AGRICULTURE GRADE 5 LESSON NOTES

1.0 Conserving our Environment

1.1 Soil Conservation

1.1.1 Soil recovery

Soil is important in a number of ways. They Include:

- It's our life support system
- It provides anchorage for plant roots
- It holds water and nutrients
- It's a home for various micro-organisms
- We build on soil.

Therefore soil plays a vital role in our environment. As without soil human life would be very difficult.

It's therefore a resource that should be guarded with a lot of caution. This is why to keep this resource in good we should limit chances of various factors doing away with it.

- **Soil erosion** is the removal of the top soil from one place to another by means of water, wind, or animal activities.
- Eroded soils by water are deposited to other places by **siltation.**
- **Silt** is the deposited soil and is rich in humor such soil very fertile. It comprises of organic matter and can be recovered. Silty soil is slippery when wet, not grainy or rocky

Soil recovery/restoration

- This is the process of collecting eroded soil from its deposition back to the farm for farming.

Importance of soil recovery

- Soil conservation is key to environmental sustainability
- It **helps protect natural resources and watersheds**,
- restores habitats for plants and wildlife,
- Improves water quality, and makes soil healthier.
- Soil conservation also creates economic opportunity.

We should therefore look for eroded places and recover the soil and conserve our environment for the future.

- **Runoff water** is the water that runs on the ground at high speed and it removes the soil from its path leaving behind a gully.
- Soil eroded by runoff are deposited at the river banks, on the sides of the roads or in places where there are cover crops.
- Recovering soil is important to crops because it is very fertile, comprising of decomposed organic matter.
- Runoff water has **the energy to detach soil particles by scour and to transport entrained soil materials either in suspension** or by pushing or rolling larger particles.

Observing runoff

Soil deposit site

1.1.2 Soil Improvement

- **Soil improvement** is the addition of soil nutrients to poor and non-productive soils. This can be done by addict organic manure.

Methods of soil conservation

- ✓ These include fallowing,
- ✓ using **compost, manure, crop residues**,
- ✓ Using fertilizer trees (e.g Calliandra and Pygeum africana),
- ✓ intercropping legumes with cereals and including the principles of conservation agriculture (crop rotation, ensuring permanent cover for the soil and no disturbing of the top soil layer).

- Organic manure can be prepared by the use of organic materials such as plants materials, animal waste, food remains or kitchen wastes. This can be done by the method of **hip compost** or **pit compost**.
- With hip compost, the organic materials are hipped on the ground and left to decompose for some time and then transported to the farm where planting takes place.

Constructing compost pit

In the absence of compost pit or residue pit, we may use drum or wood pallet as compost bin."

Wood pallet compost pit

Drum

- On the other hand, pit manure is prepared by digging underground and dumping all organic waste materials inside. These materials are left for sometimes to decompose then are used in the farm to improve soil.

- Once the waste materials have decomposed fully we can plant a suitable crop in the waste pit.

- Dumping green and dry plant remains, food remains and kitchen wastes in a pit situated on a poor soil site is a god farming practice.
- This is because once the organic waste materials decay, they release nutrients that are required for the growth of pants.
- Therefore if an area has poor soil, it can be improved using organic manure, a crop can be grown successfully.

Importance of conserving soil

1. **The soil is literally the foundation of plant life.** A tree will not be a tree without soil. While there are some plants that can live in water or air, most plants need to be rooted to the ground.

It is the soil that provides nutrition to this plant life. It is through this vegetation that nourishes the humankind and the animal kingdom. Plants are important resource of food and fuel and of wood and other by-products that make our other life functions possible.

2. **The soil additionally supports the animal kingdom.** Our agriculture also relies on soil, for its location and for other functions to be derived from its existence. It will be almost impossible to support the animal and human life without land.
3. **The soil is necessary for water supply.** This is the magic of nature. The land is also necessary to ensure the quality of water we derive from our earth. Soil and water co-

exist. So do we and soil co-exist? Taking good care of our soil equates to taking care of our water supply.

1.2 Water Conservation

Water conservation is the process of retain water in the soil for planting. Water conservation can be done through mulching, shading, and cores cropping.

i. Mulching

- Is the process of soil water conservation by spreading dry leaves or planting on the ground surface where the crops are planted.
- The dry leaves are called mulch where they are used to conserve soil water/moisture.
- Mulching prevents direct sunshine to the soil surface which lowers the rate or evaporation.

Figure 16: Straw mulching in vegetable (Source: https://horticulture.ucdavis.edu/)

ii. Shading

- This is done by constructing a shade structure and covering its top with dry leaves.
- This is usually constructed on top of seedbeds to protect the seedling from the scotching sun and also to protect the soil from losing water through evaporation.

iii. **Cover Cropping**

- Cover cropping is the process of soil water conservation through planting short crops that spread wide on the ground.
- Plants used for cover cropping are bean plants, peas and green grams.

- Water just like soil, is an important resource in our environment for farming practices. We can use mulching, cover cropping and shading to conserve soil moisture.
- These farming practices reduce loss of water from the soil.
- Conserving water ensures that water in our farms is well used throughout the growing season

It is important to conserve water because it is an important resource for farming in our homes. Without water, the plants will not grow to produce food for us.

Importance of water conservation

- Without fresh water you will die in just a few days.
- Conserving water is important because it keeps water pure and clean while protecting the environment
- Water conservation reduces energy use and can even save your household money.

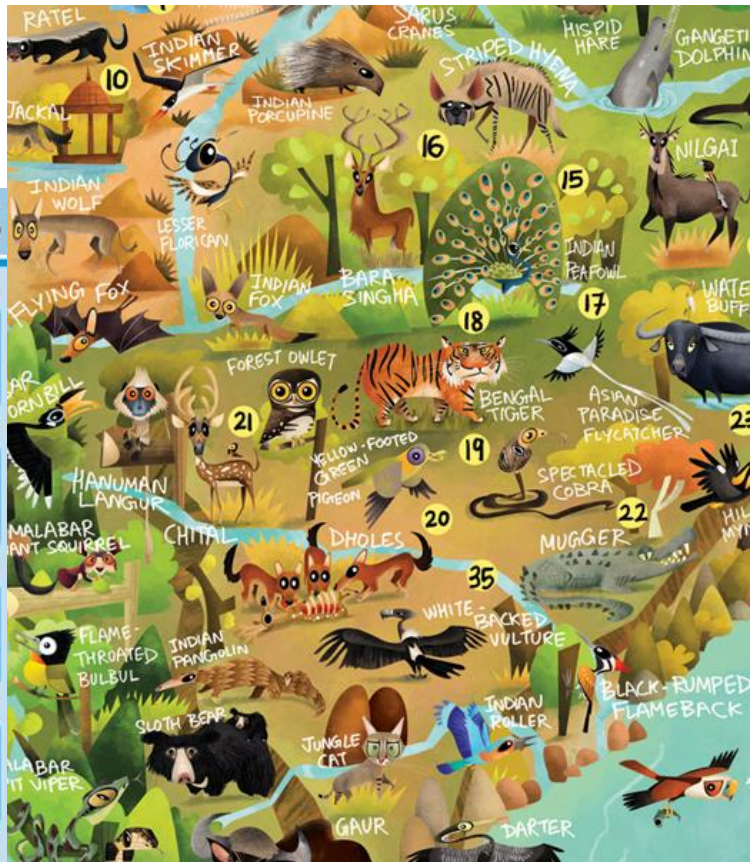
1.3 Living better with wild animals

- Wild animals are very useful to use. Some are dangerous like the leopard and the lion.

Importance of wild animals

1. Wildlife provides nutrients to humans
2. People depend on wildlife for their livelihoods
3. Wildlife has cultural significance
4. Wildlife is important for the economy
5. Protecting wildlife creates more jobs

- Wild animals generate revenue through local and international tourism. Some animals destroy our crops and some kill our domestic animals.
- We can scare and keep away wild animals without killing them.
- We can keep away animals by the use sounds, using smells and use of smelly and bitter tasting plants.



i. Use of Sounds

Some animals are often scared by sounds made by people talking or shouting. Animals like monkeys and squirrels can be scared away by the use of sounds made by radio. A radio is switched on and put in a plantation to scare wild animals' away.

ii. Using Smells

Some wild animals are repellant to bad smells. Smells can be produced by burning items such as rugs, plastics or tires. This smell is used to keep away animals such as rodents.

iii. Use of Smelly and bitter tasting plants

Some animals avoid smelly and bitter tasting plants. This method keeps away root eaters (rodents) such as the mole from destroying farm plants, and digging holes in the farm.

iv. Care and Safety from Wild Animals

Some wild animals can be dangerous. They can attack us or even kill us, they include the wild dog, wild cat and monkeys. Such animals can also transmit dangerous diseases such as rabies. We should always keep a safe distances from wild animals. We should not touch or provoke wild animals.

1.4 Growing Climbing fruit Plants

- Fruits are source of food rich in vitamins.
- They are important for our bodies for growth vitamins are nutrients needed by the body to repair warm out tissues.
- Climbing fruits plants have a stem called a vain. Vains are weak and therefore are needed to be supported using wood or wires.
- Such fruits plants can also be made to climb along the fence. They include the passion fruits, grapes, blackberries, kiwi fruits, raspberry fruits and gooseberry fruits.

1.4.1 How to Plant

- Climbing fruit plants can be planted from seeds or from stem cutting. Fruits seeds can be found from the market or can be prepared at home for planting.
- To prepare fruits seeds, get a fruit from a tree or from the market, extract seeds from it and wash.
- Dry the seeds on the sunlight and select the best seeds for planting. Prepare a seedbed and plant your seeds.
- Always water your seeds regularly until the seeds germinate. After germinating and the seedlings are strong, you can transfer them to their place of planting.

- This process of transferring seedlings from the seedbed to their place of planting is called **transplanting**.

Passion fruit seeds

- To prepare stem cutting select a sweet able fruit plant to get the stems form. Using a knife, cut the stem into small pieces of about one feet.
- Insert the cuttings into a planting site such as a container or a socket. Take care of the planted cutting by watering them, shading and removing weeds. When the cuttings start to develop leaves and roots, you can transplant them to their new places.

stem cuttings

- Young climbing fruits plants should be taken care of. We should make a shade of them to prevent them from direct sunlight.
- We should also construct a support structure using strong poles and wires for the fruit plant to support itself on.
- We also need to guide the plant along wires the process of guiding a climbing fruit plant along a wire is called **Training.**

Ways of training a plant

- A grower trains plants to:
    - ✓ Improve flower or plant appearance and management,
    - ✓ improve flower and fruit size and quality and
    - ✓ to protect plants from damage.
- Training plants is done by:
    - supporting,
    - thinning,
    - stopping,
    - disbudding and
    - pruning.
- Water the young fruit plant regularly and apply manure at its roots. Artificial fertilizer can also be used at minimal quantities to ensure safe food, protect the plant from any weeds by weeding them regularly by uprooting weeds from the stem.

1.5 Managing Climbing fruit plants

- This is taking care of the plant to ensure that it grows until the harvesting stage. The process of managing fruits plant include, watering, weeding, manure application, training and harvesting.
- This can be well achieved by developing a project schedule.

- The planted climbing fruit plant should be watered regularly on the established site.
- Weeding should be done to reduce competition from weeds for nutrients, water and light.
- It is important to make a shade over the young plants. The shade protects them from direct heat of the sun. It is important to make a fence around them.
- A fence protects them from being damaged by animals.
- Well-rotted manure should be applied from time to time to ensure that the fruit plants grow healthy.
- Climbing fruit plants also need to be supported so that they grow well and receive adequate light.

i. Harvesting

- Fruits can be harvested at their right time of harvest. Once the fruits are mature, they should be harvested. The right time for fruit harvesting can be determined by observing the colour of the fruit.

- Some fruits like the yellow passion fruit turn their colour to yellow and become a bit softer, smoother and sweet smelling. Some fruits such as the passion fruits fall of from the tree when they are ready for harvesting.

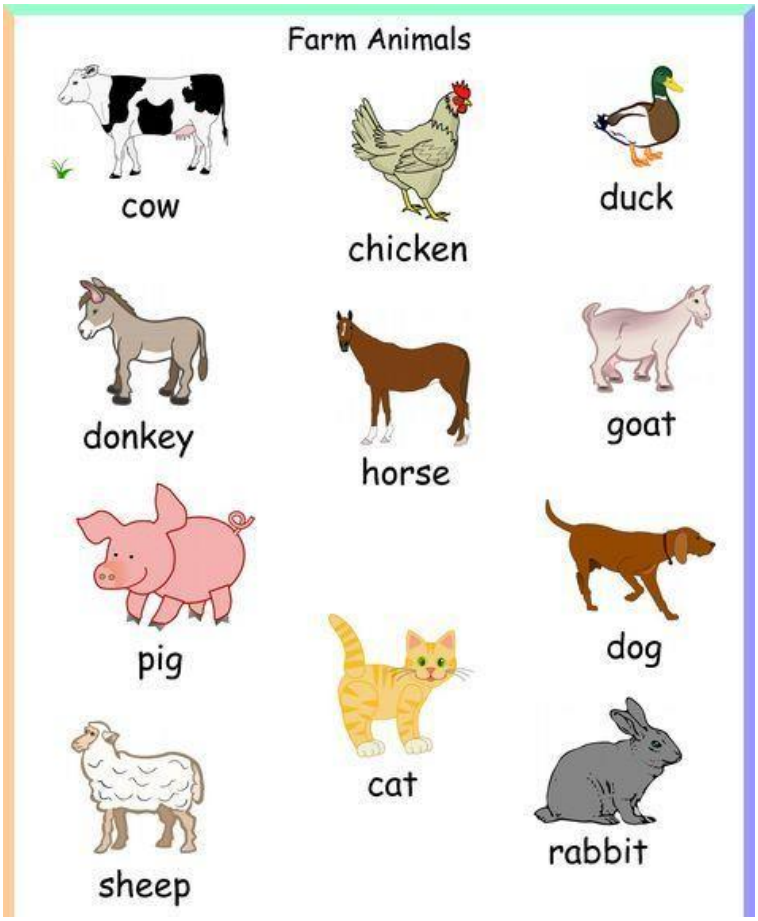
ii. **Harvesting Process**

- Climbing fruit plant can easily be damaged during the harvesting process. We should take care not to pull the fruits from climbing fruit plant.
- Pulling the fruits can damage both the fruit and the plant. Tender fruits such as berries should be placed in small container immediately after harvesting to prevent damage.

DOMESTIC ANIMALS

2.0 Domestic Animals

- Domestic animals are the animals that are kept at home. They include cow, donkey, chicken, duck, horse, rabbit, cat, dog etc.
- Domestic animals are important to human life because:
    - They provide, meat for food, milk,
    - security, eggs,
    - manual Labour and
    - May be sold to generate income.
    - Some animals like cows, donkey, horses and rabbits produce wastes to make manure.



Animal welfare

- Domestic animals are of great use to us. They should be treated well and showed love.
- To care for domestic animals,
    - They should be kept clean and
    - Given medication for good production.
    - Food and water should be provide pastes and
    - Parasites should be controlled and treated to ensure good health among domestic animals.
    - Water should be given to them and
    - They should be protected from extreme temperatures.

Uses of animals

Cat

- Its kept for beauty
- Provide safety against rats at home

Rabbit

- Provides meat
- Kept for beauty at home

Dog

- Provides security at home
- Used for transport
- Provides companionship

Pig

- Sold to give us money
- Provides pork and bacon

Fish

- Is a source of food

Camel

- Used for transport
- Provides milk.

Horse

- Used for sports
- Used for riding
- Used during war

Camel

- Provides labour when ploughing land
- Used for transporting goods and people
- Provides fur

Bees

- Gives us honey
- Pollinate our fruit crops

✓ All domestic animals are important to us. Some domestic animals provide beauty at home, others provide security while others provide us various food products such as meat, milk and honey.

✓ Some domestic animals also provide us with transport.

- ✓ Various communities in Kenya use some of the domestic animals during cultural ceremonies e.g. the Somali community use camels as payment for dowry during marriage ceremonies.
- ✓ We should therefore love and take care of all the domestic animals. We should also encourage other people to treat them well.

3.0GARDENING PRACTICES

3.1 Indigenous Food Crops

- Indigenous food crops are the crops that grow naturally in the garden. Some of these indigenous food crops have been adopted by human beings and they are now grown artificially to provide food for Kenyans Examples of these crops include; spider weeds, arrow roots, cassava, sorghum, sweet potatoes and black night shade.
- Indigenous foods crops are much important to our nutrition because they provide required nutrients and minerals to our body.
- They provide carbohydrates from root tubers, vitamins from leafy crops and minerals such as zinc and iron from plant like the black night shade and the spider weeds.

Night shade

spider sheet

Sweet potato ***arrowroot***

Cassava ***sorghum***

- ✓ *Indigenous foods are foods that our great grandparents used to eat*
- ✓ *These foods benefit us in a number of ways like providing us with carbohydrates, minerals, vitamins that protect us from diseases, they also help in healing of wounds.*
- ✓ *Also when surplus are sold they generate income*
- ✓ *Some these plants need to be handled with care like stinging nettle can cause an itching sensation on the skin and should be handled with care. Ensure you put on gloves when handling such leaves.*

- ✓ *Therefore they are important in reducing food shortage and hunger in the country. Most of these crops can be grown using organic manure, hence no need of buying expensive artificial fertilizer.*

3.2 Vegetable gardening practices

- Vegetable gardening is the process of growing vegetable crops. Vegetable group are important to our bodies because the provide carbohydrates to the body.
- Vitamins are best nutrients for the body because they protect our bodies against diseases. Vegetable crop include; tomatoes, cabbage, kales, spinach, cucumber and carrots. A vegetation is a part of a plant that is used as food.

Preparing a seedbed

- A part from providing food, vegetables can also be sold to earn income for farmers.
- Some vegetable are first raised in a nursery before being transplanted. **A nursery bed** is a small area of land for raising young seedling before they are transplanted to a permanent place called a seedbed.

- A nursery bed is prepared to comprise of fine soil particles. Fallow are made using a stick or an index finger, after leveling the nursery bed and mixing the soil with organic manure.

Sowing seeds on a nursery bed

- The seeds are then spread along the fallows in the process called **drilling**. Cover the seeds with a thin layer of fine soil.
- Apply dry plant materials to mulch the nursery bed and water it on top of the mulch.

Care for the vegetable seedlings in the nursery

- Vegetable seedlings are taken care of by constructing a shade on top of them to prevent being weakened by direct sunlight and to preserve water, by preventing water lose from the nursery bed through evaporation.
- The seedlings should be watered regularly and weed removed from their midst. When the seedlings are ready, you should transplant them into a seedbed.

Preparing a seedbed for planting vegetable seedlings.

- Transplanting seedlings in the seedbed should be taken care of. This is through weeding, watering and application of fertilizer or manure. Dried up seedlings after transplanting should be replaced in the process called **gapping**.
- Other practices such as mulching, shading application of pesticides to control pests and diseases are important. **Pruning** of some vegetables such as tomatoes is needed. This is cutting of excess branches.
- Tall tomatoes varieties need to be trained, so that they grow upright. Once the crops are ready, they need to be harvested in time.

- It is important to keep records of various gardening activities such as the date of planting. This can help us to estimate the expected date of harvesting.
- Some vegetables such as cabbages take between two to three months before they are harvested. Other vegetables may take longer than this.
- Some vegetable fruits are harvested when they are big in size and when they start changing colour. E.g. tomatoes and hot pepper turn red while some pumpkins turn orange.
- However, other vegetable fruits such as sweet pepper may still be harvested when they are green in colour.
- The ripe fruits are picked by the hand. Care is taken so as not to damage the skin of the fruit. Harvesting of the fruit should be done at the right time to avoid over ripening which lowers their quality.
- For leafy vegetables such as kale and spinach, it is good to harvest when the leaves are tender and green. The lower outer leaves are broken from the stem to allow the plant to produce more.
- The cabbage head is removed by cutting the base of the stalk with a sharp panga.
- Bulb onions are harvested when the top leaves start bending and turning yellow. Soil is loosened around the bulbs and then the bulbs are pulled out.

3.3Innovative Gardening

3.3.1 Vertical and Horizontal Gardening

Vertical gardening is crowing crops above the ground. This is used to minimize the space for practicing crop production. It can be used in places where is enough land to practice gardening on a large piece of land. This practice also save water.

The importance of vertical gardening is that it is easy to control weeds, pest and diseases. Crops produced from vertical gardens are also clean because they don't get into contact with soil.

Leafy vegetables such as kales and spinach are harvested when they large enough to use for cooking. They are carefully plucked using hands to avoid uprooting the whole plant.

Fruit vegetables are plucked when they are ripe. Tomatoes should be carefully picked when they are ripe.