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**FIRST TERM E-LEARNING NOTE**

**SUBJECT: AGRICULTURAL SCIENCE CLASS: SS1**

## SCHEME OF WORK

**WEEK TOPIC**

1. Introduction to Agriculture: Meaning, Branches and Importance of Agriculture.
2. Types of Agriculture: Subsistence and Commercial Agriculture.
3. Problems of Agricultural Development in Nigeria and their Possible Solutions.
4. Roles of Government and Non-governmental Organization in Agricultural Development.
5. Roles of Science and Technology in Agricultural Development
6. Agro-Allied Industry and Relationship between Agriculture and Industry.
7. Land and its Uses: Agricultural and Non-Agricultural Uses.
8. Agricultural Laws and Reforms.
9. Environmental Factors Affecting Agricultural Production.
10. Classification of Crops:Based on Life Cycle, Morphology and Uses.
11. Revision of the Term’s Work.
12. Examination.

**REFERENCES**

* Essential Agricultural Science by O. A. Iwena
* Fundamental Agricultural Science by P. E. Okafor
* Prescribed Agricultural Science by Omoruyi and Oruhue
* SSCE Agricultural Science pack

**WEEK 1 DATE ………………………………**

**INTRODUCTION TO AGRICULTURE: MEANING, BRANCHES AND IMPORTANCE OF AGRICULTURE**

**CONTENT**

* Meaning of Agriculture
* Branches of Agriculture
* Importance of Agriculture

**MEANING OF AGRICULTURE**

Agriculture is the art and science (or management) that deals with the cultivation of crops and the rearing of animals for man’s use. This means, it refers to all the activities involving cultivation of soil for the production of crops and livestock management to the distribution and marketing of the plant and animal products.

The term, agriculture, is derived from two Latin words which are:

1. “Ager” which means field/farm/land.
2. “Culture” which means cultivation.

By this, agriculture means field cultivation. However, this is not a complete definition of agriculture since agriculture also has to do withanimal production.

EVALUATION QUESTION

1. Define Agriculture.

2. State the two Latin words from which the term Agriculture is derived from and

their meanings.

**BRANCHES OF AGRICULTURE**

The branches of Agricultureinclude the following:

1.**Animal Science/Animal Husbandry/Animal Production**: Animal Science ensures the

efficient and effective management of farm animals. It ensures better animal productivity.

2. **Veterinary Medicine/Animal Health**: Veterinary medicine providesa better

health management for farm animals.It ensures the control of pests, parasites and

diseases of farm animals.

3. **Soil Science:**Soil science ensures the maintenance of soil fertility, better soil

classification and mapping. It also helps in erosion control, soil moisture conservation

and application of appropriate fertilizer for different soil types.

4. **Crop Production/Crop Science:** Crop production helps in effective crop

management practices, development of better planting materials, correct crop spacing,

etc. The aspects of crop production include: Agronomy, Crop Pathology and Entomology.

5. **Agricultural Economics and Farm Management**: It ensures the effective management

of agricultural resources, promotes agricultural marketing and good farm accounting.

6. **Agricultural Engineering:** It promotes the mechanization of farm operations, development

of processing and storage equipment and also maintenance of farm tools and equipment.

7. **Agricultural Extension and Education:** It promotes the training anddissemination

of agricultural information to farmers, and also link farmers to researchers.

8. **Forestry and Wildlife Conservation:** It promotes the conservation of forest products,

wildlife and also creation of micro climate.

9. **Fishery:** It promotes the production of fish, its management, processing and other fishing

Practices.

10. **Apiculture/Bee Farming:** It promotes the production of honey for local consumption/uses.

11. **Heliculture/Snailry:** It involves the production of snails for consumption as a source

of protein and minerals.

EVALUATION QUESTIONS

1. Define these aspects of crop science:

(a) Agronomy (b) Crop Pathology (c) Enthomology

2. State three functions of: (a) Veterinary Medicine (b) Agricultural Extension

3. What are agro-based industries?

**IMPORTANCE OF AGRICULTURE**

1. PROVISION OF FOOD: - Agriculture provides food such as maize, rice, yam, vegetables, fruits, meat, and milk, either in fresh form or processed form for man and farm animals.
2. SOURCE OF MATERIALS FOR CLOTHING: Agriculture providesfibre and cotton for textile production. It also provides hides and skin for clothing, shoes, belts, caps, and bags.
3. PROVISION OF MATERIALS FOR SHELTER AND FURNITURE: **-** Agriculture provides timber for making building materials such as doors, windows, roofs, poles e. t. c. Timber is also used for making furniture such as shelves, cabinets, tables, chairs e. t. c.
4. PROVISION OF INCOME: - Agriculture generates income for farmers and farm labour through sales of plants and animal produce and wages or salaries.
5. EMPLOYMENT FOR THE WORKING POPULATION: - Agriculture and other agro-based industries provide employment for farmers, farm workers and other people who engage in agricultural finance and marketing.
6. PROVISION OF RAW MATERIALS FOR INDUSTRIES: - Agriculture provides raw materials for agro-based industries (industries which depend on agriculture for their raw-materials). It provides cotton and wool for textile industries, cocoa, coffee, tea and kola nut for beverage industries, rubber latex for tyres and foams industries e.t.c.
7. SOURCES OF FOREIGN EXCHANGE**: -** Agriculture contributes significantly to foreign exchange earning in Nigeria through the export of cocoa, coffee, groundnut, cotton, palm produce, timber e. t. c. to other countries.
8. PROVISION OF MARKET FOR INDUSTRIAL GOODS: **-** Finished products from agro-allied industries such as fertilizers, pesticides, herbicides, agro-pharmaceutical drugs, farm tools, machines as well as storage and processing facilities are used in agricultural sector.
9. DEVELOPMENT OF RURAL AREAS: - Agriculture brings about development in rural areas as social amenities such as good roads, electricity, pipe-borne water, schools and hospitals are provided where commercial agriculture exists.
10. PROVISION OF FACILITIES FOF RECREATION AND TOURISM: - Agriculture leads to the establishment of game reserves. It also provides horse for horse racing and polo.

EVALUATION QUESTIONS

* + 1. Outline five importance of agriculture.
    2. Give five examples of agro-based industries
    3. State five agricultural raw materials and the industries that use them.

**GENERAL EVALUATION/REVISION QUESTIONS**

1. What is Agriculture?

2. List and define eight branches of Agriculture.

3. What are agro-allied industries? State five examples of them.

4. State five Agricultural raw materials and the industries that use them.

5. State ten relevance of agriculture.

6. Define these aspects of crop science:

(a) Agronomy (b) Crop Pathology (c) Enthomology

**READING ASSIGNMENT**

Essential Agricultural Science by O. A. Iwena, Chapter 1;pages 2-6.

Fundamental Agricultural Science P. E. Okafor. Chapter 1; pages 1- 4

**WEEKEND ASSIGNMENT**

1. The two Latin words: “Ager” and “Cultura” means \_\_\_ and \_\_\_ respectively.

A. animal/rearing B. cultivation/field C. field/cultivation D. water/cultivation

2. The study of insect pests is known as\_\_ A. Agronomy B. Entomology C. Pathology

D. Zoology

3. The study of diseases attacking crops and animals is known as\_\_ A. Agronomy

B. Entomology C. Pathology D. Zoology

4. Which of these is the most important reason for practicing agriculture? A. Clothing

B. Food C. Shelter D. Income

5. All these are agro-based industries except….. industry A. soap B. textile C. electronics

D. paper

THEORY

1. (a) Define Agriculture

(b) State ten importance of agriculture

2. List and define ten branches of agriculture.

**WEEK 2 DATE………………………………………….**

**TYPES OF AGRICULTURE:SUBSISTENCE AND COMMERCIAL AGRICULTURE**

**CONTENT:**

* Subsistence Agriculture
* Commercial Agriculture

**SUBSISTENCE AGRICULTURE**

Subsistence agriculture is defined as the type of agriculture which is concerned with the production of food (cultivation of crops and rearing of animals) by the farmer to feed himself and his family only. It is also known as peasant farming because it is practiced by poor farmers. It is done on a small scale and involves the use of crude tools (e.g. cutlass, hoe, axe, etc.) only.

**COMMERCIAL AGRICULTURE**

Commercial agriculture is the type of agriculture which is concerned with the production of food and cash crops in large quantities for sale.It is done on a large scale because commercial farmers are rich farmers. Complex farm machines like tractors, bulldozers, planters, harvesters, etcare used.

EVALUATION QUESTIONS

1. Define the two types of agriculture.

2. Who is a peasant farmer?

3. State ten examples of simple farm tools used by subsistence farmers.

4. State ten examples of complex farm machines used by commercial farmers.

**CHARACTERISTICS/DIFFERENCES BETWEEN SUBSISTENCE AGRICULTURE AND COMMERCIAL AGRICULTURE**

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| --- | --- |
| **SUBSISTENCE AGRICULTURE** | **COMMERCIAL AGRICULTURE** |
| 1.Produce mainly for the family with little or no excess. | Products are principally for sale |
| 2. Practiced on small area of land. | Practiced on large area of land. |
| 3. Family labour is used | Skilled and mechanized labour is employed |
| 4. Traditional management is employed. | Modern or scientific management is employed. |
| 5. Production is on small scale | Production is on large scale |
| 6. Cost of production is low. | Cost of production is high. |
| 7. Does not need organized market for the sales of its products. | Need well organized market for sales of its products. |
| 8. Operation results in low environmental degradation. | Operation results in high environmental degradation. |
| 9. Provide direct employment for many citizens. | Skilled people are employed for different tasks. |
| 10. Engages in mixed-cropping. | Often engages in mono-cropping. |
| 11. No specialization, since the farmer produces different types of crops and rears different classes of farm animals. | Farmer specializes in the production of fewer crops and animals rearing. |
| 12. Has no access to credit facilities. | Has access to credit facilities. |

EVALUATION QUESTIONS

1. Define subsistence and commercial agriculture.
2. State five differences between subsistence and commercial agriculture.

**GENERAL EVALUATION/REVISION QUESTIONS**

1. What is agriculture?
2. List and explain five importance of agriculture
3. Mention five agro-based industries and their raw materials.
4. Define subsistence and commercial agriculture.
5. State five characteristics each of subsistence and commercial agriculture.

**READING ASSIGNMENT**

Essential Agricultural Science.Chapter 1, page 2 – 6

Fundamental Agricultural Science.Chapter 1, page 1- 4

**WEEKEND ASSIGNMENT**

1. The system of agriculture practiced solely for the benefit of the farmer and his family is A. Subsistence B. Commercial C. Family farming D. Agro forestry
2. The agriculture that is practice for the production of food and cash crops in large quantities for sale to make profit is called… A. Subsistence B. Commercial C. Scale farming D. mixed farming.
3. Agro-based industries include the following except A. textile B. beverage C. automobile D. brewery
4. The following are source of foreign exchange earning in Nigeria except A. cotton B. yam C. cocoa D. palm produce
5. Which of these is not a characteristic of subsistence agriculture? A. Depend on family labourB. Operates small farm size C. Has access to credit facilities D. Use crude tools

THEORY

* 1. List out five agro-based industries and their raw materials.
  2. State five characteristics for each of: (a) subsistence agriculture

(b)commercial agriculture

**WEEK 3 DATE ………………………………**

**TOPIC: PROBLEMS OF AGRICULTURAL DEVELOPMENT IN NIGERIA AND THEIR POSSIBLE SOLUTIONS**

**CONTENT**

* Problems of Agricultural Development
* Solutions to Problems of Agricultural Development

**1. Inadequate Land / Land Tenure System**: -

There is problem of enough agricultural land production as a result of situation arising from the system of land. Land is communally owned in Nigeria and no person can lay sole right over the land. People who have capital find it difficult to obtain land for investment.

*SOLUTION* (i) Reviewing and enforcing the land use act of 1978.

(ii) Abandoned land should be put to use

**2. Inadequate Provision of Basic/Social Amenities:-**

Inadequate provision of amenities like electricity, pipe borne water, health care, school, etc. in rural area are part of the problem hindering agricultural development in Nigeria.

*SOLUTION* (i) The government should provide basic social amenities such as electricity medical centres, schools e. t. c. in rural areas.

(ii) People should join hands together to engage in community development.

**3. Poor Financial Status of The Farmers:-**

Farmers find it difficult to invest considerable capital in their farming activities because of their poor financial status. They cannot acquire modern farm input like machinery, improved seed, fertilizer, pesticides, herbicides etc.

*SOLUTION* (i) Farmers should form co-operative societies to pool their resources together to benefit members and for easy procurement of loan from bank.

(ii) Government should subsidize the price of agricultural inputs.

(iii) Commercial and agricultural banks should make loan available to farmers at low interest rate.

(iv) Collateral security should be in form of guarantee.

**4. Loan and Credit with High Interest Rate:-**

The interest rate that is normally charged on the principal sums by banks or other financial institutions are high. This discourages farmer from borrowing.

*SOLUTION:* As in poor financial status of farmers*.*

EVALUATION QUESTIONS

Give two possible solutions each to the problems of

* + 1. inadequate land and
    2. poor financial status of the farmers

**5. Illiteracy of the Farmers:-**

Most of the farmers are not educatedand cannot understand modern farming approach because basic education is needed.

*SOLUTION*:

(a) Mass literacy programme should be organized by the government to educate farmers.

(b) Demonstration farms should be established in strategic locations to train farmers.

**6. Transportation Problem:-**

Lack of efficient transport system also adversely affects agricultural production and development. The roads are generally poor and badly maintained. This makes it difficult for farmers to transport their products from villages to cities and forces them to sell at local markets at relatively low prices.

*SOLUTION:* (a) Government should construct roads leading to food producing areas.

(b) Construction of railways and water ways to link rural and riverine areas to urban centres.

(c) Rehabilitation of existing damaged road.

(d) Regular supply of fuel and spare parts at affordable price to reduce transportation cost.

**7. Inadequate Storage and Processing Facilities:-**

The farmers lack adequate storage facilities to preserve or convert excess farm produce into another form. This result in wastage of a reasonable proportion of farm produce annually or the farmers are forced to dispose them off when prices are low there by getting little returns.

*SOLUTION*: (a) Government should provide modern storage facilities such as silos, cribs, cold rooms to farmers at affordable price.

(b) Government should such as millers and threshers should be made available to farmers at subsidized rate.

(c) Farmers should be educated on how to make use of modern processing and storage facilities.

(d) Private individuals and cooperate bodies should invest in processing of agricultural produce.

EVALUATION

Suggest two possible ways each to the problems of i) illiteracy of farmers ii) transportation in agricultural development

**8. Poor Marketing System:**

The system through which agricultural products are been sold does not allow the farmer to get full benefit or reward for their labour, this discourages farmers from producing in large quantity.

*SOLUTION*; (i) Government should stabilize prices of agricultural produce through the marketing board.

**9. Problems of Pests and Diseases:**

Pests, which are organisms capable of damaging farm produce and pathogens which are disease causing organisms render a lot of havoc to agricultural produce thereby reducing the quantity and quality. The cost of controlling these pests and diseases increases the cost of production. Pests and diseases reduce the farmers’ income.

*SOLUTION*: (i) Pesticides and other agro-chemicals should be made available to farmers at subsidized rate.

(ii) Development of disease resistance varieties by the research institutes.

**10. Poor Agricultural Inputs:**

Fertilizers, pesticides, herbicides, machineries are not within the reach of farmers and some are expensive to purchase and maintain.This leads to reduction in farm yield.

*SOLUTION*: (a) Government should subsidize the price of agricultural inputs

(b) Improved farm inputs should be made available to farmers at the right time.

**11. UnfavourableClimate:**

This generally discourages serious farming activities. Low rainfall leads to poor harvest of crops and low sunlight intensity reduces the rate of photosynthesis which eventually leads to low yield.

*SOLUTION*: (a) Provision of irrigation facilities.

(b) Provision of drainage facilities

(c) Insurance policies.

EVALUATION QUESTIONS

1. Suggest two possible solutions each to the problems of i) unfavourable climate ii) poor agricultural input

12. **Use of Crude Tools:**

Farmers lack access to modern implement or machinery. This affects the rate of production in their farms.

*SOLUTION*: (a) Farmers should form co-operative societies to purchase modern machines and use them in turn.

(b) Government should encourage local fabrication of suitable intermediate machinery.

(c) Government should provide credit facilities to farmers to enable them to purchase modern machineries.

**13. Inadequate Number of Extension Workers:**

There are few agricultural extension agents who own the responsibility of teaching the farmers the improved method of farming.

*SOLUTION*: (i) There should be more training and employment of extension workers.

(ii) By providing more incentives to agricultural extension workers.

**14. Inconsistent Government Policies on Agriculture:**

Government policies fail to recognize the peasant farmers that produce food for the country. Most of the farmers do not have access to farm input provided through such policies.

*SOLUTION*: (i) Government should formulate dynamic agricultural policies and implement them.

(ii) The policies should recognize genuine farmers (rural farmers)

**15. Natural Hazard/Environmental Degradation:**

Some of the agricultural land has been degraded due to the effect of flooding, soil erosion, water logging etc.

*SOLUTION*: (a) Afforrestation

(b) Planting of cover crops

(c) Terracing and strip cropping should be practiced

(d) Insurance policies

EVALUATION QUESTIONS

1. Suggest two possible solutions to the problems of (i) crude tools (ii) natural hazards in agricultural development in Nigeria.

**GENERAL EVALUATION/REVISION QUESTIONS**

1. State five problems of agricultural development in Nigeria and suggest two possible solutions to each.
2. Who are extension agents?
3. Discuss the roles of agric extension in the development of agriculture in Nigeria.
4. Outline four possible solutions to the problem of natural hazard in agricultural development.
5. List five agricultural inputs

**READING ASSIGNMENT**

Essential Agricultural Science;Chapter 1, page 6 – 11

Fundamental Agricultural Science.Chapter 1; page 5 – 10

**WEEKEND ASSIGNMENT**

1. Artificial supply of water to farmland is known as… A. irrigation B. drainage C. conservation D. assimilation
2. The following are farm machineries except A. tractor B. bulldozer C. ridger D. hoe
3. The following activities can make soil fertility to be degraded except A. erosion B.flooding C. leaching D. crop rotation
4. The chemical used to destroy weeds on farms is called A. herbicide B.pesticide C weedicide D. insecticide
5. Farmers can collect credit facilities from any of the following except A.commercial bank B.agricultural bank C.thrift and saving society D. mortgage

**THEORY**

1.      List out five problems of agricultural development in Nigeria.

2.      Suggest two possible solutions to each of the problems listed above

**WEEK 4 DATE ………………………………**

**TOPIC: THE ROLE OF GOVERNMENT AND NON-GOVERNMENTAL ORGANIZATION**

**IN AGRICULTURAL DEVELOPMENT**

**CONTENT**

* Roles of Government in Agricultural Development
* Roles of Non-governmental Organization in Agricultural Development

**ROLES OF GOVERNMENT IN AGRICULTURAL DEVELOPMENT**

Agricultural activities are controlled or directed in one way or the other by government through their ministries of agriculture. They draw up policies and programmes, they make regulations for those concerned with agricultural development, they grant loans or credit facilities and subsidy, finance research, establish farm settlements and supply vaccine and quarantine services.

**1. Establishment of Agricultural Policies:**

Every country has its own agricultural policies. Such policies in any underdeveloped economy may have the same goals which are summarized below:

1. To increase the production of suitable food crops.
2. To meet the needs and changing taste of the growing population.
3. To increase the quality and efficiency of producing the major export crops as demanded by the world market.
4. To provide employment opportunities through establishment of large farms.
5. To supply the essential raw materials which are vital to the development of local industries.
6. To increase the production of livestock so as to supply animal proteins in diets.

EVALUATION QUESTIONS

1. Mention five goals of the government in establishing agricultural policies

**2. Establishment of Agricultural Programmes and Planning**:

When a government has stated it policies, it draws up a programme for their execution. A programme is a projection of what is to be done in future; while a plan can be defined as an organization of goals and the means for attaining these goals. Some of the government programmes for agricultural development in Nigeria are listed below.

Extension Services, Farm Settlement Schemes, Agricultural Loan Schemes, Credit Facilities, River Basins Development Authorities, National Agricultural Insurance scheme, subsidies, Agricultural education and research, quarantine and vaccines, Operation feed the nation, Green revolution, Agricultural Development Project, DFRRI, National Agricultural Land Development Agency.

EVALUATION QUESTIONS

1. Outline five programme of the government in agricultural development

**3.Provision of Farm Inputs**:

Farm inputs are either provided by the government or subsidized to enable peasant farmers to buy and use their inputs on their farms.

**4.Provision of Basic Amenities**:

Government decides to provide basic amenities in rural areas so as to decrease the migration of able-bodied men and youths from rural to urban areas so that they can stay and farm

**5. Provision of Storage and Processing Facilities**:

Government decides to provide storage and processing facilities in all parts of the country in order to prevent food wastage and provide food in periods of scarcity.

**6.Provision of Extension Services:**

Government has helped to employ qualified and experienced extension officers that carry new ideas and innovation to rural farmers.

**7. Provision of Agricultural Education**:

Due to the fact that some of Nigerian farmers are illiterate, the government decides to provide adult education in order to enable them to read and write, so as to accept new and improved techniques and innovations in agriculture.

**8.Provision of Quarantine Services**:

Plant quarantine regulations are made by government to prevent the introduction and distribution of foreign plant diseases and pests into the country.

**9. Provision of Research Work**:

In order to improve the local varieties of crops and breeds of animals, the government set up some research institute to provide solutions to crops and animals problems so as to improve production. Examples of such institutes are

1. Cocoa Research Institute of Nigeria (CRIN) Ibadan.
2. Nigeria Institute for Oil Palm Research (NIFOR) Benin.
3. International Institute for Tropical Agriculture (IITA) Ibadan.
4. National Horticultural Research Institutes (NIHORT) Ibadan.
5. Rubber Research Institute of Nigeria (RRIN) Benin.
6. Forestry Research Institute of Nigeria (FRIN) Ibadan.
7. Leather Research Institute of Nigeria (LRIN) Zaria.

EVALUATION QUESTIONS

* + - 1. State five roles of Government in agricultural development in Nigeria
      2. Give five examples of research institutes in Nigeria

**ROLES OF NON-GOVERNMENTAL ORGANIZATION IN AGRICULTURAL DEVELOPMENT**

Non-governmental organizations are organizations established and owned by a person or a group of people whose primary objective is to find solutions to problems facing humanity. Examples of NGOS include:

* 1. International Institute of Tropical Agriculture
  2. West African Rice Development Agency
  3. Food and Agricultural Organization
  4. Hunger Project (Ghana)
  5. Catholic Relief Service (Gambia)

NGOS are relevant to agriculture in the following areas.

* + 1. RESEARCH: - They research to come up with solutions to agricultural development and to develop new crop varieties as well as new breed of animals
    2. FINANCE: - They fund many agricultural projects
    3. PROVISION OF INPUTS: - They provide inputs such as fertilizers, herbicides, pesticides and distribute to rural farmers
    4. EXTENSION SERVICES: - They create awareness to improve farmers’ agricultural knowledge and render other extension services
    5. RURAL DEVELOPMENT: - They provide basic amenities like road, water supply for rural farmers.
    6. IRRIGATION AND DRAINAGE: - They provide these facilities to make year-round agricultural production possible.

EVALUATION QUESTIONS

1. Outline five roles of NGOS to agricultural development in Nigeria.
2. Give five examples of Non-governmental organization in Nigeria

**GENERAL EVALUATION/REVISION QUESTIONS**

1. State five research institutes in Nigeria that contribute to the improvement of crops and animals.
2. Give five examples of non-governmental organizations that contribute to the development of agriculture.
3. Outline five roles of government in agricultural development in Nigeria
4. Discuss briefly the basic roles of NGOS in agricultural development.

**READING ASSIGNMENT**

Essential Agriculture.Chapter 13, pages 125-130

Fundamental Agriculture.Chapter 1, pages 122-127

**WEEKEND ASSIGNMENT**

1. Which of the following agricultural programmes was designed to attract young educated people to take up farming? A. O.F.N B. Farm settlement scheme C. Green revolution programme D. Agriculture insurance scheme
2. Which of the following is not a method of controlling pests? A. quarantine B. crop rotation C. fumigation D. mulching.
3. The roles of government in the development of agriculture in Nigeria include the following except A. provisions of credit facilities for farmers B. education of farmers C. formulations of agricultural policies D. increasing cultivation of export crops.
4. Government’s agricultural policies include the following except A. increasing the production of food crops and animals B. increasing the efficiency of production of export crops C. supplying raw materials for use in local industries D. increasing the number of peasant farmers.
5. The following are non-governmental organization except A. Hunger projects in Ghana B. IITA C. Agricultural Development Authority D. West Africa Rice Development Agency

### THEORY

1. List five agricultural programmes introduced by the government of Nigeria
2. State two major objective each of the agricultural programmes listed in (1) above.

**WEEK 5 DATE ………………………………**

**TOPIC: ROLES OF SCIENCE AND TECHNOLOGY IN AGRICULTURAL DEVELOPMENT**

Science and Technology has played significant roles in the development of agriculture in Nigeria and many other countries of the world. These roles include

1. **Modern farm machinery**: - The development of modern farm implement such as tractor, plough, planter, harvester, sheller to replace old simple tools such As hoe and cutlass has been made possible by science and technology. This has greatly increase productivity (commercial farming) and farm work becomes easier, faster and attractive.
2. **Agro-climatology**: - Science has been able to explain the ideal climatic conditions for plants and animals. Farmers are equally helped to understand the weather and climate of their area and are able to determine the type of crops to grow and animals to rear.
3. **Pests and disease control**: - Chemicals inform of pesticides, fungicides, nematicides, fumigants has been developed by science and technology to combat the problems caused by pests and disease.
4. **Crops and animals improvement**: - Through genetics and breeding, improved crop varieties and animal breeds which possess desirable qualities such as disease resistance, fast growth, early maturity, high yield has been developed.
5. **Soil fertility**: - The development and application of organic manure and inorganic fertilizers by science and technology has been able to solve the problem of soil infertility and also increase crop yield. Farmers can also test the soil; determine the nutrient deficiencies and the type of crop to plant on a farm land.
6. **Animal health management**: - Feeds are formulated to meet the nutritional needs of farm animals, other factors such as ventilation, sanitation, immunization and medication has been put in place by science and technology to ensure good health and productivity of farm animals.
7. **Storage and processing facilities**: - In order to preserve excess farm produce and to avoid wastage, modern storage facilities such as silos, cold rooms and processing facilities such as millers, shellers has been developed by science and technology.
8. **Transportation network**: - Science and technology has been able to develop roads, railways and water ways linking food producing areas to urban centres.
9. **Soil and water conservation**: - Through irrigation, drainage and erosion control, the soil is preserved from losing its fertility and water is made available at optimum level required for plant growth.
10. **Land surveying:** - Surveying equipmentis made available by science and technology and with these equipment, the physical feature and size of a farmland can be determined. This help to determine the suitability of a farm location for various uses and input requirement of a given farmland.
11. **Agricultural system**: - Improved farm management system such as crop rotation, mixed farming, rotational grazing has been put in place by science and technology to maintain soil fertility, increase yield and maximize land use.

**EVALUATION**

1. State ten roles of Science and Technology in Agricultural Development
2. Discuss ways through which Science and Technology has contributed to the development of Agriculture in Nigeria.

**GENERAL EVALUATION**

* 1. What is technology?
  2. Describe how science and technology has been able to bring about crop and animal improvement
  3. Outline five improved farm management system
  4. List five modern storage facilities
  5. What is the importance of agro-climatology to farmers?

**READING ASSIGNMENT**

Essential Agricultural Science, chapter 13, page 130 – 131

Fundamental Agricultural Science chapter 1, page 127 - 130

**WEEKEND ASSIGNMENT**

1. The following are improved system of agriculture except A. crop rotation B. bush fallowing C. mixed farming D. rotational grazing
2. The aspect of science and technology that aids the development of new crop varieties and breeds of animals is known as A. Genetic engineering B. Reproduction engineering C. Animal health D. Breeding engineering
3. Land surveying in agriculture helps the farmer to determine the following except A. the size of a farm land B. physical relief of the farm land C. labour requirement D. fertility of the soil
4. Which of these is not a method of conserving soil and water in agriculture? A. irrigation B. erosion control C. land surveying D. drainage
5. Which of these is not an advantage of modern storage and processing facilities? A. avoid wastage B. scarcity of agricultural produce C. convert agricultural produce to desired form D. make produce available throughout the year

THEORY

1. Outline five roles of Science and Technology in Agriculture
2. State five importance of agro-climatology to farmers

**WEEK 6 DATE ………………………………**

**TOPIC: AGRO-ALLIED IDUSTRIES**

**CONTENT:**

* **Meaning of Agro-allied Industries/Agro-based Industries.**
* **Examples of Agro-allied Industries and Raw Materials Used.**
* **Relationship between Agriculture and Industries.**

**MEANING OF AGRO-ALLIED INDUSRIES**

Agro-allied industries/Agro-based industries are industries which depend on agriculture for their raw materials in order to operate successfully. In other words, agro-based industries require the supply of agricultural raw materials in order to provide some finished products that are essential for human and animal consumption.

**EXAMPLES OF AGRO-ALLIED INDUSTRIES AND RAW MATERIALS USED**

The table below shows the examplesof agro-allied industries and the raw materials used in each industry:

|  |  |  |
| --- | --- | --- |
| **S/N** | **Agro-based Industries** | **Raw Materials Used** |
| 1. | Oil mill | Oil seeds |
| 2. | Soap industries | Oil seeds/oil |
| 3. | Cigarette/Tobacco | Tobacco leaves |
| 4. | Textile/Ginnery | Cotton |
| 5. | Breweries | Cereals |
| 6. | Fruit canning | Fruits |
| 7. | Paper industry | Pulpwood |
| 8. | Sugar industry | Sugar cane |
| 9. | Plywood/saw mill | Wood |
| 10. | Flour mill | Cereal/grains |
| 11. | Starch | Cassava, maize |
| 12. | Tyre | Rubber latex |
| 13. | Feed mill | Groundnut, maize, etc |
| 14. | Beverage | Cocoa, coffee, tea |

EVALUATION QUESTIONS

1. What are Agro-based industries?

2. State ten examples of agro-allied industries and the raw materials used.

3. State five examples of cereals.

**RELATIONSHIP BETWEEN AGRICULTURE AND INDUSTRIES**

There is a positive and wide range of relationshipsbetween agriculture and industries. These relationships include the following:

1. **Provision of Market:**Agriculture provides market for industrial products such as farm machinery, chemicals and fertilizer
2. **Provision of Food**: Agriculturealso provides food for industrial workers.
3. **Provision of Raw Materials**: Agriculture provides raw materials such as cocoa, cotton, palm produce and groundnut for industries.
4. **Competition for Labour**: Both agriculture and industry compete for labour.
5. **Provision of Essential Goods**: Industries provide a large range of desirablegoods that farmers want to buy.
6. **Provision of Agro-chemicals**: Industries produce agro-chemicals for agricultural uses. Examples are pesticides, fertilizers, vaccines and herbicides.
7. **Provision of Storage Facilities**: Industries provide storage facilities for agricultural produce e.g. grains, milk, fruits, vegetables, meat, fish, etc.
8. **Provision of Processing Facilities:**Industries also provide processing facilities such as grinders, millers, etc for agriculture.
9. **Provision of Agricultural Tools and Machinery**: Industries produce machinery and equipment for agricultural uses. Examples include tractors, ploughs, cutlasses and hoes.
10. **Development of Industrial Sector**: Rise in agricultural income due to efficient and economic factor combination brings about development of industrial sector of the economy.

EVALUATION QUESTIONS

1. State seven relationships between agriculture and industries.

2. State five essential industrial goods that farmers may want to buy.

3. State any three agricultural storage structures produced by industry.

**GENERAL EVALUATION/REVISION QUESTIONS**

1. What are Agro-based industries?

2. State five examples of agro-allied industries and the raw materials used.

3. State five examples of cereals.

4. List out five agro-chemicals being used by farmers.

5. State any three agricultural storage structures produced by industry and the produce

being stored by them.

6. List out five roles of Science and Technology in agricultural development.

**READING ASSIGNMENT**

Essential Agricultural Science by O.A. Iwena.Pages 46-47

**WEEKEND ASSIGNMENT**

1. Which of these is not a farm machine? A. planter B. incubator C. sowing machine D. plough

2. Brewery industry needs …… as a raw material for its production. A. groundnut B. pulp wood

C.cotton D. cereal

3. All these are agro-based industries except….. industry A. soap B. textile C. electronics

D. paper

4. ….is not a storage structure. A. freezer B. silo C. crib D. grinder

5. Which of these is a processing structure? A. freezer B. silo C. crib D. grinder

THEORY

1. (a) What are Agro-based industries?

(b) State five examples of agro-allied industries and the raw materials used.

2. State any three agricultural storage structures produced by industry and the produce being stored by them.

**WEEK 7 DATE ………………………………**

**TOPIC: LAND AND ITS USES**

**CONTENT**

* Definition of Land
* General Characteristics of Land
* Agricultural Use of Land
* Non Agricultural Use of Land
* Factors Affecting Availability of Land for Agricultural Purposes

**LAND**

 Land is man’s natural endowment (the gift of nature). It is the solid part of earth’s surface (the soil and its mineral resources) where production like farming and livestock management takes place.

**GENERAL CHARACTERISTICS OF LAND**

1. It is fixed in supply and its value rise steadily in response to increasing demand for it.
2. The supply of land is limited and cannot be easily increased.
3. Land is mobile i.e. cannot be moved from a place of plenty to a place of scarcity.

EVALUATION QUESTIONS

1. What is a land?
2. Mention three characteristics of land

**USES OF LAND**

 Land use is sub-divided into agricultural and non-agricultural uses.

**AGRICULTURAL USES OF LAND**

* 1. **Crop Production: -** Land is used for the production of food crops such as yam cassava rice etc and cash crops such as cocoa, kola nut, coffee etc.
  2. **Grazing: -** Large areas of land set aside where there are abundant grasses for grazing by livestock is called a pasture land.
  3. **Fishery:** - It involves the area of land set aside for the production of fish through fish farming. It involves the establishment of fishponds where fishes are reared artificially to provide necessary source of protein and income for the people.
  4. **Forestry: -** This involves the management of forests land and their resources to produce food and services that are valuable to man. It is established in areas where there is no great pressure for cultivation or where the land is too poor and not suitable for crop production. Economic trees are cultivated on forest land to provide raw materials for wood and paper industries. Medicinal herbs, ropes, fibres, resins etc are also obtained from the forest.
  5. **Wildlife Conservation: -** Wild life refers to animals and birds found in the bush. Wild life is conserved in game reserves. The forest provides cover and food for large number of wild life. These animals and birds provide good recreation facilities and good centres of tourist attraction. Land not suitable for farming may be used for game reserves. They generate revenue to the government. Examples of game reserves and where they are located in Nigeria are
     + Kanji national park in Niger state
     + Borgu game reserve in Kwara state
     + Zurguma game reserve in Niger state
     + Yankari game reserve in Bauchi state.

EVALUATION QUESTIONS

1. Outline four agricultural uses of land

2.Mention five game reserves and their locations in Nigeria.

**NON-AGRICULTURAL USES OF LAND**

1. **Housing**;-This involves the use of land for the construction of residential houses and buildings
2. **Industrialbuilding**: - For building of industrial, individual estates.
3. **Transport**;- Land is used for the construction of many forms of roads, railway line, bridges airports etc.
4. **Social**-**economicactivities**: - Stadia, amusement parks, markets, hospitals cemeteries etc that are used for various socio-economic activities are constructed on land centres
5. **Religiouscentres: -** Construction of churches, mosques and shrines
6. **Mining**: - Land where minerals like petroleum, tin, coal, gold etc are found are used for mining purposes.

**FACTORS AFFECTING LAND AVAILABILITY FOR AGRICULTURAL PRODUCTION**

1. **Population pressure**: - Increase in population lowers the area of available land. Social life and demand on life increases with population growth.
2. **Land tenure system**: - Leads to land fragmentation which rarely gives enough land for effective agricultural venture. Communal land tenure system leads to land deterioration.
3. **Topography:** - Land in mountainous and hilly areas with rocks are not suitable for agriculture. Steepness of the slope of the hill or mountain encourages rapid run off and erosion. Depressed part of the land is easily waterlogged.
4. **Soil type**: - A land with predominantly sandy soil is not suitable for agriculture. A land that is mainly clay is difficult to till and heavy to work on.
5. **Government laws**: - Government laws on land use of decree 1978 prevent individuals from owning land.
6. **Environmental pollution and oil spillage**: - This renders a land unsuitable for agriculture or cultivation.
7. **Climatic factors**: - Restricts the use of land for agricultural purposes. Rainfall is the major determinant in crops and animals distribution. Areas with heavy rainfall favours tree crops while areas with moderate rainfall favour food crops.
8. **Cultural practices**: - Cultural practices like bush burning, shifting cultivation, deforestation etc make land unsuitable for agriculture.
9. **Socio**-**economic factors:** - Use of land for residential buildings, markets, schools, roads etc does make land available for agricultural use.

EVALUATION QUESTIONS

1. Outline five non-agricultural uses of land
2. State five factors that can affect availability of land for agricultural purposes.

**GENERAL EVALUATION/REVISION QUESTIONS**

1. What is land?
2. List three general characteristics of land.
3. Outline four uses of land for agricultural purposes.
4. State five game reserves in Nigeria.
5. Outline five non-agricultural uses of land.
6. List five socio-economic factors affecting land use.

**READING ASSIGNMENT**

Essential Agricultural Science: Chapter 6, pages 105 – 108.

Fundamental Agricultural science: Chapter 2, pages 4 – 12.

**WEEKEND ASSIGNMENT**

1. Which of the following is not a factor affecting land availability for agriculture in Nigeria?A.  rainfall B. topography C. soil type D. soil micro organism
2. The climatic factors affecting land use for agriculture include the following exceptA. pests B. rainfall C. temperature D. light
3. Which of the following farm practice does not have a harmful effect on soil? A. crop rotation B. land clearing C. over grazing D. flooding
4. Agricultural lands should not be used for the establishment of A. game reserve B. pastures C. horticultural crops D. arable crops
5. The use of land for agriculture is not influenced by A. Labour B. Climate C. topography D. population

**THEORY**

1.      State three major uses of land for agricultural purposes

2.      Outline five factors affecting land availability for agricultural purposes.

**WEEK 8 DATE ………………………………**

**TOPIC: AGRICULTURAL LAWS AND REFORMS**

**CONTENT:**

**LAND TENURE SYSTEM IN NIGERIA**

Land ownership ranges from individual ownership to communal ownership. In the individual ownership system, land is held by the family who can farm on it, build on it, pledge it for money or sell it.

In communal ownership system, the land belongs to the community which may be an extended family, a village or a town and no member of the community can use the land against the wishes of the rulers of the community. Only annual crops can be planted on this piece of land.

### LAND TENURE SYSTEM

Land tenure is defined as the system of land ownership or acquisition either by individual, family, and community or government agency either for temporary or permanent use.It is also the body of right and relationship established among men to control and use land.

### TYPES OF LAND TENURE SYSTEM

1. COMMUNAL LAND TENURE: This is a traditional ownership of land whereby land is generally regarded as the property of the community. Every member of the community has the right to use the land for agriculture but cannot sell any part of it since it is regarded as a legacy that should not be sold.

### *Advantages*

1. Each member of the community has the opportunity to request for farm land to provide food and earn some money for his family.
2. Co-operative farming is possible since the land is extensive.
3. Large scale farming is possible due to its large size if only community members co-operate.
4. It is easier to transfer the land to a prospective farmer since individual attachment is almost absent.

***Disadvantages***

1. Inadequate maintenance of soil fertility.
2. Non-members of the community cannot have access to the land for farming.
3. There is usually lack of co-operation among community members if the land is to be used for large scale farming.
4. It leads to fragmentation of land into small and scattered units.
5. Perennial crops cannot be planted because of possible re-allocation of land to another person.
6. Mechanization is difficult to introduce because farm lands are scattered and small.
7. It cannot be used as security to obtain loans from banks.

**EVALUATION**

2. TENURE BASED ON INHERITANCE: This is the type of land tenure in which land is inherited from one’s parents or from one generation to another.

***Advantages***

1. The land can be used as security to obtain loans from bank.
2. The owner prefers to invest on the land to improve its fertility for agricultural production.
3. Mechanized farming can be practiced if the land is large enough.
4. Perennial crops can be planted.

#### *Disadvantages*

1. It leads to land fragmentation since the land is divided among many children.
2. Mechanized farming cannot be practiced on small plots of land.
3. Sharing of land can bring about dispute among family members.
4. Land may belong to people who have no interest in land development or in making the fullest use of the land.

EVALUATION QUESTIONS

1. What is land tenure system?
2. State the types of land tenure system we have in Nigeria.

**Types of Land Tenure**

3. LEASE HOLD TENURE: This is a situation in which the farmer is allowed by the land owner to work on a piece of land for a fixed length of time under stipulated conditions. Certain amount of money is paid as rent for the use of the land. At the expiration of the period of tenancy, the land reverts to the landowner or the agreement may be reviewed if the landlord so desires.

***Advantages***

1. The land is efficiently used.
2. Easy accessibility of land is possible compared to land in communal ownership.
3. There is no time wasting to acquire or leave the piece of land.
4. The owner of the piece of land can earn more money.

***Disadvantages***

1. It cannot be used as security to obtain loans from banks.
2. The user may not be encouraged to plant perennial crops on a piece of land.
3. It can bring disputes between the tenant and the owner.
4. It affects long term planning.

4. TENURE BASED ON FREE GIFT: This is the type of land tenure in which land is donated or given out on good will or free of charge in appreciation or as an incentive.

***Advantages***

1. It ensures the maximum use of the land for increased production.
2. Large scale farming can be practiced depending on the size of the land.
3. It can be used as security to obtain loans.

***Disadvantages***

1. The ownership of land can be challenged at anytime.
2. There may be disagreement over such gifts among family members.

5. STATE OR GOVERNMENT OWNERSHIP OF LAND: In this system, land belongs to the state or government and persons working or living on the land are tenants of the government. This system makes for effective government control of land and use but it may be subject to excessive bureaucratic control which may hinder individual initiative and give room to political abuses.

***Advantages***

1. There is effective government control of land ownership in this system.
2. The government can earn more money leasing out the land.
3. It encourages government investment on the land.

***Disadvantages***

1. The system encourages bureaucratic control which may hinder individual initiative and lead to political abuses.
2. There is monopolistic power over the land as the tenant may not be able to use the land according to their wish.
3. Tenants may tend to lease the piece of land to other people in order to make some money which may hinder development of agriculture.

**CONCLUSION**

We have learnt that land tenure is the body of rights and relationships established among men to control and use land. Types of land tenure include communal, inheritance, free gift, leasehold tenure, and state or government ownership of land.

**GENERAL EVALUATION/REVISION QUESTION**

1. Define land tenure system.

2. State the types of land tenure system in Nigeria.

3. List out three advantages and three disadvantages of communal land tenure.

4. Which land tenure system is most prominent in Nigeria and why?

5. Which land tenure system promotes perennial crop cultivation and why?

**READING ASSIGNMENT**

Read Roles of Government in Agricultural Development from Essential Agric. Pages 154-159.

**WEEKEND ASSIGNMENT.**

1. A major disadvantage of land tenure by inheritance is that the land is. A. very infertile for crop and animal production. B. usuallysmall for commercial farming C. too large for commercial farming D. available for large scale mechanization

2. Which of the following factors largely determines the amount of land available for agriculture in an area? A. cash crop tenancies B.climatic and physical factor C. biotic factors D. religion and tradition.

3. The commonest method of land tenure in Nigeria is ………….. A. inheritance B. lease C. outright purchase D. state allocation.

4. A piece of land is said to be on lease to a farmer when the land is A. inherited from his father B. given to him as a gift C. given as compensation D. given for a specified period on a rental basis.

5. Land tenure system is a process of ……………… A. conserving soil types B. determining the suitability of soil for agriculture C. acquiring land for agricultural purpose D. developing land for building industries.

**THEORY**

1. State five land ownership systems in Nigeria.

2 .Explain four ways in which agricultural production is affected by communal ownership

of land in Nigeria.

**WEEK 9 DATE ………………………………**

**ENVIRONMENTAL FACTORS AFFECTING AGRICULTURAL PRODUCTION (CROPAND ANIMAL DISTRIBUTION AND PRODUCTION)**

**CONTENT**

Environmental factors affecting agricultural production can be grouped into:

* Climate factors
* Biotic factors
* Edaphic factors.

**CLIMATE**: This is defined as the average weather condition of a place measured over a long period of time.

***FACTORS OF CLIMATE*:** It includes rainfall, relative humidity, temperature, light, wind, pressure.

Each of the factors has its own influence on agriculture. This is shown by the distribution of vegetation and crops in the climatic zones. The result is that when the soil condition is favourable, thick evergreen forest develops.

**1). RAINFALL:** Is defined as the amount and distribution of water precipitation within a given time in a given area.

**RAINFALL DISTRIBUTION AND PATTERN:** West Africa is known for its high temperature throughout the year. It is brought about by the south- west monsoon trade wind blowing from the Atlantic Ocean.

The wind blowing from the ocean to the inland drops some water. A narrow part of the coast has rainfall throughout the year against the rest of the region. As we move from the coast, the amount of rainfall decreases. By the time the wind get to the northern part of the country, there is little or no moisture left in it. Here, less rainfall is experienced per year. In the coastal area, the raining season ranges from 8 months to the all year round while in the north, raining season lasts only 3 to 4 months. The moisture required affects crop and livestock production. In the coastal areas more of the southern parts, crops adapted to heavy rainfall predominantly trees, yam, maize, rice, fruit, banana, etc. Much animal rearing does not take place here due to high humidity rate which exposes the animals to tsetse fly infection.

Only animals which can resist the attack of trypanosomiasis can be seen in this area. Examples are N’dama and Muturu breeds of cattle, dwarf sheep and goat, poultry. Those crops that can thrive well in the northern part with little rainfall or resistance to drought are guinea corn, millet, groundnut, cowpeas, cotton etc.

**EVALUATION**

1. What is rainfall?

2. List those crops that perform well in the Northern part and Southern part of Nigeria

**IMPORTANCE/EFFECT OF RAINFALL**

1. It determines the distribution of crops and animals.

2. It helps to dissolve nutrients in the soil making it available for plant use

3. It is necessary for seed germination.

4. Excessive rainfall leads to leaching of nutrients and causes soil erosion.

5. It determines the type of vegetation of an area.

6. Insufficient rainfall causes crop failure and poor yield.

**2). TEMPERATURE:** Is defined as a measure of the heat energy which a body contains or the degree of hotness or coolness of a place, at a point in time. Temperature varies from the coastal areas to extreme north. In the dry season, temperature is not high in the coaster area as against the north which is extremely high.

**IMPORTANCE/EFFECTS OF TEMPERATURE**

1 It affects the distribution of crops and animals.

2. Necessary for germination of seed.

3. Unfavorable temperature may result in seed dormancy

4. High temperature may cause premature dropping of fruits and sudden death of livestock in heat stress.

5. High temperature reduces the performance of livestock.

**3). SUNLIGHT**

***IMPORTANCE/INFLUENCE***

1. It is necessary for photosynthesis.

2. It affects the rate of production in poultry.

3. It affects evapo- transpiration.

**4). WIND**

***INFLUENCE/IMPORTANCE***

1) High wind may cause wind erosion.

2) It aids seed and fruit dispersal

3) It can aid pollination and spread of disease.

4) It helps in the distribution of rainfall and changes in seasons e.g. rainy and dry season

5) High wind velocity causes damages to crops.

**5). RELATIVE HUMIDITY**

***INFLUENCE***

1. It results in the formation of rain**.**

2. It affects the performance of crops and animals

3. High humidity in poultry causes moldiness of feed and litters.

4. Low humidity leads to heat stress in animals.

5. Relative humidity determines the type of pests prevalent in an area.

6. High relative humidity forms the re-growth of disease pathogen.

**GENERAL EVALUATION**

1. What is climate?

2. Discuss the importance of rainfall in agriculture.

3. What is temperature?

4. What is the difference between a farm and a farmstead?

5. Outline five principles of farmstead layout.

**READING ASSIGNMENT**

Read Environmental Factors Affecting Agricultural Production from Essential Agriculture by O.A. Iwena pages 212-216

**WEEKEND ASSIGNMENT(WK 9A)**

1. The climatic factors affecting the production of animals and plants include the following except A. rainfall B. temperature C. pests and disease D. sunlight
2. Factors of climate include the following except A. Rainfall B. temperature C. light D.vapour (cloud)
3. Which of the following is not a function of the forestry department ? A. Routine vaccination of wild animal B. conservation of forest resources C. specification of size of tree to be felled D. grading of timbers for export
4. The taungya system of farming… A. integrates arable crops with forestry B. gives priority of land use to arable crops C. gives priority of land use to forestry D. encourages establishment of game reserves
5. Which of the following is not an edaphic factor affecting agricultural production?

A. Soil pH B. Soil texture C. Soil organism D. soil type

**THEORY**

1 (a) Define forest

(b) Outline eight uses of the forest and its resources.

2 Write brief notes on the following.

(a) Forest regulation (b) Selective exploration (c) Afforestation (d) Reforestation

**BIOTIC FACTORS OR BIOLOGICAL FACTORS AFFECTING CROPS AND ANIMAL PRODUCTION**

**1. PREDATORS:** These are living organisms that prey or feed on other organisms. Examples are birds, rodents, insects, etc. Some are beneficial and some destructive. Some control harmful pests of crop and animals, others feed on other animals e.g. hawk etc.

**2.PARASITES (PARASITISM)**: A parasite is an organism which lives on or in another living organism known as the host. It obtains its food from the body of its living host. Often, a parasite harms its host by causing diseases or death.

***TYPES OF PARASITES***

1. **ENDOPARASITE: - T**hese are parasites which live inside or within the body of other animals. e.g. liver fluke, tapeworm, roundworm or ascaris.
2. **ECTOPARASITE: -** Parasites that live outside or on the host. Example tick, lice, mites, insect bugs, fleas, etc.

**3. SOIL ORGANISM:** Soil organism can be classified into micro organism or macro organism.

Microorganisms are bacteria, virus etc, while macro organisms are rodents, termite, centipedes etc. Some like bacteria and fungi can cause disease, some aid aeration in soil, hence improving soil fertility. Some like root nodule bacteria can fix nutrients directly to plant and soils. Some help in the decomposition of plant and animal material to form humus.

**4. PESTS**: These organisms cause damage or destroy crops either in the field or in stores. They include insect, rodents, birds and some animal e.g. monkeys. They reduce the yield of crops and animals thereby reducing the farmer’s income. Some are vectors or carriers of diseases .The cost of their control increases the cost of production.

**EVALUATION QUESTIONS**

1 What are pests?

2 State five examples of pest.

**5. DISEASES**

Disease is a situation in plants or animals in which there is a deviation of the plant or animal from normal state of health. Disease can be caused by pathogens which are virus, bacteria, fungi, protozoa etc. They cause reduction in the yield of crops and animals. They can cause loss or death of plants and animals. The cost of control increases the cost of production which affects the income of the farmers.

**6. MUTUALISM (SYMBIOSIS)**

In mutualism, two organisms live together for the mutual benefit of each other. Termites and the protozoa living in their guts are mutualistic. The protozoa receive protection from termites; it helps in the breakdown of food in termites. The protozoa help them to digest it.

**7. WEEDS**: They compete with crops for space, water, nutrients and sunlight. Some may harbour diseases and pest. They reduce the yield of crops. The control increases the cost of production.

**EDAPHIC FACTORS OR PHYSICAL FACTORS**

**1** ***SOIL pH***: This is the degree of acidity or alkalinity of a soil.

1. It affects the growth of plant.
2. It affects the availability of soil nutrients to plant.
3. It affects the presence of soil micro-organisms

**2 SOIL TEXTURE:** This is the measure of fineness or coarseness of soil samples.

1. It determines the type of soil in an area.
2. It determines the level of soil fertility.
3. It determines the type of crops to be grown.
4. It affects the level of leaching and erosion of the soil.

**3 SOIL STRUCTURE:** This is the physical appearance of the soil according to the way individual particles are packed or arranged**.**

1. It determines the fertility of the soil.
2. It determines the water retaining capacity of the soil
3. It determines the level of aeration.
4. It determines the level of micro-organism

**GENERAL EVALUATION/REVISION QUESTIONS**

1. What is soil structure?

2. Define soil texture.

3. What is soil pH?

4. State three features of soil texture

5. List out any five soil organisms

**READING ASSIGNMENT**

Read Pasture and forage crops from Essential Agriculture by O.A. Iwena pages 179-182.

**WEEKEND ASSIGNMENT(WK 9B)**

1. Which of the following is not an edaphic factor affecting agricultural production? A. Soil pH B. soil texture C. soil organic D. soil type
2. Plant and animal remains allowed to decay in the heap is referred to as. A. Farmyard manure B. compost C. green manure D. inorganic manure
3. Which of the following is a primary product of forest trees? A. Pulp B. timber

C. paper D. cardboard.

1. Which of the following practices can prevent excessive evaporation from soil surfaces? A. mulching B. weeding C. harrowing D.ploughing
2. The appearance of the soil according to the way individual particles are packed or arranged is called A. soil structure B. soil texture C. soil pH D. soil profile
3. The following are endo-parasites of livestock except A. roundworm B. tapeworm

C. liver fluke D. earthworm.

**THEORY**

1) Discuss briefly five biotic factors that affect crops and animals distribution.

2) State three edaphic factors affecting crops and animals distribution.

**WEEK 10 DATE ………………………………**

**TOPIC: CLASSIFICATION OF CROPS**

**CONTENT:**

* **Classification Based on Life Cycle**
* **Classification Based on Morphology**
* **Classification Based on Uses**

A crop is a plant which is cultivated by man for some beneficial purposes. Crops can be classified based on (i) life cycle (ii)morphology (iii) uses.

**CLASSIFICATION BASED ON LIFE CYCLE**

The life cycle of a crop is the period from planting of seed to maturity of the crop. Based on life cycle, crops can be grouped into three: -

1. ANNUAL CROPS: - These are crops which grow and complete their life cycle within a year e. g. cotton, cowpea, yam, rice etc.
2. BIENNIAL CROPS: - These are crops which grow and complete their life cycle within as year e. g. cassava, pepper, onions, carrot, ginger etc.
3. PERENNIAL CROPS: - These are crops which grow and complete their life cycle in more than two years e. g. banana, orange, cocoa, coconut etc.

EVALUATION QUESTIONS

1. What is a crop?
2. Classify crops based on life cycle.

**CLASSIFICATION BASED ON MORPHOLOGY**

On the basis of morphology i.e. structure (form and shape of a plant), crops are classified as:

1. MONOCOTYLEDONOUS CROPS: These are crops which bear seeds that have only one seed leaf (cotyledon). Their leaves have parallel veins and they have fibrous root system. Examples include:maize, rice, millet, wheat,oil palm, grasses, etc.

2. DICOTYLEDONOUS CROPS: These are crops which bear seeds that have two seed leaves or cotyledons. They possess leaves with net veins and tap root system. Example include: mango, orange, cowpea, groundnut, kola nut, pepper, etc.

EVALUATION QUESTIONS

1. State five characteristics of monocot crops and three examples.

2. State five characteristics of dicot crops and three examples.

**CLASSIFICATION BASED ON USES**

1. CEREALS: - Crops grown for their grains or seeds which are rich in carbohydrates. They belong to the grass family e. g. maize, millet, rice, wheat, oat, barley, guinea corn etc.
2. LEGUMES (PULSES): - These are crops grown for their seeds or grains which are rich in proteins e. g. cowpea, groundnut, soya beans, pigeon peas etc.
3. ROOTS AND TUBERS: - These crops produce tubers under the ground that are rich in carbohydrates e. g. cassava, yam, potato, carrot, etc.
4. VEGETABLES: These are crops grown for their leaves, fruits, or roots which are rich in vitamins and minerals e. g. tomato, lettuce, okro, amaranthus, cabbage etc.
5. SPICES: - These crops are also rich in vitamins and minerals and are rich in food flavours e. g. pepper, ginger, garlic, onions, curry etc.
6. BEVERAGE CROPS: - They are used in making food drinks e. g. cocoa, coffee, tea, kola nut etc.
7. FRUIT CROPS: - These are plants which bears edible fruits that are rich in vitamins and minerals e. g. oranges, cashew, guava, water melon etc.
8. OIL CROPS: - These are crops which produce edible oil when processed e. g. cotton seed, coconut, oil palm, groundnut, shear butter etc.
9. LATEX CROPS: - They produce fluid called latex which when processed served as raw materials for making tyres, plastics, foam etc. Example is rubber tree.
10. FIBRE CROPS: - They produce fibres used for making clothes, ropes, sacs etc. Examples include cotton, sisal, jute, hemp, kenaf etc.
11. DRUG PLANTS: - Crops grown for medicinal purposes e. g. tobacco, neem, Indian hemp etc.
12. FORAGE CROPS: - Crops grown to feed ruminant farm animals e. g. stylo, cowpea, guinea grass etc.
13. ORNAMENTAL CROPS: - Crops grown to beautify our environment e. g. hibiscus, morning glory etc.

EVALUATION

1. What are a) forage crops b) ornamental crops?
2. Give three examples each of: a) fibre crops b) beverage crops c) drug plants

**GENERAL EVALUATION/REVISION QUESTIONS**

1.What are crops?

2. Classify crops based on life cycle.

3. Classify crops based on morphology.

4. Classify crops based on uses.

5. List out three examples of spice crops.

6. State five biotic factors affecting agricultural production.

**READING ASSIGNMENT**

Essential Agricultural Science by O.A. Iwena.Pages 130-132

**WEEKEND ASSIGNMENT**

1. Cocoa and coffee are examples of …… crops. A. spice B. stimulant C. beverage D. cereal

2. All these are annual crops except A. cotton B. cowpea C. yam D. pepper

3. Coconut is a/an… crop. A. annual B. biennial C. perennial D.ephemeral

4. Monocot crops have… A. two seed leaves B. three seed leaves C. tap root system

D. fibrous root system

5. Dicot crops have… … A. one seed leaves B. three seed leaves C. tap root system

D. fibrous root system

THEORY

1. (a) Classify crops based on life cycle.

(b) Classify crops based on morphology.

2. In a tabular form, state seven differences between monocot crops and dicot crops.