SCHEME OF WORK FOR YEAR 10 THIRD TERM

WEEKS	TOPICS AND CONTENT
1	Sources of farm power . human power, animal power, mechanical power, wind power etc
2	Mechanization . definition . explanation of mechanization in a broad term
3 – 5	Prospect of mechanization . advantages of mechanization . limitations of mechanization . Possible ways of improving agriculture through mechanization.
6	Factors of production . land, labour, capital and management
7	Farm Manager . functions of a farm manager
8 – 9	Agricultural Financing . sources of farm financing: banks, governments, cooperatives, individuals etc
10	Implications of farm credits
11	Practical
12	Revision
13	Examination

SOURCES OF FARM POWER

Power is defined as the rate of doing work or the rate of expenditure of energy. Farm power can be obtained from the following sources: solar power, mechanical, water power, animal power, human power, electrical power, wind power and biogas.

HUMAN OR MANUAL POWER

Human power is derived from the power provided by human beings. It is the most common power in farm operations. Human power is used with traditional tools. It can be hired; it may be skilled or unskilled.

Human power is required in all farm operations. In crop production, human power is required in land clearing, stumping, planting, weeding, harvesting, storage, food processing, land preparation e.g. ploughing, harrowing and ridging.

ADVANTAGES

1. Man uses his intelligence to control the work he does
2. It is easily available in all farm operations
3. He has control over all other sources of farm power
4. It is the most intelligent source of farm power used for precision of jobs

DISADVANTAGES

1. Human power is not stable. A normal human power is about 75W and it decreases to about 20W when it is used continuously.
2. Poor state of health of the individual may affect his performance
3. It is expensive
4. Human beings can easily die out of exhaustion
5. Efficiency of work decreases with age
6. It consumes time and is less efficient

ANIMAL POWER

This is the type of power derived from some animals which are used to perform certain farm operations. Animals like the bull are used for pulling plough, harrows, planters, ridgers while donkeys, camels, and horses are used for transportation of farm produce. Animals can be hired. Draught animals such as oxen, bullock etc. are yoked. The yoke is attached to any farm

implement. Animal drags the implement while man controls the direction of the implement for the tillage of soil.

Qualities of a good draught animal

1. It must have a good body size or deep barel
2. It must have strong hind limbs and a sloping rump
3. It must possess strong hooves, good strides and stance/ gait
4. It should be castrated
5. Must be docile
6. It should strong, energetic or powerful.

Precautions to be observed when using draught animals

i. Treat animals fairly to prevent them from being hostile
ii. Apply muzzle
iii. Do not overwork draught animals
iv. The best time to use animals are early in the morning or evening
v. Keep them in a healthy environment
vi. Feed and provide them with adequate water.

ADVANTAGES

1. It can perform more tedious jobs than man, because the output is bout 500W for a bull
2. Initial outlay is cheap relative to cost of machines
3. It can be controlled or easy to operate
4. It has a relatively low maintenance cost compared to machines
5. Animals do not get fatigued easily, compared to man
6. It can operate on rugged terrains
7. It can be used for evacuation of produce from inaccessible areas
8. Animals removes drudgery and makes work easier

DISADVANTAGES

1. Huge amount of money is needed to feed and maintain the animals
2. It cannot perform at certain periods of the day – afternoon
3. Diseases may affect the efficiency of the working animals

4. Poor handling of the animals by the operator may result in poor performance and even refusal to work
5. The use of animals is restricted to certain climatic zones, e.g. tsetse fly-free zones
6. It is unsuitable for processing agricultural products as they may eat up the products`

MECHANICAL POWER

This requires the use of machines and engines like planters, harvesters, harrows, ploughs, ridgers to carry out various farm operations like ploughing, weeding, planting, processing and transportation. Machines are used in tractions, grinding, and food processing e.g. water pump, generators, tractors and bulldozers

ADVANTAGES

1. It can handle more land area per unit of time
2. It works faster and more efficiently
3. It reduces labour cost and overall cost of production
4. It is not prone to diseases
5. It can perform a wide range of farm operation
6. Reduction in farm drudgery or makes farm operations less tedious

DISADVANTAGES

1. It requires high capital investment
2. It requires lots of technical skills to operate
3. It can lead to unemployment
4. It cannot be used by small scale farmers
5. It can cause air pollution through gases from exhaust pipes
6. It requires high cost of maintenance and not easily available
7. It can destroy soil structure

ELECTRICAL POWER

This type of power is derived from electricity or generator. It is used for many purposes. It is a neat or clean source of energy. It is very efficient and reliable but expensive. Farming operations which require electrical power are;

incubation, refrigeration, milking machines, drying of products, brooding of chicks, shelling of fruits/seeds, candling, egg grading etc.

ADVANTAGES

1. It cannot contaminate products
2. It is a cheap source of power
3. It is very versatile and neat
4. It aids fast operation or increases production
5. It is very dependable and easy to operate
6. It saves labour

DISADVANTAGES

1. Its supply is not always regular, especially in developing countries lie Nigeria
2. It is dangerous or fatal, if carelessly handled
3. It must strictly controlled or regulated
4. Cost of maintenance may be high and its expensive
5. It can cause fire hazards
6. It cannot be widely used in field operations

SOLAR POWER

Solar energy is derived from the radiation, light and heat reaching the earth's surface from the sun. The energy from the sun is the ultimate source of energy. It is converted into electrical energy by solar panels installed in bulidings. In other words, solar energy is trapped by photo-voltaic cell or solar collectors or panels. It is then converted to electrical energy which can be stored in batteries.

ADVANTAGES

1. It is a cheap source of power
2. It is free and easily available
3. It is a neat source of energy

DISADVANTAGES

1. It is only available during the day
2. It cannot be adjusted and stored
3. Its supply cannot be controlled
4. It is expensive to harness and store
5. Excess of it can cause transpiration and evaporation
6. It fluctuates in supply

WIND POWER

This is generated by wind movement. Its use in windmill helps to pump water out of a borehole to a generating set for the production of electricity. It can be converted to mechanical power.

ADVANTAGES

1. It can serve as alternative to electrical power
2. It is cheap and available everywhere

DISADVANTAGES

1. Its supply is sporadic and uncertain as power depends on the wind
2. Its operation is expensive compared with the energy it generates
3. It is limited to certain farm operations
4. It cannot be stored and difficult to control
5. Efficiency is highly varied

WATER POWER

Water power is the power derived from water flowing in rivers, streams and dams. It is used in hydro-electric stations to drive the turbines.

ADVANTAGES

1. It is very cheap
2. It is easy to be harnessed
3. It can easily be converted to other forms of energy.

DISADVANTAGES

1. Low level of water can hinder low electricity output

2. It is not available in all areas
3. It could be destructive if carelessly handled
4. It does not supply water directly

BIOGAS POWER

Biogas is a new method of generating power by making use of farm wastes, especially cow dung. Animal dung is carefully collected and processed through scientific means to produce certain gas that provides power. Animal droppings mixed with water are accumulated in airtight device called digester or dome. As it decays anaerobically by microbes, hydrocarbon (methane) which is colourless and odourless gas is released. This hydrocarbon is stored and used for heating and lighting.

ADVANTAGES

1. It constitutes a cheap source of power
2. It can convert chemical power in dung to heat power
3. Power derived from biogas can be used as source of heat for brooding chicks
4. The power can also be used for cooking and drying
5. It can be easily controlled

DISADVANTAGES

1. It is not common source of power
2. It requires expertise which may not be easily available
3. It may be expensive to set up and maintain
4. It is only limited to where animals are reared on commercial basis, where dung is easily available

FARM MECHANISATION

Farm mechanisation is the application of engineering principles and technology in agricultural production, storage and processing on the farm.

PROBLEMS OF FARM MECHANISATION

1. Land tenure system
2. Scattered farm holdings
3. Poverty of farmers
4. Inadequate facilities (machinery)
5. Bad topography
6. Varied soil types
7. Inadequate spare parts
8. Inadequate technical manpower
9. Problems of stumps and logs

ADVANTAGES OF FARM MECHANISATION

Farm mechanisation has the following advantages

1. Timeliness of operation
2. It saves labour
3. It reduces health hazards
4. It reduces drudgery
5. Increases farm revenue
6. It encourages large scale farming
7. Increases output
8. It promotes specialisation of labour
9. Co-operation among farmers
10. It saves time
11. Reduction in cot operation
12. Improvement in quality of produce
13. Availability of labour for other sectors
14. Use of less human labour

DISDAVANTAGES OF FARM MECHANISATION

1. High cost of machines
2. Displacement of workers
3. Compaction of soil
4. It cause environmental pollution
5. Degradation of landscape

6. Land tenure system
7. Destruction of soil structure
8. Redundancy of farm labour
9. Few crops can be mechanised
10. Inadequate technical know-how
11. Damage to crops
12. Inadequate spare parts
13. High cost of maintenance
14. Spread of pest and diseases
15. Human control
16. Unstable fuel supply

LIMITATIONS OF FARM MECHANISATION

Factors limiting agricultural mechanisation in Nigeria can be discussed under the following major headings

a. Economic limitation

i. Machines are not readily available
ii. Most farmers are poor and cant afford them
iii. Cost of hiring the machines are high
iv. Cost of maintenance is high
v. Operators of machines demand high pay/wages which most farmers cannot afford

b. Technical limitation

i. There is lack of technical know-how of the machines
ii. Experts on these machines are not readily available
iii. Mode of operations of most machines are not known
iv. Most of the machines are not adapted to our local environment/needs
v. Very few schools exist for the training of machines operators

c. Lack of maintenance

i. Most machines are imported
ii. Replacement of parts are not available
iii. Inadequate trained personnel to repair farm machines
iv. Facilities for repair and maintenance are lacking

v. The very few trained personnel are not always available when machines break down.

d. Small farm holdings

i. Land tenure system encourage fragmentation of land which cannot be mechanised

ii. Agriculture is practised by peasant farmers and they possess small area of farmland.

POSSIBLE WAYS OF IMPROVING AGRICULTURE THROUGH MECHANISATION

1. Farmers should be educated to accept modern systems of farming, especially in the area of mechanisation
2. Government should provide loans to enable farmers purchase farm machines
3. The land tenure system should be reviewed to enable farmers to acquire large hectares of land
4. Simple and less expensive machines should be developed
5. Government should establish agricultural engineering schools to train personnel and fabricate simple machines

FACTORS OF PRODUCTION

Production refers to all economic activities which result in the creation of goods and services. It is the process of making or manufacturing goods as well as process of providing services. For goods and services to be created during the process of production, certain factors have to come to together. These resources or factors that are combined for goods and services to be purchased are known as **factors of production.** There are four factors of production. These are land capital, capital, and entrepreneur/management.

LAND

Land refers to where productive activities such as growing of crops, rearing of animals and establishment of farmstead etc are carried out. Land is a free gift of nature or a natural resource. It is immobile and a fixed factor. It is subject to the law of diminishing returns. It includes soil, mineral, water and vegetation. The reward for land is collected from tenants. It can be used as collateral for loans, limited in supply especially in highly populated areas. Its value is determined by its location and can appreciate or depreciate.

Importance of Land in an Agricultural Enterprise

1. Land is used for the cultivation of food crops such as maize, yam, pepper, rice etc
2. It is also used for the cultivation of cash crops e.g. cocoa,rubber, oil palm etc
3. It is used for rearing animals
4. It is used for forest development
5. It is also used for fish pond development
6. It is used for wildlife conservation
7. Land is used as collateral for securing loans from banks

Non-agricultural uses of Land

1. Land is used for construction purposes e.g. airports, roads etc
2. It can be used for social or recreational purposes e.g. schools, markets, cementries etc
3. Land is used for residential buildings
4. Land can also be used for industrial buildings
5. It can be used for minning purposes e.g. extraction of petroleum, gold etc

Appreciation of Land

Land can appreciate (increase) in its value through the following ways:

i. Fallowing
ii. Addition or use of fertilizers/manure to increase its fertility
iii. Use of clean uninfected inputs, e.g. planting materials like seeds

iv. Weeding/clearing to remove weeds that compete with crops for nutrients and space
v. Good drainage
vi. Good access road network
vii. Irrigation
viii. Appropriate soil tillage that can prevent soil erosion

Depreciation of Land

Land can depreciate or decrease in its use or value through the following ways:

i. Erosion menace
ii. Infestation by weeds
iii. Infestation by pests
iv. Infestation by diseases
v. Continuous cultivation without the use of fertilizer/manure
vi. Abuse on land e.g. overgrazing, indiscriminate bush burning
vii. Dumping of toxic materials as it tends to reduce soil fertility
viii. Water-logging

LABOUR

Labour includes all forms of productive human efforts put into or utilised in production. It is mobile and has feelings and cannot be used anyhow. Human effort can be intellectual or mental, manual or physical, provided it is directed towards the production of goods and services. It exists in three types; skilled labour (white collar-jobs), semi-skilled and unskilled (brown collar-jobs). The unit of labour is man-hours or man-days and its reward is wages and salaries. It is a variable asset, converting natural resources into usable products. Its output can be improved by training.

Forms of labour available to the farmer include:

a. Family Labour
   i. This refers to labour provided by the man, wife and children

ii. It involves the head of the family as the manager/operator
iii. He organises his labour by himself and assigns job to each member of his family
iv. His major source of labour is relatively cheap

b. Personal Labour

c. Communal Labour

d. Hired or Paid Labour

i. This is the kind of labour that is paid either daily, weekly or monthly
ii. It is common where a farmer has large farm size
iii. It is engaged either in a permanent or time-rated basis
iv. Not readily available; hence, expensive

Importance of Labour in Agricultural Enterprise

1. Intellectual labour ensures high agricultural production
2. Skilled labour provides the expertise required for major farm operation
3. It ensures the success of any agricultural enterprise
4. It provides the services required to achieve the various stages of agricultural production.

CAPITAL

Capital includes all man-made productive assets which are used in production. It can appreciate or depreciate.it is a stock of asset used in production. And its reward is interest. It is used to acquire other factors of production, obtained in form of loans or subsidies. Sources of capital include personal savings, banks, government agencies, cooperative societies etc. capital is grouped into two classes:

- **Fixed Capital**: these are assets or items purchased for continuous use in production. Example of fixed capital are farm buildings, motor vehicles, farm tools and implements, land furniture and fitting, incubators, ploughs, harrows, tractors, milking machines etc
- **Working or Variable Capital**: these are capital or assets which are used up during the process of production. Examples include; water, feeds, drugs, cash in hand, vaccines, litters, fertilizers, seeds, chemicals, etc

Importance of Capital in Agricultural Enterprise

i. Working capital is used in the day-to-day running of the farm enterprise
ii. It is used for paying wages
iii. It is used for the purchase of farm inputs, maintenance services on the farm, and feeding of livestock, etc
iv. Fixed capital in form of immovable houses and farmsteads provide shelter for farm operations
v. Fixed capital in form of machinery provides farm power for farm operations
vi. Fixed capital is used to generate more funds and the success of farm enterprises usually depends on the maximum use of these capital assets
vii. Working capital helps facilitate farm expansion or increase in farm size

MANAGEMENT OR ENTREPRENEUR

Management refers to the person or group of persons who coordinate, organise and control the use of other factors of production. It determines when to produce, what to produce, the type of production, supervise work, recruits workers determines what to sell in order to make profit.

Features of Management

i. It involves the management skills of an individual or group of persons
ii. It influences the organisation of other factor of production
iii. It co-ordinates and controls other factors of production
iv. It is involve in decision making
v. It determines the level of pay or wages
vi. Management reward is profit
vii. The quality of management influences the output

Function of a Farm Manager

The functions of the manager is grouped into five major headings

1. **Organisation**
    i. Secures suitable land for farming

ii. He determines what to produce and scale of production
iii. He procures loan or capital for farming
iv. He employs workers for the farm
v. He decides on which enterprise(s) to undertake, given the available resources e.g. fish farming, tomato production etc

2. Administration

i. He supervises the work on the farm and arranges work roasters
ii. He directs staff on day-to-day activities
iii. He makes arrangement for staff welfare
iv. He rewards or discipline staff according to their performance
v. Organises training of manpower in the farm
vi. Maintains good labour relations to avoid the disruption of farm activities
vii. He acquaints himself with government agricultural policies with respect to opportunities and constraints they pose on the farm

3. Production

i. He is responsible for the purchase and use of farm inputs
ii. He ensures the health of animals/crops on the farm
iii. He makes arrangement for general security of the farm and ensures adequate supply of feeds
iv. He avoids waste by efficient use and maintenance of farm resources
v. He sets production targets and wage level

4. Marketing

i. He determines the quantity of produce to sell
ii. He determines the best marketing channel to use to make maximum profit
iii. He determines when to sell to make maximum profit and at what price to sell

5. Evaluation

i. He keeps the general record of the farm
ii. He supervises account and book keeping of all operations on the farm
iii. He develops new strategies for further improvement of farm operations

iv. He analyses farm operations with respect to targets and objectives

Problems of a Farm Manager

1. Inadequate information
2. Marketing problems
3. Inadequate farm input
4. Financial problems
5. Inadequate personnel
6. Government policies
7. Transport problems
8. Administrative problems

AGRICULTURAL FINANCING

Agricultural financing is the supply of and demand for funds in the agricultural sector of the economy. It is the act of acquisition and use of capital in agriculture. Invariably agricultural credits are loans obtained by the farmer to start or expand his farming business.

Types of Farm Credits

1. Short term credit: This is a productive credit which the borrower is expected to refund in a year or less. It may be used to purchase livestock feeds, fertilizers, seeds or to pay hired labour
2. Medium term credit: this credit is to be repaid within a period of two-five years. It may be used to purchased machinery or housing for livestock
3. Long term credits: This credit is repayable within a period of 3-20 years. It can be used to purchase costly fixed assets such s land, construction of farm buildings, dams and irrigation projects.

IMPORTANCE OF AGRICULTURAL FINANCING

1. It enables farmers to meet seasonal and annual fluctuations in income and expenditure
2. It enables farmers to adjust to changing economic situations

3. It also increases the efficiency of the farmers and increase the size of his farm
4. It helps to protect against adverse conditions of the farmit enables farmers to acquire more farm inputs for increased production

SOURCES OF FARM FINANCE

1. **Agricultural bank**
2. **Commercial bank'**
3. **Supervised agricultural credit scheme**
4. **Thrift and saving societies**
5. **Money lenders**
6. **Cooperative societies**
7. **Government agencies**
8. **Self-finance**
9. **Individuals**

Problems Farmers may encounter from some Credit Sources

1. **Commercial banks:**
   i. They are usually biased in favour of large scale farmers
   ii. They demand collateral which farmers cannot provide
   iii. There is a problem of relatively high interest rate
2. **Community banks**:
   i. The amount of credit is usually small and inadequate to meet the needs of farmers
   ii. They insist on a-would- be lender coming to open to open an account with them before loans are embursed
3. **Money lenders**:
   i. They are usually biased towards enterprises that brings in quick returns to repay the loan
   ii. Their interest rate are too high to allow for an appreciable input from the farm business
4. **Family sources**:
   i. The use of loan is usually small and inadequate
   ii. They usually insist on short term credit

IMPLICATIONS OF FARM CREDITS

Farmers find it difficult to get loans from banks because of the following reasons:

1. Interest rate
2. Collateral security
3. Long gestation period of some crops
4. Unpredictable climate which can lead to crop failure
5. Lack of farm records
6. High level of loan defaulters
7. Lack of insurance policy
8. Lack of moratorium
9. Land tenure system
10. Small farm holdings
11. Lack of awareness
12. Bureaucracy