dominant vegetation cover consists of grass. Also included in cultivated land where cultivation was or will have to be abandoned and which will be changed into grassland or closed areas.

- Controlled Grazing
- Cut and Carry
- Grassland Improvement

FORESTLAND: This refers to land where the dominant vegetation cover consists of trees as well as land that is designated for reforestation or area closure

- Hillside Terrace
- Micro-basin
- Tree Planting
- Trench

There are some conservation measures common to all land use types to mention some of them:

- Area Closure
- Checkdam
- Cutoff Drain
- Gully Rehabilitation
- Revegetation
- Water Harvesting

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- Waterway

2.3 Soil conservation measures on forest land

Forests provide an excellent protection of soil against erosion. Apart from being the source of wood products, they maintain high rate of evapo- transpiration, interception and infiltration, and the litter layer on the surface of the soil produce low erosion rate. Increases in erosion occur where the land is permanently or temporarily cleared for agriculture, logging, or firewood cutting.

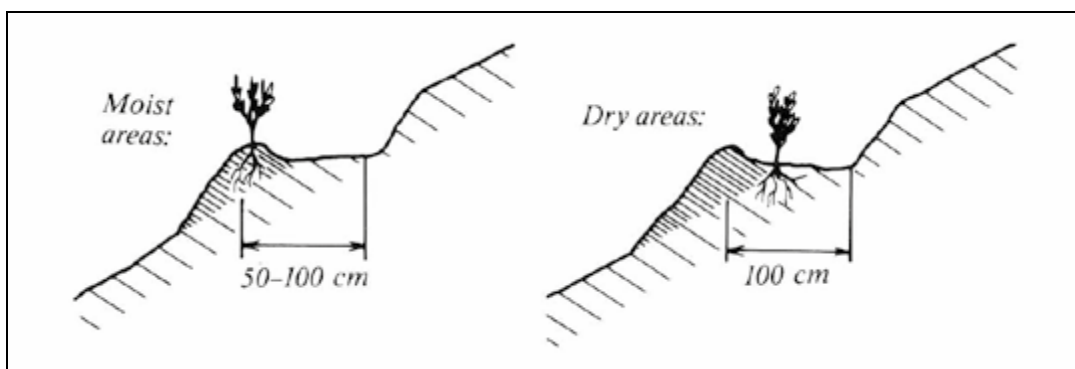
Exploitation of a forest should aim at a good management that maintains a protective vegetation cover. During logging/harvesting, the level of disturbance is related to the method of felling. The choice clear felling or selective extraction is usually decided on economic grounds, but from conservation point of view selective felling is much less damaging and preferable. This method allows some of the trees to survive and natural regeneration that restrict erosion.

Clear felling may be suitable with some species, or may be the preferable economic method. Since this method remove the tree entirely, particularly on a steep hillside expose the land to continued erosion. In fact a more important issue is not the extent of damage, but the restoration afterwards.

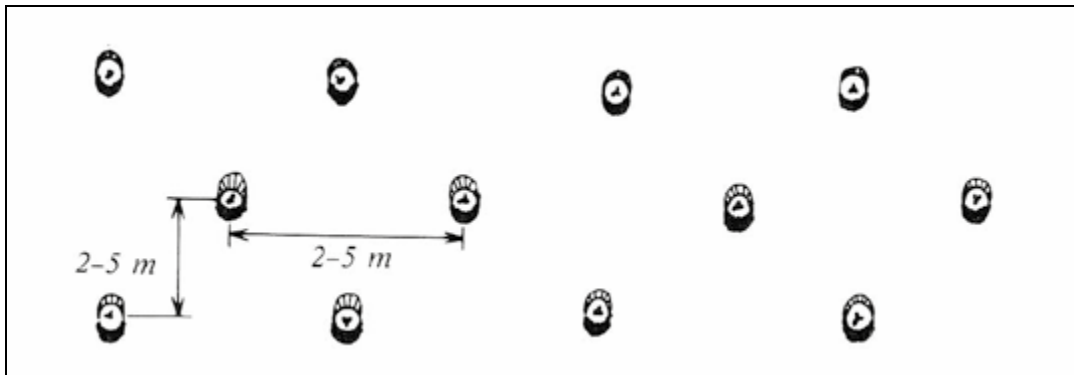
a) Micro basin:

Micro basins are shallow basins surrounded by earth bunds, built within crop fields. They collect rain water and allow it to seep in the soil, where plant roots can reach it. The basins are usually staggered in alternate rows so that overflow from one row runs in to the next row down the slope.

Cross-section:



Spacing/placement (top view)



Micro basins are usually not more than three times the size of the planting area. The size of the basin depends on the amount of water that needs to be conserved. They can be as large as 30 square meters. Use small basins in moist areas and large ones in dry areas.



Where to use Micro-basins

Agro climatic zones: all dry and moist areas.

Soils: all soils except much degraded land. Soils neither too clay nor too sandy. Soils should be fairly deep, so enough water in can be stored in the soil, and so roots have enough room to grow.

Slopes: all, but most appropriate on slopes less than 5%.

Advantages of Micro-basins

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- ✓ Micro basins collect water that would otherwise flow down the slope.
- ✓ In dry areas micro basins are one of the few ways to plant trees.
- ✓ In windy areas, the micro-basins also trap fertile windblown soil.

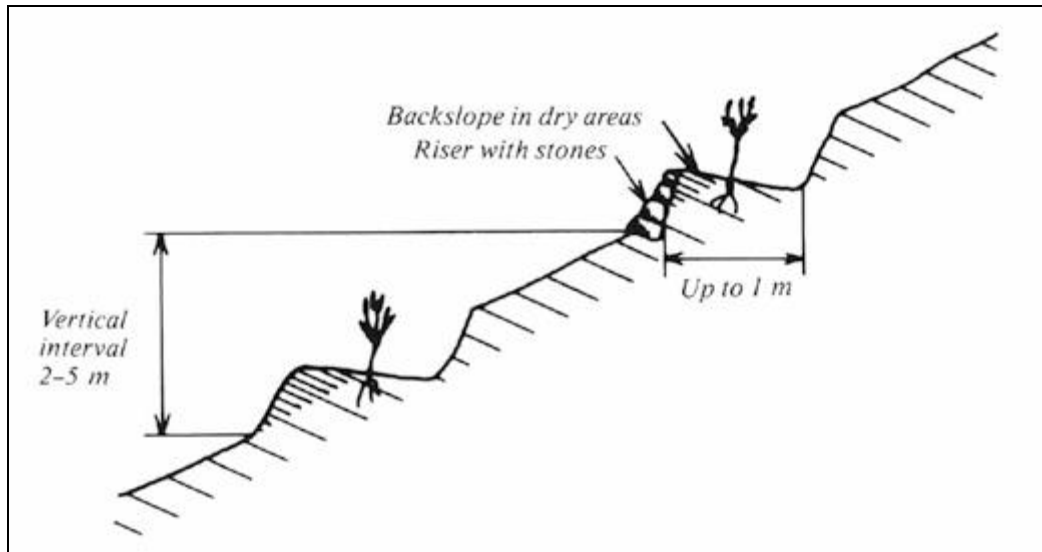
Disadvantages and constraints

- ✓ Making micro-basins takes a lot of work, and cannot easily be mechanized.
- ✓ It is not possible to cultivate with tractors because this would damage the bunds.

b) Hillside terrace:

Is a structure along the contour where a strip of land is levelled for tree planting. Hillside terraces are up to 1m wide and constructed at about 2-5m VI. Hillside terraces are only applied if there is a strong necessity justifying their construction.

Cross-section:



They are laid out along the contour and are mainly used to prevent damage of flood below steep slopes. Hillside terraces help to retain runoff and sediment on steep sloping land. to accommodate tree seedlings to be planted on them. and also effective on badlands and in areas with low rainfall to conserve water.

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c) **Tree planting**

Tree planting for conservation is an activity to improve the vegetation cover of the ground thereby reducing erosion and producing wood.

Tree planting for afforestation or reforestation is a soil conservation measure because the canopy intercepts the raindrop, the litter covers reduce splash erosion and the tree roots stabilize the soil.



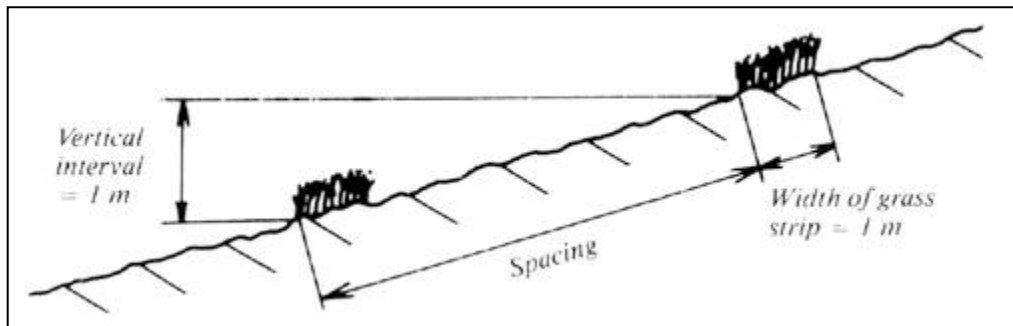


2.4 Soil conservation measures on cultivated land

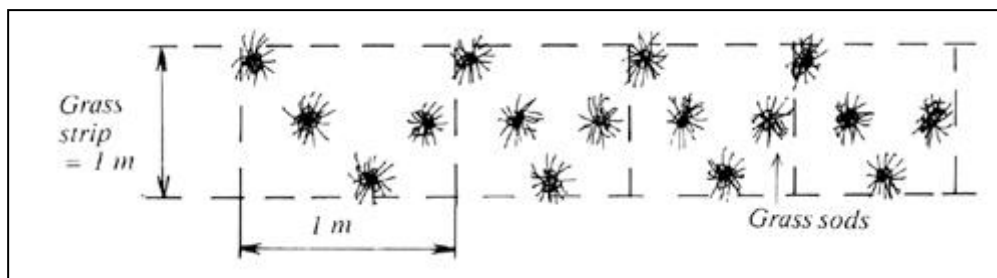
a) Grass strips

A Grass strips is planted along the contour on cultivated land to reduce the amount of water flowing down the slope and to retain soil. Usually grass strips are about 1 m wide. They are used mainly to replace physical structures (like bunds) on gentle slopes.

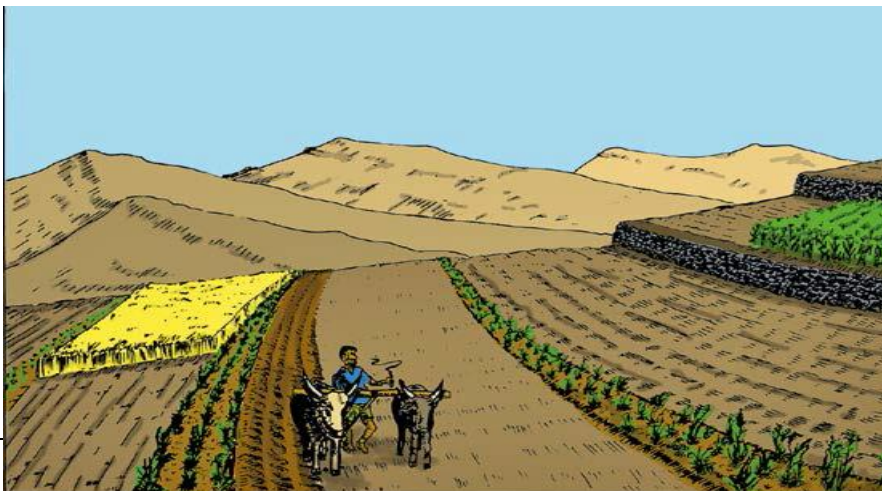
Cross-section:



View from top:



Grass strips are suitable where the climate is not too dry for grass to grow densely. If no grazing is allowed the grass strips build up in to terraces and provide fodder for livestock.





Where to use Grass strips

Agro climatic zones:all moist and wet areas

Slopes:Less than 15% gradient

Soil:All, especially sandy and silty soils where water seeps the ground easily.

Advantages of grass strips

- ✓ Grass strips help to reduce runoff and trap eroded soils
- ✓ IF THEY ARE NOT grazed, the grass strips will built up in to terraces.
- ✓ The strips provide cut-and- carry fodder for cattle.

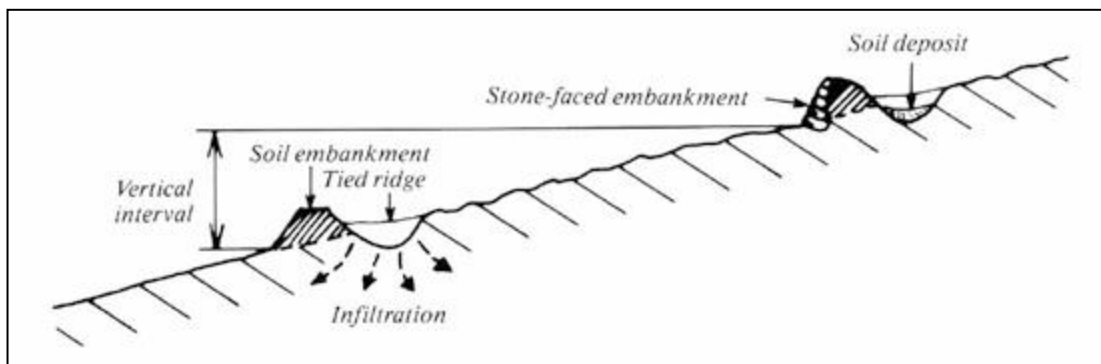
Disadvantages and constraints

- ✓ Grass strips are not effective in arid areas.
- ✓ When they are newly established, the strips do not offer much protection against erosion.
- ✓ The strips can easily be overgrazed and damaged by animals.

b) Level bunds

A level bund is an embankment or ridge built across a slope along the contour. It prevents water from flowing down the slope, and so also prevents soil erosion. The embankment is about 50-75 cm high on the up slope side. Water is trapped behind this wall and percolates in to the soil.

A cross-section through bunds looks as follows:





Soil accumulates behind the bund, and overtime creates a level bench like terrace. This retains fertility and moisture, leading to higher yields of crops grown on the land between the bunds. The bund may a simple ridge of soil, a line of large stones with the gaps filled in with earth, a ridge of soil faced with stones on the down slopes side, or a wall built entirely of stones. The bunds can be planted with grasses, fodder legumes and trees. the bund may have a shallow ditch running along its upper side. Tied ridges interrupt this ditch about every 10 m. they stop water from flowing along the ditch. That means large pools of water do not form in one place and flow over the top of the bund at its lowest point. The ends of the bund are usually closed with a short ridge to prevent water from flowing around them and creating a gully.



Where to use level bunds

- **Agro climatic zones** All moist and dry zones, except moist Bereha and Moist Alpine Wurch. Use cutoff drains in addition if the rainfall is high.
- **Soils** Level bunds are ideal on soils deeper than 50 cm. they can also be used on shallower soils, for example to rehabilitate degraded land. Pay particular attention to farmers experiences of erosion on these soils.
- **Slopes** 3-50% (20% is the maximum slope if farmers plough with oxen).

Advantages of level bunds

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- Bunds hold water and allow it to soak in to the ground. They prevent water from draining away and causing gullies.
- Soil gradually builds up behind the bunds, producing a bench terrace.
- Soil fertility also builds up on the terrace, producing higher yields.
- Bunds can be built by an individual farmer or a group.
- The bunds can be used to produce feed for animals.

Disadvantages and constraints

- Building bunds needs a lot of labour.
- The bunds take land out of crop production. (Planting grasses, fodder crops or fruit trees make them productive.)
- Breaks in a bund can cause gullying. (make sure the bunds are close enough together to prevent large amounts of water from building up in heavy rains. Repair breaks promptly.)
- Rats may live in the bunds, especially those made of stones. (they can be controlled using conventional methods or by using thorny branches.

c) Graded bunds

A Graded bund is an embankment or ridge made of or stones built across a slope. Unlike a level bund it slopes gently at a gradient of between 0.4% and 1% towards a water way or river. This allows excess water to remove/drain away.

The gradient must be very gentle; if it is too steep, the channel behind the bund could be scoured, causing a gully. But if the gradient is not steep enough, soil will build up in the channel and eventually cause an overflow.





Where to use Graded bunds

Agro climatic zones:all moist and wet zones

Soils:all soils in wet Agro climatic zones, and clay soil in moist zones.

Slopes:3-50%

Advantages of graded bunds

- Bunds reduce the speed of water running down the slope. This prevents erosion and the formation of gullies.
- Most of the soil eroded between two bunds is deposited behind the bund, eventually forming a bench terrace.

Disadvantages and constraints

- Building bunds needs a lot of labour.
- The bunds take land out of crop production. (Planting grasses, fodder crops or fruit trees make them productive.)
- Breaks in a bund can cause gullying. (Make sure the bunds are close enough together to prevent large amounts of water from building up in heavy rains. Repair breaks promptly.)
- Rats may live in the bunds, especially those made of stones. (They can be controlled using conventional methods or by using thorn).

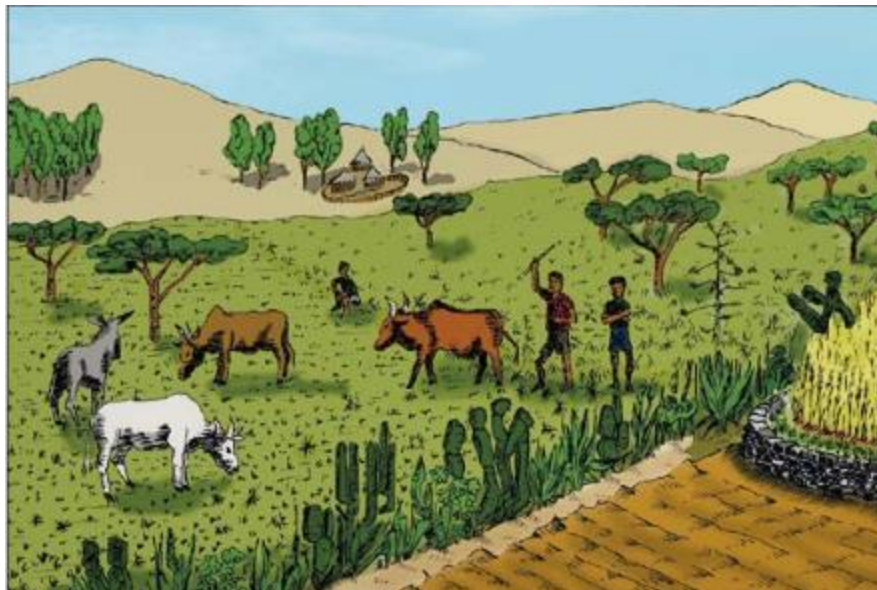
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2.5 Soil conservation measures on Grass land

A) Controlled Grazing

Controlled grazing is defined as direct utilisation of grassland with livestock in such a way that no degradation of vegetation and soils occurs, allowing the grass to recover and to retain the quality of the rangeland. Controlled grazing can be in rotation or continuous if well managed. Rotational grazing is the best method of providing for periodic recovery of grassland.





Area Closure is indispensable for the production of fodder for periods of shortage on grazing land. About 30% of a Kebele needs to be reserved for this purpose in order to produce sufficient fodder. Revegetation is needed for degraded parts of the grass-land, and Grassland Improvement to increase production. A Cut-off Drain protects cultivated land below from excessive runoff from the grassland.

B) Cut and Carry

Cut and carry is a system of utilising forage for stall feeding. It can be applied in Area Closure, in forests, on conservation structures, and in all areas where livestock are excluded from grazing.

Cut and carry is a conservation-based management technique to preserve soil and vegetation. It also provides fodder for livestock, and firewood and small fuel wood from Area closures

Cut and carry is applied only after the grass has recovered or if certain types of grass, legumes or bushes have to be removed.



C. Grassland Improvement

Grassland improvement includes all activities aimed at improving the productivity of grassland whereby runoff and soil erosion are reduced. Activities include the introduction of better



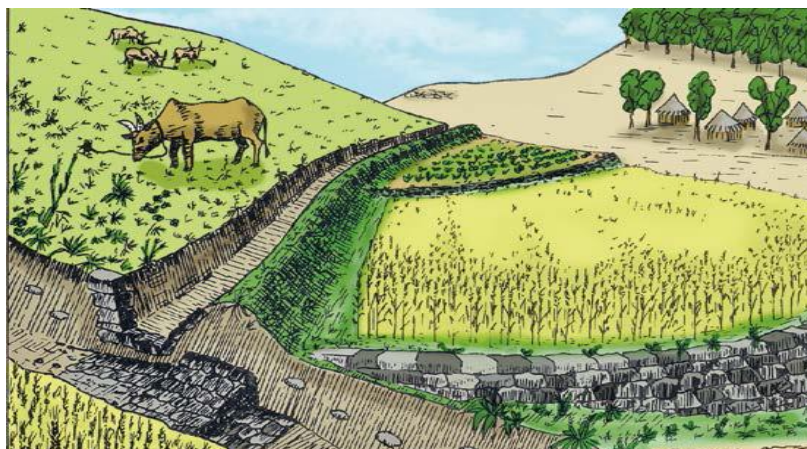
forage species, moisture conservation, removal of unpalatable species, the cutting of shrubs, regular weeding and maintenance of fertilisation.



2.6 Soil conservation measures common to all land use types

A) Cut-off drain (diversion ditch)

A cutoff drain is a ditch dug across a slope to collect runoff water and divert it to natural or artificial water way or to a water storage structure. It protects cropland and other land down the slope. One cutoff drain on a slope is usually enough, but more can be built on long slopes. Cutoff drain should not be more than 400 m long.





Where to use a cutoff drain

Agro climatic zones: all agricultural zones except dry bereha and dry kolla.

Soils: all soils are suitable, but it is hard to build a cutoff drain on sandy soils because runoff easily undermines it.

Slopes: 3-50%. It is hard to construct cutoff drains on slopes steeper than 50%.

Advantages of cutoff drain

- Cut-off drains take excess water safely away from cropland help prevent gully erosion.
- Some of the diverted water seeps in to the soil, raising the water table and benefiting crops.

Disadvantages and constraints

- Cut-off drains can cause gully erosion if not properly constructed.

They take work to build. The spacing /distance between basins along contour line is 2.5m whereas the distance along the slope (perpendicular to the contour line) will be 2.5m. For aligning micro-basins along the contour a line level has to be used. It is not necessary to align every row of micro-basins precisely with line level. Once the "key" row has been shaken out, the next four rows downhill can be established by measuring with measuring tape and the position of individual basins is marked very carefully with a peg. Every fifth row alignment is carried out again with line level.

Principles: cutoff drains are needed where protection from water flow coming from areas outside a farm. They can also be used for gully control. They should be constructed only where the need is quite evident with great care.

B) Waterways

It is a natural or artificial drainage channel along the steepest slope or in the valley /depression used to accommodate a runoff. The runoff intercepted by terraces (graded terraces) and CoD must be able to discharge the water into a watercourse. Frequently there is no suitable natural watercourse or non-erodible areas to discharge the water and one must be made artificially.

Therefore, artificial waterways are designed to transport down slope the runoff too empty into the natural river system. Usually they are best located between two farmers boundary, preferably in natural

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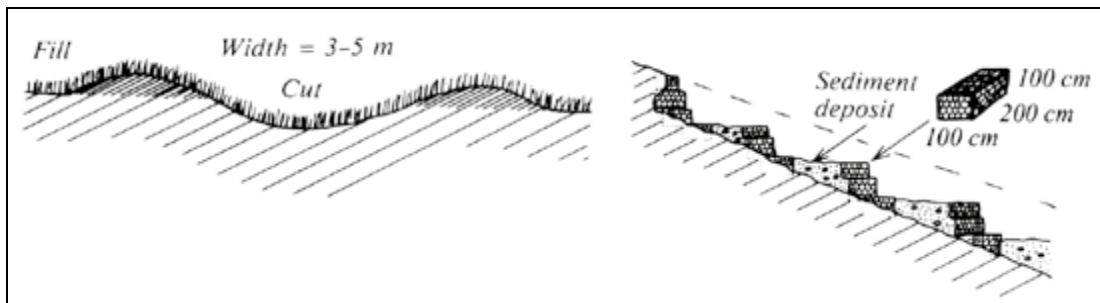


depression whenever possible. If it is difficult to find a good site, it may be better and perhaps cheaper to dig a long CoD.

On cultivated land with graded structures, waterways must be placed every 250 m to avoid graded ditches that are too long.

Waterways must always be constructed and grass developed on them one year before graded structures are applied on the land.

If there is enough land, cross-sections of waterways should be gentle, as shown below:



The waterway should have a cover of thick grass to prevent erosion. Usually it will take 2 years to establish a good grass cover. It is best to construct artificial waterways first and CoD and terraces 2 years later, but this is not always possible. Therefore discharging into waterways should if possible be blocked up during the 2-year period.

Specifications:

Agro climatic zone: all wurch, dega wet and moist weyna dega, moist kolla.

Slope: 3-50%

Soil: all soil, care on deeply weathered subsoil.

Cross section: should be gentle (wide and shallow 3-5m)

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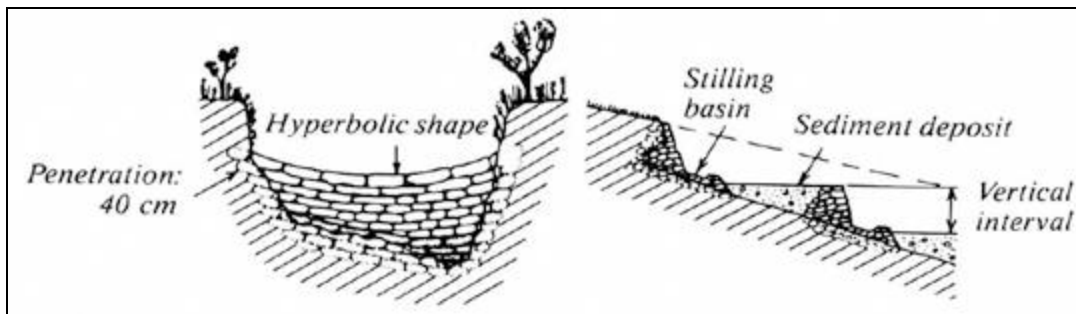


C) Gully controlling measures

Check dams

A check dam is a wall built across the floor of a gully or a waterway. It slows down the water flow and stops the gully from getting deeper or wider. It can be made of stones, live or dead branches, metal bars or wooden poles. It has a depression in the middle to allow runoff to flow over it.

Gully cross section: Section along gully:



Check dams are useful in small and medium size gullies. There are three main types:

- Wooden check dam
- Stone check dam, and
- Gabion(wire cages filled with stones)

❖ Wooden Check dams

A wooden check dam is made of small branches and poles woven together and held in place with wire or sisal ropes. It is useful on waterways where the water cannot be controlled with grass alone. The vertical interval between two wooden Check dams should be equal to the height of the dams.

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A wooden check dams can have one or two rows. Double-row dams are stronger but are harder to make.

❖ **Stone check dams**

If the gully floor is rock, use a stone or gabion check dam instead of a wooden one. Stone check dams should be built across a gully at 1 m vertical intervals to prevent gully erosion.

❖ **Gabion check dams**

Gabions are boxes of wire mesh that are filled with stones. The boxes are put in position then filled with stones, because they are too heavy to move when they are full. Gabions are tough and last a long time. They can be placed where the surface is uneven.

2.7 Afforestation work

Afforestation

Afforestation & Reforestation: Afforestation is the establishment of a forest or stand of trees in an area where there was no previous tree cover. Reforestation is the reestablishment of forest cover, either naturally (by natural seeding, coppice, or root suckers) or artificially (by direct seeding or planting).

Advantages of afforestation work

- small-scale re-vegetation works can provide (often simultaneously):
 - ✓ shade and shelterbelts
 - ✓ landscape protection and rehabilitation (e.g. erosion control, salinity management and serrated tussock control)

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- ✓ habitat for native vegetation and wildlife
- ✓ farm forestry opportunities
- ✓ a sink for greenhouse gases
- ✓ amenity, aesthetic and other benefits

Following the instruction and directions in afforestation

When we are going to carryout nursery activities it is possible to understand the following point:-

- Standard operating procedures for each activity.
- Company policy and procedures in regard to product merchandizing and displays, specification, work notes, materials safety data sheet (MSDSs),
- Manufacturer's instructions, product label or verbal instruction from manager or supervisor.

2.7.1 Under taking afforestation work in safe environment

Land evaluation for plantation purpose

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 plantation establishment.

Three important aspects of an area are worthy of consideration in land evaluation for forestry.

- Biophysical attributes of the area
- Market and economic aspects
- Environmental impact assessment

Biophysical attributes of the site

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.

The three major physical/abiotic environmental factors are climate, soil and topography. Site assessment in forestry involves the characterisation of a given site in terms of these important environmental factors. The site will be described through a quantitative and qualitative assessment of these factors to enable making a decision on its capacity for tree growth.

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- ➔ Climate
- ➔ Soil
- ➔ Topography
- ➔ Biotic factors

Economic considerations

The economic transport distance of the product

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

Environmental impact assessment

- We need to assess the positive impact of afforestation and create awareness to the society

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. Generally, in areas where deficiency of water limits plant growth at certain times of the years, a more intensive and thorough preparation is required than in moister areas

The objectives of ground preparation are:

1. To remove competing tree and grass vegetation from the site. The drier the area, the more complete removal of vegetation is necessary. Certain tree species, notably eucalypts, are very intolerant of weed competition.
2. To create conditions which will enable the soil to catch and absorb rainfall. Surface runoff must be reduced to a minimum. The aim is to build up reserved of moisture in the soil.
3. To provide good rooting conditions for the trees. Many species, especially eucalyptus, benefit from thorough cultivation of soil.
4. To minimise the risk of fire. This may be an important consideration on sites with a tall and dense grass vegetation.

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5. To facilitate mechanised tending operations after planting. This usually involves removal of all tree stumps. So far, no mechanised planting projects have been started in Ethiopia.

To sum up, the aim is to give the young trees a good start with rapid early growth, so that there would be no period of decreased growth after planting. Ground preparation, together with tending operations that are done after planting form the biggest block of expenditure in the total establishment cost of the plantation. Ground preparation and subsequent tending are interlinked: inadequate ground preparation may greatly increase weeding costs, whereas proper site preparation may decrease need for later tending

Methods for clearing land

- ➔ Manual methods
- ➔ Mechanised clearing methods
- ➔ Chemical methods



- Re-vegetation is often undertaken on degraded lands. Photo: Gregory Heath, CSIRO.

Ground cultivation before planting

The extent of soil cultivation before planting depends on the vegetation of the site and on the species to be planted. As cultivation is one of the biggest items of cost in the establishment of plantations, it should be limited to the necessary minimum. On the other hand, in certain conditions thorough ground preparation is a worthwhile investment, as it causes savings in subsequent weeding operations.

In the following, common cultivation types are described in an increasing order of intensity.

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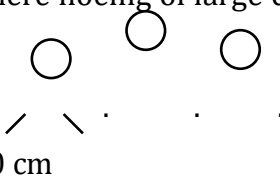
No cultivation

Pines (e.g. *Pinuselliottii*) are sometimes planted in grassland sites by simply digging a hole and inserting the plant into it. This method can only give satisfactory results, if weeds are controlled after planting by frequent slashings. This is not an adequate method of ground preparation for eucalyptus and cypress. Even pines would benefit from a more thorough ground preparation.

Spot hoeing

In areas where short grass is predominant, mere hoeing of large circular spots for each plant is sufficient for *Pinuspatula* and

P.radiata. A recommended spot size is 60 cm the planting pit.



(120 cm in diameter), but as small as 30 cm radius spots have been used successfully in some areas. Preferably the hoeing should be done as deeply as possible.

More intensive ground cultivation is recommended for cypress and eucalypts. If spot hoeing is used with these species, the spots should be large and deeply hoed to give the plants the best possible start.

In WondoGenet spot hoeing, including hoe digging, is given to workers on contract basis, 50 spots per man-day. (120 cm diameter).

Strip hoeing or ploughing

Strip cultivation is practised on sites with dense, tall grass growth. Up to 1.5m wide strips are hoed along

planting lines. The strips provide an easier access

to the planting spots, and they are kind of

compromise between total cultivation and

spot hoeing. Strip cultivation reduces

competition from vegetation much more

more efficiently than spot hoeing and at

the same time prevents soil erosion as strips of natural grass are left intact between the cultivated strips.



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In some parts of Ethiopia the strips have been prepared by digging the soil down to 30 - 40 cm depth with special forked hoes, which are used for digging the soil for false banana planting.



Strip cultivation is recommended for eucalypts and cypress, particularly in cases when total cultivation is out of question because of the risk of erosion.

Complete cultivation

The whole planting site is cultivated either by hoeing or by ploughing. Total cultivation opens the ground very well and reduces weed competition to nil and so gives the plants the best possible start. For these reasons it is particularly recommended for planting eucalypts in dry areas. Also other species would benefit from clean cultivation. Total cultivation must not be practised on slopes and other sites prone to soil erosion.

Plantation

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.

1. Insert roots into the soil up to the root collar.
2. Avoid damaging roots by breaking, bending, or crushing.
3. Firm soil around the roots by heeling or foot pressure.
4. Remove impervious containers before planting.
5. On dry sites the planting position should maximize water retention, eg. Furrow bottom, base of mound.
6. Stumps should not be forced into the ground. They should be placed in specially prepared holes and the soil firmed around them as with ordinary plants.

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7. In arid regions plants may be put in specially deep to ensure that roots reach moist soil and only a small part of the shoot is above ground and subject to transpiration stress. Deep planting of tall plants can sometimes be done to prevent them being blown over.

Maintenance of conservation areas

A. Weed control

If not properly managed, weeds can create several problems. They can compete with trees, especially young ones, for water, nutrients, and even sunlight.

Weeds can also enhance the activities of other pests such as insects, mites, nematodes, and diseases, and create a fire hazard when they dry up in the summer.

Weed controlling can be performed by;

Mulching, applying Cover crop (Be sure to select a cover crop such as fall-seeded cereal crops (wheat, oat, cereal rye, or barley), that will not compete with the trees)

Herbicides

Before using any herbicide, identify the weed species to be controlled, then read and follow product label directions carefully.

Pre-emergence Herbicides

Pre-emergence herbicides are applied to bare soil and are leached into the soil with rain or irrigation where they are active against germinating weed seeds.

Post-emergence Herbicides

Post-emergence herbicides are applied to control weeds already growing in the orchard. They may be contact herbicides or translocation (systemic) herbicides. Contact herbicides kill only the parts of the plants that are actually sprayed good coverage and wetting are therefore essential.

B. Cultivation

This is best accomplished when weeds are still in the seedling stage; it becomes more difficult when weeds are allowed to get large.

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Animals

Sheep will eat almost all weeds down to ground level, which reduces weed competition, but does not eliminate it. Be careful about browsers, they eat trees.

C. Mulching

Benefits of Mulching

Conserving moisture, adds organic matter to soil, provide insulation, discourages weeds, reduces soil erosion, protects trunk, and looks nice.

Improper Mulching Can Kill Trees

One of the most common mulching mistakes is *over-mulching*. *Over-mulching* exacerbate the lack of oxygen in the soil (suffocation).

Another common mulching mistake is *placing the mulch against the trunk of the tree*.

Excess moisture at the base of the tree can favor bacterial and fungal diseases that attack and kill inner bark tissues.

D. Pruning

Pruning is the removal or reduction of certain plant parts that are not required, that are no longer effective, or that are of no use to the plant. It is done to supply additional energy for the development of flowers, fruits, and limbs that remain on the plant. Essentially, it involves removing plant parts to improve the health, landscape effect, or value of the plant. By cutting back lateral branches, the tree or shrub is trained to develop a desired shape, to fill in an open area caused by storm or wind damage or to keep it in bounds to fit a given area.

Pruning can be done at any time of the year; however, recommended times vary with different plants.

Prune plants damaged by storms or vandalism or ones with dead limbs as soon as possible to avoid additional insect and disease problems that may develop.

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E. Fertilizing

Fertilizer is not plant food. Plants use water, carbon dioxide, elements from fertilizer, and energy from the sun to produce their own food. Synthetic (manufactured) and natural (sometimes incorrectly called organic) fertilizers provide nutrients for plant growth.

Addition of the correct amount of fertilizer can promote healthy flower production and foliage growth while an excessive fertilizer application can decrease plant health and can lead to decline and death.

Fertilizer applications are used during the growing season to improve the health and appearance trees. Most deciduous trees should be fertilized once every two to three years. Evergreens may be fertilized in the spring, but less often than deciduous trees.

Methods of application

1. Homeowners have two main methods of applying fertilizer to trees. The fertilizer can be applied directly to the soil surface or it can be applied below the soil surface via augured holes.
2. Spreading the fertilizer on the soil surface is the easiest and least expensive method

F. Watering

Regular watering is essential for summer bedding, vegetables, pots and hanging baskets as well as newly planted trees, shrubs and herbaceous plants.

- Always water your plants in the cool of the evening or very early in the morning
- Apply water to the base of plants where it can soak down to the roots
- Micro-drip irrigation systems can be installed to deliver water directly to where the plants can use it

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Self-Check- 2	Written Test
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Name: _____

Date: _____

Directions: Answer all the questions listed below. Illustrations may be necessary to aid

1. Why some actions of conservation work succeeds while others do not? (5 points)
2. Mention the standards/directions of natural area conservation in this guide. (5 points)
3. What is Open Standards for the Practice of Conservation? (5 points)
4. Explain the guidelines of natural areas conservation. (5 points)
5. Mention the three categories of nature conservation mentioned in this guide.(5points)
6. What tools and equipment may be required for pruning work? (3 points)
7. Explain the method of weed control. (5 points)
8. Why improper/over mulching can kill trees? (2 point)
9. Elaborate the following points and method of applications: (3 points each)
 - a. Re-vegetation (3 points each)
 - b. Mulching
 - c. Watering
 - d. Fertilizing
 - e. Pruning
10. What do mean by *Open Standards in context of conservation*? (5 points)

Note: Satisfactory rating - 50 points and above Unsatisfactory - below 50 points

You can ask you teacher for the copy of the correct answers.

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Operation Sheet-1

Under take natural area conservation works

Objective: - At the end of this practical session the learners will be able:-

- To understand how to *undertake* different *natural area conservation works*
- To understand different procedure for natural area conservation work

PROCEDURES

1. Level bunds

You will need an –frame or line level, digging tools, and stones for stone bunds. To stabilize the bund, you will need suitable grasses, legumes and tree seedlings.

Here is how to make a bund from soil.

1. Work out the gradient of the slope.
2. Decide on the spacing of bunds. Use pegs to mark out where to begin building each bund down the slope.
3. At the top of the slope, mark out a contour line (a line running at the same height across the slope) where you want to build the first bund.
4. Scrap the soil from either side of the contour line, remove the grass so the soil can be compacted and pile soil and stones up to form an embankment running along the line.
5. Compact the embankment and shape it so the top is level.
6. Move down the slope to where you want to build the next bund and repeat step 3-5.
7. Plant the grasses, fodder legumes and trees with the bunds to stabilize them and make them productive.

2. Graded bunds

How to make a graded bund

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To make a graded bund You will need an –frame or line level, digging tools, and grasses, legumes and tree seedlings.

1. Measure the gradient of the slope and check the soil type. These will determine the safe gradient for the bund and the spacing between the bunds. You can measure the slope gradient using a line level.
2. Go up water way or channel you want the bund to drain into, to the top of the slope. Starting here, use the line level to mark out where to build the bund.
3. Scrap the soil from either side of the line you have marked, remove the grass so the soil can be compacted and pile soil and stones up to form an embankment running along the line.
4. Compact the embankment and shape it so the top is level.
5. Move down the slope to where you want to build the next bund. Repeat steps 2-4.
6. Plant the grasses, fodder legumes and trees with the bunds to stabilize them and make them productive.

3. **Micro basin:**

How to build a micro-basin

1. Decide where to plant the trees. Mark a pattern on the ground, staggering the basins on a slope to control runoff.
2. Dig a shallow basin around each planting site, piling the soil in to a ridge around the down slope side, 15 cm from the edge of the basin. Make the ridge 30-50 cm high and 60-90 cm wide.
3. Plant the seedling. In dry areas, plant it in the middle of the basin. In moist areas, plant it in the ridge of soil you have built on the lower side of the basin so it does not get waterlogged.

4. **Waterways**

How to make a grassed waterway

1. Decide where to make the waterway.
2. Decide how wide and deep the waterway should be.
3. Cut out grass sods from the path of the waterway and put them to one side.

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4. Dig a channel along the Planned path. Throw The soil on both sides to Form an embankment. Leave a 15-30 cm space to stop the soil from sliding back in to the channel.
5. Arrange the sods along the channel and on the ridges and fix them in place with pegs.
6. Leave the channel until grass has grown in the channel and on the ridges.

5. **Gully controlling measures**

❖ **How to make wooden check dams**

1. Make a set of wooden posts, 5-10 cm in diameter and 1.5-2.5 m long. Sharpen one end of each post to make it easy to hammer in to the ground.
2. Hammer the posts 0.5-1 m apart, at least 60 cm deep in to the floor of the gully. The spacing between the posts depends on the height of the check dam: the higher the dam, the looser the posts. For a double row check dam, make two rows of posts, 50-60 cm between the rows.
3. Weave thinner branches between the posts to form a wall.
4. Dig the branches 50 cm or more in to the side of the gully.
5. Pack brush and other debris behind the wall (or between the rows in a double-row dam).
6. Tie the top of the structure with wire or rope, and anchor it to the ground using brushwood.

❖ **How to make stone check dams**

1. Dig a trench 40 cm wide and 40 cm deep across the gully, and extend it 40 cm in to the gully banks on both sides.
2. Put large stones in to the trench you have dug.
3. Use more stones to build a wall 1 m high and 1 m thick. The sides of the wall should be higher than the middle, so that water can flow over the middle.
4. Put more stones against the downstream side of the dam to break the flow of water falling over it.

❖ **How to make Gabion check dams**

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Gabion boxes come in two standard sizes: 2 m long × 1 m wide × 1 m high, and 2 m long × 1 m wide × 0.5 m high.

1. Dig a trench 1 m deep in the gully floor. The trench must be as wide as the gully and should be dug in to the wall to stop water from eroding around the sides of the dam.
2. Place gabion boxes in to the trench, fill them with stones and tie them with wire.
3. Add another layer of gabions on top to raise the height of the dam. Make the sides of the dam higher than the middle.



Operation Sheet-3	GROUND CULTIVATION BEFORE PLANTING
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Objective: To understand how to *cultivation ground before planting*

Materials:

- Shovel
- Pickaxe
- Meter
- Fork

Procedure

Spot hoeing

- ➔ Dig spot size is 60 *60
- ➔ Dig Diameter 120cm
- ➔ Removing soil properly with their layer

Operation Sheet 4	Planting
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Objective: - understand how to plant tree properly

Material

- ➔ **Wheel barrow**
- ➔ **Dibble**
- ➔ **Watering can**

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- ➔ **Spoon**
- ➔ **Root pruner**
- ➔ **PPE**

Planting procedures

For all planting the following general rules apply.

1. Insert roots into the soil up to the root collar.
2. Avoid damaging roots by breaking, bending, or crushing.
3. Firm soil around the roots by heeling or foot pressure.
4. Remove impervious containers before planting.
5. On dry sites the planting position should maximize water retention, eg. Furrow bottom, base of mound.
6. Stumps should not be forced into the ground. They should be placed in specially prepared holes and the soil firmed around them as with ordinary plants.
7. In arid regions plants may be put in specially deep to ensure that roots reach moist soil and only a small part of the shoot is above ground and subject to transpiration stress. Deep planting of tall plants can sometimes be done to prevent them being blown over.

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LAP Test	Practical Demonstration on undertaking natural area conservation works
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Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions:

1. You are required to perform any of the following:

1.1 Request your teacher to arrange for you to visit field demonstration area. Then, assess whether the conservation field area is clean and all materials and equipment's are properly handled.

1.2 Request a set of undertaking natural area conservation works equipment, then perform the following tasks in front of your teacher –

- How to clean conservation field equipment and
- Prepare a report and submit what kind of problem you faced while you implemented natural area conservation work.

2. Request your teacher for evaluation and feedback.



InformationSheet-3	Carrying out interactions with other staff farmers and clients
---------------------------	---

3.1 Effective communication

The purpose of this topic is to determine the minimal components of a self-management program necessary to increase positive interactions among staff and clients at work place. Three interventions were implemented, as needed, in an additive fashion including: Instruction and Goal Setting, Self-management, and Feedback. Instruction and Goal Setting did not increase staff positive interactions to a criterion level of 30% of intervals. However, during the self-management phase, all staff increased their positive interactions with clients, but two staff required feedback to maintain their positive interactions at the criterion level. Measures of generalization, compliance, and acceptability showed that increases in positive interactions occurred outside the assessment sessions; staffs were consistently employing the procedures; and staff found all procedures to be acceptable.

The other communication is with farmers. Any conservation project plan need to be participatory, centralizing the opinions of farmers which will help in ensuring the sustainability of the work. Natural resource conservation work is not a onetime project and it needs the participation of the society.

Clear communication with different stakeholders such as local people impacted by the project or their representatives, local policy makers and representatives of local authorities, Designated National Authority (DNA), local NGOs working on topics relevant to the project and other is necessary for successful accomplishment and sustainability of conservation work.

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Self-Check- 3	Written Test
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Name: _____

Date: _____

Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

1. What kind of interaction you need to have in the workplace?
2. What is the purpose of interaction with other staff and clients? (7 points)
3. How positive interactions among staff and clients at work place very? (10 points)
4. Mention the three the type interventions were(8 points)

Note: Satisfactory rating -30 points and above Unsatisfactory – below 30 points

You can ask you teacher for the copy of the correct answers.

InformationSheet-4	Observing policy and procedures in relation to workplace handling and disposal of materials
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4.1 What is a workplace policy?

A **policy** is “a documented statement of overall intentions and direction defined by those in the organization and endorsed by management.

Policies are a statement of purpose, which highlight broad guidelines on action to be taken to achieve that purpose. The statement of purpose should not be more than one page in length, but this will vary depending on the policy.

Policies give broad and general direction to the quality system. They:

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- Tell “what to do”, in a broad and general way;
- Include a statement of the organizational mission, goals, and purpose;
- Serve as the framework for the quality system, and should always be specified in the quality manual.

Procedures

Procedures are the specific activities of a process that tells “how to do it”, and shows the step-by-step instructions. Procedures explain how to perform tasks and duties.

4.2 Disposal of materials and Land Clearing Debris

Waste materials (vegetative /green wood) removed from a site:

➤ **Waste Management Planning**

Waste management should be an integral part of a project's development. Each of the principal project participants—the Owner, their Architectural and Engineering (A/E) services (or Construction Management consultant), the Contractor, and Subcontractors—will engage in waste management to some degree throughout the project. Initially, the Owner and their A/E must establish waste reduction goals and define what levels of diversion are achievable and reasonable under the project's conditions

➤ **Facility Design**

The Contractor is responsible for the means, methods, techniques, sequences, and procedures of construction, which include waste disposal methods. However, the A/E's design team can contribute to waste reduction in several ways. These include:

➤ **Construction Contract Requirements**

The Owner and their A/E must determine how their waste management requirements will be represented in the contract documents and incorporated into the project. Several provisions are relevant to the project's overall waste reduction performance.

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Self-Check- 3	Written Test
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Name: _____

Date: _____

Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

1. What is work place policy regarding material disposal?

Note: Satisfactory rating -30 points and above Unsatisfactory – below 30 points

You can ask you teacher for the copy of the correct answers.

InformationSheet-5	Reporting problems or difficulties in completing work
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5.1 Factors affecting conservation work

Most conservation projects concluded without difficulties and the people near by the area will be satisfied with the implemented project. Unfortunately, we may face unforeseen occurrences or difficulties. Some of the common factors why some conservation actions succeed while others do not may be:

- ✓ Local climate
- ✓ Labour availability
- ✓ Equipment utilization
- ✓ Local cultural characteristics
- ✓ Conservation site availability
- ✓ Extent of conservation work
- ✓ Material shortage
- ✓ Non-working holidays

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Problems or difficulties in completing work to required standards or timelines should be reported to supervisor on time so that measures will be taken either to fix the problem if it can be such as sharpening tools and equipments or report to higher position if problems cannot be fixed on the time.

Complete your work: we try to complete a conservation work by estimated materials and labor costs. In order to successfully bid your job you need to know all aspects of what it is going to cost in order to complete the job.

5.2 Plan a project

Study your plans carefully, walk through the project and approve the plans in writing before work begins. Unsuccessful studies of design result in difficulties in completing work.

- ✓ Visit the site where we are going to conserve
- ✓ Estimate your materials costs
- ✓ Communicate with all the concerned bodies

Take immediate action as needed. When permanent correction takes time, take any temporary measures you can, such as roping off the area, tagging out equipment, or posting warning signs.

Self-Check- 3	Written Test
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Name: _____ Date: _____

Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

1. What are the factors that may affect conservation work?(10)

Note: Satisfactory rating -5 points and above Unsatisfactory – below 5 points

You can ask you teacher for the copy of the correct answers.

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InformationSheet-1	Storing/stockpiling plant debris and waste material produced during conservation activities
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1.1 Material storage

Safe and efficient materials storage depends on good co-operation and co-ordination between everyone involved including, client, contractors, suppliers, and the construction trades.

On all project, the arrangements for materials storage should be discussed and agreed between contractors and the project client. Larger notify able projects should have arrangements for materials storage included in the Construction phase plan.

1.2 Waste management

There is other legislation governing the proper disposal of waste, ranging from low risk waste through to hazardous waste.

Top tips for waste management on smaller projects:

- **Flammable materials:-** make sure that all flammable waste materials (such as packaging and timber off cuts) are cleared away regularly to reduce fire risks;
- **Work areas** - make clearing waste a priority for all trades. Check that everyone is aware of what is required that it is being done;
- **Skips** - waste materials need storing safely before their removal from the site so make sure that you allow sufficient space for waste skips and bins etc. Plan where the skips can be positioned and how often they will need to be collected;
- **Waste within buildings** - consider waste generated inside the building and whether you need to provide wheeled bins or chutes etc. to enable it to be brought out of the building safely;

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Self-Check- 3	Written Test
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Name: _____

Date: _____

Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

1. Mention top tips for materials storage on smaller projects. (10 points)
2. What shall we do for Safe and efficient materials storage? (5 points)
3. Explain top tips for waste management on smaller projects (10 points)

Note: Satisfactory rating -13 points and above Unsatisfactory – below 13 points

You can ask you teacher for the copy of the correct answer.

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InformationSheet-2

Preparing and processing plant debris and waste materials

Safe and efficient materials storage depends on good co-operation and co-ordination between everyone involved including, client, contractors, suppliers, and the construction trades.

On all project, the arrangements for materials storage should be discussed and agreed between contractors and the project client. Larger notify able projects should have arrangements for materials storage included in the Construction phase plan.

Proposing to stockpile surplus material adjacent to the future/removal is very essential activity. The placement of the surplus fill material will be ongoing for approximately four months subject to weather. The material will be re-used on future works.

Some studies indicate that about 38,500 cubic meters of material will be placed to a maximum height of about 5.7 meters. The material will be stabilized with vegetation to prevent erosion and dust and will be monitored regularly.

One of the simple and easy ways of processing agricultural wastes is making compost.

2.1 Compost

Compost is organic matter that has been decomposed and recycled as a fertilizer and soil amendment. The decomposition process is aided by shredding the plant matter, adding water, and ensuring proper aeration by regularly turning the mixture.

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Ingredients

Composting organisms require four equally important things to work effectively:

1. **Carbon:** For energy, the microbial oxidation of carbon produces the heat.
 - High carbon materials tend to be brown and dry.
2. **Nitrogen:** is used to grow and reproduce more organisms to oxidize the carbon.
 - High nitrogen materials tend to be green (or colorful, such as fruits and vegetables) and wet.
3. **Oxygen:** for oxidizing the carbon, the decomposition process.
4. **Water:** in the right amounts to maintain activity without causing anaerobic conditions.

Common items suitable for composting

These common items can likely be added to compost with no negative effect.

- Paperboard or clean paper
- Dried-out egg shells
- Leaves, yard trimmings
- Fruits and vegetables

Pile method

This method is suitable for areas with higher rainfall areas, for low rainfall areas, use the pit method.

1. Select a location close to where you want to use the compost. The place should be sheltered from the wind, rain, sun and runoff.
2. Measure a rectangle 120 cm wide and 150 cm or more long (the length depends on how much composting material you have)
3. Dig a shallow pit about 30 cm deep. Put the soil on one side (you will need it latter)
4. Begin building a compost pile by putting a bottom layer of rough materials such as maize stalk and hedge cuttings in the pit. This layer should be about 30 cm thick. Chop up any materials, which are too long to improve the air circulation in the pile. Sprinkle some water in this layer.

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5. Add a second layer of dry vegetation, hedge cutting or grass. This layer should be about 15 cm thick. You should sprinkle the water on each layer as you add it. The pile should moist throughout.
6. Put on a third layer of animal manure or biogas slurry. The manure contains the microorganisms which are vital for decomposition.
7. Sprinkle some ash or dust on this layer. The ashes contain valuable mineral containing potassium, phosphorous, calcium and magnesium .the ashes also neutralize the acids produced during decomposition, especially by the animal manure.
8. The next layer should be of green materials about 15-20 cm thickness green leaves from high protein leguminous trees like Calliandra, Leucaena and others.
9. Sprinkle on a little topsoil or old compost. The topsoil contains bacteria, which are useful in the decomposition process.
10. Add more layers in turn , starting with dry vegetative materials as above
11. To complete the pile cover it all over with a layer of top soil about 10 cm thick this layer prevents plant nutrients from escaping from the compost pile. Lastl, cover the whole with dry vegetation such as banana leaves to reduce moisture loss through evaporation.
12. Take a long, sharp pointed stick and drive it in at an angle so that it passes through the pile from top to bottom. This stick will act as your “thermometer”. After three days, decomposition will have started in the pile and the stick will be warm when you pull it out.
13. Pull the thermometer out from time to time to check the progress of the pile. You can also tell the thermometer how dry or wet the pile is: it should be moist but not wet.
14. Sprinkle water on the pile occasionally (about every 3 days, depending on the weather) if it has been raining, you may not need to water the pile.
15. After 2-3 weeks, turn the pile over. Do not add any fresh materials except water. You turn the pile if the thermometer is cold when you pull it out, or if it has a white substance on it, as this shows that decomposition has stopped. Turning the pile is important because it mixes the different layers, making the decomposition faster and more complete.
16. The compost should be ready after four weeks or after 2-3 months. Finished compost should have a fresh earthy smell and contain no grass, leaves or animal manure

You can store compost by covering it with a layer of banana leaves or polythene

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Self-Check- 3

Written Test

Name: _____

Date: _____

Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

1. What is compost? (5 points)
2. What is the important of compost? (7 points)
3. Mention common items suitable for composting. (6 points)
4. What composting organisms require for equally important things to work effectively? (7 points)

Note: Satisfactory rating -15 points and above Unsatisfactory – below 15 points

You can ask you teacher for the copy of the correct answers.



InformationSheet-5

Clean and safe work site while completing conservation activities

5.1 Maintain clean and safe working environment

A few tips on how to maintain a clean and safe working environment

Like Health & Safety, maintaining a clean work environment is the responsibility of everyone. As a professional cleaning company we are paid to clean up the workplace. At the end of each day and we take pride in this task.

Working together we can all contribute to creating a safe and healthy workplace and a professional looking facility for employees, visitors and customer

Procedures in keeping a clean landscape site

- Paths are swept and cleaned,
- planted areas are checked to ensure they are well presented,
- damaged turf is replaced/ re sown,
- disturbed areas are repaired,
- all materials, debris, tools and equipment are removed from site,
- damaged plants are pruned or replaced,
- Other signs of disturbance or damage are corrected.
- Support construction of landscape features including paths, paving, retaining walls, site structures and furniture, planted areas and irrigation systems.
- Support maintenance of landscape features including watering, weeding, staking, repairing, painting, and cleaning.

Storing plants and materials in a designated area

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To prevent or reduce the discharge of pollutants to storm water from material delivery and storage, pollution prevention and source control measures, such as minimizing the storage of hazardous materials on-site, enclosing or covering materials, storing materials in a designated area, installing secondary containment, conducting regular inspections, preventing storm water run-on and runoff, and training employees and subcontractors must be implemented.

Pollution Prevention

- Store all materials inside. If this is not feasible, covered with a roof and enclosed to prevent storm water contact.
- Keep liquids in a designated area on a paved impervious surface within a secondary containment.
- Design paved areas to be sloped in a manner that minimizes the pooling of water

Identifying raw materials that can be contaminate, regular controlling of the storage area, training of employees, construction of storage shade, and space limitation for storage areas are the key pollution prevention methods.

Self-Check- 3	Written Test
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Name: _____

Date: _____

Directions: Answer all the questions listed below. Illustrations may be necessary to aid some explanations/answers.

1. How can you prevent pollution? (10 points)

Note: Satisfactory rating -5 points and above Unsatisfactory – below 5 points

You can ask you teacher for the copy of the correct answers.



Information Sheet-6	Cleaning, maintaining and storing tools and equipment
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The main activities that used in maintaining and cleaning tools and equipment include:-

a. Clean tools last longer

If nothing else, tools should be cleaned after each use. Doing so keeps diseases, fungi, insect eggs, and weed seeds from being unwittingly spread around the garden. Cleaning also extends the life of a tool by removing moisture-laden, rust enhancing soil from steel surfaces. For tools with a keen edge, a good cleaning keeps rust from eating the edge away.



After every use, wash soil and grime from tools with a steady spray of water from the garden hose

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b. Apply oil to prevent rust

Even after washing and drying, steel tool heads are still susceptible to rust when exposed to oxygen. In fact, as a general rule, the better the grade of steel used, the more vulnerable it is to rusting. So, considering the high cost of quality gardening tools, it just makes sense to keep rusting to a minimum.

Motor oil is inexpensive and effective rust preventer. When applied to steel surfaces, the oil insulates the steel and prevents it from oxidizing.



Oil steel tool heads to prevent them from oxidizing. The oil creates a barrier between the air and the steel.

c. Remove rust with a wire brush

Extremely rusty tools require special attention. Use a sheet of 80-grit sandpaper to remove light coatings of rust.



For a slightly heavier coat, a stiff wire brush can be effective.

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Sand away a light coating of rust. 80-grit sandpaper should be coarse enough to get the job done.



Use a wire brush to remove a layer of rust with a wire brush attachment.



For a very heavy coat of rust, use a drill

D. Sharpen tools for peak efficiency

Sharpening tools is a slightly more complicated procedure than removing rust. Some tools like shovels, axes, hoes, and trowels are best sharpened with a hand file, while other tools like pruning shears and knives call for a honing stone. Depending on how dull an edge is, some tools may require a session with a high-speed grinding stone. Use a hand-held mill file to sharpen hoes and shovels. The key to successful sharpening is keeping the tool steady and the file at the proper angle.





Sharpen pruning blades and knives by sliding an oiled honing stone in one direction across the tool's beveled edge.

d. Grind battered tools into shape

Since the grinding process removes metal quickly, only the most battered tools are candidates for regular grinding. Tools like lawn-mower blades and grub axes usually merit an annual trip to my grinder. An electric bench grinder is the best way to retrieve a keen edge because it has an adjustable tool-rest platform that allows for more exacting edges.





Grinding sharpens tools quickly

Storing tools and equipments

Tools are issued to the workers every morning by the storekeeper, and returned in the afternoon after completion of works. The supervisors need to ensure that the workers are issued the correct type of tools according to the work activities they will be carrying out. The storekeeper is responsible for keeping full records of the tools and controlling the issue of tools to the workers

The size of the store depends on the quantity of tools to be stored. When the work site is very isolated, the store has to be well stocked and will therefore be larger. Tools should be stored in a dry and secure place. They should be stacked neatly so that they can easily be counted. Stack different items and items of different sizes separately. Employ a watchman to guard the stores when the storekeeper is off duty.

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**Self-Check- 4****Written Test**

Name: _____

Date: _____

Directions: Answer all the questions listed below. Illustrations may be necessary to aid

1. Why maintenance and storage of tools and equipment is very important? (4 points)
2. Some equipment/tools require oil or lubricants. Why? (Give some example) (5 points)
3. Mention some ways of hand tools handling? (4 points)
4. What kind of storage is appropriate for storing equipments/tools? (4 points)
5. How Selecting the proper tool for the job and using the tool properly will increase the efficiency and reduce maintenance problems? (8 points)

Note: Satisfactory rating -10 points and above Unsatisfactory – below 10 points

You can ask you teacher for the copy of the correct answers.



Instruction Sheet	Learning Guide # 54, LO 4 Complete documentation
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This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics:

- Reporting problems or difficulties in completing the work
- Recording and reporting materials tools and equipments damage
- Reporting work outcomes to the supervisor

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:**

- Report problems or difficulties in completing the work
- Record and reporting materials tools and equipments damage
- Report work outcomes to the supervisor

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described
3. Read the information written in the information “Sheet
4. Accomplish each “Self-check respectively.
5. If you earned a satisfactory evaluation from the “Self-check” proceed to the next or “Operation Sheet

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Information Sheet-1	Report problems or difficulties in completing conservation work
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We should report the work out come to supervisor. On-site supervision to insure high quality work are important.

There are number of activities you should do for area conservation work. These works should record for further reporting.

Inspection reports

The inspection report can draw attention to possible hazards. Inspection report is essential to determine whether previous recommendations implemented or not.

Types of inspection reports:

1. Ongoing
2. Pre-operation
3. Periodic

1. Ongoing inspections

Supervisors and workers continually conduct ongoing inspections as part of their job responsibilities. Such inspections identify hazardous conditions and either correct them immediately or report them for corrective action.

2. Pre-operation

Pre-operation checks involve inspections of new or modified equipment or processes. Often checks are done after workplace shutdowns.

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3. Periodic inspections

Qualified persons periodically inspect some types of equipment, such as elevators, boilers, pressure vessels, and fire extinguishers, at regular intervals.

What should the final report have in it?

To make a report, first copy all unfinished items from the previous report on the new report. Assign a priority level to the hazards observed to indicate the urgency of the corrective action required. For example:

- ☐ Major (requires immediate action)
- ☐ Serious (requires short-term action)
- ☐ Minor (requires long-term action)

Following each listed hazard, specify the suggested corrective action and establish a definite correction date. Each inspection team member should review for accuracy, clarity, and attention to detail.

Self-Check- 4	Written Test
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Name: _____

Date: _____

Directions: Answer all the questions listed below. Illustrations may be necessary to aid

1. Explain the method of work outcomes report. (5 points)

2. Discuss the following: (15 points each)

- a. Ongoing
- b. Pre-operation
- c. Periodic

Note: Satisfactory rating -30 points and above Unsatisfactory – below 30 points

You can ask your teacher for the copy of the correct answers.

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Information Sheet-2	Recording damage/wastage of tools and equipment
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A major goal of keeping documents and records is to find information whenever it is needed.

Develop a work sheet for recording damaged tools and equipments during conservation and afforestation work so that they can be maintained before the next conservation work. The following check list sheet can be used

s/n	Tools/equipment	Status				
		Lost	dull	broken	Other(specify)	Remark
1	Secateurs	✓				
2	Spade			✓		
3	Rake		✓			
5	Secateurs		✓			
6	Spade	✓				
7	Shovels			✓		
8						

After evaluating the status tools and equipments need to be stored separately and the stolen and highly broken tools and equipments will be reported to the responsible body so that they will be ready before the next project operation in conservation work.

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Self-Check- 4	Written Test
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Name: _____

Date: _____

Directions: Answer all the questions listed below. Illustrations may be necessary to aid

1. How can we separate materials damaged from materials not damaged?

Note: Satisfactory rating -30 points and above Unsatisfactory – below 30 points

You can ask you teacher for the copy of the correct answers.

Information Sheet-3	Record and Document Activities Accomplished
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Document

- Permanent
- Describe facility policies and work instruction(level 1,2 and 3)
- Define systems,proceses and procedures

Records

- Filled in as activity occurs (level 4)
- Provide proof that policies were followed or activities performed
- Demonstrate processes and procedures are being conducted as required

General principles to develop record and document

- a. Keep it short and simple: use bullet points and flow diagrams
- b. Clarity is important: step by step instruction are easily understood

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c. Use a standardised and consistent format

What makes a good document?

- written clearly and concisely; it is better to avoid wordy, unnecessary explanations in the documents;
- written in a user-friendly style; it might be helpful to use a standard outline so the general structure will be familiar to staff and easily used by new personnel;
- written so as to be explicit and accurate reflecting all implemented measures, responsibilities, and programs;
- maintained to ensure that it is always up-to-date.

Prepare a list of activities accomplished during conservation work and experiences gained so that it will be used as an impute for the next conservation work. Conduct SWOT (strength, weakness, opportunity and threat) analysis to evaluate the how much planned activities were accomplished.

Self-Check- 4	Written Test
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Name: _____

Date: _____

Directions: Answer all the questions listed below. Illustrations may be necessary to aid

1. what is the difference between document and record?

Note: Satisfactory rating -30 points and above Unsatisfactory – below 30 points

You can ask you teacher for the copy of the correct answers.



Information Sheet-4	Record, document and report work outcomes
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4.1 Field Work Report Writing Guidelines

The field work is not a research work. The field work report is about the activities done in the field and the skills acquired during the exercise reflecting the academic competency at that level.

The following is one sample format of field work report.

Executive summary/Acknowledgment/Table of content

Chapter one: Introduction

- Overview of the field work placement.
- Discussion of the primary functions/ structure/business of the Organization/company and their role within that business.
- Review of the industry that the company works within.

Chapter Two: Work done and lessons learnt

- Brief description of task undertaken
- Deduce lessons learnt for each task undertaken (supervisor should make sure that students produce information that relate to the log book)

Chapter Three: Analysis

- Description of skills learned and enhanced, review of how the experience has affected career plans and ambitions, and what skills the student may be currently lacking.

Chapter Four: Conclusion and Recommendation

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Reference

Word length

- The report should not exceed 5,000 words.

Presentation Layout

General Text: Space between line should be 1.5 spaced using one side of the page only.

Font selected should be Times New Roman, print size 12.

Page number: centered at the bottom of the page.

Justified: Both left and right.

Headings: chapter heading print size 16 in bold typeface. Sub heading print size 14 in bold type.

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Sample Report format

THE INSTITUTE OF xxxxxxxxxxxxxxxxxxxx

(Logo)

Sector of xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

Occupation xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

Level xxxxxxxxx

Year xxxxxxxxx

A FIELD REPORT ON xxxxxxxxxxxxxxxx

Trainees Name : xxxxxxxx

ID. NO : xxxxxxxx

Academic year xxxxxxxx

Trainer's name: xxxxxxxx

Submission date: xxxxxxxx



TITLE (COVER) PAGE – (See format above)

PRELIMINARY PAGES: Begin each part on a separate page Headings must appear at the top of the page, positioned at the centre, in capital letters and in bold text. Presentation of the preliminary pages takes the following sequence which involves some or all of the following parts;

- ✓ **Executive Summary/abstract:** short summary of your writing
- ✓ **Acknowledgement:** a statement which explains the gratitude you want to forward who help you to finish your writing
- ✓ List of acronyms: if there is abbreviations used, list them here
- ✓ Table of contents

CHAPTER ONE

1.0 INTRODUCTION

- Overview of the field work placement.
- Discussion of the primary functions/ structure/business of the Organization/company and their role within that business.
- Review of the industry that the company works within.

CHAPTER TWO

2.0 WORKDONE AND LESSON LEARNT

- Brief description of task undertaken
- Deduce lessons learnt for each task undertaken
- Make sure that you produce information that relate to the work done

CHAPTER THREE

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3.0 ANALYSIS

- Relate theories learnt in class with what is happening in the market
- Description of skills learned and enhanced, review of how the experience has affected career plans and ambitions, and what skills the student may be currently lacking.

CHAPTER FOUR

4.0 CONCLUSION AND RECOMMENDATION

4.1 Conclusion

- Provide an effective conclusion which gives the answer to the main questions/objectives of the report
- Your conclusion should provide a summary of what argued in before in the texts, and incorporate your personal view.
- Identify if there is any challenges in your analysis

4.2 Recommendations

- In line with what you observed in your analysis, give your advice to the respective authority addressing the needs of your report and the challenges, if any.

5.0 REFERENCE/ BIBLIOGRAPHY

- Use either reference or bibliography as your heading for this section. In both cases, make sure that you discuss with your supervisor and agree on which term to use.
- Adhere to the alphabetical order i.e. different entries should be arranged in alphabetical order by the surname of the first author. Each entry starts with a hanging indent and 1.5 lines spacing between.
- no numbering for your list
- You list the sources that you have used in your work. Don't list sources just for the sake of adding materials to this section

Formatting

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Presentation Layout

- ✓ General Text: 1.5 line spacing using one side of the page only.
- ✓ Front; Times New Roman, font size 12.
- ✓ Page number: cantered at the bottom of the page.
- ✓ Justified: Both left and right.
- ✓ Headings: chapter heading print size 16 in bold typeface. Sub heading print size 14 in bold typeface.
- ✓ Word length: your report should not exceed 5,000 words

Final Rules:

- ➔ Follow the structure of the report as indicated above.
- ➔ Plan your work carefully and back-up your work using different storage devices in order to avoid problems as a result of computer crash, virus attack or any other reason.
- ➔ Finally, **PLAGIARISM** is not accepted

Self-Check- 4	Written Test
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Name: _____

Date: _____

Directions: Answer all the questions listed below. Illustrations may be necessary to aid

3. Discuss the following: (5 points each)

- d. Ongoing
- e. Pre-operation
- f. Periodic

Note: Satisfactory rating -15 points and above Unsatisfactory – below 15 points

You can ask you teacher for the copy of the correct answers.

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