THIRD SCHEME OF WORK FOR AGRICULTURAL SCIENCE

(J.S.S. 2)

WEEK	**1**	**Fishery: Definition of Fishery, Importance of fish farming**
“	**2**	**Classification of Fishes**
“	**3**	**Establishment of Fish Pond**
“	**4**	**Establishment of Fish Pond: (field excursion to a nearby fish pond)**
“	**5**	**Forest and Forest uses**
“	**6**	**Forest Resources and uses**
“	**7**	**Field Trip/ midterm exam**
“	**8**	**Effects of forest on the Environment**
“	**9**	**Effects of forest on the environment: (Human activities that affects the forest)**
“	**10**	**Revision**
“	**11&12**	**Examination**

WEEK 1.

TOPIC: FISH FARMING

DEFINITION OF FISH FARMING: Fish farming (culture) is the acts of rearing selected species of fish under scientifically controlled conditions in enclosed bodies of water such as ponds, stream, rivers, etc., where they feed, grow, breed and are harvested for consumption or for sale.

Terms Associated with Fish Farming

Fingerlings- The newly hatched fish (es).

Fisheries- This is the study of fish and fishes.

Fish - This refers to a particular species, regardless of the number or quantity.

Fishes - This refers to the different species of fish.

Pond - This is artificial body water where fish (es) can be reared.

Gears - These are equipment used in harvesting fish.

Fry - This refers to young fish (es).

School - This is a group of fish (es).

Hatchery- This refers to a unit where fish eggs are incubated and hatched artificially into fish.

Aquarium- This is an artificial fish pond kept for aesthetic or entertainment purposes at home.

Aquaculture- This refers to the study and production of fish, shrimps and other acquatic food organisms.

Importance of Fish Farming

Fish farming is important for the following reasons:

(i) It provides fish which serves as a source of food, e.g., protein to man and livestock.

(ii) It provides a means of increasing the availability of protein to people at reduced cost.

(iii) It provides a means of recycling wastes, e.g., animal dungs from farms, factories and sewage disposal systems.

(iv) Fish can be processed into fish by-products such as fish meal, fish oil, manure and skin.

(v) It provides employment and income to many people.

(vi) A better use of land and water in our environment is also ensured through fish farming.

(vii) It can generate foreign exchange to a nation, especially when fish are exported to other countries.

(viii) Fish farming is also useful in the area of research work and other educational purposes.

EVALUATION

1. What is fish farming?
2. Mention three importance of fishery

ASSIGNMENT

1. Mention any five types of fishes
2. Read about classification of fishes

WEEK2.

TOPIC: CLASSIFICATION OF FISHES

Fishes can be classified into two main groups:

(a) Classification based on fish habitat: under this classification, two groups exists:

(i) Fresh water fishes: These fishes live in fresh water, i.e., the water does not contain salts. Examples of such fresh water include pond, streams, rivers and lakes. Examples of fishes in this group include tilapia, carp, perch, trout, mudfish etc.

(ii) Salt water fish: These fishes live in water containing salts such as lagoons, seas and oceans. Examples of salt water fishes include salmons, mackerel, shark, tilapia, rays, eels, etc.

(b) Classification based on body structure: under this classification, two groups also exist:

(i) Bony fishes: These fishes possess bony skeletons. Examples include tilapia, mudfish, carps, trout, catfish, salmon, perch, and herring. Majority of these fishes are found in fresh water.

(ii) Cartilaginous fishes: These fishes possess soft bones composed of cartilages. Majority of these fishes are found in salt water and examples include shark, dolphin, dogfish, rays.

Classification based on nature of body covering:

(i) Scaly fish: these are fishes that have scales on their body e.g tilapia ,croacker e.t.c
(ii) Non- scaly fish: these are fishes that have no scales on their body. E.g mackerels, catfish, mudfish e.t.c

EVALUATION

1. Mention two classification of fishes based on habitat
2. Mention two classification of fishes based on body form

ASSIGNMENT: Mention and give examples of classes of fishes based on nature of body cover

WEEK3-4.

TOPIC: CONDITIONS OR FACTORS NECESSARY FOR SITING A FISH POND

The factors or conditions necessary for siting a fish pond include:

(1) Adequate water supply.

(2) Soil in the area.

(3) Vegetation of the area.

(4) Topography of the area.

(5) Availability of fast growing fishes.

(6) Availability of supplementary feedstuff.

(1) Adequate water supply: There must be constant supply of water of good quality and quantity. The water can be from streams, lakes, rivers, irrigation canals, springs etc. Good quality water is necessary because it will provide Oxygen and food to fish, create a medium for waste discharge and reproduction. The water should not have a bad smell, taste or colour and should not be too muddy and must be free from pollution.

(2) Soil in the area: Soil in the area must be fertile so as to supply nutrients to the fish. It should be clay because of its ability to hold water which is very important in fish pond construction. Soil with too much sand or gravel is not good and would not retain water.

(3) Vegetation of the area: Low vegetation, especially grasslands are preferred. Woody sites are not suitable because clearing and stumping will greatly increase the cost of setting up the fish pond.

(4) Topography: The shape of the land should allow for easy draining and filling of pond with water. The water must flow from a place that is higher than the pond so that the water can flow into the pond directly if not, the need for water pumps would arise and this will increase the cost of the project. However, fish pond can be constructed on a flat or **level** ground but lots of soil has to be removed to create the slope.

(5) Availability of fast growing fish: Fingerlings or baby fish for stocking a fish pond should be the type that can grow fast and mature within a very short time. The use of improved varieties (breeds) in stocking fish pond makes fish farming more profitable.

(6) Availability of supplementary feedstuff: Supplementary feeding is done to ensure rapid growth of fish and allow high stocking density. Artificial or compounded feeds in form of pellets are used to supplement the natural feed (planktons) The addition of fertilizers also promotes the rapid growth of planktons (natural fish food) in the pond.

Importance of Fish

Fish products and other aquatic food organisms are useful to man in various ways. Some of their

Importance is as followings:

i. **Food:** Fish is useful as food for man, it is eaten by man as part of his diet. Fish is a good source of protein, vitamins and minerals necessary to keep the body healthy and strong.

ii. **Source of income:** Fishes serves as a source of income for fish farmers and traders. They are sold for money which provides a major source of income.

iii **Feed:** Fish and its products such as bones can be used in the manufacture of animal (livestock) feed especially in poultry feed. The shell fishes such as from oysters and squids supply calcium in poultry feeds. Dead fish and its parts are grinded into fish meal as source of animal protein.

iv. **Medicinal purpose:** Fish products such as the cod-liver have medicinal properties. It supplies vitamins especially for babies. In addition, some species of tilapia and minnows have been used to control malaria in the tropics. They are used for biological control (prey) of mosquitoes.

v. **Recreation:** Fishing as a form of recreation or sports has played an important role in the society and in some cultures for instance, in the Argungu festival in northern Nigeria.

vi. **Entertainment:** Fish ponds provide entertainment to many people. People derive pleasure from watching fishes in pond, aquarium and documentaries.

vii. **Scientific study (education):** Fishes are used for scientific study, experiment and research to widen and increase knowledge.

viii. **Raw materials:** Fish and its products provide raw materials for agro based industries for instance, in canneries such as geisha, sardine and tuna fish industries. In addition, fish oil is a basic raw material for industries that make paints, enamels, candles, soaps and vanishes.

ix. **Leath**er**:** The skin of fishes especially sharks are dried and processed into a special type of leather known as shagreen. Skin of other aquatic organisms such as crocodiles and turtles equally make good leather for handbags, belts, shoes and wallets.

x. **Ornaments:** Some parts of fish such as shells as in oysters, as well as scales and teeth especially of sharks have been found useful in the manufacture of jewels, necklaces and other decorative materials.

xi. **Buildings:** shell fishes especially oysters and periwinkles have been exceptionally useful in building. Their shells can be mixed with sand and cement to make the walls of buildings stronger and more attractive.

xii. **Manure:** Fish by products or the discarded parts of fish and those fishes that have gone bad can be heaped to decompose and used as manure.

EVALUATION: Mention five (5) importance of fish

ASSIGNMENT: Draw and label a fish

WEEK 5 & 6

TOPICS: FOREST AND FOREST USES

There are two major types of vegetation in Nigeria. These are the forest and the savannah.

1. The Forest Zones

a. Mangrove and fresh water swamp forests

b. Rain forest:

2. The savanna Zones

(a) Derived savanna:

(b) Southern Guinea Savanna:

(c) Northern Guinea Savanna

(d) Sudan Savanna

(e) Sahel Savanna

FORESTRY

Description of forest

A forest is an ecological habitat where trees, animals and many other plant co-exist. A forest is made up of groups of trees and other living things. Shrubs, herbs, lower plants and microscopic organisms grow under the trees. A forest also serve as a home for many kinds of animals such as antelope, grass cutter, elephant, hare, monkeys, etc. The study and management of forests and forest resource is known as forestry. Simply put forestry is the study and care of all the living organisms which live in the forest.

Forest Resources (Products)

The two major components of forests are trees and wild animals (wild life). **Forest trees:** Tree species are widely spread in the forest. Forest reserves in Southern Nigeria contain most of the timber species of economic importance such as Teak, Neem (Dogoyaro). The table below shows a list of some timber species of economic value in Nigeria.

Name of Tree	Common Name	State / Location
Khaya (grandifoliola, Ivorensis, Senegalensis)	Mahohany	Cross River, Ondo, Anambra Delta, Edo, Ebonyi, Kwara, Plateau, Ogun,Oyo, Nassarrawa and Sokoto
Tenninalia Superba	Afara	Anambra, Delta, Edo, Imo, Cross River, Ogun, Oyo, Ondo and Ekiti.
Mansonia Altissima	Mansonia	Cross River, Delta, Edo, Ogun, Ondo, Oyo.
Chlorophora excels	Iroko	Edo, Kaduna, Anambra, Delta, Ogun, Ondo Oyo.
Tetminalia ivorensis	Idigbo	Cross River,Delta, Edo, Imo, Ogun Oyo

Forest Animals: These are usually referred to as wild life. In Nigeria, forest animals are called bush meat. They include: Rabbits and hares, Rodents (grass cutter, squirrels, porcupines and giant rat); Pangoling; monkey and apes (baboon, gorillas and chimpanzees); ungulates (hoofed animals such as zebras, hippopotamus, giraffe, buffalo, rhino, and bush pigs); carnivores (mongoose, hyenas, lions and leopards); Elephants; Reptiles (snake, lizards, crocodiles and tortoise; and Birds (eagles, buzzard, cattle egret and guinea fowl etc)

EVALUATION

Week 10 pg 120 fundamental facts agricultural science for J.S.S 2 NO 1,2,3,4 and 5

ASSIGNMENT: Pg 122 week 12 exercise NO, 6,7,8,9 No 1-10

WEEK 8 & 9

TOPIC: FOREST RESOURCES AND USES

Uses of Forest Resources/Products

Forest resources play an important role in the economy of the country. The value of forest can be described under the following headings: Productive, Protective, aesthetic and economic uses.

Productive Uses

(i) Timber: The wood of trees such as Iroko, Mahogany, obeche and Teak are raw materials used extensively in the construction and furniture industries to produce canoes, coffins, carvings. Forest trees such as gmelina are also processed into pulp which is an industrial raw material for making paper and newsprint. Fuel wood and charcoal are also derived from forest trees (timber)

(ii) Food: Many forest trees provide edible fruits, nuts, vegetables and mushrooms which nourish the body. Forest animals (wild life) make a major contribution to the protein requirement of Nigerians.

(iii) Medicines: Some forest trees are medicinal. Their roots, stem, leaves and bark can be used to cure a wide range of sicknesses. Such trees include Neem, Eucalyptus, Cinchona etc.

(iv) **Beddings:** Silk from silk- cotton tree is used in making pillows and mattresses.

(v) Domestic and Industrial raw material: Exudates of some forest trees provide the raw materials for rope, fibres, dyes, resins, gum, rubber, tannins which are used for both domestic and industrial purposes.

(vi) Leather: Animal skin is used for leather works such as bags, drum and others.

(vii) Fuel: Charcoal and dead wood are used for fuel (making fire) or heating.

INFLUENCE OR EFFECTS OF FOREST ON THE ENVIRONMENT

Forest influences our environment in the following ways:

(i) Purification of Air: All living things breathe in oxygen and give out carbondioxide as the by – product of respiration. Forests purify the air by utilizing the carbondioxide for photosynthesis and releasing oxygen which is needed for our respiration.

(ii) Cloud and Rain Formation: Water lost into the atmosphere from trees through transpiration cause very high humidity which results in cloud formation and rainfall. Forest also influences rainfall by intercepting moisture laden wind and causing them to rise up. When the winds cool down rain follows.

(iii) Wind break: Forest trees reduce the effect of strong wind on farmlands and bare soils thereby checking erosion and desert encroachment.

(iv) Erosion control: Forest trees and shrubs form a thick cover on land. This reduces the impact of rain drops on the soil and control erosion which could wash it away. Roots and trunks have a binding effect on the soil.

(v) Improvement of Soil fertility: When the trees dies leaves fall the decay and forms humus which helps in improving soil fertility.

(vi) Prevention of Leaching: Soil nutrients (minerals) which could have been permanently lost by leaching are absorbed by the long tap roots of forest trees. Shed leaves and branches of these trees decay and release the minerals back to the surface soil where they can be utilized by shallow rooted plants.

The organic matter formed from decayed leaves and branches also improve soil structure by binding the soil together this prevents excessive leaching of soil nutrients.

(vii) Soil water conservation: The canopy of forest leaves reduce the impact of direct sunshine on the soil thereby reducing evaporation of soil water.

HUMAN ACTIVITIES THAT AFFECT THE FOREST

(a) Deforestation: This is the continuous removal of forest trees (either by bush burning or indiscriminating felling) without replacing them. Uncontrolled deforestation should never be allowed because of its adverse effects on some of these effects include:

(i) It destroys the micro-climate and warms up the forest environment.

(ii) It depletes the supply of forest raw materials e.g timber to industries.

(iii) It reduces the forest wild life population.

(iv) It may lead to desert encroachment as sand particles are more likely to drop in areas without trees.

(v) It encourages soil erosion and loss of organic matter resulting in loss of forest soil fertility.

(b) Depletion of wild life: Indiscriminate bush burning and farming activities reduces the game (wildlife) population in the forests.

Some important species are being exterminated gradually. This is because thick forest which provide an enabling environment or habitat for the animals have become easy prey to hunters and some others have fled to new environments

(c) **Poaching:** This refers to illegal hunting of animals in the forest. Poaching reduces the population of forest wildlife. It also results in the extinction of some important species of forest animals.

EVALUATION:

Week 14 exercise, Pg 124 No 1-10

ASSIGNMENT:

Week 15 exercise, Pg 125 No 1-10

REVISION QUESTIONS

Week 11 exercise pg 121 No 1-10

Week 16 exercise pg 126 No 1-10