SMALL SCALE IRRIGATION DEVELOPMENT LEVEL-I

Model TTLM

Learning Guide #01

Unit of competency: Support irrigation and drainage work

Module Title: Supporting irrigation and drainage work

LG code: AGR SSI1M 01 Lo1-Lo4

TTLM Code: AGR SSI1 TTLM1218V2

Nominal Duration: 20 Hours

Instruction sheet	Learning guide -01

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

- Prepare materials, tools and equipment for irrigation and drainage work
- Undertake irrigation and drainage work as directed
- Handle materials and equipment
- Clean up on completion of irrigation and drainage activities

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 irrigation and drainage work,
- undertake irrigation and drainage activities,
- handle materials and equipment, and
- clean up on completion of irrigation and drainage work
- Identifythe required materials, tools and equipment considering male and female.
- Conductchecks on all materials, tools and equipment.
- Use techniques for loading and unloading materials
- Select and checking suitable personal protective equipment for male and female users.
- Provide irrigation and drainage support following gender policy and work place
- Identify and reporting OHS hazards.
- Follow and clarifying instructions and directions.
- Collect, analyzing and organizing information.
- Plan and organizing activities
- Undertake irrigation and drainage work.
- Carry out interactions with other staff and customers.
- Understand the role of gender in interaction with staff and customer.
- Observeenterprise policy, guideline and procedures.
- Report problems or difficulties in completing work.
- Store waste materials and debris considering environment.
- Handle and transporting materials, equipment and machinery considering male and female
- Maintain clean and safe work site.
- Return materials to store or disposed considering environment.
- Clean, maintaining and storing tools and equipment.
- Make good work site.
- Report work outcomes.

Learning Activities

1. Read the specific objectives of this Learning Guide.

2. Read the information written in the “Information Sheets”

3. Accomplish the “Self-checks”

4. If you earned a **satisfactory** evaluation proceed to “the next information sheet However, if your rating is **unsatisfactory**, see your teacher for further instructions or go back to Learning Activity

5. Submit your accomplished Self-check. This will form part of your training portfolio (if necessary)

6. Read the “Operation Sheet” and try to understand the procedures discussed.

7. Request access to the materials required for that particular practical session. Practice the steps or procedures as illustrated in your learning guide. Go to your teacher if you need clarification or you want answers to your questions or you need assistance in understanding a particular step or procedure

8. Do the “LAP test” (if you are ready) and show your output to your teacher. Your teacher will evaluate your output either satisfactory or unsatisfactory. If **unsatisfactory**, your teacher shall advice you on additional work. But if **satisfactory** you can proceed to the next Learning guide**.**

Information Sheet-1	Preparing Materials, Tools And Equipment For Irrigation Work

1. INTRODUCTION

1.1 Identifying the required materials, tools and equipment for irrigation work.

What is irrigation?

Irrigation is the artificial application of water to the soil or artificial watering of plants/ provides the root zone of the crop with usable amounts of water during periods of need.

Irrigation is the application of water to soil for the purpose of supplying the moisture essential for plant growth.It is particularly a science of planning and designing a water supply system for Agricultural land to protect the crops from bad effect of drought or low rainfall.

Irrigation plays a vital role or benefit for increasing crop yields and stabilizing production and some ill-effect if not properly managed.

BENEFITS OF IRRIGATION

- ✓ Increase in crop yield
- ✓ Protection from famine
- ✓ Hydro power generation
- ✓ Economic development

Other Benefits of Irrigation

- ✓ Leaching of salts
- ✓ Frost protection
- ✓ Plant/soil cooling
- ✓ Chemical application
- ✓ Wind erosion control

ILL-BENEFIT OF IRRIGATION

The uses of irrigated agriculture have the following ill-effect (benefit) if not properly managed:

- ✓ Raising of water Table
- ✓ Formation of marshy area
- ✓ dampness of weather

- ✓ loss of soil fertility
- ✓ soil erosion
- ✓ production of harmful gases
- ✓ loss of valuable lands

Note: Irrigation is often studied together with drainage, so irrigation and drainage is known as complementary subject. Land drainage, or the combination of irrigation and land drainage, is one of the most important input factors to maintain or to improve yields per unit of farmed land.

What is drainage?

Drainage is the natural or artificial removal of surface and sub-surface water and dissolved salts from a given area or land. So, In General 'Land drainage is the removal of excess surface and subsurface water from the land to enhance crop growth, including the removal of soluble salts from the soil.'

What is the need of land drainage?

Land drainage plays an important rolein maintaining and improving crop yields. The main functions of drainage are:-

- ✓ to control ponding on the land surface
- ✓ control water logging occurred under crop root zone
- ✓ to control soil salinity or salinization

BENEFITS OF DRAINAGE

One of the benefits of installing a drainage system to remove excess water is that the soil is better aerated. This leads to a higher productivity of crop land or grassland because:

- ✓ . The crops can root more deeply.
- ✓ . The choice of crops is greater.
- ✓ . There will be fewer weeds.
- ✓ . Fertilizers will be used more efficiently.
- ✓ . There will be less denitrification.
- ✓ . The grass swards will be better

Other benefits of well-drained soils are:

- The land is more easily accessible
- The land has a greater bearing capacity.
- The soil has a better workability and tilth.
- The period in which tillage operations can take place is longer.
- The activity of micro-fauna (e.g. earthworms) is increased, which improves permeability.
- The soil structure is better, which also improves permeability.

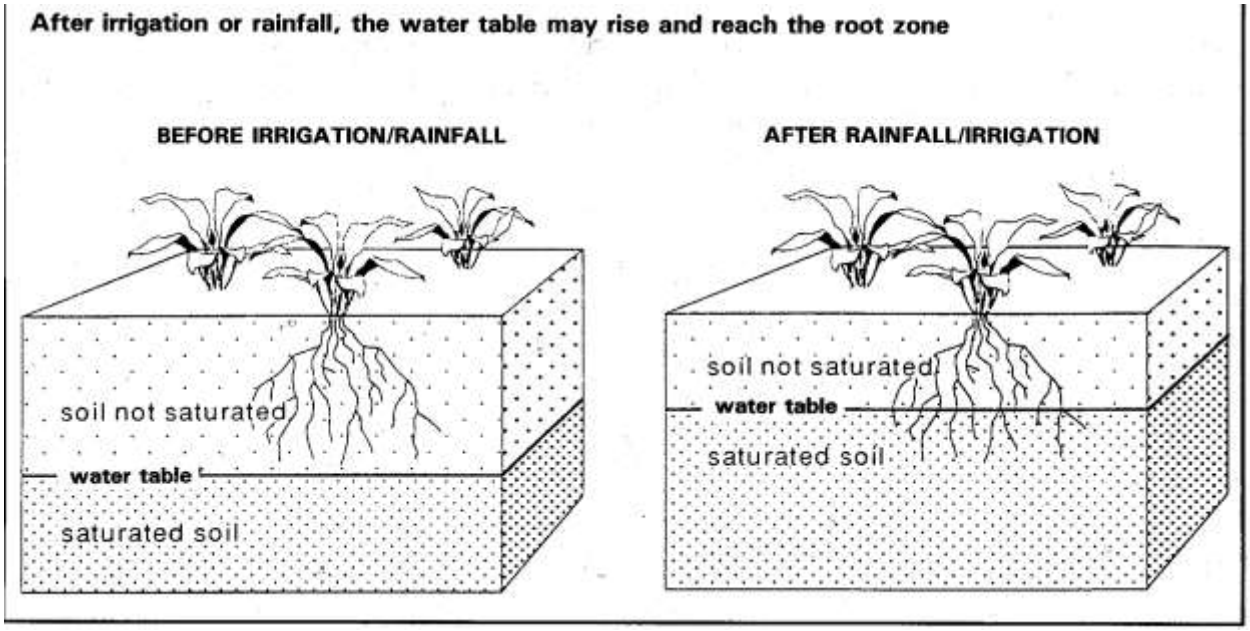
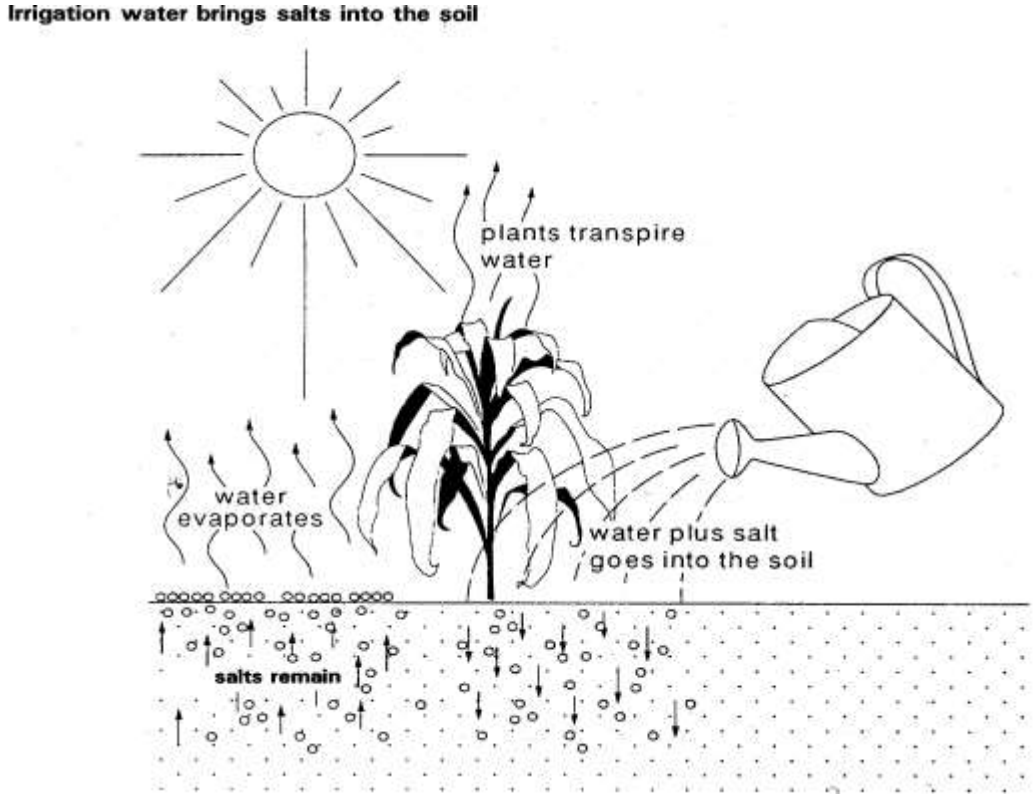

After irrigation or rainfall, the water table may rise and reach the root zone
BEFORE IRRIGATION/RAINFALL
AFTER RAINFALL/IRRIGATION
soil not saturated
water table
saturated soil
soil not saturated
water table
saturated soil

Figure: 1


Irrigation water brings salts into the soil
plants transpire water
water evaporates
water plus salt goes into the soil
salts remain

1.1 Identifying the required materials, *tools and equipment*

Equipment can be defined as:-

- Are especially made for purpose.
- Equipment is a set of tools.
- Equipment is basically to "equip" somebody. You cannot equip someone with a spanner or a screwdriver.

Tool can be defined as:-

- Tools is American wordare objects to work.
- Tools in a non-literal sense are devices to use to do something.
- Tools are commonly used for machinery.
- Tools are generally small, hand held, common items.

Irrigation systems use equipment's which range from sophisticated to locally available materials Most irrigation systems have the following major ***tools*** *and equipment s*uch as Leveling equipment, wheelbarrow, string lines, tape measures, marking gauges, spades, shovels, crow bars, rakes, broom

Leveling equipment types of leveling equipment

- Hand Levels
- Abney Levels
- Automatic Levels
- Laser Levels
- Dumpy Levels

HAND LEVELS

- A hand held instrument.
- Low precision work or for checking purpose

ABNEY LEVELS

- A type of hand level.
- includes a clinometer for measuring vertical angles.

AUTOMATIC LEVELS

- Incorporate a self-leveling feature.
- Popular for general use.
- Easy to set up and use.

•Rough leveling is done by adjusting the leveling screws, then the self-leveling feature takes over to completely level the telescope.

LASER LEVELS

- Used in construction surveys to create a visible line of known orientation and elevation from which measurements for line and grade can be made.
- Give accurate readings at distances of 1000 ft.
- can provide control elevations over a 1,000,000 square foot area from a single setup.

DUMPY LEVELS

- Standard equipment before automatic levels were available.
- The telescopic sight must be completely leveled manually by adjusting the leveling screws.

❖ **Equipment Such as:-**

Hand tools

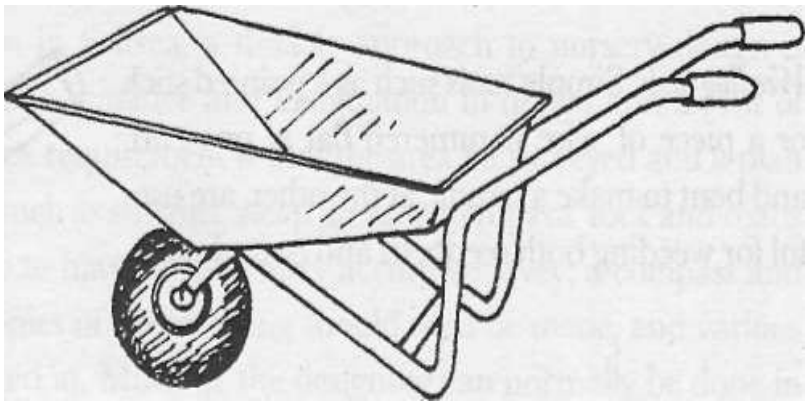
☞ **Some hand tools used in different operation.**

Wheel barrel:

☞ Used for transferring all kinds of materials in the work site.

☞ Is essential for carrying important tools, seed and seedlings into the field.

☞ Keep tres pumped up, grease all moving parts, wash out soil or rubbish after use and store out of the weather.



Spade:-

☞ There are many jobs in agriculture that require the use of hand tools. A spade, commonly used in gardens, is good for digging because of the flat, sharp shape.

- Useful for cutting and digging heavy soil, digging straight-sided, flat-bottomed trenches, or removing a layer of soil.

Shovels:-

- Used for moving earth, sieving soil, soil mixing, etc.
- Shovels are used for digging and lifting loose soil or other substances.
- A shovel is atool for digging, lifting, and moving bulk materials, such as soil, coal, gravel, snow, sand, or ore.

Rakes

- A rake, usually with a long handle and a finger-like base, is used in gardening and clean-up.
- Break up and level the soil; and it has a row of 10-16 teeth and is kitted up with a 1.80 m handle.
- A rake is a tool used to gather or loosen material or to grade or level a surface.
- Rakes work a lot like pitchforks in that they can turn over soil so that plants can get more nutrients. The difference is that the prongs on a rake create a right angle next to the handle, where as a pitchfork is only slightly curved.

Hand Fork:-

The most useful garden tool when hand weeding to loosen the soil around the weeds and ensure that all of the roots come out. Then afterwards a general scuffle over the surface leaves a tidy finish. It can also be used for planting out.

1.2 Conducting Checks on all materials, tools and equipment

It is essential to check irrigation system, tools and equipment's for damage or malfunction and shall report damage or malfunction to the authorized representative in writing. If failed to maintain the broken or malfunctioning irrigation system components within few days of the breakage or malfunction, there will be a loss due to damages resulting from the broken irrigation system component.

Hence, it is necessary to check the system, materials and equipment's. In addition, maintenance of the system has to be carried out regular

1.3 Techniques used when loading and unloading materials

The techniques used when loading and unloading materials should demonstrate correct manual handling and minimize damage to the load and the vehicle while transporting irrigation equipment's.

- The most common techniques of loading and unloading materials use the following guidelines:

- Develop an operations plan that describes procedures for loading and/or unloading.
- Conduct loading and unloading in dry weather if possible.
- Cover designated loading/unloading areas to reduce exposure of materials to rain.
- Consider placing a seal or door skirt between delivery vehicles and building to prevent exposure to rain.
- Design loading/unloading area to prevent storm water run-on, which would include grading or berming the area, and position roof downspouts so they direct storm water away from the loading/unloading areas.
- Have employees load and unload all materials and equipment in covered areas such as building overhangs at loading docks if feasible.
- Load/unload only at designated loading areas.
- Use drip pans underneath hose and pipe connections and other leak-prone spots during liquid transfer operations, and when making and breaking connections. Several drip pans should be stored in a covered location near the liquid transfer area so that they are always available, yet protected from precipitation when not in use. Drip pans can be made specifically for railroad tracks. Drip pans must be cleaned periodically, and drip collected materials must be disposed of properly.
- Pave loading areas with asphalt. Instead of concrete.
- Avoid placing storm drains in the area.
- Grade and/or berm the loading/unloading area to a drain that is connected to a dead end.

- Inspection

- Check loading and unloading equipment regularly for leaks, including valves, pumps, flanges and connections.

- Look for dust or fumes during loading or unloading operations.

1.4 Selecting and checking Suitable *personal protective equipment (PPE)*

Personal protective equipment (PPE) is used to protect an individual from hazards associated with their work tasks or environment. personal protective equipment that includes Steel capped boots/shoes, overalls, gloves, sun hat, sunscreen lotion, safety goggles, face mask and ear protectors .Personal protective equipment is not a substitute for engineering controls such as chemical fume hoods and bio safety cabinets, or for administrative controls and good work practices. PPE is used in conjunction with these controls to provide safety and maintain health.

- Some of the commonly used PPE include the following:

✓ **Eye protection**

It is required to use eye protection equipment's like goggle, eye shield, to protect our eye from dusts, chemicals, etc by all workers engaged in hazardous activities or are exposed to identify eye hazards.

✓ **Hand Protection**

It is required to use appropriate hand protection when hands are exposed to hazards, such as:

• Skin absorption from harmful substances;

• Cuts, lacerations or abrasions;

• Chemical exposure;

• Thermal burns and/or temperature extremes

• Potentially infectious material.

✓ **Body Protection**

- Chemical Resistant Clothing: Protective apparel designed to provide a barrier against a variety of chemical hazards. Chemical resistive clothing may be required for tasks where chemical splashing is anticipated or large volume transfers are conducted. Prior to selection of chemical resistant clothing, EH&S should be consulted;
- Laboratory Apparel and Scrub Suits: A wide variety of styles and materials are available to protect employees during laboratory operations. The selected type of lab coat or other apparel is designed to protect the wearer against accidental splashes or day-to-day handling of chemicals;

- Clean room Apparel: Clean room apparel is designed and classified to meet federal requirements for the control of airborne particles
- Overalls.

1.5 Providing Irrigation and drainage support

Irrigation is the application of water to soil for the purpose of supplying the moisture essential for plant growth. Irrigation work requires support to be effective and efficient. Some land requires irrigation or drainage before it is possible to use it for any agricultural production; other land profits from either practice to increase production. Some land, of course, does not need either. Although either practice may be, and both often are, used for nonagricultural purposes to improve the environment, this article is limited to their application to agriculture.Irrigation and drainage improvements are not necessarily mutually exclusive. Often both may be required together to assure sustained, high-level production of crops.

1.6 . Identifying and reporting *OHS hazards*

- Hazard identification

Hazard identification is a process used to identify all possible situations where people may be exposed to injury, illness or disease, the type of injury or illness that may result from these and the way in which work is organized and managed. It is the first part of a risk management strategy described in Occupational Health & Safety Management System (OHSMS).

Workplace Health and Safety Regulations require employers to ensure that appropriate measures are undertaken to identify all hazards and to manage risk in the workplace.

- ✓ **Hazard:** a situation at the workplace capable of causing harm (i.e. capable of causing personal injury, occupationally related disease or death).
- ✓ **Risk:** the chance of a hazard actually causing injury or disease. It is measured in terms of consequences and likelihood.
- ✓ **Risk Management:-** the overall process of risk identification, risk analysis, control of risks and risk evaluation.
- ✓ **Risk Control:** that part of risk management which involves the implementation of policies, standards, procedures and physical changes to eliminate or minimize adverse risks.

- **Reporting Hazards and Accidents**

Employees are required to report any situation or occurrence in the workplace that may present a risk or have the potential to affect the health and safety of employees or others in the workplace.

It is required that all injuries, incidents and hazards are properly reported, investigated and recorded in accordance with the procedures detailed below.

An **accident** is commonly used to describe an incident which has resulted in an injury.

An **incident** is any unplanned event resulting in or having the potential for injury, ill health, damage or loss.

- ✓ A **hazard** is a source or a situation with the potential for harm in terms of human injury or ill health.

Injury Reporting

In the event of an injury the person involved should;

1. seek first aid or medical attention as required;
2. inform their supervisor as soon as possible;
3. complete the Confidential Incident / Injury Report Form
4. Assist their supervisor in the investigation and reporting on the incident or accident.

The Supervisor of the person(s) involved in the incident is required to;

1. ensure that any injured person is promptly attended to;
2. conduct an initial investigation into the cause of the incident;
3. complete the Confidential Incident / Injury Report Form and ensure that it reaches the Safety and Health; and
4. Notify and liaise with the local Safety & Health Representative and line management in relation to the incident.
5. Ensure that all serious injuries are reported to the Safety and Health immediately after hours of assistance.

On identifying a hazard, staff must act as quickly as possible to eliminate it. This may mean a simple alteration, substitution or removal of the hazard or even talking to the people involved to enlighten

them of their hazardous practices.

Self-Check 1	Written Test

Name: _____ **Date:** _____

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

1. Write some of the tools and equipment's used in irrigation work? (5 pts)
2. List irrigation PPEs? (5pts)
3. Discuss the techniques used to load and unload irrigation equipment? (5pts)
4. Write few OHS hazards? (5pts)

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

You can ask your teacher for the copy of the correct answer

Lap Test	Practical Demonstration

Name: _____ Date: _____

Time started:_____ Time finished:_____

Instructions:

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

1.1 Request your teacher tools and equipment for irrigation work then perform the following task in front of your teacher-

- Identify for what purpose do the tools and equipment used in irrigation.

Information Sheet -2	Undertake Irrigation And Drainage Work As Directed

2.1The roles and responsibility of supervisor

Supervision is the set of activities carried out by a person in order to oversee the productivity and progress of employees who report directly to that person in an organization. Supervision is a management activity and supervisors typically are considered to have a management role, particularly a leadership role, in the organization.

To Truly Understand Supervision, Be Acquainted With Its Broad Content
--- Know How Organizations Are Typically Structured and Operate
--- Know Major Functions in Management in Organizations
--- Know Which Leadership Approach to Use and When in Organizations

Typical Roles in Supervision
--- Advocate
--- Boss
--- Coach
--- Facilitator
--- Mentor
--- Trainer

Typical Responsibilities of a Supervisor
--- Designing Job Roles
--- Hiring Employees
--- Training Employees
--- Employee Performance Management
--- Leading Employees
--- Organizing Teams

--- Leading Teams

--- Ensuring Conformance to Personnel Policies

2.2 Undertaking Irrigation work in a safe and environmentally appropriate manner

The benefits of irrigation have resulted in lower food prices, higher employment and more rapid agricultural and economic development. The spread of irrigation has been a key factor behind the near tripling of global grain production since 1950. But irrigation and water resource development can also cause social and environmental problems.

Irrigation represents an alteration of the natural conditions of the landscape by extracting water from an available source, adding water to fields where there was none or little before, and introducing man-made structures and features to extract, transfer and dispose of water.

Irrigation projects and irrigated agriculture practices can impact the environment in a variety of ways. For this review we will distinguish the following sources of environmental impact:

a) Construction of irrigation projects,

b) Water supply and operation of irrigation projects, and

c) Irrigated agriculture management practices.

To bring sustainable development, considerable attention towards the environment should be given through various mechanisms:

- Emphasizing responsible investment practices that minimize the impact of business operations on the environment;
- Pioneering innovative investments and projects that help preserve ecosystems and protect the health and safety of citizens;
- Launching various campaigns and initiatives to raise awareness of environmental issues and promoting responsible social practices amongst community members including the wise use of resources and the promotion of recycling.

2.3 Carrying out interactions with staff and customers

We can all agree that customer interaction is critical in today's market, but what does that mean? According to **VerchelleDehn, CSI Manager for Ivan Gandrud Chevrolet in Green Bay, WI,** "We fundamentally believe that our customers want three things in any of the departments; tell them the truth, do what you say you are going to do and keep them informed."

The term "**customer interaction**" may have several definitions. Let's define it as communication between one of staff members and the customer. We still need to improve at the basics; smile, make eye contact, slow down, be sincere, focus on your customer, tell the truth now, make promises and keep them, ask good questions then shut up and listen. Do not take these for granted. We all tend to get wrapped up in our busy days and we slip a little further away from what we know is right without intention. Watch your people execute these fundamentals daily.

"Ask the customer what they want and give it to them" has long been our premise for doing business but that is no longer enough. Interaction for its own sake falls short; it must fit our customers' desires. We must now learn our customers as individuals and anticipate their wants and needs. This includes how they wish to interact with us on a personal level, how often, in how much detail and method.

Positive interactions with staff help create an atmosphere which is calming and safe, especially it encourage treating each other with kindness and respect.

An environment where staff relationships are positive, where staffs are able to express their emotions appropriately and where staffs feel satisfaction within their job helps create an ideal environment. High quality interactions lead to meaningful experiences on both sides.

2.4. The role of gender and enterprising policy on irrigation work

Few women participate in community meetings and water user groups. Fewer women are to be found in Government policy-making processes. The majority of rural women are not involved in planning and are unable to express their interests. Women only meetings can be a way of making women speak up and increase their self-confidence. It is often difficult for women to talk in the presence of men because of deep-rooted gender roles.

Gender roles have been reinforced by neglecting women's access to education and in particular to technical training. In the poignant words quoted in one article: "the spanner was a shock... I never knew in my whole life that I would hold a spanner in my hand".

Lack of empirical data on women irrigators' performance denies women the chance to present cogent arguments for increased inclusion of women in the decision-making processes. It is hoped that by gathering relevant literature, gaps in current knowledge can be identified and filled.

Undoubtedly many worthy contributions have been missed in this short work and its publication may stimulate further debate.

It is also important to remember that neither men nor women are homogeneous groups. Men may belong to under-privileged and under-represented groups just as some women may have powerful and privileged positions in society. The aim of encouraging men and women to share decision-making and planning should be to improve future successful development and to reap full benefit from participation and sharing of responsibilities by all.

Gender has significant roles and implications on irrigation work through its direct influence in participation, labor division, crop preference and involvement in income generating activities.

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Self-Check 2	**Written Test**

Name: _____ **Date:** _____

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

1. What is the roles and responsibility of supervisor? (5 pts)
2. Write some of the problems to carryout irrigation and drainage work? (5 pts)
3. List some elements which help to have positive Interaction with staff and customers? (5pts)
4. How could you undertake irrigation and drainage work in a safe and environmentally appropriate manner? (5pts)
5. List few enterprise policy and procedures in relation to workplace practices? (5pts)
6. What is the role of gender? (5pts)

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

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

Operation Sheet 2	Preparing land for irrigation work

Land preparation and safe work practices for drip irrigation installation a preliminary activity during undertaking irrigation work. Irrigation activities including assisting in establishing work base, clearing site, erecting barriers and signs, unloading and loading of materials, setting out of works, cleaning up site and disposal of debris and materials.

In order to distribute water equally to plant land should be leveled and prepare for activities. Due to that student will enable apply basic construction techniques, demonstrate safe work practices. Collect, analyze and organize information locate, interpret and apply with further clarification.

Lap Test	**Practical Demonstration**

Name: _____ Date: _____

Time started: _____ Time finished:_____

Instructions:

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

1.1 Request your teacher the tools and equipment for irrigation work then perform the following task in front of your teacher-

- Site selection and clearing site for irrigation installation
- Prepare the selected site for irrigation work

Information Sheet 3	**Handle Materials And Equipment**

3.1 Storing waste material and debris produced during irrigation drainage work

- ❖ All wastes have the potential to pollute the environment if not handle or store properly
- ❖ Store all waste materials safely and securely in suitable containers
- ❖ Label containers clearly with their contents
- ❖ Separate hazardous wastes from other types of wastes and keep different types of hazardous waste separately

- ❖ Prevent liquid wastes and pollutants from escaping into drains, watercourses or surrounding ground.
- ❖ Ensure that your storage facilities are secure against vandalism, theft and accidental damage
- ❖ When transporting, maintain safe distance from all heavy equipment
- ❖ Be aware of operators blind spots and park in areas where vehicle is easily seen
- ❖ Regular inspections must be carried out

3.2. Safety in Handling and Transporting materials , equipment and machinery

Examples of the correct equipment to use are shown below.

The equipment has been purposely designed to secure the equipment's or to restrain it that it cannot fall when raised

Where possible, avoid using parts and attachments not purpose-built for the particular model of front-end loader you are using. Any modifications made to existing equipment must be purposely designed and the work should be carried out by qualified persons.

3.3. Maintaining a clean and safe work site Poor housekeeping on the job site a frequent cause of workplace incidents and worker injuries

- ❖ These incidents can be easily prevented by keeping the workplace clean
- ❖ Good housekeeping makes more efficient and safe.
- ❖ Keep all of the materials stored on the job site in a neat and orderly way.
- ❖ Clean up scraps, debris, and trash as the work progresses.
- ❖ Focus on keeping walkways, ramps, ladder platforms, scaffolds and stairways free from materials, scrap and debris.

Self-Check 3	**Written Test**

Name: _____ **Date:** _____

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

1. Why do you need to clean your working area? . (5 pts)

2. How could you dispose waste materials produced in irrigation work? (5pts)

3. Write how you transport and handle equipment's? (5pts)

4. List some irrigation wastes? (5pts)

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

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

Operation sheet-3	**Handle materials and equipment**

Purpose: to familiarize trainees with to Handle materials and equipment for irrigation work

Conditions or situations for the operation: provided the needed materials and tools the trains will perform the task within 3hr

Tools and equipment's: micro sprinkler set

Procedure

- Use PPE
- Prepare tools and equipment's
- Observe and list materials and equipment
- Clean and store the tool and equipment's of the systems

Precaution:

- wear PPE
- check tools and equipment's before the work is starting and after the work is completed if they are in good condition
- dispose wastes safely

Quality criteria: keepsafeties of the components/careful not to damage the components

LAP Test/ Job Sheet	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions:

1. You are required to perform the following activity:

    - Request your teacher to arrange materials, tools and equipment's used in irrigation work, in order to handle materials and equipment.

2. Request your teacher for evaluation and feedback

Information Sheet 4	**Clean Up On Completion Of Irrigation Activities**

4. CLEANING UP ON COMPLETION OF IRRIGATION ACTIVITIES

Objective: at the end of this learning outcome the trainees will be able to clean up store or dispose materials and report activities at the completion of work

To meet this objective the trainee will:

1. Store or dispose materials
2. Clean, maintain and store tools and equipment
.3. Clean work site
4. Report Work outcomes

Following a one-time irrigation, removeequipment.Dispose of usedequipmentproperly. If equipment is kept at the bedside forrepeated irrigation at scheduledintervals,rinsesyringe in tapwater,andkeepsyringeandsolutionbowlbetweenfolds of thewrapper.Replacewithcleanequipmentdaily.

4.1 Disposing of or returning materials to store

Irrigation practices generate waste materials, such as catch basin sludge's and street sweeping debris. Virtually all irrigation practices generate waste by-products. Typical wastes include:

• **Slurry** from road repair and resurfacing activities and right-of-way utility work.

• **Base material** and gravels from road base and shoulder repair activities.

• **Sludge's, sediment, and debris** from streets, parking lots, catch basins, and storm drain lines which are picked up with mechanical sweepers, vacuum/air sweepers, vacuum equipment, or by hand.

• **Dredged sludge materials** from channel, stream and detention pond maintenance.

• **Dropped leaves** that are collected seasonally.

• **Other vegetation** such as grass clippings, woody debris and dead plants and shrubs, that are

collected by crews maintaining streamside areas, roadsides, medians, parks and other vegetated public areas.

• **Deicing sands and gravels** from road and bridge snow and ice control operations.

Currently there are several options for recycling some of the waste materials described above. Leaf and other vegetative debris can be made into compost for use at public park facilities, or sold to suppliers in the local area (see Case Study later in this chapter). Sand and gravels can be collected and washed for reuse as deicing materials, or used "as-is" for trench backfill and for road base and shoulder material.

Dewatering practices

Dewatering is commonly used by most agencies to reduce the volume and weight of debris to be recycled or land filled. Dewatering facilities should be contained (e.g., concrete pad, berms and roof if possible) and should be plumbed to the sanitary sewer system, not to the storm sewer or nearby streams.

Irrigation sewage should be disposed of wherever and however: via privies, "behind the bush," cesspits, cesspools, pipes or troughs away from the homes, etc. These approaches worked for a long time in the new United States -- until, in certain cases, the density of the involved cities and towns evolved to the point that the sewage disposal locations were getting too close to (and/or negatively impacting the taste, odor and quality of) the area's drinking water supplies

Intermittent filtration, in which raw or settled sewage was applied evenly to the surface of prepared areas of sand or other fine material a few feet in depth (which was undertrained by lines of tile with open joints). The goal was that during its passage through the bed, the sewage was to be purified via the removal, and changing of the organic matter into more stable substances by physical and biological processes working in conjunction with the oxygen present in the matrix of the sand. The process derived its name (basically) from the necessity to intermittently apply the sewage in order that air required for the oxidation of the organic matter could enter the voids of the sand during the dry period.

Another early method of sewage treatment was "**chemical precipitation**"; it involved the addition of lime, lime and sulfate of iron, or other coagulants to form an inorganic floc, which absorbed and, upon settling, carried down with it particles of suspended solids, leaving a

relatively clear liquid. The sludge produced was large in volume and quite offensive in character.

4.2 cleaning, maintaining and storing tools and equipment

The equipment's used in irrigation work require cleaning, maintaining and storing properly after use. Maintenance and storing of equipment's has been discussed before.

Cleaning is one of the most essential elements in maintaining a safe tool and equipment. Some of the equipment's commonly used for cleaning purpose are listed below.

- air freshener dispenser,
- sealer applicators, rubbish bins, waste bins, large industrial bins, tidy bins,
- brooms, handles, buckets, mop buckets, window cleaning buckets, brushes, Bannister, flue, bottle brush, brickies brushes, dairy scrub, deck scrub, grout brush, kitchen brush, lint roller, nail brush, shoe brush, spirit brush, scrubbing brush,
- wire brush, toilet brush, toilet set, dust pans, duster, lamb's wool duster, feather duster, mops, mop heads, carpet bonnets, nippers,
- rubbish picking up tools, wall washers, wall washing, warning sign, safety signs,
- wet floor sign, tool holders,
- Freedom spray Mop,

4.3 Making the site good

Irrigation work sites are expected to be clean, tidy, comfortable and good to create conducive environment for work.

Cleanliness is the most essential elements in maintaining a healthy and safe work environment. Not only does a clean workplace reflect the professionalism of a business or facility and help motivate employees, it also promotes a healthy workforce as a clean environment prevents accidents and the spread of germs.

Many office managers strive to maintain a clear work site policy, few succeed. However, each employee

Like Health & Safety, maintaining a clean work environment is the responsibility of everyone.

However, there is only so much cleaning the team can do during each shift and in such cost conscious times it makes sense for employees to adopt some simple good housekeeping practices and allow the cleaning team to concentrate on hygiene and deep cleaning tasks.

Preventing mess as well as clearing up as you go along helps create a healthy workplace and provides the professional cleaning teams with a good platform to make effective use of their time on-site, allowing them to concentrate on hygiene, germ containment, recycling and deep cleaning. Working together we can all contribute to creating a safe and healthy workplace and a professional looking facility for employees, visitors and customers?

Site maintenance

1) The job site shall be kept in a neat, clean, and orderly condition at all times during the installation process.

2) All scrap and excess materials are to be regularly removed from the site and not buried in trenches.

3) Trenching, laying pipe and backfilling shall be continuous so that the amount of open trench at the end of each work day is minimized. Any open trench or other excavations shall be barricaded and marked with high visibility flagging tape.

4.4. Reporting work outcomes.

Work outcome reports must be submitted to the supervisor after completion of irrigation work.

The reports shall include;

(i) Specification of the quantity and each of the principal work accomplished

(ii) The results of the environmental monitoring program,

(iii) A summary of disposal unit survey and maintenance activities,

(iv) A summary, by waste class, of activities and quantities of waste disposed of,

(v) Any instances in which observed site characteristics were significantly different from those described in the application; and

(vi) Any other information the Commission may require.

Self-Check 4	Written Test

Name: _____ **Date:** _____

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

1. How could you dispose wastes? Explain it. (10pts)

2. Why do you need to make good working area? (5pts)

3. How do you report work outcomes? (5pts)

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

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

Operation sheet-4	clean, maintain and store tools and equipment's

Purpose: to provide the trains with the skill of cleaning, maintaining and storing tools and equipment's

Conditions or situations for the operation: provided the needed materials and tools the trains will perform the task within 1:30hr

Tools and equipment's: spade, rake, hoe, shovel, mater tape, string, wheelbarrow and PPE

Procedure

- Use PPE
- Inspect tools and equipment's
- Separate damaged tools and equipment's
- Repair damaged tools and equipment's correctly
- Clean tools and equipment's properly
- Store tools and equipment's properly in the right place

Precaution:

- Wear PPE
- Separate damaged tools and equipment's carefully

- ❖ Dispose wastes safely

Quality criteria: keepsafeties of the components

LAP Test/ Job Sheet	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions:

1. You are required to perform the following activity:
    - Request your teacher to arrange materials, tools and equipment's used in irrigation work, in order to clean up on completion of irrigation activities.

2. Request your teacher for evaluation and feedback.

REFERENCE

- S.K Garg, 19th revised edition, 2005. Irrigation engineering and hydraulic structures
- D. Lenka, 3rd revised edition, 2005. Irrigation and drainage