Unit 4: FARM ECONOMICS AND FARM MANAGEMENT		
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FARM ECONOMICS AND FARM MANAGEMENT

Introduction:

- Agricultural economics refers to the science which deals with the studies of how scarce resources are allocated to meet the alternative needs.
- This is the study of how best man can utilize crops and animals with minimum losses to get maximum returns

It's about allocation of scarce resources to achieve a particular goal (satisfy his unlimited wants) which could be making more profits, have more time for leisure etc

In agriculture production, resources used in production include; land, labour and capital. It should be noted that these resources are scarce and it is very important for the farmer to maximize his or her resources for the better returns.

Economics is divided into two main branches namely:-

[1] Micro-Economics; this deals with specific units in the exploitation of the scarce resources on the farm. It deals with price determination and allocation of the scarce resources e.g. examining the small units of an enterprise (It looks at the functioning of the individual economic units)

[2] Macro-Economics; this is the study of aggregates and averages of the whole economy in a broad way with respect to fluctuation in the national output, national income, national expenditure, total consumption and total investment

It is the study of the structure and performance of national economies and of policies that governments use to effect economic performance

For production to take place there are production decisions that have to be taken; these are referred to as the ***fundamental economic questions***. The farmer must ask himself the following economic questions;

1. **What to produce?** This is determined by the available resources and the ability to combine them
2. **How to produce?** This is concerned with the production methods and skills required in the combination of resources to produce a given out put that is, production methods
3. **How much to produce?** This depends on the demand for the product and the demand will depend on the number of people in an area and their income levels
4. **How and when to sell and buy?** This is determined by the nature of the product and the timing of the availability of market for the product
5. **For whom to produce for?** It involves identifying market for the product. Farmers may produce for export (external markets) or for domestic e.g. Wagagai and Mairye estate grow flowers for export

- What are the decisions that would be made in agricultural production ***[UACE 2014; No. 8 (a) (i)]***

The basic Principles of economics on which the subject matter centers

[1] Goods and services; these are items that prove to be useful to man in life and serve the purpose of satisfaction. Goods can be classified as consumer or producer goods

Services; are products but of an intangible nature e.g. transport and communication

[2] Scarcity; economic scarcity means resources are limited in supply relative to demand. That is to say the goods and services available are scarce relative to people's desire for them. According to modern economics, scarcity exists whenever there is an opportunity cost, that is, whenever a meaningful choice has to be made. Human wants/needs are many, varied and the means of satisfying them are limited. Therefore because resources are scarce, man has to make a choice among the alternatives to be able to satisfy the unlimited wants by using the available resources.

Causes of Scarcity

1. Natural factors like drought, pests and diseases, heavy storms, floods, landslide among others
2. High costs of production which limits the supply of goods and services, that is people do not go in for expensive production but instead look for those where the total cost of production is very low.
3. Poor production methods that limit the scales of production. In developing countries, most farmers use hoes for cultivation instead of tractors leading to low productivity hence scarcity of goods.
4. Inadequate stock of the factors of production e.g. land, labour, capital (physical and financial)
5. Some crops such as coffee have long gestation period which causes limited supply of coffee to the market and seasonal production hence scarcity.
6. Poor planning and price policies that discourages producers from taking up certain enterprises leading to scarcity of such goods and services in the market

[3] Choice; because of scarcity of resources to satisfy man's un-limited wants, man is forced to make choice. A choice refers to the selection of the desire to be fulfilled according to human wants or it is the preferential determination between two ends. When making a choice, the most pressing need should be satisfied first. This is called **scale of preference**

[4] Opportunity cost; this refers to the alternative (returns) foregone or given up when the resources are used to produce a commodity instead of its next best alternative use. Since resources are scarce, more of one commodity has to be produced and the less of the other. In order for you to choose amongst the two alternatives, one has to choose the best alternative and the one that has been left out is called **opportunity cost.**
Therefore opportunity cost is defined as the alternatives foregone when making a choice e.g. a farmer may choose between growing potatoes and cassava. Where there is no alternative to choose from, the opportunity cost is **zero**

Importance of opportunity cost

1. It helps the consumers to make consumption plans or choices
2. It is the basis for the government in planning its expenditure
3. It helps in specialization in international trade (when a country is planning what to produce for international market)
4. It helps in factor pricing (payment for factor of production)
5. It is used as a basis for planning on the farm

Limitations of opportunity cost

1. It is subjective and lacks uniformity, i.e. it varies from one individual to the other
2. It is based on the assumption of rational producer or consumer which is not always true
3. It does not have a cardinal value therefore it is hard to perceive
4. It operates in situation of full employment-something quite ideal

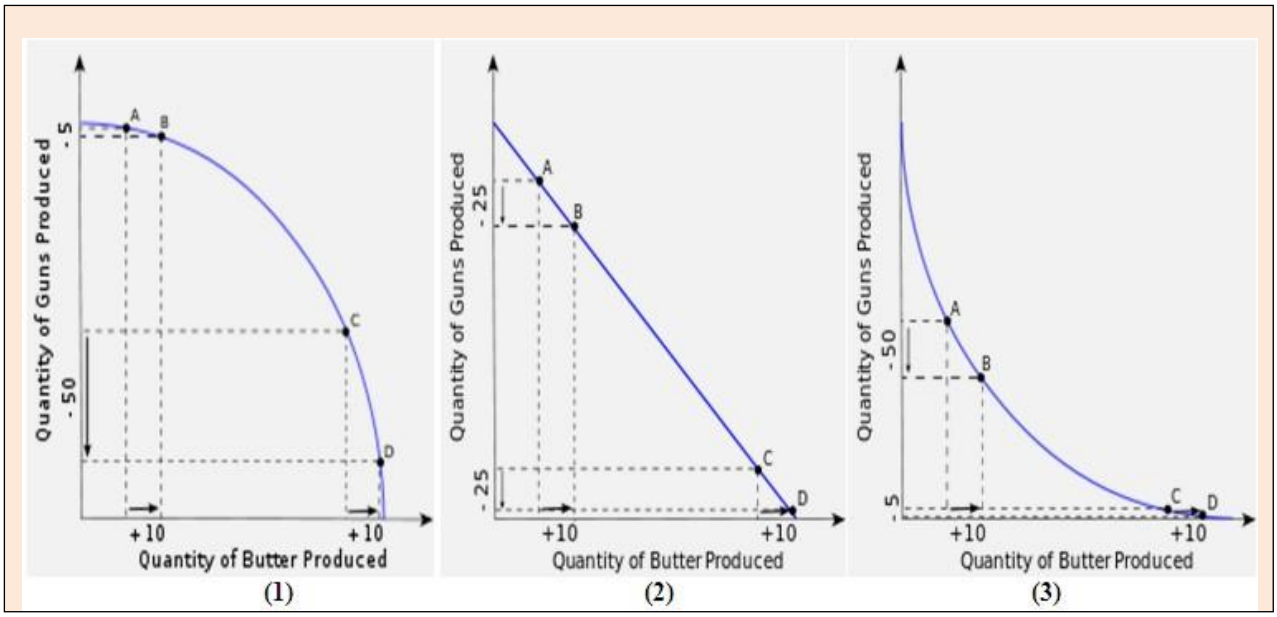
[5] Scale of preference: This is the list of unsatisfied needs arranged according to their order of preference with the most pressing one on top (upper scale) and least pressing on the bottom scale

[6] Production possibility frontier (PPF) or Transformation curve: This is a locus of points showing a combination of two commodities that can maximally be produced when all the country's available resources are fully and efficiently utilized. It is called a transformation curve because it shows the rate at which an economy can transform one commodity into another

Assumptions of the production possibility frontier

1. Assumes that all the available resources are fully utilized
2. Assumes production of only two commodities
3. Technology and production skills are assumed constant, i.e. known and adequate enough for utilization of resources
4. The economy is assumed to be closed (there is no foreign trade)
5. Assumes that land is fixed
6. Assumes a concave shape relative to the origin

Illustration of the PPF



1. A common PPF: increasing opportunity cost
2. Straight line PPF: constant opportunity cost
3. An inverted PPF: decreasing opportunity cost

Increasing butter from *A* to *B* carries little opportunity cost, but for *C* to *D* the cost is great.

If there is no increase in productive resources, increasing production of a first good entails decreasing production of a second, because resources must be transferred to the first and away from the second. Points along the curve describe the trade-off between the goods

The 2 main determinants of the position of PPF at any given time are;

1. The state of technology used in the production process
2. The management expertise employed in the production of goods

E.g. Assuming that the economy's available quantity of ***factors of production*** does not change over time and that ***technological progress*** does not occur, then if the economy is operating on the PPF, production of guns would need to be sacrificed in order to produce more butter.

If production is efficient, the economy can choose between combinations (i.e., points) on the PPF: *B* if guns are of interest, *C* if more butter is needed, *D* if an equal mix of butter and guns is required.

THEORY OF PRODUCTION

- This is the process in which resources are transformed into products usable by a consumer.
- Production is the process of transforming raw and semi-finished material resources into products with aid of human resources, capital goods and technology. This is therefore the creation of utility.
- It is any activity aimed at bringing a physical change in inputs into a good to make it satisfying and useful

Utility is the ability of a good to satisfy human wants. Utility is of three types

Form of utility

(a) **Form utility:** The good should be in a form in which it is able to satisfy human wants
(b) **Place utility:** The good must be available in the place in which its required to satisfy human wants
(c) **Time utility:** The good must be available at the time in which it is required

Output can be classified as;

1) **Consumer goods:** these are goods which when consumed satisfies human wants directly. They include non-durable consumer goods e.g. all types of food. These are goods that provide direct satisfaction and are destroyed in the process of being consumed
2) **Capital goods:** these are goods that do not provide direct satisfaction. They are also referred to as producer goods, and they are used in production of other goods e.g buildings, tractor etc.
3) **Services:** these are economical goods which are intangible e.g. security, treatment, transport and communication etc.

Types of production

(a) **Direct production:** This is where one produces a commodity for his immediate use

(b) **Indirect production:** Is the production of a commodity purposely for exchange with others or for sale

Factors of production

These refer to the inputs which facilitates the process of creation of goods and services. In agricultural economics, four factors or resources are recognized; these include:-

(1) Land; it refers to all natural resources like minerals, forests, water and physical plant surface etc

Economists regard land as soil, water, mineral resources etc while agriculturalists refer to it as the soil on which crops and animals are raised.

It is a fixed factor of production, therefore limited in supply and cannot be increased like capital or labour. Land is not of the same value therefore its quality keeps on varying from place to place. Land is immobile or can't be moved and its supply is usually fixed. The payment for use of land is called ***Rent***

(2) Labour; refers to all human effort both physical and mental effort employed in the production process

It's the human effort extended or exerted towards the fulfillment of an economic objective, it can be skilled, semi-skilled or unskilled. The payment for use of labour is called a ***Wage***

Characteristics of labour

1. Its human effort and therefore cannot be stored.
2. Labour has a high opportunity cost that is it takes a lot of time, effort and capital to train labour
3. Labour cannot be inherited since each individual owns his personal skills
4. Labour has a will of its own that is to say has the capacity to make own decisions
5. Labour is mobile that is to say can be moved from one place to another.

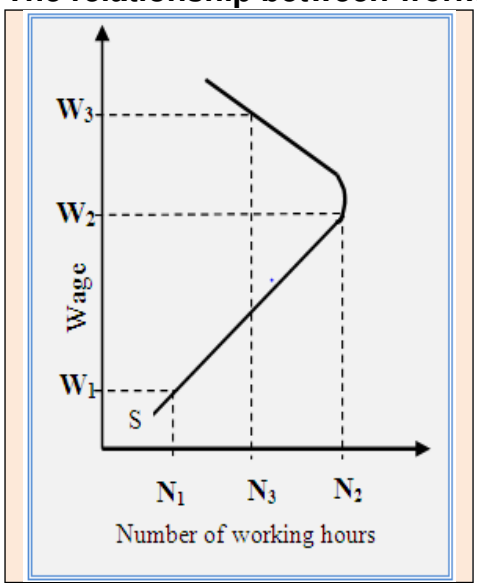
Factors determining the supply of labour

1. **Population size or density;** the country with bigger population will have a high supply and the country with low population will have a low supply of labour other factor remaining constant.
2. **Structure of the population;** youthful population has a high supply of labour than either young or old population
3. **The wage or salary rate offered;** the higher the wage or salary rates, the more attractive the job and the more willing people will be to offer their labour
4. **Health of workers;** the healthier the labour force, the more the amount of labour they can provide
5. **Retirement benefits;** people are more attracted to those jobs that offer a favorable retirement package for them when out of the job e.g. public service and NGOs, which recognize humanity
6. **Mobility of labour geographically and occupationally;** where people can move from one job to another or from one place to another, labour supply is greater than when people are less mobile

7. **The level of skills required;** for jobs that require high skill levels, labour supply will be low and labour supply will be more where the job requires little skills
8. **Working conditions;** where the working conditions are ideal (good), more people will be attracted into the labour force than when the working conditions are not conducive
9. **Political climate or environment;** areas that are free from insurgency (politically stable) attract more labour than those with conflicts e.g. Kampala attract more labour force compared to Karamoja
10. **Attitude towards work;** some people prefer remaining unemployed even when there is something to do, especially in communities which recognize those out of work by attaining favorable social benefits
11. **Nature of the jobs;** some jobs are more attractive than others depending on the risks or uncertainties that prevail. Risky jobs may not be very attractive even when financial rewards are great. A case in point is mining, the military forces etc.
12. **Publicity of job opportunities;** workers are likely to offer their services more if they are aware of the existing jobs in the market
13. **Net flow of labour force;** through emigration and immigration. In a liberalized economy, where regional and international borders offer free entry and exit of resources for instance labour force, labour supply will be more than where there are barriers at the borders

➢ Discuss factors that influence labour supply in agriculture. ***[UACE 2000; No.2. (a)]***

The relationship between workers' wages and extra hours of work



The supply of labour offered by households is based on the traditional assumption that; more work will be done for higher wages implying an up sloping supply curve for labour

At a higher wage W_2, the supply of labour is N_2 while at a lower wage W_1, the supply of labour is N_1

However, for some individuals of groups of workers, higher wages might lead to a reduction in hours of work offered

The workers will prefer leisure at higher wages. For target workers, after achieving their targets, they will either reduce their effort or stop working despite an increase in the wage

The outcome would be a backward bending labour supply curve that is beyond W_2, the number of hours worked for reduces to N_3

(UACE 2015 Section A)

Efficiency of Labour

This is the ability of labour to stick to the expected routine but also to accomplish the assigned duties in a specified period of time

Factors that determine efficiency and productivity of labour *(How to increase labour efficiency?)*

1 **Length of working hours:** labourers should be given a reasonable length of working hours. Working for long period of time discourages workers and affects their output
2 **Organization:** farm productivity depends on the organization of farm manager to allocate and divide labour according to the place of work to be done
3 **Individual characteristics:** most efficient workers possess some outstanding qualities and they may include intelligence, courage, strength and ability to work for long without getting tired
4 **Climate:** cool climate encourages labourers to work for long hours and hot climate discourages them hence it determines efficiency
5 **Fair or appropriate and early remuneration:** when workers feel that they are not being exploited, they invest more effort in their work. Prompt and enough payment are essential in improving efficiency while delayed payment discourages labourers
6 **Specialization:** giving workers specific tasks according to their skills enables them to develop their skills on the job and to become more efficient
7 **Adequate supervision:** semi skilled or unskilled labour force should be highly supervised to ensure that they accomplish their work as demanded or required
8 **Provision of housing:** this increases the workers' comfort and their esteem and avoids many hours lost when employees commute from far off residence, consequently this increases efficiency
9 **Supply of proper equipment and tools (Mechanization):** the use of appropriate machines increases the speed and may increase accuracy and output of labour hence increasing efficiency
10 **Provision of transport:** consistent and timely transport ensures that workers are at their working station on time and avoids loss of many hours hence increasing their efficiency
11 **Level of education and training of labour force:** highly trained workers are more productive and efficient than untrained workers. training can be done through providing refresher courses, on job training among others to enable the labour force to improve upon their skills and efficiency as well
12 **Improving or proper human resource management:** treating labourers humanely and professionally increases their efficiency as it raises their esteem and willingness to work
13 **Health status of labourers:** sick people can't provide the required labour, they should therefore be treated and well fed to keep them healthy
14 **Assigning an appropriate work load*:*** humans are not like machines and so their efficiency reduces as the number of hours worked for increases
15 **Working conditions:** good working conditions increase labour productivity and efficiency

- Explain the factors that influence the efficiency of labour on a farm. ***[UACE 2000; No. 2 (b), 2010; No. 8 (a) (ii)]***

(3) Capital: this refers to all assets or resources used in the production to create more wealth. Capital includes buildings, farm machinery, seeds for planting, livestock feeds, crops in the field and store, fertilizers, and livestock. Capital employed in agriculture can be broadly grouped into three groups;

i. **Overhead or Durable or fixed capital:** this includes all items which have more than one year of useful life or these are fixed assets of the business e.g. buildings, machinery, land etc

ii. **Working or circulating capital:** these include, livestock and feeds, cash needed for operating expenses such as fuel and fertilizers

iii. **Semi-fixed capital:** this is the type of capital that is productive in the short run.

Capital as a factor of production earns ***interest*** for its contribution in the production process

Sources of capital

1. Personal savings
2. Loans from banks
3. Gifts from friends
4. Inherited income
5. Loans from government
6. NGOS

Factors influencing capital accumulation

1 Level of income
2 Political climate
3 Level of infrastructure development in an area
4 Population growth rate
5 The existing stock of capital
6 Capital inflow and outflow of an organization
7 The level of accountability of capital resources

(4) Management or entrepreneurship: this refers to the mental effort that is used in the farm management and the co-ordination of the production process. A manager or an entrepreneur is a person who runs the business to make profits, in agricultural production it is usually the farm manager

The return or reward for management/entrepreneurship is ***profit***

Roles or functions of a farm manager

1 The manager undertakes the task and risk of organizing other factors of production to make profits
2 The manager combines the other factors of production so as to produce the desired product
3 Initiating innovations and decision making within the business
4 Bears the risks and uncertainties in production
5 Finds market for produced goods and services
6 The manager prepares and keeps the farm records
7 He raise finance and other resources on the farm
8 He reward other factors of production like labour
9 He co-ordinates and plans the whole activities undertaken in the enterprise or project

NB; Entrepreneurship therefore is the ability or initiativeness of a person to be able to fully utilize all the available materials so as to produce the desired products

- Explain the roles of an entrepreneur in farm production ***[UACE 2014 No. 8 (a) (i)]***
- Outline the roles of a farm manager. ***[UACE 2015 No. 8 (c)]***

Qualities or traits of an entrepreneur

An entrepreneur or manager is an individual who organizes, operates and assumes the risks of a productive venture

He undertakes the risk to organize other factors of production; therefore he is rewarded profits or losses

1. **Risk taker;** an entrepreneur must have the ability to take measured or calculated risks. Such risks include working out the likely costs and gains in the business, chances of success and the belief in one self to make risk pay off
2. **Goal oriented;** this involves the ability to set goals or targets and to work towards achieving them
3. **Self-confidence;** an entrepreneur must believe in himself and in the ability to achieve the goals set
4. **Hardworking;** it involves the ability to work for long hours when necessary, to work intensively and cope with less than a normal amount of sleep
5. **Creativity and innovation;** he is usually a creative person who comes up with new and original ideas. An entrepreneur is expected to be innovative in whatever he does in business so as to tackle the unknown, do things in new and different ways, transfer ideas into products and be ahead of others
6. **Persistent;** involves being consistent in solving business problems and disappointment
7. **Profit oriented;** recognizing that the business comes first and competing firmly. This implies that he must aim at generating profits or interest from the money invested in business
8. **Reliable and has integrity;** it involves honesty, fair dealing and reliability in terms of doing what one has promised to do
9. **Builds on strengths;** successful people base their work upon the strength they have like manual, interpersonal skills, organizational skills and knowledge of a particular product
10. **Sets own standards;** he must be able to set standards of performance and then work to achieve them
11. **Willing to listen;** he must be able to listen to advices of others
12. **Demonstrates initiativeness;** he must take the initiative and put himself in positions where he is personally responsible for the success or failure of the business
13. **Responds to feed back;** he must be concerned to know how well his farm is performing to keep track of their performance, feedbacks and advice obtained are important in proper farm management
14. **Builds for the future**; he must understand that it may take several years to build income to a reasonable standard
15. He must be having financial discipline in order to control the financial assets of the business
16. His or her reward is determined lastly after other factors of production are rewarded

➢ Give the qualities of a good entrepreneur. ***[UACE 2009 NO. 8 (b)]***

PRINCIPLES OF DEMAND AND SUPPLY (ECONOMICS BASICS)

Supply and demand are perhaps one of the most fundamental concepts of economics and they are the backbone of a market economy

DEMAND

- It refers to how much (number of units or quantity) of a commodity or service a person is willing and able to buy at a given price in a specified period of time.

- The desire for the commodity backed by the ability and willingness to pay for it in a given period of time

Theory of Demand

This is a general statement which indicates the desire for the commodity however there is a particular quantity which is desired for at a time hence ***effective demand***

Effective demand: This is the actual buying of different quantities of goods and services at different alternative prices

The demand schedule and curve

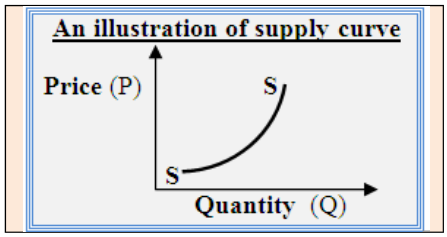
For any given product offered for sale in the market, there is usually a state of demand for that commodity, i.e. what the volume of sales will be, e.g. weekly at each of a series of prices, such a presentation is often tabulated and represents a ***demand schedule***

- **Demand schedule;** is a table showing different quantities of a commodity that would be bought at various prices over a given time.

Price of the commodity (shs)	1000	800	600	400	200
Quantity demanded (kg)	5	10	15	20	25

- **Demand curve;** It is defined as the quantity of the produce demanded at a variety of prices. Therefore it represents the relationship between price and quantity bought on a graph

  It is drawn on the assumption that quantity demanded depends on price of the commodity other factors like taste, income etc remaining constant (ceteris paribus)



Types of demand

1) **Consumer demand:** refers to various quantities of a particular commodity that an individual consumer will be willing and able to buy as the price of that good varies other factors remaining constant
2) **Market demand:** the aggregate or summation of all the individual consumers' demand. It's defined as the quantities of commodities that all consumers in a particular market are willing and able to buy as price varies other factors remaining constant
3) **Derived demand:** it's the demand for a given commodity mainly because it can be used to produce other things that are needed. e.g. the demand for land to set up a farm
4) **Speculative demand:** this refers to anticipated future price relative to the current prices. Most agricultural commodities are produced seasonally but consumed throughout the year. Consumers can anticipate that prices will rise after harvest and so they buy and store the commodities hoping to avoid high prices

Law of Demand

It expresses an inverse relationship between price and quantity demanded.

The law of demand states that; if all other factors remain constant, the higher the price of a good, the less people will demand for that good.

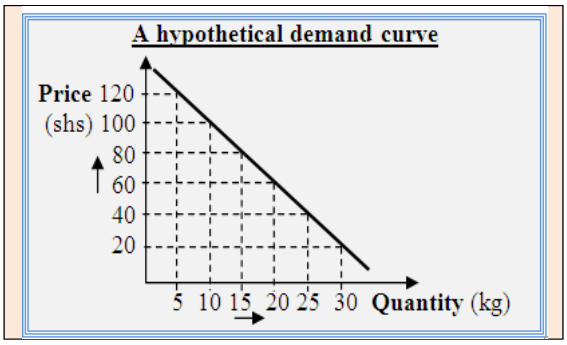
In other words, the higher the price, the lower the quantity demanded and the lower the price the higher the quantity demanded other factors remaining constant (ceteris paribus)

Or

The quantity of a good demanded is inversely proportional to the price of the commodity

Ceteris paribus; a Latin expression meaning other factors remaining constant

Price (shs)	120	100	80	60	40	20
Quantity demanded (kg)	5	10	15	20	25	30



Reasons why a normal demand curve is downward sloping

1) Price effect; it obeys the law of demand which states that the higher the price, the lower the quantity demanded and the reverse is true, thus explaining why the normal demand curve is downward sloping
2) It obeys the law of diminishing marginal utility which states that "As more units of a commodity are consumed the satisfaction derived from each additional unit goes on reducing or diminishing, therefore the consumer would be willing to consume each extra unit at a low price than that of a previous unit
3) The behavior of low income earners in a society; these people tend to buy more when the price is low and buy less when the prices are high
4) Substitutional factors; when the price of the commodity increase and remains constant the consumers will abandon it and buy more of the substitute whose price has not changed or with reduced price
5) Income effects of price change; a fall in price of a commodity, income remaining constant causing an increase in the real income (purchasing power) i.e. the consumer will buy more out of his income
6) The number of uses the commodity can be put to; when price of the commodity that is multipurpose is high, people will buy it and abandon the commodity whose price is high but has a few uses

Factors affecting demand (determinants of demand)

1) **Market price of the commodity:** more of the commodity will be demanded when its price is low and less when its price is high and as the price increases, demand falls and vice versa
2) **Price of other related goods** (substitutes or complementary)**:** price of substitutes; if the price of the product is high while that of related goods is low, consumers will demand more of the related goods and less of that product

   Price of complements; these are goods consumed together or are goods which go hand in hand e.g. tractor and fuel. When price of a complement is low the demand for a commodity will be high and when the price of a complement is high demand for the commodity in question will be low

3) **Income level of the population (consumers' income):** people with low income are expected to shop in a humble way and people with high income can afford high priced commodities. The higher the income of the population, the more the goods they can afford
4) **Level of education:** educated people demand for high quality commodities and uneducated people demand for inferior goods
5) **Tastes and preferences:** when the consumer has a taste and preference towards certain commodity, demand will be high and if they are not favourable for the consumer, demand will be low (individuals have different feelings about a good or service and one is bound to buy what satisfies his/her feelings)
6) **Religious factors:** some religions prohibit consumption of certain goods so the demand is low e.g. pork in Muslim communities has zero demand and Christians communities demand for pork is high
7) **Population size:** a high population increases demand for most of the produce and a low population reduces the demand because of fewer people (low aggregate demand)
8) **Social and economic factors:** when social and economic factors such as age, sex, culture among others favour the consumption of certain commodity; its demand will be high and vice versa. Certain commodities have got a high demand within a certain age like the demand for sweets amongst children is high and low among the adults
9) **The supply level:** if the level of supply is high, there is surplus produce in the market and the demand reduces. The demand is high where the level of supply is low (where scarcity exists)
10) **Government policies:** e.g. taxation, the higher the taxes, the higher the price and so the lower the demand for a good while subsidization of a good leads to high demand of a commodity because it increases disposable incomes

NB: Disposable income; is the income actually available to households for consumption or saving. It is equivalent to personal income minus direct taxes and when other compulsory payments have been deducted

11) **Advertisement:** the level of advertisement influences awareness about a product and so it increases its demand as the public is fully informed about the good. Goods that are advertised tend to have a higher demand than those that are not advertised.
12) **Quality of the commodities:** high quality commodities are highly demanded and vice versa
13) **Future price expectation** (speculation)**:** expectation of future price rise leads to high demand and vice versa
14) **Income distribution among the people:** when the income is concentrated in hands of few individuals, demand will be very low and vice versa
15) **Seasonal factors:** some commodities are consumed seasonally and once the season in on, the demand is high and when the season is over the demand decreases e.g. umbrellas and raincoats have high demand during rainy season
16) **Level of technology involved in the production:** this determines the level of supply and the quality of the products and their demand

- What are the factors that affect the quantity of a commodity demanded for? ***[UACE 2006 No. 9 (c)]***

Elasticity of Demand

It is defined as the measure of the degree of responsiveness of the quantity demanded due to changes in the factors affecting demand e.g. price, income, government policy among others.
It can also be defined as the responsiveness of the quantity demanded of a commodity to change in the determinants of demand e.g. price, income among others

$$Elasticity of demand = \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in the factors affecting demand}}$$

- What is meant by elasticity of demand? ***[UACE 2006; No. 9 (a)]***

E.g. If the price of maize dropped from 1000shs to 800shs, the quantity demanded increased from 12000kg to 15000kgs of maize. Determine the elasticity of demand for maize.

Solution: $P_O = 1000$ shs $P_N = 800$ shs $Q_O = 12000$kg $Q_N = 15000$kg

$$E.D = \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in the price}} \qquad E.D = \frac{\frac{(HIJHK \times MNN)}{HK}}{\frac{(PKJPI \times MNN)}{PK}}$$

$$E.D = \frac{\frac{(MQNNNJMRNNN \times MNN)}{MRNNN}}{\frac{(MNNNJSNN \times MNN)}{MNNN}} \quad E.D = \frac{\frac{(TNNN \times MNN)}{MRNNN}}{\frac{(RNN \times MNN)}{MNNN}} \quad E.D = \frac{\frac{TNNNN}{MRNNN}}{\frac{RNNNN}{MNNN}} \quad \text{or} = \frac{UVVV\,W\,XVVV}{XYVVV\,W\,YVV} = \frac{25}{20}$$

$$E.D = 1.25 \quad E.D = 1.3$$

Exercise 1: In Jan, 2020 the price of maize in Mbale market was shs 400 per kilogram and the demand for maize was 2000kg per day. When the price increased to shs 500 per kg, the quantity demanded reduced to 1000kg per day. Determine the elasticity of demand for maize in Mbale market.

Exercise 2: In Jinja market, at 1150 shs the quantity of millet demanded was12500kg, when the price reduced to 950 shs the quantity of millet demanded was 15500kg. Determine the elasticity of demand

Exercise 3: Mukasa bought 20kg of rice when the price was 100 shillings per kg, when the price rose to 150 shillings per kg, he bought 15kg. Determine the elasticity of demand

(b). What type of elasticity is Mukasa's demand for rice? Give a reason to support your answer.

Types of elasticity of demand

Price elasticity of demand: it is the measure of the degree or extent of responsiveness of the quantity demanded due to changes in the commodity price.

It is the measure of the degree to which quantity demanded by buyers responds to price change**.**

$$P.E.D = \frac{\textbf{Percentage change in quantity demanded}}{\textbf{Percentage change in price of the commodity}}$$

$$\textit{or} = \frac{\textbf{Proportionate change in demand}}{\textbf{Proportionate change in price}}$$

$$= \frac{(\Delta Q \times 100)}{Q} / \frac{\triangle P \times 100}{P}$$

$$= \frac{\Delta Q}{\Delta P} X \frac{P}{Q}$$

Where P.E.D is the coefficient of price elasticity

- What is meant by price elasticity of demand? ***[UACE 2014 No. 9 (a)]***

Example: If the price of rice per kilogram changed from shs.1200 to shs.1600 and the amount bought per person changed from 4kg to 2kg. Determine the price elasticity of demand

Solution: P_O = 1200 shs P_N = 1600 shs Q_O = 4kg Q_N = 2kg

P.E.D = $\frac{gh}{gi}$ x $\frac{jV}{kV}$ P.E.D= $\frac{(Y1m)}{(XnVV1XYVV)}$ X $\frac{XYVV}{m}$

P.E.D = $\frac{Y}{mVV}$ X $\frac{XYVV}{m}$ P. E. D = $\frac{u}{Y}$ **P. E.D = 1. 5**

NB: For any calculations of price elasticity of demand, we only consider absolute values i.e. we ignore the negatives.

After any calculations, price elasticity of demand is treated in three ways;-

1. **Elastic demand,** if the answer obtained is greater than one (1). This means that buyers have varied their purchase due to higher prices,
2. **Inelastic demand,** if the answer obtained is less than one (1)
3. **Unitary demand,** If the answer obtained is equal to one (1)

Exercise 1; In the month of August 2020, the price of ground nuts was shs.500 per kg, 10kg were demanded. When the price reduced to shs.400 from shs 500 per kg in January 2020, the quantity demanded increased from10kg to 12kg. Calculate the price elasticity of demand.

Exercise 2; Kiziri, a farmer in Namataba sold 35kg of millet at a price of 7250 in the month of February 2019, when the price for millet was increased to shs 11000, in the month of March; he was only capable of selling 28 kg. Determine the price elasticity of demand for millet in Namataba.

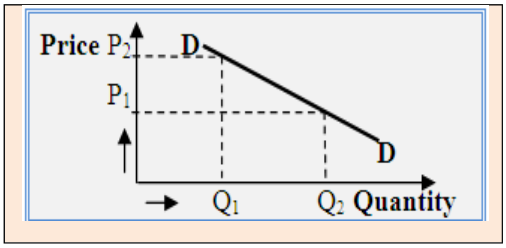
Exercise 3; Kajjoba bought 20 kg of millet at a price of shs.800 per kg. When the price rose to shs.1000 per kg, he was able to buy 15kg. Calculate the elasticity of demand for Kajjoba

Factors determining price elasticity of demand

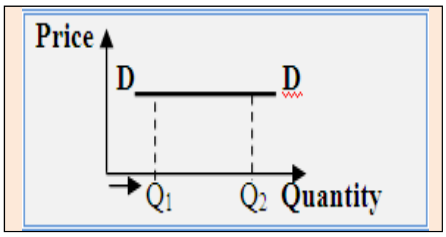
1. **Price of the commodity;** expensive commodities have elastic demand and cheap commodities have inelastic demand
2. **Availability of close substitutes;** where there are close substitutes, the commodity will have elastic demand and where there are no close substitutes, the demand will be inelastic
3. **Income levels of the consumers;** for rich people price elasticity of demand is inelastic and for poor people it is elastic
4. **Addiction and habit;** where there is addiction, the demand is inelastic and vice versa. E.g. addictive and habit forming commodities such as cigarettes and alcohol tend to have inelastic demand. I.e. one cant reduce on the consumption whether the prices increases or reduces
5. **Degree of necessity;** commodities such as salt that are necessities have inelastic demand because they are purchased at whatever the price may be, while luxuries such as television have elastic demand
6. **Durability of the commodity;** durable commodities have inelastic demand and perishable (nondurable)products exhibit elastic demand; products whose consumption can be deferred have elastic demand
7. **Gestation period;** commodities that take long to be produced have inelastic demand and those that are produced within in short period have elastic demand
8. **Number of uses to which a commodity can be put;** goods having several uses have less elastic demand while demand for goods having single use is rather elastic

Classification or variations in elasticity of demand

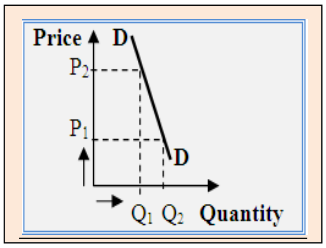
1) **Elastic demand;** a small change in price leads to a greater change (more than proportionate change) in the quantity demanded.
The coefficient of elasticity of demand is greater than one



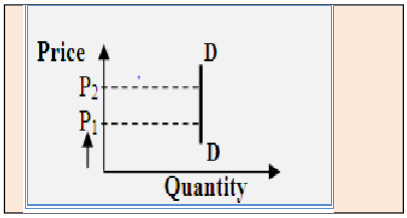
2) **Perfectly or purely elastic demand;** a zero change in price causes unlimited or an infinite change in the quantity demanded. The coefficient of elasticity is infinity or undefined and the demand curve runs parallel to the output curve



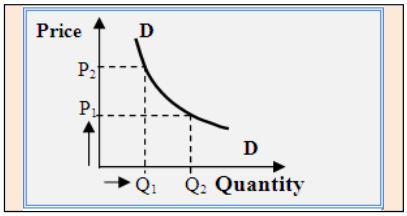
3) **Inelastic demand;** a large change in prices results into a small or slight (less than proportionate) change in the quantity demanded. The coefficient of elasticity of demand is less than one but greater than zero and its common in goods without close substitutes.



4) **Perfectly (purely) inelastic demand;** this is also referred to as ***zero demand***, occurs when a rise or fall in price of a commodity does not cause a change in the quantity demanded (there is absolutely no change in quantity demanded due to changes in price)



5) **Unit or Unitary elasticity of demand;** the percentage change in the quantity demanded is equal to percentage change in price of a given product, therefore demand elasticity equals to one (coefficient of elasticity of demand is one '1')



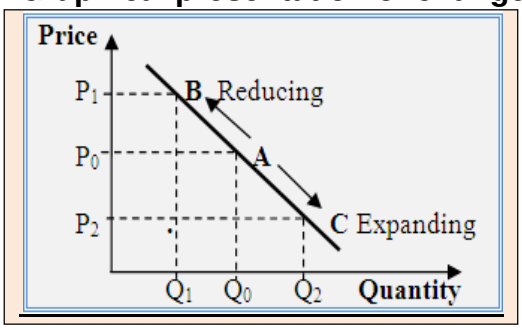
- Using illustrations describe the following types of elasticity of demand.
  i. Elastic demand
  ii. Unitary demand
  iii. Inelastic demand

  [UACE 2014 No. 9 (b)].

Change in the Quantity Demanded

This is an increase or decrease in the quantity demanded due to changes in the price, other factors affecting demand remaining constant. It involves movement along the demand curve

Graphical presentation of change in quantity demanded



Explanation

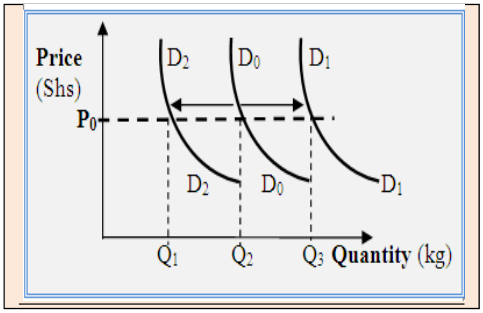
From the graph, the increase in quantity demanded from Q_1 to Q_2 is due to the decrease in price from P_1 to P_2 other factors that influence the quantity demanded like income, tastes and preference, price of substitutes among other remaining constant (*ceteris paribas*)

The decrease in the quantity demanded is illustrated by moving upwards on the demand curve that is from Q_0 to Q_1

Change in Demand

This refers to an increase or decrease in the quantity demanded due to other factors affecting demand with price remaining constant, it involves a shift of the demand curve either to the right or to the left. This means that more or less is demanded at constant price

Graphical representation of change in demand



Explanation

In the figure on the left; increase in demand is illustrated by the shift of the demand curve to the right from D_0 to D_1 at a constant price P_0, quantity demanded increases from Q_2 to Q_3. A decrease in demand is illustrated by a shift of the demand curve to the left D_0 to D_2 but at a constant price P_0, quantity demanded decreases from Q_2 to Q_1

NB: A change in demand is caused by changes in conditions or parameters of demand at a constant price

Factors that lead to an increase in demand

1. Decrease in price of complements
2. Increase in price of substitutes
3. An increase in the incomes of the consumers
4. Consumers' tastes favoring the commodity more than before
5. Increase in total population (increase in aggregate demand)
6. The government subsidizing the commodity (government policy)
7. Distribution of income between the rich and the poor (narrowing of the income gap)
8. Reduction in interest rates on consumption loans
9. Seasonal factors e.g. during the festive season demand for agricultural commodities tend to increases

Factors that lead to a decrease in demand

1. An increase in the price of the complements
2. A decrease in the prices of the substitutes
3. A decrease in consumers' level of income (reduces the consumers' disposable income)
4. Consumer's tastes moving away from the commodity due to changes in season, technology etc
5. Decrease in the total population
6. Taxation of the consumer's income which reduces the disposable income
7. Increase in the income disparities (income gap)
8. Increase in the interest rates on the consumption loans

- Explain the factors that may lead to a drop in demand for agricultural commodities ***[UACE 2014; No. 9 (b)]***

SUPPLY

It's the amount of a commodity producers are willing and able to offer for sale at a given price and time. If a good is scarce in the market, suppliers will be more willing to supply more to the market and high supply results into low demand which consequently lead to low prices and hence the supply decreases

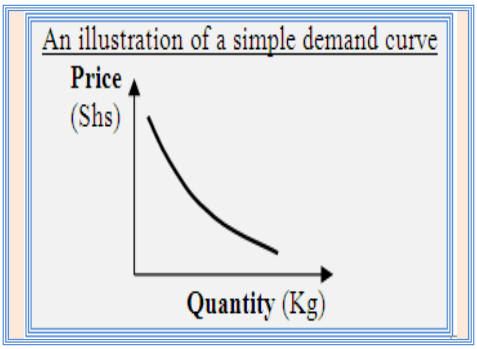
The suppliers become reluctant because of high cost of production, marketing etc low income expected after selling. Therefore for supply as price increases, the quantity supplied also increases i.e. price and supply have a direct proportionality

Price of the good(shs)	Quantity supplied (kg)
1000	100
2000	150

- **The supply schedule;** is a table which shows the amount of a good or service that producers are willing to offer for sale at different or varying prices, ***ceteris paribus***

3000	200
4000	250

- **The supply curve;** it's drawn from the assumption that quantity supplied depends on the price of the commodity ceteris paribus



It's a locus of points showing different amounts of a product sellers are willing to sell at different prices. (It's a graphical representation of the supply schedule)

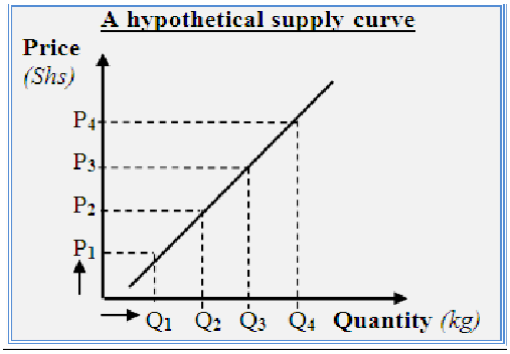
It therefore represents the relationship between quantities supplied and price ceteris paribus.

The Law of Supply

The law of supply demonstrates the quantities that will be sold at a certain price. It states that; if other factors are held constant, the higher the price, the greater the quantity that will be offered for sale and the lower the prices, the less the quantity that will be offered for sale.

That is; as price increases, the quantity supplied also increases because of selling a higher quantity at higher price increases revenue and as price lowers the quantity supplied also reduces ***ceteris paribus***

Price (shs)	Quantity (kg)
P_1	Q_1
P_2	Q_2
P_3	Q_3
P_4	Q_4



Explanation

Unlike the law of demand, the supply curve shows an upward slope from the left to the right. It shows a positive relationship between price and quantity supplied

One significant explanation for the upward sloping of the supply curve is the law or principle that states that "the amount supplied varies directly with the price ceteris paribus". That is; as price increases from **P_1** to **P_4**, quantity also increases from **Q_1** to **Q_4**. ***This is how the law works***

Factors influencing supply (Determinants of supply)

1. **Change in price of the commodity:** as the price increases more farmers will enter into production and supply increases. When the prices are low more farmers are discouraged from production and therefore the supply reduces
2. **Prevailing conditions:** conditions under which production takes place affect output e.g. drought, pests and diseases can cause serious damage to crops and livestock, favorable

weather conditions enhance high production. Reduced output would result in low supply of the commodity to the market.

3. **Gestation period:** this refers to the length of time taken to produce a commodity by an enterprise. when the gestation period is short, the supply of that commodity can easily be increased than when the gestation period is long e.g. in production of beans and coffee, it would be easy to increase the supply of beans than the supply of coffee
4. **Speculation (future price anticipations):** when suppliers anticipate future increase in price, their ability to supply reduces and it increases when they anticipate a reduction in price in future
5. **Managerial efficiency:** a well-organized farm enterprise yields more than a poorly organized one. The farmers therefore should take care of their production to avoid chances of crop and animal failure
6. **Government policy:** if the government charges high taxes on agricultural inputs, the cost of production increases and many farmers will be discouraged from production, this therefore reduces supply and vice versa
7. **Transport:** improved and efficient transport facilities ensures the delivery of farm produce to the market and this support supply
8. **The cost of production:** a rise in the price of inputs would result into reduced production which in turn would lead to a fall in supply. for example if the costs of fertilizers are low, then it is easy for the farmers to buy them and to increase production leading to high supply
9. **Number of sellers in the market:** many sellers bring more to the market and this increases supply because farmers will be encouraged to produce
10. **Import and export:** an increase in importation of a commodity increases its supply on the market. Excessive supply of a commodity can lead to a fall in price. Some countries do not allow importation of certain commodities so as to avoid such situation and to protect home producers

    When a commodity is exported, its supply on the local market decreases. This is what happens sometimes when maize is exported from Uganda
11. **Prices of other commodities:** if the price of other goods increases then the demand for the product whose price has not increased increases and this calls for increase in supply
12. **Method of production (state of technology):** employing better techniques or methods of production encourages more supply because this will improve on the efficiency in production
13. **Political climate or stability:** people can engage in a meaningful production when they are assured of security and consequently increase the output available for supply. Insecurity results into poor supply of commodities due to destruction of farms by thieves
14. **The level of demand:** as the demand increases, more producers are encouraged to produce to offset the increased demand and as a result the quantity supplied increases

Elasticity of Supply (E.S)

- It is defined as the ratio of the relative change in the quantity supplied to the relative change in the price of the commodity.
- It refers to the measure of the degree or proportion of the responsiveness of quantity supplied of a commodity with respect to changes in price. Therefore

$$\mathbf{E.S} = \frac{\textbf{Percentage change in quantity supplied}}{\textbf{Percentage change in price}}$$

$$\mathbf{E.S} = \frac{\text{Change in amount supplied}}{\text{Original quantitity}} \div \frac{\text{Change in price}}{\text{Original prce}}$$

$$= \frac{\Delta Q}{QS} \div \frac{\Delta P}{P} = \frac{\Delta QS}{\Delta P} \times \frac{P}{Q}$$

NB: Supply is said to be;-

1. **Elastic supply;** if the value of elasticity of supply obtained is greater than one (1),
2. **Unit elasticity;** if the value of the fraction is equal or exactly one (1)
3. **Inelastic supply;** will occur when the value is less than one (1)

Example; In May 2019, the price of maize increased from shs 4000 to 4500 per bag resulting into an increase in supply of coffee from 85 bags to 105 bags. Determine the elasticity of supply for maize in May

Solution

$$\mathbf{E.S} = \frac{\textbf{Percentage change in quantity supplied}}{\textbf{Percentage change in price}}$$

$$\mathbf{E.S} = \frac{[(XV\ddot{a}\,\mathbf{1}\tilde{a}\ddot{a})\mathring{a}\ XVV]\div\tilde{a}\ddot{a}}{[(m\ddot{a}VV\,\mathbf{1}\,mVVV)\tilde{a}\ XVV]\div mVVV} \qquad \boldsymbol{E.S} = \frac{[YV\ \mathring{a}\ XVV]\div\tilde{a}\ddot{a}}{[\tilde{a}VV\ \mathring{a}\ XVV\ ]\div mVVV}$$

$$\boldsymbol{E.S} = \frac{YVVV\div\tilde{a}\ddot{a}}{\tilde{a}VVVV\div mVVV} \qquad \text{E.S} = \frac{YU.\ddot{a}Y\grave{e}}{XY.\ddot{a}} \qquad \textbf{Elasticity of Supply = 1.88}$$

NB: The value of the ratio of elasticity of supply is usually positive because generally both price and quantity will go up or down together

Exercise 1; (a) In the month of June 2019, a bag of potatoes costs shillings 20000 and the farmers supplied 100 bags to Kayunga market. In Dec. 2019, the price of potatoes rose to shillings 40000 and the farmers supplied 140 bags. Calculate the elasticity of supply and state its type.

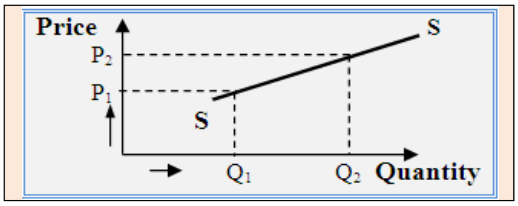
b). Indentify the type of elasticity of supply and give a reason to support your answer

Exercise 2: In March 2014, the price of tomatoes in Seeta market increased from 3000 to 3500 per box. This increase in price resulted in the increase in supply of tomatoes from 100 boxes to 120 boxes. Determine the elasticity of supply for tomatoes.

Exercise 3: In Nov. 2015, the price of beans increased from shillings 1600 to shillings 2000 per kg, as a result; supply of beans increased from 200 kg to 210kg. Calculate the elasticity 0f supply for beans

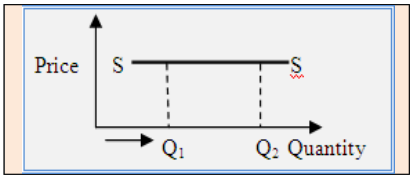
Variations in Price Elasticity of Supply

1. **Elastic supply:** a slight change in price causes more than proportionate (large) change in the quantity supplied. Supply tends to be elastic for: durable goods, manufactured goods that require very short

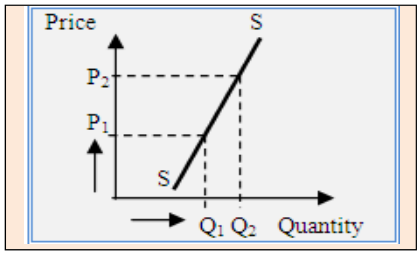


periods of production

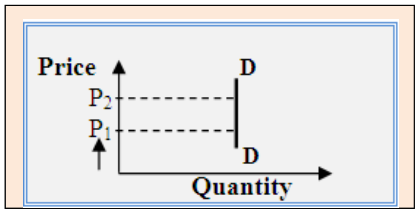
2. **Perfectly elastic supply:** this is a situation where the elasticity of supply equals to infinity. The producers are willing to supply an infinite quantity of a commodity at a constant price offered by consumers in the market



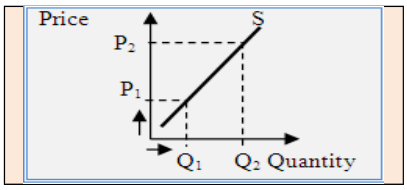
3. **Inelastic supply:** this is where a large change in price causes a less than proportionate change in the quantity supplied. Perishable goods, those that require a very long time to supply and for goods that entail heavy fixed cost like goods requiring large input, their supply tends to be inelastic. The elasticity of supply is greater than zero but less than unitary supply. The curve is steep implying that a big change in price leads to a small change in quantity



4. **Perfectly inelastic supply:** supply is perfectly inelastic when a change in price causes no change in quantity supplied. It occurs when producers cannot increase their output and supply of a commodity and it is common in crops that take long to yield a product e.g. coffee, tea, etc. the coefficient of supply curve is zero



5. **Unit elasticity of supply:** this is where a proportional change in price is equal to proportional change in quantity supplied. The coefficient of elasticity of supply is one, i.e. **P_1, P_2 = Q_1, Q_2**



Factors that determine elasticity of supply

1 **Ease of entry of new suppliers into the market;** if there is an increase in price of the product, new suppliers enter market easily and supply will be elastic. Sometimes it's difficult to enter new market due to the amount of capital required or legal barriers limiting their entry and supply will be inelastic

2 **Cost of production;** commodities that have very high cost of production have inelastic supply but goods with low cost of production have elastic supply

3 **Availability of variable factors of production;** the more readily available these factors are, the more elastic is the supply. Inadequacy of variable factors of production makes supply less elastic

4 **Length of production process;** long gestation period implies more inelastic or rigid supply. However products that can be produced in a short time their prices can be increased followed by increase in supply

5 **Nature of the products;** durable commodities have greater elasticity of supply while perishable goods have less elastic supply

6 **Method of production;** commodities produced with simple methods have elastic supply and those produced using more advanced or complicated methods have less elasticity of supply

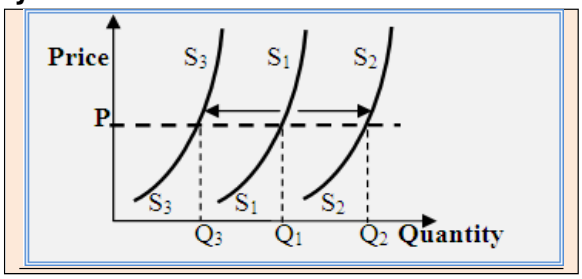
Change (Shift) in Supply

A change in quantity of a commodity supplied occurs when there is a change in price of that commodity and other factors affecting supply remaining constant. However, a change in supply can occur at a constant price as a result of change in other factors that affect supply. Such a change in other factors affecting supply is referred to as a shift in supply and is illustrated in diagram below

Explanation

As a result of changes in the factors that affect supply (determinants of supply), the quantities of a commodity supplied at a particular price (P) change from Q_1 to Q_2 is shown by the change or shift from S_1 to S_2 while a decrease in supply from Q_1 to Q_3 is illustrated by the change or shift from S_1 to S_3 at a constant price (P)

Graphical representation of the shift in supply



THE RELATIONSHIP BETWEEN DEMAND, SUPPLY AND PRICE

Price determines the quantity supplied and the quantity demanded. As the price increases, the supply also increases although the buyers reduce their demand. Therefore there is a tendency on the part of the sellers to cut the price in order to dispose of gradually. And as price fall, demand increases, demand continues increasing until a point is reached when quantity demanded is equal to quantity supplied. At this point the price is called the equilibrium price and the quantity is called equilibrium quantity

Price determination in the market

- **Price;** is the monetary value attached to a good or service. Price is also said to be money offered, or any other value in the quantity of a commodity offered for sale. (Value expressed in terms of money)
- **A market;** is a place where buyers meet in close contact with sellers to transact goods and services

It's an arrangement where the buyers and sellers are brought into close contact with a view of exchanging goods and services for money (price)

Importance of prices in agriculture production

1 Price stimulates production and determine what to produce and how to produce it
2 Price facilitates full utilization of resources in an economy. High prices for the products enable the producer to have some money to save and re-invest
3 Acts as an incentive for growth, higher prices and profits encourages improvement, innovations and inventions
4 Price determines the distribution of the products that is it determines who consumes what, people will consume those products they can only afford

5 Prices determine the distribution of wealth and income. Since many people get their income by selling one resource or another, the price of the resources they have to sell will reflect the amount of wealth they can accumulate
6 Price determines how to produce, the aim of many producers is to maximize profits and in order to achieve this, the producer uses the most economically efficient production techniques

Ways of determining price in agricultural production

1 By bargaining (haggling) i.e. The buyer and the seller negotiate on the price
2 By auctioning: The price is determined through bidding and the highest bidder takes the commodity
3 Price control; Here the government may determine prices through minimum and maximum legislation
4 By treaty or agreement i.e. an agreement is reached on at which a certain commodity should be sold at a given period of time
5 Re-sale price maintenance; This is a system where manufacturers insist in fixing prices for their products up to the last stage of distribution
6 Reserve price; this is the lowest price a seller can accept for the commodity, below that price a seller is not prepared or willing to sell
7 Price leadership; this is common in oligopolistic firms whereby the dominant firm sets price and other smaller firms follow
8 Through collusion; firms may come into an arrangement and fix the price of a commodity to avoid underselling

NB: Price control is very important especially by government to determine the minimum and maximum prices and to avoid exploitation of producers and consumers respectively

Price determination in a competitive market

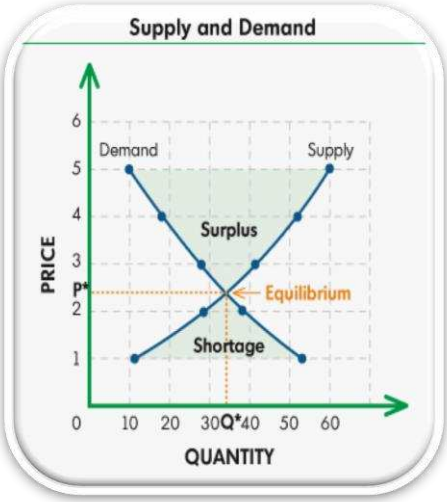
The forces of demand and supply of agricultural commodities in a free market determine the price at which the consumers are willing to buy the commodities. Normally as price of a commodity increases, the supply also increases but demand decreases. This eventually creates excess supply over demand. The amount at which the quantity supplied exceeds the quantity demanded is called excess supply.

When the price for maize is very high, demand is very low while supply is very high. The suppliers gradually reduce the price so that they can sell off the excess maize. As price continues to fall, a point is reached where consumers are willing to buy all that is supplied on the market for sale; this price is referred to as equilibrium market price.

At this price, the quantity supplied is equal to the quantity demanded by the consumers. That is; both the consumers and suppliers are in equilibrium hence the term equilibrium point

By definition; equilibrium point is where the quantity of a commodity demanded by consumers is equal the quantity supplied at a particular price. Supply and demand curves intersect at this point

An illustration of how the market forces of demand and supply lead to price determination



When supply and demand are equal (i.e. when the supply and demand functions intersect) the market is said to be at ***equilibrium***

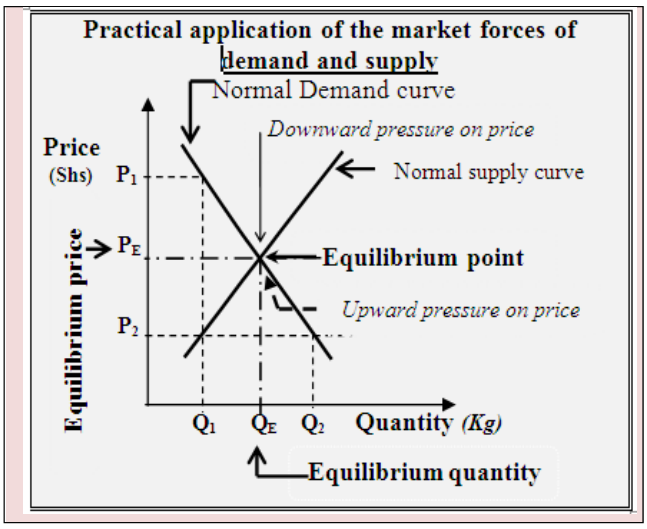
At this point, the allocation of goods is at its most efficient level because the amount of goods being supplied is exactly the same as the amount of goods being demanded. Thus, consumers are satisfied with the current economic condition. At this price, suppliers are selling all the goods produced and consumers are buying all the goods that are supplied.

Equilibrium occurs at the intersection of the demand and supply curve, which indicates no allocative inefficiency. At this point, the price of the goods will be P* and the quantity will be Q*.These figures are referred to as equilibrium price and quantity respectively. But in the real market place equilibrium can only ever be reached in theory, so prices of goods and services are constantly changing in relation to fluctuations in demand and supply

However if the price is below the equilibrium price, suppliers will be discouraged to bring their commodity to the market and supply will be low but demand will be very high resulting into excess demand due to shortage in supply. The lower the price, the larger the excess demand over supply as buyer will compete for whatever little that will be supplied on the market,

Disequilibrium; this occurs whenever the price (P*) or quantity (Q*) are not equal. Because of the following;-

1. Excess supply created within the economy leading inefficiency in allocation of resources
2. Excess demand created when price is set below the equilibrium price and because the price is so low, too many consumers will demand for the good while producers will not be in position to supply what is enough for consumers



Explanation

In order to sell off goods supplied at higher price P_1, the price has to be lowered to P_2 (downward pressure on price). Similarly the low price P_2 has to be raised to P_1 for producers to supply more goods. The resultant price is the equilibrium price which is attained when the demand and supply curve meet or intersect, at this point quantity supplied is equal to the quantity demanded. There is no shortage and surplus thus the new market price.

Exercise; Basing on the information in the table, determine its equilibrium point with use of demand curve and supply

Price (Shs)	120	100	80	60	40
Quantity demanded (kg)	10	14	25	40	70
Quantity supplied (kg)	68	60	50	40	26

- With the aid of a labeled diagram, describe how prices of agricultural commodities are determined in a free and competitive economy. ***[UACE 2012; No. 7 (a), 2008; No. 8 (a), 2002; No.2 (a)]***

Revision Questions

1. (a).Explain the following terms as used in agricultural economics
(i). Opportunity cost (ii). Price elasticity of demand
(b). Explain the factors that influence the supply for agricultural products
(c). State the law of; (i). Demand (ii). Supply

2. With the help of illustrations, explain the following
(i). Change in demand
(ii). Change in quantity demanded

MARKETING PRICE

This is the prevailing price in the market and the shortage turns the equilibrium price. This is the price by free interaction of the market forces of demand and supply. It is the point where the quantity supplied equals to quantity demanded

The long run equilibrium price is stable because the conditions of supply and demand have settled and this become the normal price

Conditions favoring price mechanism

1. Existence of market forces of demand and supply determines the price
2. Absence of government interference; there is free entrance and exit of the firm in the industries
3. There is perfect knowledge of the market condition i.e. the consumer knows where to get cheap products and producers know which commodities to produce and what profits they are likely to get because they produce what the consumers demand

Merits of price mechanism (price control)

1. It encourages competition which leads to more efficient means of production (Improvement of both quality and quantity of goods and services which also raise the price of the commodity
2. It leads to efficient allocation of resources i.e. producers producing in response to consumers' demand
3. The profit motive encourages hard work; innovation and invention hence increase in production

4. It decentralizes power i.e. individual households and firms make their decisions without any interference at all.
5. It avails a wide variety of goods and services which enables consumers to buy from the cheapest seller
6. There is consumers independence under this system because the consumer is a king and this is to his advantage to determine what to consume

Demerits of price mechanism

1. It may lead to gross income inequality because goods tend to go to those who can pay for them
2. There is consumer ignorance which may lead to their exploitation. Consumers are unlikely to buy other commodities at higher prices because they don't know the similar goods and how they can be got at a given time
3. Leads to monopoly which may result into selling commodities at higher prices
4. It may lead to unemployment as the inefficient firms that can't compete are always thrown out of the production cycle and also price fluctuation discourages others from joining
5. Encourages wasteful competition as there is duplication of activities and intensive advertising of all which leads to wastage of resources
6. It may not allocate resources to priority areas since it is determined by profit margins and many of the goods are of public consumption
7. Cheap consumer goods may not be produced i.e. producers will tend to produce highly priced goods that will enable them to get abnormal profits
8. It may also encourage the production of luxuries needed by the rich since production is according to demand instead of beneficial centers such as public health facilities among others
9. It may lead to over exploitation of resources as producers seek to maximize price. They end up over using the existing resources and this may cause things like over fishing, deforestation, over cultivation, some of which are irreplaceable

AGRICULTURAL MARKETING

This refers to all the activities involved in transforming raw agricultural products into consumer goods

It is the situation where the suppliers bring goods and the buyers are willing to buy the goods at a price acceptable to the supplier

Marketing Functions

These refer to all activities involved in the movement or transfer of goods produced until when they are utilized by consumers. Marketing functions include the following:

1) **Buying and assembling:** this is the process of purchasing and gathering the small amounts of the products from individual farmers or suppliers and bringing them to a central store so that they are ready for the next operation

2) **Transportation:** it involves the physical movement of the products from their production centers to the consumption centers or stores for processing and grading. It occurs at all

stages of marketing. It increases the size of the potential market since it enables the product to reach far off consumers

3) **Storage:** most agricultural commodities are seasonal in nature therefore proper storage has to be done until they are required for consumption (to ensure constant supply to consumers)

Advantages of storage

1. It helps producers in preserving the quality of their produce.
2. It protects the produce from the field pests.
3. It protects the crops against harsh weather conditions e.g. rainfall, extreme sunshine for perishable commodities such as vegetables
4. It facilitates the processing of the produce.
5. It helps farmers to wait for high prices when the supply of the produce on the market is low.
6. It improves on the profitability of production.

4) **Processing:** this is change of the state (form) of the products from its raw form to another form in which it can easily be used and is more accepted to consumers e.g. milling of maize flour.

Advantages of processing

1 It increases the market value of the product.
2 It increases the shelf life (useful life) of a product e.g. processed milk takes longer period of time before losing value
3 It destroys toxins in products e.g. the heating of soya beans destroys the trypsin inhibitors
4 It enhances easy transportation of the product as it breaks the bulk of the product
5 It is used in the standardization of the product
6 It makes packaging easy and this makes marketing of the products more easier
7 It improves on the quality of the products in terms of taste, flavour and colour among others
8 It reduces wastage of spaces during storage by breaking the bulk of the product
9 Easy utilization of the product e.g. grinding of maize into flour makes it easy to prepare/cook

5) **Grading:** refers to the sorting out of the product into uniform size and according to their quality, size, and colour among others. It makes distribution more effective because different grades are sent to different places depending on demand

Importance of grading

1 It helps the farmer in fixing the price of the commodity
2 It assists the buyer to pay for high quality products
3 It helps in standardization and packaging of the products according to uniformity and in determining the suitable market price for the products
4 Encourages production and marketing of good quality products thereby increasing the farmers returns
5 It facilitates buying and selling by not necessitating personal inspection of the commodity
6 By separating products of high quality from those of low quality spoilage is minimized

6) **Packaging:** this is the process of putting commodities in different containers to facilitate handling and marketing of the product.

Advantages of packaging

1 It reduces the bulk of the product which makes it easy for handling
2 It makes substitution of the product by other unscrupulous traders difficult
3 It facilitates quality identification of the products as different qualities are packed in different containers and labeled.
4 It reduces shrinkage and damage to the product due to environmental factors.
5 It may help to reduce other marketing costs by facilitation of self-service retailing.
6 It is used in collecting market information from the labeling on containers.
7 It may assist in advertising the product because products are well labeled.
8 It reduces the contamination of the product by dust and water (foreign objects).

7) **Standardization:** this is the process of sorting and putting the products according to the accepted level or standard (specification of quality and quantity) in the market.

Merits of standardization include

1 It enables the establishment of criteria or procedure for inspection and quality control to ensure that the products are safe for consumption
2 It avoids exploitation of the consumers by the producers and helps to keep the price of the commodity constant in different places

8) **Branding:** this involves setting of the product into uniform lot according to colour, shape, quality and use among others. It makes distribution more easy and efficient because different brands can be sent to different places depending on the effective demand in those areas. Branding makes products unique from others by assigning them special identification marks.

9) **Labeling:** it gives particulars about the produce, the quantity, the grade and the price. It enables the consumers to know exactly what is in the container however the packing should be attractive.

10) **Financing:** money is required to finance all the activities from buying of the materials to final sale of finished products

11) **Advertising:** this is the process of creating awareness of the product to the consumers. It can be done through radios, newspapers, posters and banners.

Advantages of advertising

1. It informs new consumers about the availability of goods in the market.
2. It bridges the gap between the producers and the consumers.
3. Helps the farmer to introduce new products in the market
4. It enables consumers to buy a product hence increase in sale
5. It creates direct contact between the farmer and consumers such that other middlemen are not able to increase prices which may lower demand for the products produced on the farm
6. It persuades consumers to buy more products of the farm instead of buying those of other producers
7. It provides the necessary information on salient features of different products.
8. It helps manufacturer to retain his market share and to create inclinations to the mind of the consumers (mental tendency)
9. It helps consumers to know the technical use and application of the product.

12) **Market research:** it is important to know all about the market and about demand and supply. Consumers need to know where to sell and at what price. It is also important for producers to know when to produce, where to sell and this would help in fixing the market price

13) **Risk bearing:** as goods move through the different stages of marketing, they are liable to spoilage, loss or total destruction. So somebody has to bear the cost of such negative externalities

Problems faced in agricultural marketing

1. Bulkiness; most of the agricultural products have low value in relation to their weight and are difficult to transport because they are heavy and this increases the transport costs.
2. High competition with other synthetic substitute products which are usually of low price and more durable e.g. cotton and rubber faces very stiff competition from plastics, nylon and metals
3. Limited price elasticity of demand; most of the agricultural products are foods whose demand in relation to price is inelastic because once one is satisfied, can't take more even if the price is very low
4. Lack of market information especially where better prices are hence narrowing the market for agricultural products
5. Long production cycle (gestation period): this makes farmers uncertain of the price at harvesting time
6. Inadequate storage facilities especially during harvesting. This exposes the produce to bad weather conditions lowering their quality
7. Large number of small scale producers; there are many producers that can't command a sizeable quantity of the market and therefore they can't be able to meet market demand as a large number makes it hard for them to agree on the selling price and at times are cheated by middlemen
8. Low income elasticity of demand; as ones' income increases beyond a certain point, a proportion of that income on agricultural products fall and that one of manufactured goods increases
9. Variable quality of agricultural products due to instabilities and lack of uniformity in weather, handling of products, pests and disease incidences among others. The quality is often variable and this makes standardization and marketing difficult
10. Price fluctuations: due to the fact that during harvesting, there is surplus produce that leads to low prices and during the dry seasons, there is scarcity which leads to high prices.
11. Seasonality of products; agricultural products are seasonal and as such there is surplus products during harvesting season that results into low demand. In between the season, products become scarce with increase in demand but the farmers can't produce immediately
12. Poor transport facilities e.g. roads yet most farmers are in rural remote areas which delays supply
13. Perishability of the produce: agricultural products are highly perishable (rot easily) and therefore they need ready market and consumption which sometime may not be available

14. Lack of enough advertising facilities to create awareness of the commodities and those which exists are expensive to use
15. Lack of substitute, most agriculture products lack substitutes so in times of scarcity prices become high
16. Lack of enough processing facilities, this makes the agriculture products to be sold off in their raw form hence less prices are offered for the produce
17. Many farmers stay long distance away from the market centers thus incurring high costs of transport to deliver commodities to the consumers.

Solutions to marketing problems

1. By carrying out market diversification measures to open up new markets to consume the excess production and stabilize prices
2. Provision of credit facilities to farmers; the marketing process requires financing for it to be more effective. credit facilities would provide money to aid in assembling, transport, processing etc
3. Carrying out market research and send information to the farmers, this helps the farmers to produce exactly what consumers want
4. Industrialization; this will absorb excess produce from farmers and create market for them
5. Making trade contracts and protocols between consumers and producers. This helps to determine the prices of goods in advance and it reduces exploitation by the middlemen (intermediaries)
6. By setting up buffer stocks; this can be done by government through creating marketing boards or marketing agencies that would buy all the products every season from the farmers, store and sell them when prices are high
7. Establishment of proper communication and transport infrastructure, these help in transporting the produce from where they are in plenty to where they are scarce i.e. to the market. Efficient transportation system enables the products to reach the consumer as quick as possible while still fresh
8. Establishment of processing industries; to improve on quality before storage and to reduce on bulkiness so as to increase on its value for good prices
9. Through construction of proper storage facilities; these help in collection and assembling of the products. Stores also help to stabilize supply and to preserve the quality of the products
10. Proper extensions to farmers; information given to farmers by extension workers enables them to produce good quality commodities that would attract more consumers hence fetching higher prices
11. Formation of co-operatives to enable farmers to pool resources together, gather market information, construct storage facilities, organize transport and bargain for better market price collectively

Benefits of controlling the market system by government

1) It ensures that the market is not monopolized by a single buyer or seller
2) It prevents the dangers of farmers running away from an enterprise beneficial to the country because of unjust prices
3) It ensures that farmers are getting what is due to their produce without being cheated

4) It encourages more sellers and buyers in the market, this allow competition and fair prices
5) It reduces price fluctuation, that is; it ensures price stabilization
6) It ensures production of good quality products
7) It ensures easy revenue collection by the government

Definitions and terms used in agricultural marketing

1) **Marketing margin:** this is the difference between the purchase price and resale price of product retained by either marketing agency or the marketing system as a whole
2) **Monopoly:** a monopolistic situation means a sole seller who has little or no competition. Monopolies are very few in nature
3) **Perfectly competitive market:** is a situation which exists when no single buyer or seller can by his or her own actions alter the market price. It is also characterized by free entry and exit without any limitations
4) **Arbitrage:** the movement of suppliers between one place to another until prices come into balance taking into account transport costs
   It may also be defined as the process of buying a good in one market and selling it at the same time in another market in order to take advantage of the price difference
5) **Imperfect competitive market:** is a situation which exists when the entire supply of any specific product in a unit time is controlled by one seller or a group of sellers who has some agreements among themselves
6) **Oligopoly:** this strictly means few sellers, in this situation few sellers exists and these deal in particular commodities e.g. petrol stations, telecommunication networks among others
   Or
   It is the market structure in which the number of sellers is small enough that changes in price and output of one farm will affect the price and the output decisions of the others

- Describe the activities carried out to facilitate marketing of agricultural products. ***[UACE 2011; No. 9 (a), 2004; No. 8 (a)]***
- What is the role of advertising in marketing? ***[UACE 2011; No. 9 (b)]***
- What problems are associated with the marketing of agricultural products? ***[UACE 2002; No. 2 (b), 2004; No. 8 (b)]***
- Outline the benefits of controlling of the market system by government. ***[UACE 2007; No. 9 (d)]***

PRICE FLUCTUATIONS IN AGRICULTURE MARKETING

These are the sudden changes that occur in prices of goods and services. The prices may go up (positive change on the side of producers and negative on the side of consumers) or down.

Reasons why prices of agricultural products fluctuate

1. Inelastic demand for agriculture products; many agricultural products are food stuffs whose consumption can't be increased significantly even when the prices are reduced i.e. the price of the commodity has little to do with the demand of the produce
2. Perishability of the produce; agricultural products are highly perishable and are not easy to store to even out supply (have poor keeping quality) and need ready market. Price control is therefore hard to enforce by regulation of supply leading to variation in prices.

3. Divergence from planned and actual output due to the inability to predict accurately the final output. Agriculture production depend heavily on natural factors such as weather, diseases and pests over which producers have little or no control, there is often a very big divergence than what is expected
4. Gestation period; agriculture products requires relatively a long period of time to produce compared to industrial products. This makes supply less elastic and they can't respond adequately to demand
5. Seasonality of production; agricultural products are seasonal in nature therefore during harvesting there is surplus leading to low prices and in between seasons the products are scarce and their prices are high
6. Large number of small scale producers; these can't influence the market in their favour and therefore makes it difficult for them to decide at what price to sell their products. This means that none of them can influence the market
7. Bulkiness of the agricultural produce which makes their transportation from production center (areas of plenty) to the market (areas of scarcity) difficult leading to delayed deliveries and low returns
8. Variation in the quality of the produce which makes the commodities to be sold at different prices. This may be as a result of pests and diseases, poor agronomic practices, poor-post harvest handling among others and may at times results into rejection of the produce hence low prices
9. General lack of alternative use of the resources used in agriculture production; the fertile soils and favourable rainfall used to produce crops have very few alternative uses. Farmers therefore may have to continue producing agricultural products even when prices are low or with no improvement
10. Poor transport facilities; this makes the supply and the distribution of produce uneven and at increased transport costs hence variations in prices
11. Lack of co-operation among producers; to limit supply of their commodities on the market, that is failure to follow pre-determined quotas
12. Lack of proper planning and disorganization among producers whereby producers base their production decision on the current prices on the market but these decisions can only be fulfilled after time lag while demand depends on the current prices when the commodities are supplied
13. Competition from artificial or synthetic fibres; this worsens price fluctuation in agriculture as much of the output can only be bought when sellers drastically reduce their price e.g. cotton
14. Weak commodity agreements in producing countries characterized by low bargaining powers and as a result, prices are determined by the forces of demand and supply due to lack of conditions attached

Effects of price fluctuation of agriculture products

1 Unstable income amongst farmers and as such farmers can't meet their domestic expenditures
2 Discourages installation of capital assets because it reduces savings and sometimes much have been spent on production process yet less is gained

3 Increases the risks and uncertainty in farming as farmers get less income that cannot be used to offset risks and uncertainties. This discourages farmers to invest in farming business
4 Unstable prices cause severe strain on the country's balance of payments because the government gets less revenue
5 Price fluctuation may become politically dangerous as farmers may blame the government for unstable prices
6 Interest payment on borrowed capital becomes a burden to the farmer e.g. when prices fall, farmers may not be able to pay promptly or may totally fail to pay back
7 Unstable government revenue due to failure of government to meet its budget or expenditure
8 Falling prices makes farmers to incur losses since they sale their produce at low prices as compared to cost of production
9 It makes planning or budgeting for the next season difficult because income of farmers is unpredictable
10 It causes farmers to hold their product as they speculate or expect increase in prices in future
11 Makes some people to abandon agriculture sector to other sectors of the economy

Methods or measures of reducing price fluctuations (stabilizing agriculture market price**)**

1. Establishment of processing plants to improve on the quality of the produce together with keeping the prices high and stable due to better quality of the goods.
2. Through construction of proper and improved storage facilities to regulate or control supply by storing excess produce after harvesting.
3. Establishment of buffer stocks and price stabilization funds, buffer stocks are products kept in stores and only released when there is acute shortage which is likely to cause a big increase in prices
4. Price legislation i.e. by the government fixing the prices of agriculture products
5. Diversification such that farmers are encouraged to produce more than one product and in case of fall in price of one, the farmer gains from the other
6. Industrialization; this diversifies revenue for government and avoids over dependence on revenue from agriculture goods only
7. By carrying out research and disseminate market information. This help to study the marketing trends and makes it fairly accurate to have better position on demand and supply and also in enterprise selection
8. Establishment of proper transport infrastructure to move produce with ease and to reduce on the transport costs
9. Through improving on the marketing facilities both locally and internationally and this could be done by signing agreements. Internal commodity agreement should be set up to regulate supply of the production and increase the bargaining power of the producers
10. Through formation of marketing organizations by the farmers so that a joint marketing carried out for better prices and to improve bargaining power
11. Market diversification measures should be undertaken to open up new markets to absorb or consume excess products

12. Provision of agricultural subsidies like fertilizers, improved seeds to improve on quality of the products
13. Encourage the production of products with less risks of failure or losing quality with time. However improving and encouraging scientific innovations that reduce risks and uncertainties such as irrigation, use of insecticides to control pests should also be embraced.
14. Encourage contract farming where prices offered for the products are predetermined in an agreement

Problems faced in implementing the stabilization of market prices

1 Conflicting government policy of trade liberalization which discourages price control
2 Farmers' organizations which would organize marketing of farmers' produce are weak
3 Inadequate funding of the agricultural sector
4 Poor quality products i.e. production of mixed quality products
5 Lack of adequate control mechanism for marketing of products
6 High rate of illiteracy among farmers (a big percentage of farmers are peasants)
7 Poor communication network especially roads are a setback to free movement of commodities
8 Processing plants needs sustainable supplies of raw materials which the nature of our agriculture production cannot sustain
9 Competition from synthetic products

Factors that affect the price of a commodity

1. Change in demand; as demand increases price is expected to increase and vice versa
2. Change in supply; as supply decreases, prices increases and vice versa
3. Change in quality of the product; high quality produce fetch high price and vice versa
4. Change in government policy on taxation and subsidies e.g. increase in taxation of agricultural products results into high or increased price and vice versa
5. Cost of production; if the cost of inputs is high, it leads to high cost of production hence high prices of the produce and vice versa
6. Seasonality or festivities; during certain seasons prices of commodities tend to be high e.g. during Christmas season cost of food rises
7. Marketing cost: the higher the marketing cost the higher the price and vice versa
8. Nature of market structure i.e. in monopolistic markets it is the producers to determine the price while in competitive markets, the forces of demand and supply determines the price

- Describe the effects of fluctuations in the prices of agricultural products. ***[UACE 2008; No. 8 (b), 1997; No. 3 (a)]***
- Suggest ways of reducing the effects of price fluctuations on the farm. ***[UACE 1997; No. 3 (b), 2005; No. 9 (a)]***
- What problems would be encountered in implementing the measures to reduce price stabilization? ***[UACE 2005; No. 9 (b)]"***

Revision Questions

1. (a). Explain the meaning of the following terms as used in agricultural marketing
(i). Marketing margin (ii). Arbitrage
(iii) Imperfect competitive market (iv). Monopoly
(v).Perfectly competitive market (vi). Oligopoly

2. (a). Explain why prices of agricultural commodities fluctuate

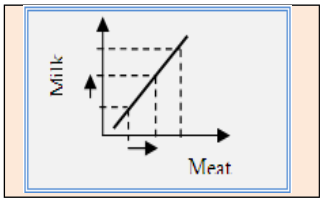
PRODUCT COMBINATIONS

This is important during decision making for a right combination of products and how inputs will improve and increase productivity. However the major problem to most farmers is finding the appropriate combination of inputs that will help to maximize yields and income. This can be done by varying the inputs until the right combination is obtained that can enhance production

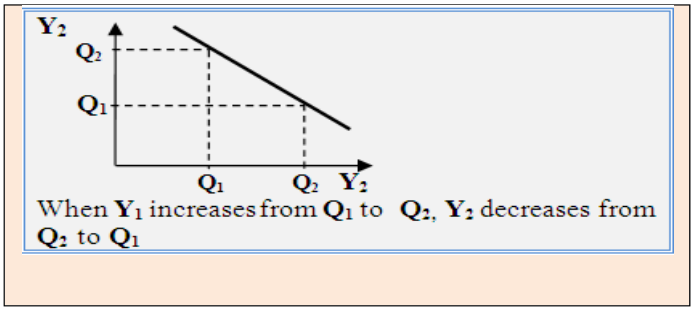
Types of products to product combination

(1) **Complimentary products;** it's a situation where the output of both products increases as the units of resource inputs are transferred between the two enterprises e.g. when legumes like beans are intercropped with cereals like maize, the yield of both crops will increase

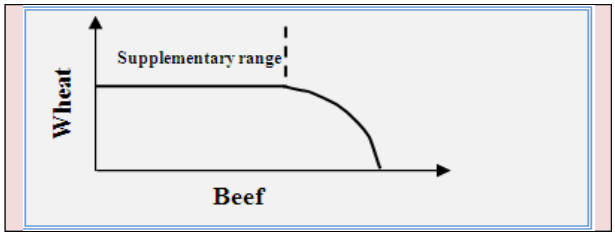
(2) **Joint products;** products are said to be joint when the allocation of resources for one of them automatically results in the production of another product e.g. rearing of cattle for milk and meat, cotton lint and cotton seeds are obtained from one product

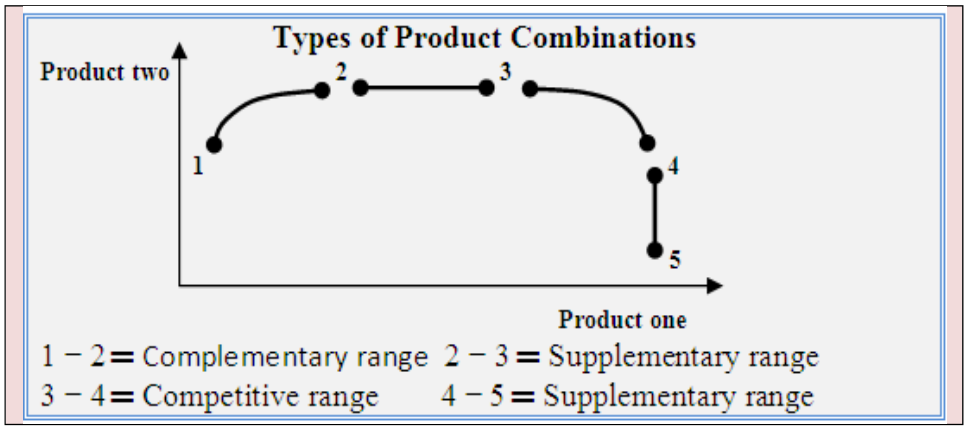


(3) **Competitive products;** these products compete for the same resources such that increase in the output of one leads to a decrease in the output of the other e.g. having both crops and animals on the same piece of land, they will compete for the land resource such that an increase in the production of one, decreases the production of the other



(4) **Supplementary products;** two products are said to be supplementary if production of one of them can be increased without the production of the other e.g. planting fodder trees on the boundaries of banana plantation, neither of the products affects the output of the other





- Giving an example in each case, explain the following product relationships.

(i) Joint products
(ii) Competitive products
(iii) Complementary products
(iv) Supplementary products

[UACE 2007; No. 6 (a), 2014; No. 8 (b)]

THE PRODUCTION FUNCTION

Output of a farm depends on the amount of inputs used therefore

- ✓ A production function is the quantity of a particular output produced as a result of using particular quantities of inputs
- ✓ This is a functional relationship between the quantities of inputs of factors of production for example labour, capital among others and the maximum quantity of output of commodities that can be produced; (the input/output relationship)

When determining the production function, it is assumed that all factors affecting production are kept constant and only one factor is allowed to change

In production we have 2 types of inputs and they include

1. **Variable inputs:** a variable input is one which changes in the production process by increasing or decreasing. Examples; fertilizers, labour, feeds, seeds, pesticides etc all these can change
2. **Fixed factors/inputs:** a fixed factor is one which remains unchanged or constant as the level of production increases or decreases. Land is considered to be a fixed factor of production

The production function can be expressed;-

a) In words or statement form e.g. the amount of maize produced per unit area of land depends on the amount of fertilizers used
b) In mathematical form, assume that Y is a dependent variable and X is a non-dependent (independent) variable factor therefore **y = f(x),** where **y** equals the output obtained and **f** is the input used

c) In tabular form e.g.

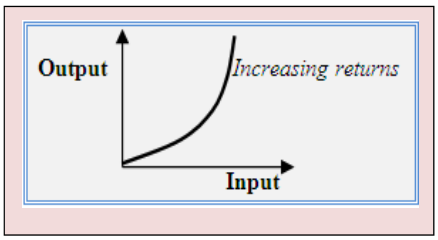
Amount of fertilizers	Yield capacity
0	0
50	200
150	300
200	400
250	500

NB: *All these results into returns*

Forms or types of returns from the production function

A production function assumes 3 forms which may be treated as different types namely;

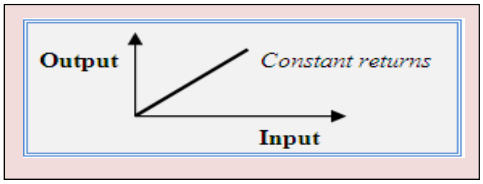
[1] **Increasing returns**: this happens when each additional unit of input applied in the production process yields more total physical product. Each additional unit results into a large increase in output than the preceding unit however its rare in agricultural production



Exercise 1; Using the data in the table below, Plot a graph to represent the relationship between change in output and change in the inputs used in the production process

Number of workers	1	2	3	4	5
Output (TPP) 20kg bags of rice	2	5	10	16	26
Increase in TPP per extra unit of input	-	3	5	6	10

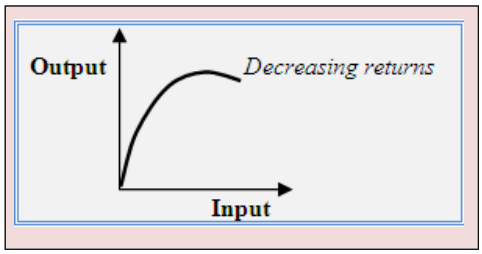
[2] **Constant returns:** this occurs when each additional unit of the variable factor added to a fixed factor yields equal units of output to the total production capacity of a function as expressed graphically as shown below



Exercise 2; Complete the table and plot a graph to show how output changed as the inputs used in the production process increased

Number of 10kg bags of CAN fertilizers	1	2	3	4	5
Output (TPP) 100kg bags of soya beans	15	30	45	60	75
Increase in TPP per extra unit of input	-				

[3] **Decreasing [Diminishing] returns**: this happens when each unit of the variable factor added to the fixed factor yields less and less output that is; each additional unit of input results in a smaller increase in output than the preceding unit. It's the most common form experienced in agricultural enterprises and results into the ***Law of diminishing returns***



Examples; Feeding a dairy cow for milk production with varying amounts of feeds, varying a feed rate in a given type of animal, crop response to application of varying amounts of fertilizer

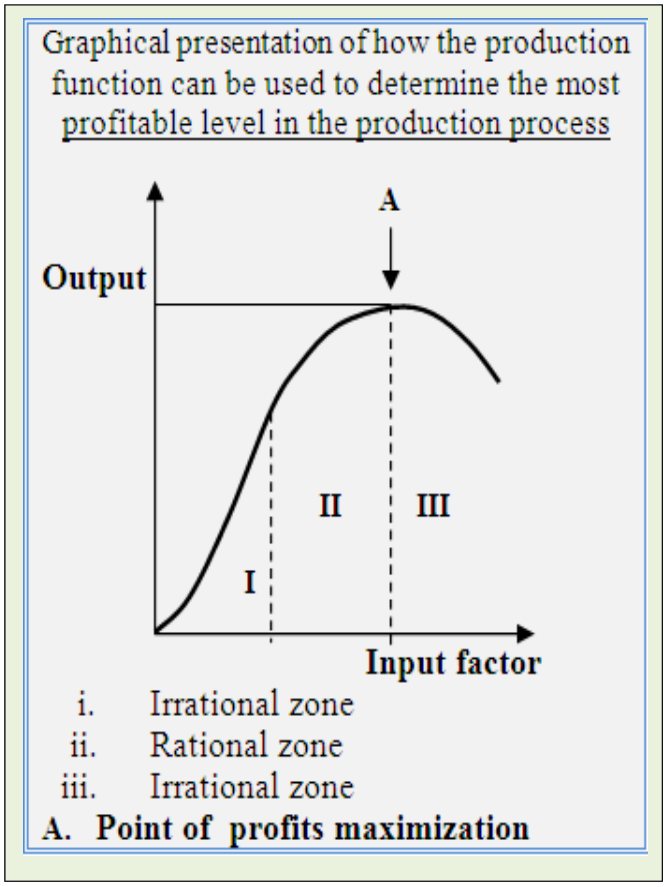
Exercise 2; Basing on the data in the table below, plot a graph of TPP against inputs used in the production process

Number of 10kg bags NPK fertilizers	1	2	3	4	5	6	7
Output (TPP) 80kg bags of beans	10	22	36	46	53	57	54
Increase in TPP per extra unit of input	-	12	14	10	7	4	-3

- Describe the types of production function experienced in farming. ***[UACE 2003; No. 8 (a)]"***

How the production function is used in determining profitability in production

- In the first zone in the production of for example maize, the production function shows constant returns.
- During this zone, profits are not maximized simply because the more additional units of inputs used in the production yields or results into the same amount of the output. (constant returns)
- Where the production function shows increasing returns additional inputs yields more additional outputs and when the production shows diminishing or decreasing returns, profits will be obtained however at a decreasing or diminishing rate
- The production of maize should continue up to when additional units of inputs results in equal output. This is referred to as the point of profit maximization
- Any production beyond the point of diminishing returns, additional units of inputs results into less or reduced output (irrational stage of production)



- Explain how the production function can be used to determine the most profitable levels in production. ***[UACE 2003; No. 8 (b)]***
-

THE LAW OF DEMINISHING RETURNS

It is one of the most eminent concepts in the theory of production function. The modern version of the law of diminishing returns is known as ***law of variable proportions.*** Production function basically shows the physical relationship between the inputs and the outputs may be either constant or variable.

It states that; "If a variable input is increased while the other factors are held constant, a point is reached when the continued addition of extra units of the variable factor yields less than the proportioned returns to the total product"

The law states that the more and more units of variable factors are added to fixed factor such as land, marginal product first increases and reaches a maximum point after which it decreases.

The law explains the relationship between inputs and outputs in the short run.

The law has been defined by economists in the following way: *"As the proportion of one factor in a combination of factors is increased, first the MP and then AP of that factor will increase and reach the maximum point after which it will diminish"*

The law studies the relationship between fixed factors and variable inputs in the short-run. However, here it is assumed that only one factor of production is variable and all other factors of production are fixed.

The law examines how an increase in the variable factor of production, while keeping other factors of production constant, affects the output level. The study attributes that in the initial stage of production, an increase in the variable factor of production increases the output level proportionately. However, eventually the output level will not increase proportionately.

Assumptions of the Law, the law is valid when the following conditions are fulfilled.

1. The state of technology is constant.
2. Only one factor is varied and all other factors remain fixed
3. The fixed factor and variable factor are combined together in variable proportions in the process of production
4. The units of the variable factor are homogeneous (similar or uniform).
5. The law operates in the short run.

According to the law of diminishing returns, output can be explained in three ways

1. **Total physical product (TPP)**; TPP is the amount of output produced from land with given number of labourers employed. It is the total amount of units of output obtained as a result of using an input.

2. **Average physical Product (APP)**; the APP_L is total product (TP) divided by the number of labourers employed. $AP_L = TP_L/L$ or (**Average point is given by** $= \frac{\text{êëíîìàñóòîí}}{\text{êëíîìõõàúòúíàí ùìôû îùüùî}}$

   Is the average of the total product per unit of a variable factor used at that level

3. **Marginal product *(MPP_L)***; the marginal product of labour (MP_L) is the change in the total product due to a change in labour. $MP_L = \Delta TP/\Delta L$ or $\textbf{Marginal product} = \frac{\textbf{Change in total product}}{\textbf{Change in total amount of inputs used}}$.

   It's an increase in the TP resulting from utilization of an extra unit of the variable factor in production

Illustration of the Law

Example; A farmer cultivating 1 acre of land; land is fixed factor tries to increase output by varying the variable factor, i.e., labour. The change in total product, average product and marginal product of the variable factor (labour) are depicted in the following table:

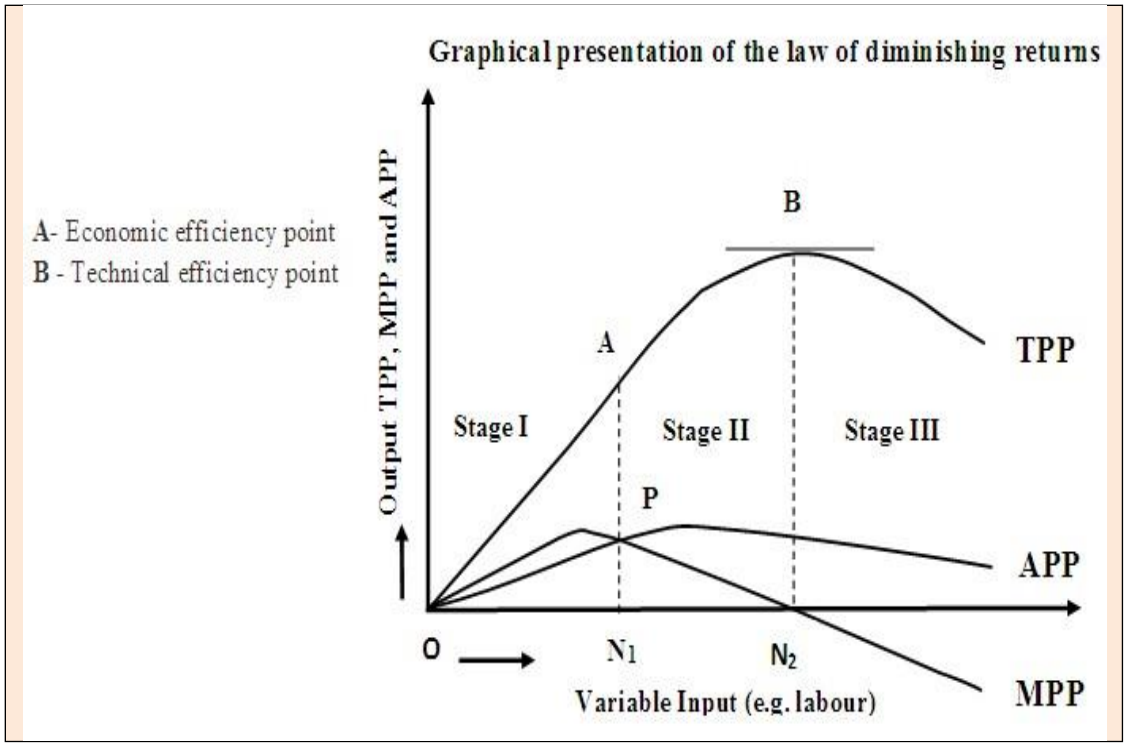
Fixed factor	Units of Input (L)	Total Product (TP)	Marginal Product (MP)	Average Product (AP)	Stage
1 acre	1	100	100	100	I
1 acre	2	220	120	110	I
1 acre	3	360	140	120	I
1 acre	4	460	100	115	II
1 acre	5	530	70	106	II
1 acre	6	570	40	95	II
1 acre	7	595	25	85	II
1 acre	8	600	5	75	II
1 acre	9	594	-6	66	III
1 acre	10	560	-34	56	III

In table above, there are increasing returns to labour for the first 3 units of labour employed. The law sets in with addition of the 4th worker. Both the AP and MP increase at first and then decline. The MP declines faster than the AP. When 8 men are employed, TP is at a maximum. The MP of the 9th labourer is negative. Thus, if

i. MP > 0, TP will be increasing as L increases

ii. MP = 0, TP will be constant as L increases

iii. MP < 0, TP will be falling as L increases.



Properties of TP, MP and AP curves in the three stages of production

Stage	Total Product	Marginal Product	Average Product
I	Increases at an increasing rate	Increases	Increases
I	Increases at a diminishing rate	Reaches a maximum and begins to diminish	Continues to increase
II	Continues to increase at a diminishing rate	Continues to diminish	Reaches maximum and begins to diminish
II	Reaches maximum at the end	Becomes zero at the end	Continues to diminish
III	Diminishes	Becomes negative	Continues to diminish but must always be greater than zero

The implications of the law of diminishing returns shown in figure O - X-axis (horizontal axis) measures the variable input, labour. AP, MP and TP are shown along the vertical axis. The TP has increased up to the point **B**, i.e. TP curve reaches a maximum when MP = 0 and starts declining when MP < 0.

The total product curve exhibits the following characteristics:

1 MP > 0 and increasing (from 0 to A)
2 MP > 0 but decreasing (from A to B)
3 MP = 0 at the point B
4 MP < 0 after the point B

Point A where the TP stops increasing at an increasing rate and starts increasing at a diminishing rate is called the ***point of inflexion***. This is the point at which the curvature of the

TP curve changes and diminishing returns set in. AP and MP curves also rise initially. However, they start declining much earlier than the TP curve. The MP curve starts declining earlier than the AP curve and cuts the AP curve at its maximum point **(P)** and then falls at a steeper rate than the AP curve

- Using an illustration, describe the relationship between total product, average products and marginal product of a production function. ***[UACE; 2011]***

Revision Question
Explain the three stages of the law of diminishing returns

The three stage of production in the short-run

Production in the short-run can be divided into three stages:

1. Stage I, from the origin to N_1
2. Stage II, from N_1 to N_2
3. Stage III, to the right of N_2

The 3 stages illustrated in figure, No profit maximizing production would take place in stage I or III.

Stage I; the proportion of variable factor to fixed factor is low. Therefore, by adding one more unit of labour, the producer can increase the average productivity for all the units. 20 acres of land with 10 tractors and only two operators would be operating in stage I of the short-run production function. By increasing the amount of labour in stage I and the AP of labour increases

Stage II; it's the only stage in which there is neither redundancy of the variable factor nor redundancy of the fixed factor. Throughout this range the AP of labour declines, but the MP is positive thus the economically meaningful stage. In this zone, the producers use their resources to the maximum. TP increases at a decreasing rate, MP becomes zero. AP reaches its average point where it intersects with a decreasing MP curve. Its' the most profitable stage to operate in because resources are optimally utilized

It is a region of technical efficiency which is measured by the level of output to level of input used in producing the output and it's a stage where fixed factor becomes scarcer in relation to variable factor

Stage III; there are negative returns for each extra unit of the variable factor. MP becomes negative for each extra unit added of the variable factor. This zone does not satisfy the role of profit maximization. TP and AP are all declining, it does not pay the producer to be in this region because by reducing the labour input he can increase total output and save on the cost of a unit of labour.

There is too much of the variable factor in relation to the fixed factor. A farm with too many workers in relation to the number of machines is an example of stage III, it's considered as an irrational stage

Nevertheless, it is quite likely that a farm lacking perfect knowledge may be operating in this stage. In agriculture, this may be found to be very common. For instance, some economists have explained evidence of overcrowding of broilers and layers in poultry houses, a farmer excessively using herbicides at a very high concentration on crops and overstocking of the pasture may result into serious erosion

Exercise 1; the table below shows the production of ground nuts at the different levels of calcium ammonium nitrate (CAN). Use the information to answer the questions below

Fixed factor (Land in ha)	Variable input CAN (kg)	Total product (TP) (no of bags, 90 kg each)	Marginal product (MP)	Average product (AP)	Stage
1	0	10			
1	1	17			
1	2	33			
1	3	52			
1	4	64			
1	5	70			
1	6	73			
1	7	75			
1	8	75			
1	9	68			

(a). Basing on the data, calculate the marginal product and complete the table
(b). Plot a graph of total and marginal products against the variable input
(c). Explain the relationship between the total and marginal product
(d). Basing on the graph, state when the law of diminishing returns begins to operate

Exercise 11;The table below shows the changes in TPP, MPP and APP in liters of Kiziri's farm as amount of dairy meal fed to the animals increased. Use the data to answer the questions below

Bags of 100kgs of dairy meal	Milk obtained in L (TPP)	MPP	APP
0	0	-	-
1	1.5	1.5	1.5
2	6	4.5	
3	9.5		
4	10.7		
5	10.5		
6	9.5		

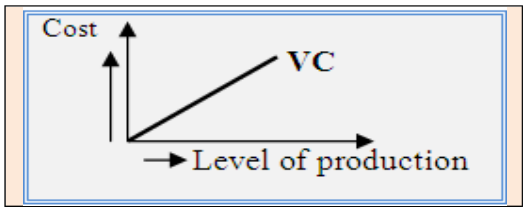
a). Use the information above to calculate the MPP and APP of the farm
b). Plot a graph using the values of TP, MP and AP and indicate the technical efficiency point of the farm

COSTS OF PRODUCTION

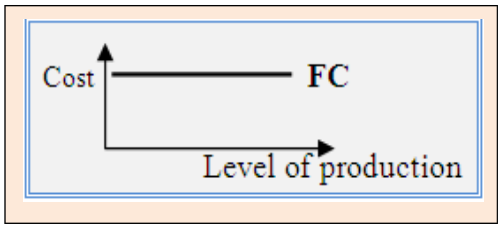
These are expenditures incurred for the production process to take place. They are meant when acquiring production inputs and these cause production to take place in order to obtain a certain level of output

Types of costs in production

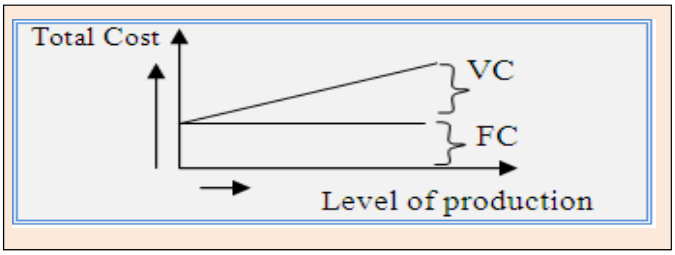
1 **Variable costs:** these costs fluctuate directly with the level of output produced or scale of production. They are costs incurred on variable factors of production like fertilizers, labour among others They are also called **prime costs** or avoidable costs and they increase or decrease as the scale of production changes



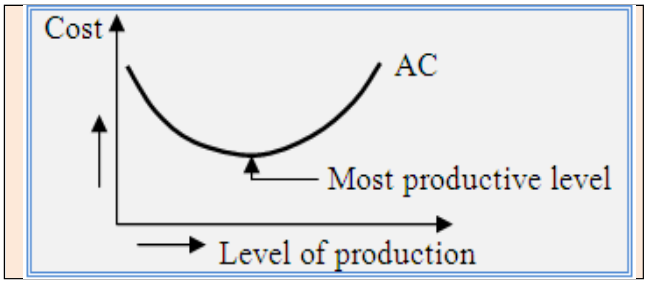
2 **Fixed costs:** these are costs or expenditures that do not vary or change with the level of production. They are incurred irrespective of the production level that is whether it's producing or not e.g. depreciation of machines, electricity bills, rent, insurance premiums, salaries and wages of permanent workers etc.



3 **Total costs:** this refers to the summation of total of fixed costs and the total variable costs. Or it's a total sum of expenditures incurred during the whole production process. T.C = TFC + TVC



4 **Average costs:** this is obtained by dividing the total cost by the total output produced. At low level of production, total costs are high because of the fixed costs and as the level of production increases the average falls gradually but increase in production beyond a certain level leads to an increase in the costs. This is due to increased variable costs and fixed costs



5 **Implicit costs:** these are costs that are not taken into account (not easily recognized) in calculating the profits of the farm e.g. family labour, self-employed resources, rent on own buildings etc

6 **Explicit costs:** they are actual costs incurred by the producer during the production process. They are easy to recognize, quantify and to include in the books of accounts to determine profits or losses in production e.g. cost of hired labour, power costs, depreciation on farm machinery etc

7 **Nominal costs:** these are obtained when the cost of production are converted into monetary value e.g. the money used to hire land, pay for transport, buy inputs, paying labour

8 **Average fixed costs:** this is the sum total of fixed cost per unit of output. $\mathbf{AFC} = \frac{\text{TFC}}{\text{Total}}$

9 **Average variable cost:** this is the total of variable cost per unit of out. $\mathbf{AVC} = \frac{\text{TVC}}{\text{TP}}$

10 **Marginal cost:** this is the additional cost to total costs as a result of raising the level of production by a single unit. (this is change in the total cost when output is changed by one unit, therefore it refers to the cost of producing one additional unit of output $\mathbf{MC} = \frac{\text{Cange in total cost}}{\text{Change in output}}$

- Describe five types of costs an investor in farming enterprise considers in order to maximize profits. ***[UACE 2005; No. 8]***

Advantages of determining the cost of production

1. It helps the farmer to know whether he is operating at loss or profit
2. It helps in the pricing of the product basing on the total cost of production
3. It helps the farmer to know the most productive level when the average cost is at the lowest point
4. Helps the farmer to get the right combination of input that will help him obtain maximum profits
5. It helps the farmer and tax authorities to agree on how much to charge per unit produced, this is determined by considering the cost of production which helps to determine the profit or losses made
6. It helps the farmer to answer the economic questions on what to produce, how much to produce, when to produce, for whom to produce

Characteristics of agricultural production in Uganda

1. Most agricultural products are seasonal in nature; being in excess just after harvesting time and scarce towards harvesting
2. Agricultural products are bulky therefore difficult to store and to transport
3. The majority of farmers are small scale peasants and they use small plots of land to carryout farming
4. Most agricultural products are perishable and thus cannot be stored for long
5. Many agricultural enterprises take long to give sellable products e.g. coffee plantation, vanilla, pine trees (have long gestation period)
6. There is stiff competition between some agricultural products and synthetic products e.g. wood and metals or plastics, cotton and polyesters etc
7. The demand for agricultural products in a market is price inelastic i.e. change in price does not influence their demand in time
8. Output is never fully under the farmers' control because of the natural factors like weather conditions, pests, parasites and diseases among others

Revision Questions

1. What is meant by the following?
(i). Production function.
(ii). Total physical product
(iii). Average physical product
(iv). Marginal physical product

2. (a). State the characteristics of agricultural production in Uganda
(b). Give reasons why it is advantageous to determine the costs of production

EFFICIENCY IN AGRICULTURE

Efficiency is one of the most important concepts to use in A-level economics course. There are several meanings of the term but they generally relate to how well an economy allocates scarce productive resources to meet the needs and wants of consumers

Efficiency Standards in Agriculture

This is the criterion that is based on in the assessment or analysis of individual enterprise performance on the farm or the entire farm. The performance can be compared with the other farms producing the same commodities, size and location or with established standards

Efficiency standards can be reflected in terms of high or more returns from least resources (cost of investment) in the production process. Efficiency enables the farmer to identify areas of weakness and to forge mechanisms to improve them using the available production factors.

In farming, efficiency standards are categorized into two sub-categories

1. **Technical efficiency;** is the effectiveness with which a given set of inputs is used to produce an output. That is a dairy farm is said to be technically efficient if a farm is producing the maximum quantity of output from the minimum quantity of inputs such as labour, capital and technology.

The concept technical inefficient is said to occur when a firm fails to be technically efficient because of absence of competitive pressures e.g. a monopoly employs inefficient working practices because it has no incentive to cut costs like a farm employed too many workers than was necessary or used outdated capital

NB: Technical efficiency is necessary for efficient allocation to be achieved however it requires optimal allocation of resources

Therefore it assesses the ability of the factors of production in giving the required positive returns within a set period of time.

2. **Economic efficiency:** it relates to the amount of inputs and the amount of output. It therefore compares the production costs against the output (returns) obtained that is, it mainly centers on profitability and it is used as a yardstick for comparison

Economic efficiency would be achieved when a certain level of output is produced with the lowest cost of inputs and it's only relevant when the quality of goods being produced is unchanged

$$\textit{Economic efficiency} = \frac{\text{Units of output}}{\text{Unitsofinputs}} \times 100$$

Economic efficiency help to depicts the farmers' economic progress and helps him in making reviews or restructuring of the farm plans

- Distinguish between economic efficiency and technical efficiency. ***[UACE 2015; No. 9 (a)]***

Types of Efficiency Standards in Agriculture

1. **Partial efficiency standards;** it focuses on the evaluation or assessment of efficiency or the performance of a particular farm enterprise. There are 2 ways of comparing yields using the method

(i) Yield index; the efficiency of carrying out an enterprise within a farm is measured

$$\textbf{\textit{Yield index}} = \frac{\textbf{Actual yeilds obtained}}{\textbf{Expected yeilds}} \times \mathbf{100}$$

The actual yields obtained from 4 acres of maize or tomatoes are compared to the expected yield efficiency standards. The farmer can therefore find out whether the yields obtained are below average or above

Exercise 1; Katamba, a cereal farmer in Wakiso district obtained 1250 kilograms of maize. The expected returns basing on the inputs used in the actual production were 2000 kilograms. Determine Katamba's farm efficiency using the yield index method.

(ii) System index; the yield of a farm enterprise (productive venture) is compared with that on another farm dealing in production of one product. For example Ssemujju in Wakiso producing maize on the 1 acre is compared to Musoke in the same area

$$\textbf{System index for Ssemujju's farm} = \frac{\acute{u}\hat{o}\hat{i}\acute{o}\acute{u}\ \ddot{e}\ddot{\cdot}\hat{i}\ddot{o}\tilde{o}\grave{u}\acute{o}\ \ddot{e}\tilde{o}\ \ddot{e}\acute{u}\grave{u}\text{Æ}\grave{o}\text{⁄⁄}\grave{o}^{\text{⁄}\acute{u}}\ \pm\grave{i}\tilde{n}\text{Æ}}{\acute{u}\hat{o}\hat{i}\acute{o}\acute{u}\ \ddot{e}\ddot{\cdot}\hat{i}\ddot{o}\tilde{o}\grave{u}\acute{o}\ \ddot{e}\tilde{o}\ \mathring{a}\grave{o}\acute{u}\ddot{e}\ddot{u}\grave{u}^{\text{⁄}\acute{u}}\ \pm\grave{i}\tilde{n}\text{Æ}} \times 100$$

NB: Any index below 100% will necessitate designing new approaches to improve farm efficiency, a farmer should always aim at improving his own efficiency using the available resources instead of comparing or competing with his neighbors.

Exercise I; Donozio and Akello are maize farmers in Kalungu District all using 10 acres of land and same number of workers. At the end of the production cycle, Donozio was able to obtain 1850kg while Akello obtained 1487kg. Determine the efficiency of the Akello's farms

2. **Overall efficiency;** in this case assessment is done by totaling or summing up all the farm enterprise as one unit. The profits from each enterprise on the farm are added or totaled up and the average profit per acreage is obtained, the percentage of the returns to amount of capital used depicts/shows the farmer overall efficiency of the farm

$$\text{Overall efficiency} = \frac{\text{¥üù}\grave{\imath}\tilde{n}\grave{\imath}\mu\grave{u}\ i\tilde{n}\ddot{e}\ddot{\pm}\ddot{o}\acute{\imath}\ \ddot{e}\ddot{\cdot}\hat{\imath}\grave{\imath}\tilde{o}\tilde{o}\grave{u}\acute{o}}{\hat{e}\ddot{e}\acute{\imath}\hat{\imath}\hat{\imath}\ \ \tilde{a}\grave{\imath}\ddot{o}\acute{\imath}\hat{\imath}\hat{\imath}\ \ddot{o}\tilde{o}\ddot{u}\grave{u}\acute{u}\acute{\imath}\grave{u}\acute{o}} \times 100$$

Farm efficiency should be an incentive for the farm to design approaches for improvement at all times but should not discourage him. Farmers should always aim at achieving a progressive improvement (improve on the previous performance). Farmers who always try to produce more than the previous season are commonly referred to as ***progressive farmers.***

Example: Alexander owns a mixed farm in Kangulumira dealing in poultry, piggery, vegetables and maize. Use the data given in the table below to calculate his farm efficiency

Project	Poultry	Piggery	Maize	vegetables	Total	Average
Capital invested in each project	295,000	188,000	85,000	39,000	**607,000**	**204,200**
Profits obtained from each project	380,000	235,000	152,000	498,000	**816,800**	

Solution; Overall efficiency $= \frac{\text{¥üùìñìµù ìñë‡öí ë¨îöõùó}}{\text{êëíìî ãìïöíìî öõüùúíùó}} \times 100$

Therefore;

Total capital = 295000 + 188000 + 85000 + 39000 = **607000**

Total profits = 380000 + 235000 + 152000 + 498000 = **816800**

Average profits$= \frac{\text{êëíìî ïñë‡öíú}}{\text{êëíìî õòÆ¨ùñ ë± ïñëßùôíú}} = \frac{\text{ãXnãVV}}{\text{m}}$ **= 204200**

Overall efficiency $= \frac{\text{¥üùìñìµù ìñë‡öí ë¨îöõùó}}{\text{êëíìî ãìïöíìî öõüùúíùó}} \times 100 = \frac{\text{YVmYVV}}{\text{nVÜ,VVV}} \times 100$ **= 33.64%**

Exercise 1; Bwana Matata is a farmer dealing in poultry, piggery, maize and vegetables; during the entire production process, he employed capital amounting to 10M and he was able to register to profits of shs 7340000 with an average. Determine the average profit and the overall efficiency of the farm

Exercise 2; Agnes owns a mixed farm in Mityana having a banana plantation, Vegetables, cassava, millet and maize. During the second season of 2015, she was able to obtain the following

Project	Banana	vegetables	Cassava	Millet	Maize
Capital used	220300	32200	143000	99800	121000
Returns on capital invested	175200	19300	114000	72100	93500

Qn. Calculate the overall efficiency of Alengoti's farm.

- Giving relevant examples, describe types of efficiency standards used in assessing the performance of a business. ***[UACE 2007; No. 8 (a)]***

Advantages of assessing the efficiency of the farm

1. It enables the owner of the business to select the best managers and workers basing on their positive contribution towards the progress of the business
2. It enables the manager to identify areas of weakness i.e. the economic progress of the farm (whether it is making profits or losses)
3. It enables the farmer or the manager to adjust the state of technology or to design approaches to improve all areas of weakness
4. It helps in decision making by selecting the most suitable enterprise to undertake
5. It enables the farm manager in selecting most affordable and the most suitable combination of inputs or factors of production to produce a given output
6. It may result in increased or intensified production in terms of quality and quantity due to the efficiency in allocation of the scarce productive resources

- Why is it necessary to assess the efficiency of a farm from time to time? ***[UACE 2015; No. 9 (c)]***

Factor that determine efficiency in farming

1. Farm records kept on the farm; these help to assess the economic status or situation on the farm and design approaches or measures to increase farm efficiency
2. Price offered for the commodities; higher prices influence production of more commodities hence efficiency
3. Farm size; the increase in the size of the farm leads to increase in returns to the units of inputs used in the production process and the farmer is able to benefit from economies of scale but large farms call for sound management to ensure increased productivity and to minimize losses
4. Capital availability to cater for the purchase of inputs such as fertilizers, farm machinery, agro-chemicals among others leading to an increase in farm efficiency
5. Mechanization of the production process, this ensures timeliness of all the production process by increasing the rate at which tasks are accomplished, it also ensures uniformity, quality and quantity of the output by increasing the acreage of land under actual production hence efficiency
6. Management; the expertise or skills employed in the management of the factors of production determines efficiency. Sound management leads to efficient allocation of scarce productive resources, effective and efficient decision making, accountability of the financial resources among others
7. Farming techniques or methods used in the production process, use of scientific methods of production or modern methods results into increased productivity and efficiency due to proper use and allocation or the factors of production

- Explain the factors affecting efficiency in farming. ***[UACE 2007; No. 8 (a)]***

Ways of increasing efficiency in farming

1. **Using improved production methods** e.g. by following proper agronomic practices such as crop protection (pests, weeds and disease control), soil and water conservation, and artificial insemination. All the above practices ensures proper growth of crops and livestock production
2. **Mechanization;** it increases the rate at which farm activities are accomplished according to the work plan and time scale. Mechanization ensures uniformity in quality, increased quantity; machines increase the acreage of land under production among others
3. **Improved farm management;** it involves proper planning for effective allocation of the scarce productive resources like capital, land and labour, knowledge of the market also helps the farm manager. Irrespective of the farm size, sound management is essential.
   Business and technical aspects are the two major aspects in management where by technical aspects calls for knowledge of scientific principles and practical skills of animal and crop production while business aspect is decision making and organizational process which call for judgment and quickness of perception (acumen or discernment)

4. **Intensification of production;** practices like fertilizer application, feeding of dairy animals on concentrates (supplementary feeding) among others, all the above leads to increased production.

- How can the efficiency of production be improved on a farm? ***[UACE 2015; No. 9 (c)]***

RISKS AND UNCERTAINTIES IN AGRICULTURE PRODUCTION

➢ Risks in agriculture production

A risk is situation in which the future occurrences of an event can be predicted with a certain degree of possibility basing on the previous experience or prior knowledge

Therefore the risk can be insured against because they can be predicted and estimated

Examples of risks in production

1. Weather changes.
2. Theft of farm produce, livestock, machines and equipment that can bring a setback to a farmer
3. Health conditions of the workers on the farm
4. Natural hazards such as floods, pests and disease attack of crops among others.
5. Accidents to the workers especially during work.
6. Fire outbreak which can burn the crops, animals, farm structures among others

➢ Uncertainties in agriculture production

These are situations when the neither outcome nor the occurrence of events on the farm cannot be predicted and therefore one has no perfect (imperfect) knowledge.

Examples of uncertainties

1. **Price changes;** prices of agriculture commodities are highly variable therefore; becomes difficult for a farmer to predict at which price he or she will sell his crops at the time when he is planning. Price fluctuation therefore puts a farmer in a situation where he has the imperfect knowledge
2. **Changes in technology advances;** this is due to introduction of new and more advanced and efficient machinery. This means that the old machines and methods of production become outdated
3. **Change in government policy;** different governments come into power with different policies that influence farm production. This can't be predicted with the respect to pricing of the agricultural products, taxation of the inputs and outputs among others
4. **Breach of contract;** a contract may be made between the producer and the consumer, but consumers may refuse to take the products at a certain period of production and at that time a loss is made
5. **Transport reliability;** there may be a failure of transport or breakage of farm vehicles for instance the delivery truck when is most required or the bridge may be swept away by the run off

6. **Human uncertainty;** it becomes difficult to predict whether workers will go on strikes or change their employment status
7. **Changes in labour supply;** labour may not be available at the time when it is mostly required
8. **Political instability** e.g. in Juba Southern Sudan which disrupts the production cycle leading to destruction of the plantation through burning or looting
9. **Personal uncertainty**; this arises when one cannot tell the time when he/she will fall sick
10. **Management uncertainty;** the policies and decisions of people responsible for farm production may be complicated and may not remain constant, situations like these arise when the farm manager and workers are in conflict

Ways of overcoming uncertainties (solutions)

1. Insurance against risks: this is when the farmer pays an insurance company certain sum of capital (premium) so that in case of a problem the farmer is compensated.
2. Making proper contract: this is an agreement between the producer and the consumer stating the quantity and their respective price of the produce at harvest.
3. By carrying out diversification: it is a practice of producing more than one product on the same farm and incase one fails to fetch income the farmer benefits from the other. Therefore; the risk of loss is spread over different commodities
4. Flexibility in production methods: refers to how easy one can change from one production or enterprise to another. It may also refer to how easy farm assets can be put to different uses to suite new circumstances, e.g. farm buildings erected should be multipurpose
5. Adopting modern methods of production to improve both quality and quantity of the produce.
6. Liquidity; this refers to the ease with which farm assets may be converted into cash. The more liquid assets a farmer has the better because the farmer can easily sell certain assets if he or she expects a drop in the price of such products
7. Price support: this aims at stabilizing the price by setting prices of the products that will at least cover the variable costs. On international market, this is done by setting quotas of certain products. A quota is that fraction of the commodity produced which by agreement can be sold at international market
8. Additional inputs: inputs like drugs are needed to control and prevent diseases so as to maintain production
9. The government should improve on the road facilities and encouraging farmers through giving them subsidies
10. Selection of the most secure enterprises: the farmer should choose the enterprises which are most certain e.g. poultry production instead of rabbit keeping, disease resistant crops and drought resistant crops in case of short rains.
11. By constructing proper storage facilities to maintain quality of the produce and to prolong the shelf life of the products so that they are sold at high prices

- Outline ways of reducing the effects of risks in a farming business ***[UACE, 2015. No. 8 (a)]"***

ENTERPRISE SELECTION AND COMBINATIONS

The enterprise chosen by the farmer in preference to others must have obvious comparative advantages

Factors to consider when selecting or choosing an enterprise

1) Weather and climate; favourable temperature and adequate rainfall are necessary for crops. Rearing of livestock also requires that rainfall supports the growth of pasture
2) Soil factors; the soil should be fertile to support farming. The topography is important when it comes to construction of buildings and roads
3) Pests and diseases; these should be limited to ease the production by lowering the production costs
4) Production objectives; this is important because what a farmer grows should yield profits when sold. A farmer normally makes decision on what to produce
5) Market; any produce needs to be sold if production is to continue, production without disposal or distribution to a consumer is meaningless
6) Price; products should have an attractive price, which gives incentives to producers. At low prices farmers will stop production
7) Social factors; in some societies e.g. sheep are very important while pigs are forbidden. These aspects are usually influenced by religion and tradition
8) Capital; this determines the type of machines or tools used and the quality of inputs used in the actual production. Availability of capital ensures timeliness of farm operations
9) Transport; this bridges the gap between producers and consumers. A good transport system ensures timely delivery of goods to the market for sale
10) Government policy among other; the government may encourage farmers to select a given enterprise by giving subsidies and tax holidays on inputs. It may also avail technical and financial support in form of agricultural credit to boost farmers' financial base

- Discuss the factors that govern the choice of a farm enterprise. ***[UACE 2001; No. 3 (b)]***
- Explain factors that influence the choice of farming enterprise. ***[UACE 2015; No. 8 (b)]***

THE CONCEPT OF SPECIALIZATION AND DIVERSIFICATION

(a) Specialization

This is the process of concentrating resources in the production of one (sole) crop or one type of animal

Advantages of specialization

1. The farmer masters the production methods as a result of concentrating on the same production procedure
2. Quality products are likely to be produced because all resources are maximally utilized in production of one product
3. It makes the production of the specific product easier because the focus is put on a sole product
4. It needs little capital to start the production of a sole or one commodity than raising capital for multiple products
5. It encourages production for the market i.e. one produces according to the market demand

6. It becomes easier to manage the production process with minimum labour thus reduced expenditure on wages
7. Increased productivity leads to reduced cost per unit of output hence reducing the price consumers have to pay
8. It facilitates mechanization because machines suited to the task at hand are developed and used

Disadvantages of specialization

1. In case of natural disasters, the whole production process is destroyed
2. There are a lot of resources which may not be used for one part of the year e.g. labour after harvesting is left without work, ploughing equipments among others
3. The income is not likely to be constant throughout the year
4. Soil fertility may be difficult to maintain due to monoculture
5. Workers employed in one production process may find it difficult to perform in the new production process especially when the product becomes economically unviable
6. It limits the range of commodities available in a given locality or may avail limited number of raw materials for industrial development
7. A farmer is forced to depend on one type of food which may cause malnutrition
8. It may lead to over production of one commodity that may be difficult to be absorbed in the market
9. Occupational immobility of labour that is changing from one job to another is difficult resulting into unemployment

(b) Diversification

This refers to the concentration of farm resources in the production of more than one product. It may include growing more than one type of crop (mixed cropping, or mixed farming)

Advantages of diversification

1. It acts as an insurance against losses from natural diseases e.g. a cattle disease (foot and mouth disease, anthrax) killing all animals
2. A farmer is assured of constant income throughout the year from different enterprises
3. Integration of farm by-products is possible e.g. peelings from food can be used to feed livestock and manure from livestock can be used for growing of crops
4. It is easy to maintain fertility as each production supplements the other
5. There is efficient use of farm resources especially labour and equipments
6. It removes the negative effects of price fluctuation as it spreads the risks to various farm enterprises
7. It increases employment opportunities to farmers, i.e. a farmer can shift from one product to another and continues to be employed throughout the year
8. It increases government revenue through taxation of incomes and so it widens the income base of a country
9. It avails a lot of raw materials for industrial development especially agro-based industries
10. Malnutrition is avoided since the farmer can access a variety of foods

Disadvantages of diversification

1. It is difficult to manage and to select a combination of enterprises
2. Workers may not be perfect as they need to acquire multi-skills
3. Pests and diseases can easily spread from one enterprise to the other
4. It is difficult to organize the marketing of several products and this may result into low returns
5. It requires a large piece of land which may not be available due to the increasing population pressure on the available land
6. It may require a lot of capital to acquire the scarce productive resources like modified tools and machines thus increased production cost

Revision questions

1. (a). Distinguish between risks and uncertainties and give examples
(c). Suggest the various ways of overcoming risks and uncertainties
2. With examples, explain the advantages and the disadvantages of specialization in production.
3. (a). Give reasons why it may be advantageous to diversify production
(b). What are the likely challenges of engaging in diversified agricultural production?

AGRICULTURAL CREDITS OR LOANS (*Financing of Agricultural Production*)

This refers to financial assistance either in cash or in kind given to farmers as loans to enable them improve the production enterprises

Types of Agricultural Credits

1. **Short term credit:** this is a loan repayable within one year and is used to purchase variable inputs such as seeds, fertilizers etc
2. **Medium or intermediate term credit:** this is a type of credit repayable within 2 to 5 years and is used to finance projects e.g. fencing land, buying equipments etc
3. **Long term credit:** it is a type of credit repayable within a period of up to 15 years and is used to finance or buy durable resources like land

Classification of Credits

(a) Soft credit: it is a type of credit offered to farmers without substantial security and given at low interest rates and usually in kind. It's payable in a very short term

(b) Hard loan: it's a type of credit offered to farmers at high interest rates and with substantial collateral security usually immovable assets such as land. It's usually payable after a long period of time

Sources of agricultural credit

1. Commercial banks
2. Insurance companies
3. Government agencies
4. Licensed money lenders/private companies
5. Farmers' organizations

6. Micro-finance organizations
7. Inheritance
8. Input suppliers
9. Co-operatives societies/banks
10. NGOs

Reasons why farmers acquire loans

1. To purchase long term assets like land that can be used to increase the level of production
2. To get working capital in order to buy farm inputs like fertilizers, herbicides etc
3. To overcome the risks and uncertainties which usually occur during the production process
4. To construct farm structures like improved stores to increase production, efficiency and minimize crop losses due to spoilage
5. To cope up with seasonal patterns of production like hiring casual workers during planting, weeding, harvesting etc
6. To increase the level of production by employing more resources like labour, high yielding varieties among others

Factors considered before giving out a loan to the farmer

1. The security offered (collateral); the security offered should be able to cover up the value of the loan requested for
2. The purpose or intended use of the loan, e.g. production loan, consumption loan or development loan
3. The amount required in relation to the purpose i.e. the amount should be able to cover the cost of the project
4. The economic status of the farmer basing on his or her assets and the liabilities
5. The contribution of the farmer towards the loan institution or project, the loan is easier to give to a farmer who has a substantial stake in the project
6. The previous loan history of the farmer, this gives the background information on his or her ability to repay loans as may be planned or scheduled
7. Level of prior training given to the farmer in loan management and use before giving out the loan to ensure proper usage and proper accountability
8. The capacity of the applicant to repay the loan (trustworthiness), this is also based on the assets and liabilities of the farmer
9. Duration of the loan repayment schedule (the time an individual farmer is supposed to pay all or a given percentage of the loan capital)
10. Personal data i.e. name of the farmer, family status or the dependants, health status, employment status among others

Reasons why some farmers fail to pay back loans or credits

1. High interest rates charged by the credit or lending agencies which makes the amount to be repaid much higher than the profits the farmer may have obtained from the use of the loan
2. Miss-appropriation or misallocation (miss use) of credit i.e. diverting it to non-intended purposes especially if it is in cash form. e.g. a farmer may use the loan intended to boost production for marrying extra wives

3. Untimely release of loan money to farmers that leads to poor timing of projects leading to poor returns
4. Unrealistic repayment schedules that do not tally with the production schedules i.e. paying back before harvesting of the produce
5. Fall in the prices (price fluctuation) of the produce due to poor market and fall in the aggregate demand leading to a loss. The farmer may produce and yet fail to find the anticipated market due to changes in market conditions such as change in tastes
6. Poor infrastructure such as the transport and communication network in an area to compliment the loans
7. Dodging of loan re-payment by farmers due to poor attitude or culture of many farmers to dodge loan repayment
8. Insecurity or political instability which may result into destruction of the farmers' assets or produce making the farmer unable to generate enough profits to cover up the loan
9. Inflation; this may depreciate or reduce the value of money lent making it both unable to cover the intended project and very difficult to pay back most especially if the loan was quoted in foreign currency that appreciates as the local currency depreciates
10. Low levels of education of the farmers resulting into poor management skills characterized by uncoordinated or poor book keeping; this makes the farmers unable to know whether they are making profits or losses in order to adjust or to switch to a new line of production resulting into losses.
11. Natural hazards e.g. sudden changes in climate, pests and diseases may lead to animal or crop failure
12. Bad or ill health of the farmers leading to poor supervision on the farm and at times death of the farmer
13. Poor marketing ability or lack of market information which makes farmers to be exploited by middlemen leading to losses
14. Poor extension services leading to poor choice of business venture whereby farmers make wrong business decisions making them unable to obtain enough profits to service the loan
15. Too much credit which may lead to wastage of the loan capital
16. Inadequate credit; the loan may be inadequate to cover the entire project making the farmer unable to implement his production plans to his satisfaction
17. Unsuitable repayment schedule; the repayment period may be too short or too long making the farmer to be overloaded with loan repayment

How to ensure effective use of loans by the farmers

1. There should be coordination services from the lending institutions to avoid duplication
2. Training of credit agencies or personnel, co-operative society staff need to be trained so as to be able to evaluate and monitor the projects appropriately
3. Agricultural credit should be provided as part of an integrated agricultural development program. The program should include extension services to provide expert advice to the farmers so that the loan is put to good use
4. Providing the credit in kind or less in cash most especially to the inexperienced farmers.
5. Regular monitoring of the projects by the lending agencies to reduce loan defaulting

6. Through creation of awareness of the credit facilities to farmers, efforts should be made to develop the commercial attitude to farming and to encourage saving
7. By giving the credit or loans to farmers with proven ability i.e. people with suitable paper work and substantial collateral security
8. The government should provide other services like transport and communication infrastructure, security etc to complement agricultural credit programs and to ensure success of the loan programme
9. There should be an active credit policy that takes the credit to the farmers rather than the farmers coming for loans. This increases awareness and timely delivery of the loan for proper co-ordination of the activities
10. It's important that; the introduction of credit programs be accompanied by improvement in marketing system to be able to absorb the increased output that would result from increased supply of capital
11. The loan recovery or repayment program should be properly designed and enforced however the institutions should give a reasonable grace period to the farmers to avoid loan overload
12. Agricultural credit should be given in suitable installments according to the level of production to ensure proper use of the funds or inputs by avoiding misappropriations

INTEREST ON LOAN CAPITAL OR CREDIT

- It is referred to as the percentage of loan capital or principle amount obtained from the financial institution that has to be paid on top of loan obtained
- It can also be defined as the amount of money charged by the financial institutions for use of a loan or the borrowed capital. It is determined in terms of percentage and usually paid monthly or per year (annually)

The determinants (factors) of the interest rate on loan capital

1. Government policy, an increase or reduction in the interest rate at which the central banks lends money to other financial institution determines the interest rate charged by other financial institutions when lending money to finance farming activities
2. The cost of loan administration, the interest rate charged depends on the administrative cost and the lower the cost the lower the interest rate and vice versa
3. Inflation or decline in value of money, as the value of the national currency appreciates the interest rate declines and as the economy depreciates the interest rate on loan capital will increase
4. Demand or need for loan or credit, if the demand for the credit is low also the interest rate charged will be low and as the demand for credit or loan capital increases, the interest rate will also increase
5. Supply of the credit finance, as the supply of loanable income increase, the interest rate charged will have to increase and vice versa
6. Loss due to default, risky loan or the ones that are likely to have higher losses due to defaulting leads to high interest rates charged by money lending institutions to be able to recover up the credit

7. The interest to be paid on loan capital, this is common when an applicant for the loan is a member of the credit society. An interest is attached to the principle amount that is given out by the credit institutions

Revision Questions

1. (a). What is meant by the term credit?

(b). Give the types of credit in agricultural production and identify the sources of credits

(c). Give reasons why farmers apply for agricultural credits or loans

2. (a). Explain the determinants of the interest charged on the agricultural credit

(b). Explain the considerations that are made before financial institutions gives out money to the farmer

TOOLS OF FARM MANAGEMENT

LIVESTOCK RECORDS (FARM RECORDS)

These are written documents of all activities to be used for future reference. They are important tools in management as they help in assessing the progress of the farm

Good record keeping improves efficiency standards on a farm; information stored on the farm is derived from the production process

Advantages of farm records

1. Farm records (financial records) enables the farmers to monitor the profits and losses e.g. in times of economic depression, profits dwindle and if expenditure is not cut down, the farmer may end up in financial bottlenecks
2. Records facilitate pedigree selection in livestock by showing individual animal lineage/percentage performance which works as a basis for selection and animal improvement
3. Records enable the farmers to obtain loans from money lending institutions or banks
4. Records help farmers to share the profits and losses in case farmers are operating on the co-operative basis (group farming)
5. Records enable the farmer to remember his debtors and creditors and to facilitate prompt payment and repayment
6. Records enable the farmers to detect for irregularities (locating weak points) of the farm and to correct them
7. Farm records help in conflict resolution mechanisms such as land boundary conflicts, settlement of an estate after the death of the farmer and this helps to avoid effects of the property-related conflicts that may result into destruction of plantation, death, unlawful evictions among others
8. Record help in tax assessment by the concerned revenue collection authority, this helps to prevent over taxing or under taxing especially in countries where record keeping in farming is a legality

9. Records show the efficiency of the farm, they are used in calculating the efficiency of the farmer
10. Records can reflect the true value of the farm, therefore they help the farmer to decide whether to sell off the farm besides the expected trend of performance
11. Farm records show past events on the farm, they show how particular enterprises have performed up to date. Therefore they are important to plan for the future

➢ Outline the value of keeping records for a livestock enterprise. ***[UACE 1995; No. 3 (a)]"***

Types of Farm Records

1) **Inventory record:** This shows a list of everything owned by the farm, e.g. buildings, feeds, land, produce in store, growing crops as well as all the money owned. The farmer also has to estimate their value in monetary terms
2) **Production records:** These depend on the type of production on the farm. production may be in crop or livestock

Types of production records include:

a. Crop production records: such records show the following i.e. date of planting, acreage, variety or breed planted, inputs used such as fertilizers, expected date of harvesting, expected cash returns, field map, yield of various crops etc.

b. **Livestock production records*:*** *these include;*

(i) Milk production records; these are used on dairy farms to show the amount of milk produced daily per animal, monthly and throughout the period of lactation. They help farmers to assess the individual animal performance and to identify changes or variations in amount of milk produced which may be as a result of disease attack, variation in feeding, heat period among others

They help the farm manager to implement the most suitable measures early enough

MILK PRODUCTION RECORD													
ate, month and year	**Name of the animal (cow's number**												**Cumulative total**
	Var platin 200			**Torpane 388**			**Hallas 097**			**Helmer 080**			
	M	**E**	**T**	**M**	**E**	**T**	**M**	**E**	**T**	**M**	**E**	**T**	
1st/09/2015	12	10	**22**	10.5	8	**18.5**	12	8	**20**	10	9	**19**	**79.5**
2nd/09/2015	11.5	9.5	**21**	10	9	**19**	12.5	8.5	**21**	10.8	9.2	**20**	**81**
3rd/09/2015	12	9	**21**	11.5	8.5	**20**	12	9	**21**	11	9	**20**	**82**
4th/09/2015	10.3	9.7	**20**	10	8	**18**	13	9.5	**22.5**	10.7	9.3	**20**	**80.5**
30th/09/2015	10	9	**19**	11.5	9	**20.5**	12.8	9.2	**22**	9.5	7.5	**17**	**78.5**
Total	**103**			**96**			**107**			**96**			**401.5**

M: Morning **E: Evening** **T: Total**

(ii) Breeding records; these shows the breeding cycles (estrus or heat period) of the animals on the farm. They also show the bull that was used to service the cow or whether artificial insemination was used, date of service, calving date and infertility cases.

ANIMAL BREEDING RECORD							
Dam or cow's name	**Sire or bull's name**	**Service date**	**Expected calving date**	**Actual calving date**	**Calving round**	**Calf sex**	**Calf number**
Var platin 200	Jolly boy 474	16th/02/2013	18th/11/2013	23rd/11/2013	1st	Male	764
Torpane 388	SK. Flex 011	05th/04/2013	07th/01/2014	06th/01/2014	2nd	Female	436
Hallas 097	Vingegard 043	12th/07/2014	14th/04/2015	17th/04/2015	1st	Female	477
Helmer 080	Alexanda 472	18th/09/2014	20th/06/2015	22nd/06/2015	3rd	Male	165
Var platin 200	Kalunda 001	02nd/10/2014	1st/07/2015	3rd/07/2015	2nd	Female	108

(iii) Sales records; they indicate the items sold by the farm e.g. eggs sold, amount of milk sold, calves sold, animals sold among others. They help to show the quantity sold and the income obtained

a) Milk sales record; this shows the amount of milk sold to the different consumers and the income obtained by the farm

MILK SALES RECORD								
Date and month	**Name of the customer or consumer**					**Total sales (L)**	**Cost per litter**	**Amount received**
	Sekimpi	Okello	Opeto	Peter	Kintu			
1st/10/2015	4	2	3	2.5	5	16.5	1,200	19,800
2nd/10/2015	4	2	3	2.5	5	16.5	1,200	19,800
3rd/10/2015	4.5	2.5	3.5	3	6	19.5	1,000	19,500
4th/10/2015	4.5	2.5	3.5	3	6	19.5	1,000	19,500

b) Animal sales record; these are used to indicate the animals sold off from the farm and the reasons for selling the animal and the amount obtained

ANIMAL SALES RECORD				
Date and month	**Animal name**	**Name of the buyer**	**Reasons for sale**	**Amount received**
1st/10/2015	SK.Flex 011	Waiswa	Low resistance to ticks and tick born diseases	895,000
2nd/10/2015	Hallas 097	Bumali	Low milk yield	730,000
3rd/10/2015	Torpane 388	Kimuli	Very old	683,500
4th/10/2015	Kalunda 001	Katongole	Bull for breeding	1,000,000

(iv) Health records; these shows the occurrence of diseases, animal disorders, treatment (drugs and medicine administered), vaccination programs. They enable the farm to properly control the diseases as early as possible

ANIMAL HEALTH RECORD					
Date of disease identification	**Animal' s name**	**Signs and symptoms**	**Diagnosis**	**Treatment administered and date**	**Remarks**
10th/07/2015	Torpane 388	- Uncoordinated body movements -Depression -Twisted head towards the body	Parturient paresis (milk fever)	Calcium borogluconate injection administered on 12th/07/2015	**Animal recovered after one and half week**
29th/07/2015	SK. Flex 011	- Loss of appetite - High body temperature - Depressed respiration - Body weakness	Red water (babesiosis)	Injection with diminazene aceturate on 30th/07/2015	**The animal responded positively to the treatment after one week**
08th/08/2015	Hallas 097	- Constipation - Loss of appetite - Blood in urine and feaces - Increased body temperature	Anaplasmosis (gall sickness)	Tetracycline and imidocarb administered on 11th/08/2015	**Recovered after 5 days**

(v) Purchase records; these help to indicate all the inputs bought or acquired by the farm, their quantity, unit cost and the total cost or amount of money spent. e.g. of items include feeds, replacement stock, tools and equipment among other

ANIMAL PURCHASES RECORD					
Date and month	**Item bought**	**Reasons for purchase**	**Quantity**	**Unit cost (shs)**	**Total cost (shs)**
1st/05/2015	Spade	Cleaning the calf barn	4	3,500	14,000
2nd/05/2015	Dairy meal	Supplementary feeding	85 kg	380	32,000
3rd/08/2015	Barbed wire	Perimeter fencing	3 rolls	57,500	172,000
4th/10/2015	Replacement stock	Bulls for breeding	2	600,000	1,200,000

(vi) Feeding records; they indicate the type and quantity of feeds given to each individual animal on the farm. They are most common on farms that practice supplementary artificial feeding

ANIMAL FEEDING RECORD					
Date and month	**Animal's name**	**Type of the feed**	**Amount**	**Cost per Kg**	**Total cost**
1st/02/2015	Helmer 080	Dairy meal	3.5 kg	500	1.750
2nd/02/2015	Hallas 097	Dairy meal	4.0 kg	500	2,000
3rd/02/2015	Torpane 388	Dairy meal	3 kg	500	1,500
4th/02/2015	Var platin 200	Dairy meal	3.8 kg	500	1,900

Revision Question; Describe the type of records that should be kept for a livestock farm to maximize output

3) **Labour record:** this record shows the number of labourers employed whether permanent or temporary, wages of labourers among others
4) **Cash record:** this refers to records of financial transactions, receipts and payment; the receipts are recorded in a cash book
5) **Account records:** these are records that show financial progress of the farm or records of monetary value of the farm products. These help the farmer to find out whether he is operating at a loss or profit

Types of account records

[1] Trading profit and loss account: this is an account that examines the aspects of profits and losses of a business. Its major function is to measure how well or badly the farm has performed throughout the financial year.

Therefore it shows the income and expenses incurred on the farm during a stated period of time, usually one year

It also shows how the inventory changed crops, supplies and livestock during the same period of time and the estimated depreciation on all the depreciable assets e.g. buildings, equipments, machines etc

An illustration of the trading profit and loss account

Trading profit and loss account
For Mr. Lumumba
As at 31st/12/2014

Opening stock/valuation xxx		Closing valuation xxx	
Purchases		**Sales**	
Feeds	xxx	Milk	xxx
Chemicals	xxx	Eggs	xx
Livestock	xx	Debts receivable	x
Seeds	x	Crop produce	xxx
Gross profit	**xxx**		
Expenses		**Receipts**	

Electricity	xxx	Gross profit b/d	xxx
Insurance	x	Commission	xx
Wages	xx		
Repairs	xxx		
Net profit	**xxxx**		**xxxx**

Features of a profit and loss account

1. There must be a heading, stating the name of the statement under preparation and the period of preparation
2. Purchases and expenses are entered on the left side while sales and receipts are entered on the right side
3. Expenses or receipts on individual items summed up and entered asa total
4. Total expenses and total receipts are indicated below the lists of expenses and receipts
5. The value of all items on the farm at the beginning of the year is entered as opening valuation under purchases and expenditure. If the farmer had to buy the farm at the beginning of the year, that would be his expense.
6. The value of the assets on the farm at the end of the year is known as the closing valuation. These are entered under the sales and receipts because if the farmer is to sell off his farm at the end of the year, this would be the amount received for it
7. There is net profit or net loss. A net profit is made when sales and receipts exceed the purchases and expenditure and net loss when purchases and expenses exceed sales and receipts

Example; Basing on the data below,

a). Draw a profit and loss account for **Nama Estates'** mixed farm for the year ending 31st/12/2019

Sale of birds	1,000	Purchase of feed stuffs	280
Opening valuation	15,000	Closing valuation	12,000
Purchase of seeds	500	Hired labour	500
Purchase of NPK	800	Depreciation on machines	300
Rent	400	Interest on loan	200
Purchase of calves	300	Repairs and maintenance	300
Sale of cereals	1,700	Purchase of chicks	240
General expenses	210	Sales of milk	700
Sale of cabbages	300		

Nama Estates'
Trading Profit and Loss Account
As at 31st/12/2019

Purchases and Expenses		Sales and Receipts	
Opening valuation	15,000	Sale of birds	1,000
Purchase of seeds	500	Sale of cereals	1,700
Purchase of NPK	800	Sale of cabbages	300
Rent	400	Sales of milk	700
Hired labour	500	Closing valuation	12,000
Depreciation on milking machines	300		
Interest on loan	200		
Repairs and maintenance	300		
Purchase of chicks	240		
Purchase of calves	300		
Purchase of feed stuffs	280		
General expenses	210		
Total expenses	19,030	Total sales	15,700
		Net loss	3,330
Total	**19,030**	**Total**	**19,030**

b). Give reasons why one side is greater or smaller than the other

Sales and receipts (total sales) are less than purchases and expenses (total expenses), the expenditure exceeds the value the income obtained as at 31st/12/2019 therefore a net loss is obtained to balance off the account

Exercise 1; At the end of the year 2018, Lugenda farm estates evaluated their farm and were to prepare a profit and loss account from the following transactions that were carried out during the year.

Basing on the information below prepare a profit and loss account for Mr. Lugenda's farm

Purchase of a knap sacker	20000	Debt receivable	2500
Fuel expenses	5000	Sale of produce	9000
Purchase of seeds	2000	Wages	1500
Opening valuation	50000	Insurance fee	800
Sales of milk	8000	Closing valuation	90000
Purchase of CAN	500	Depreciation on knap sacker	800

Exercise 2; The following data was obtained from Mr. Okello's mixed farm records as at 31st/December/2018. Prepare Mr. Okello's trading account as at 31st/12/2018 from the data provided.

Purchase of N.P.K fertilizers	60,000	Repair of dip tank	2,500
Sale of goat	3,000	Opening valuation	121,000
Sale of coffee	70,000	Interest on loan	6,500
Closing valuation	150,000	Salaries	24,000
Purchase of pruning knife	700	Egg sale	30,000
Depreciation on the tractor	7,000	Vaccination of animals	3,000

Exercise 3; Prepare a profit and loss account for Mr. Jjagwe's farm for the year ending 2016 basing on the data below

Sale of cattle	50,000	Purchase of seeds	25,000
Sale of milk	900,000	Opening valuation	2,100,000
Purchase of acaricide	128,000	Debts receivable	320,000
Sale of groundnuts	410,000	Rent	80,000
Purchase of cattle	690,000	Purchase of birds	580,000
Wages for workers	1,600,000	Closing valuation	2,300,000
Sale of vegetables	680,000	Purchase of dairy meal	
Debts payable	495,000	411,000	
Purchase of diesel	400,000	Sale of calves	400,000

[2] Balance Sheet: this is a statement drawn up to show financial position of the business on a particular date. It can be drawn at the end of the year or at the beginning of the year.

It is made up of the following;

a. Assets: these are productive resources owned on the farm, e.g. buildings, machinery, raw materials**.**

NB: Assets appear on the right hand side of the balance sheet.

They are of two types namely;

1 Fixed assets; these are permanent long-lasting assets e.g. machinery, coffee plantation, building etc.

2 Current assets or liquid assets; these are resources that are changeable or easily converted into another form within a short time e.g. raw materials, milk, fertilizers, etc

b. Liabilities: these are the debts and obligations incurred when running a farm business i.e. all that the farm should pay to other people e.g. loans, bank overdraft, depreciation, debts payable among others

NB: Liabilities appear on the left hand side of the balance sheet.

There are of three types namely;

1 Long term liabilities; these are debts or loans that are to be paid after a long period like 5 years and above and are used for buying assets, hire land, dam construction, such loans last longer and attract high interest rates during repayment

2 Current liabilities: these are debts payable within 1 year e.g. creditors, bank overdraft, rent payable. They are used for buying feeds, farm animals among others
3 Intermediate liabilities: these include loans lasting for more than one year and less than 5 years. They can be used for purchasing livestock, machinery among others

Capital: Both assets and liabilities constitute what is called capital and it's obtained by subtracting liabilities from assets.
Capital = Total assets – Total liabilities

a) Where the value of the assets is greater than the liabilities, the difference is called the Net worth or Net capital is recorded under liabilities i.e. that would be the money the farm owes the farmer
b) If the liabilities are greater than the value of assets. The difference is called net loss and is recorded under assets. The farmer would then be said to bankrupt; that's even if he sold off all his properties, he would not be able to pay off his debts

Example: Draw a balance sheet for Mr. Tomusange's demonstration farm as at 31st/12/2018 basing on the information below

Cash in bank	75,000	Value of poultry	5,000
Bank overdraft	13,830	Value of cattle	18,000
Debts payable to Nkalubo	14,600	Value of coffee husks	42,000
Debts receivable	1,700	Long term loan	38,000
Value of land	38,000	Value of knapsack sprayer	34,000

Mr Tamusange's demonstration farm
Balance sheet
As at 31st/12/2018

Liabilities	Assets
Bank overdraft 13,830	Cash in bank 75,000
Debts payable to Nkalubo 14,600	Debts receivable 1,700
Long term loan 38,000	Value of land 38,000
	Value of poultry 5,000
	Value of cattle 18,000
	Value of coffee husks 42,000
	Value of knapsack sprayer 34,000
Total liabilities 66,430	Total assets 213,700
Net worth +147,270	
Total 213,700	**Total 213,700**

Exercise: 1; Prepare a balance sheet for Mr. **Ssebugwawo**'s farm as at 31st/12/2019 basing on the information below;

Vegetable sales	640,000	Debts receivable	410,000
Cash in hand	235,000	Debts payable	1,350,000
Value land	1,310,000	Interest on loan capital	120,000
Value of heifers	1,850,000	Value of crops in store	550,000
Cash at bank	360,000	value of the thresher machine	1,100,000
Value of feeds and drugs	600,000	Wages for security guards	350,000
Bank overdraft	2,350,000	sale of a calf	380,000

Exercise 2; Draw a balance sheet for Mr. Jaggwe's farm as at 31st/12/2019 basing on the data below;

Value of tools	1,240,000	Debts payable	318,000
Value of crops	218,000	Value of livestock	298,000
Bank overdraft	1,340,000	Cash in bank	288,000
Debts receivable	462,000	Depreciation	58,000
Value of the farm structures	1,980,000	Prepaid expenses	500,000

Exercise, 3; The data was obtained from Kibirige's farm as at 31st/12/2018.

Capital improvements	350,000	Debts receivable	860,000
Account payable	600,000	Short term loan	255,500
Insurance	45,750	Promissory notes	105,000
Cash in hand	75,000	Long term loan	1,500,000
Cash in bank	630,250	crop sales	760,000
Taxes to be paid in a year	500,000		

Question; Prepare a balance sheet for Mr. Kibirige's farm

Importance of a Balance Sheet

1. It enables the farmer to acquire loans as they show the net worth of the business
2. It helps in assessment of tax liabilities
3. It helps in planning and decision making as it enables the farmer to see whether the business is viable or not
4. It enables the assessment of the value of the farm in case of sale
5. It enables the sharing of profits and losses in case co-operative farming
6. It enables companies to negotiate for mergers, contracts etc.
7. It is a legal requirement for public companies and has to be published annually (per year)

Farm Budgeting

A budget is an action plan showing the amount of money to be spent and the expected income from an enterprise to be undertaken or from the changes to be made on the farm

It can also be defined as a formal statement of financial resources that are to be used to carry out farm activities in a given period of time and the expected financial returns

A budget is needed because farmers need to operate on scarce resources amongst the competing alternatives

- What is a budget? ***[UACE 1999; No. 2 (a)]***

Advantages of budgeting

1. A budget helps the farmer to select among the many alternatives i.e. those enterprises that are likely to be more profitable
2. Shows the farmer early enough whether the enterprise being undertaken is to be profitable or not profitable
3. It clearly defines areas of responsibility in the organization
4. It enables the farmer to carryout remedial actions in case of mistakes
5. It motivates the employees by giving them a common sense of purpose especially when involved in the budgeting process
6. A budget provides a basis for performance appraisal
7. Promotes coordination among the managers who executes the duties of the farm

- Explain the ways in which a farm budget can be used to improve farm management. ***[UACE 1999; No. 2 (b), 2006; No. 8 (a)]***

Problems of making a budget

1. Goals that are set may not be achieved if there is no collective participation by the entire stake holder in the budgeting
2. It takes a lot of time and effort to make a comprehensive budget
3. Some farm managers overestimate the cost of production so that in future they are not blamed for incompletion due to lack of funds
4. Some farm managers lack perfect knowledge of farm budgeting leading to failure to make a comprehensive budget

- What limitations do farmers face when making farm budgets? ***[UACE 2006; No. 8 (c)]***

Sources of information required to prepare a farm budget

1. Farmer data; the farmer keeps variable information that can be used as a basis for drawing a budget
2. Records; obtained from other farms of related business. This acts as a guide for referencing information that is needed in the process of budgeting
3. Co-operative societies; farmers operating in a group may use information provided by these organization concerning what to produce, how to produce and this is used as variable information for determining how the budgeting process will be done

NB: The budget should set out: -

i. What to produce?

ii. How much to produce?
iii. How much resources will be required for production?
iv. Expected cost, returns or losses

Types of Budgets

1) **Complete Budget:** this is a major estimate made when big changes are to be made on the farm e.g. when introducing dairy cattle on the farm or when a new farm is being set up. It relates to the entire farm thus the physical data are included and all the costs and receipt items have to be calculated

Procedures of drawing a complete budget

1. State the objective of the business; that is whether the objective is to increase sales or to reduce services or profit maximization among others
2. List all the available resources and there are of 2 types of resources i.e. fixed resources like land, buildings. Liquid resources such as money, an inventory should be made of the farm available resources to be used. Managerial ability and skills of the available labour force should be considered
3. Estimate the crop area and livestock number to determine the stocking rate. If the area is mainly for crop then the crop area is calculated first, stock number is determined according to available pastures
4. Estimate the physical inputs and outputs. Physical inputs like raw materials, variable inputs such as seeds, feeds, fertilizers, water, electricity among others and physical outputs like milk, cotton lint, maize grains production expected
5. Workout an estimate of fixed costs e.g. rent and interest on borrowed capital, regular labour, machinery and general over heads
6. Estimate factor and product price i.e. calculate the costs and returns. Costs and returns for items of inputs and outputs are calculated by multiplying the estimated quantity and price i.e. the cost of labour, management among others
7. The estimated profits should be worked out. It involves setting out the information totaling the cost and returns and calculating the estimated profit from the estimate of the farm plan

- Describe the steps in making a complete budget. ***[UACE 2010; No. 8 (a), 2006; No. 8 (b)]***

Uses of a complete budget

1. To obtain an estimate of the future capital requirements for the farm business, the capital includes farm buildings, machinery among others
2. To accurately estimate the profitability taking into account appreciation of livestock and depreciation of assets

Ways in which a farm budget can be used to improve farm management

1. The farmer is able to estimate the required production resources in terms of labour, capital etc, these assist the farmer in allocating the scarce resources in relation to cost so that the highest returns are obtained from their use

2. It guides the farmer in choice of the enterprise that maximizes the available factors of production. The farmer looks at the opportunity cost i.e. is able to determine the most profitable enterprise
3. It can be used to improve farm management as it helps the farmer in making effective changes in the organization. This can be done through records and computing the gross margin of the two enterprises which the farmer may need to substitute and choosing the enterprise with the highest returns
4. The farmer is able to assess progress or lack of progress made towards the set goals by looking at the records of each enterprise.
5. It helps the farmer to foresee the costs or the profit by comparing what he is going to produce e.g. determining added receipts and reduced costs will help to estimate the profit
6. Information from the budget enables the farmer to identify resources for his success or failure and this strengthens the farm operations
7. Budget information improves farm management as the farmer is assisted when negotiating for profits i.e. the farmer can determine how much was to use and when it is to be used

2) **Partial Budget (the break - even budget)**: it is a type of budget used in planning a small or minor change on the farm or changing a few enterprises. It requires estimates of the extra costs and the returns expected from such a change. It is relatively a simple budget unless when it involves shifting from one enterprise to another e.g. switching from dairy to poultry production

Terms used in relation to partial budget

1. Added costs; these are extra costs added to what you had budgeted. It is mainly that extra cost which you intend to incur as a result of changes made during the production process
2. Added receipts; this is extra revenue beyond what you had estimated
3. Reduced costs; these are estimates of costs which will not be incurred compared to what had been estimated
4. Reduced receipts; this is getting of less revenue compared to what had been budgeted (returns that will no longer be received after a change has been made)
5. Total credits; these are additional receipts plus reduced cost
6. Total debits; this is the sum of the additional costs plus reduced receipts
7. Change in net income; this is the difference between total debits and total credits

Steps followed when making a partial budget

1. Calculating the expected increase in farm income e.g. added revenue/receipts from the products that will be sold
2. Calculating reduced expenses that will be eliminated if the proposed change is implemented
3. Added revenue + Reduced expenses = Total income or revenue expected
4. Estimate added expenses by adding up the new expenses and the increment in the current expenses that are directly associated with the proposed change

5. Calculate the decreased income by estimating the expected income that will be lost if a change is effected
6. Added expenses + Reduced income = Total expenses on debt side
7. Total credit expected – Total debt = Profit or loss made

Example; Switching from piggery to a dairy enterprise, a partial budget may appear as follows

Sample of a partial budget
Mrs. Nafamba's
Partial budget for the dairy enterprise

Income Shs		**Expenditure Shs**	
Added revenue		**Added expenses**	
Milk	xxx	Cost of cow	xxx
Calves		Cost of land	
xx		x	
Manure		Plant fodder	
xxx		xx	
		Drugs	
		xxx	
Reduced expenses		**Reduced income**	
Piggery feeds		Piglet sales	
xxx		xxx	
Drugs		Culled pigs	
xx		xx	
Transport			
xx		**Profit**	
Loss		**xxxx**	
xxxx			

Exercise 1; Distinguish between partial budgeting and complete budgeting

[c].The cash/financial flow budget: it's a statement of projected farm payments (outflow) and farm receipts (inflow) associated with a particular farm plan. It is required to ensure that adequate funds will be available for the operation of the farm for a given period of time

DEPRECIATION OF FARM ASSETS

- ✓ It's the reduction in value an asset over a period of time. Therefore it is a non-cash business expense
- ✓ This is the portion of the fixed asset's value that is consumed by use during its working or useful life
- ✓ It is the loss in the value of an asset

Depreciable assets must have the following characteristics

1. Must be owned permanently or on lease but not rented
2. Must have a life greater than one year
3. Must have a useful life that can be projected
4. Must have a use in the business

In agriculture, examples of assets that are depreciable include buildings, vehicles, machinery, equipment, fences etc; however assets like land appreciate or increase in value at the end of the financial year.

The calculation of depreciation utilizes the asset's original cost and requires the projection of useful life and estimation of the salvage value.

Salvage value; this equals the asset's worth after it has been fully depreciated. For some assets the salvage value is zero

Causes of depreciation of farm assets

1. **Wear and tear;** this is where parts of a fixed asset keep on peeling off though the peelings cannot be seen with the naked eyes. Basically its brought about by friction
2. **Passage of time;** fixed assets like lease on land and copyrights expire as time pass by
3. **Obsolescence;** this is where an asset loses value because of an invention of a cheaper and more efficient asset that is, the asset become outdated
4. **Depletion;** this is where a non-renewable resource gets finished in a particular area due to over extraction
5. **Inadequacy and superfluity;** some properties cannot be expanded in order to be used for the same purpose after the business expanding such assets become inadequate
   (Superfluous – An asset becomes less useful due to change of business line)

Methods of determining depreciation

[1] Revaluation method; this means assigning new value to the assets so the difference between the previous valuation and the current valuation is either an appreciation or depreciation.

This method is used for properties that cannot accurately be depreciated using the straight line and diminishing balance method. Such properties include livestock, land (lease land) among

Example:

Item	Original valuation (price)	Current valuation (price)
Livestock	345000	303000
Land	600000	700000

Qn. Determine the loss or gain in value

[2] Straight line (fixed installment) method; under this method, a fixed proportion is written off the cost of a fixed asset annually throughout the asset's useful life (life span). Normally the lifespan and scrap value are estimated before applying this method

Formula: **Depreciation for the year =** $\frac{\textbf{Cost price} - \textbf{Salvage(scrap value)}}{\textbf{life span(number of years)}}$

NB: It's also the same as applying a fixed percentage on the cost of the fixed asset since the asset cost does not change

Example; A tractor was acquired on 01/01/2019 at a cost of shillings 20,000,000. It was estimated to be used for 10 years and leave behind a scrap value of shillings 5000000. Determine the depreciation to be written off the cost of the asset per year

Solution: Original cost of the tractor =20,000,000 Salvage/scrap value = 5000000.

$$\textbf{Depreciation} = \frac{\text{ªñöµûõìî ôëúí ïñôôù - ëôñìï üìîòù}}{\text{ºòÆ¨ùñ ë± ´ùìñú (îö±ùúïìõ)}}$$

$$= \frac{\mathbf{20{,}000{,}000 - 5{,}000{,}000}}{\mathbf{10}}$$

$$= \frac{\mathbf{15{,}000{,}000}}{\mathbf{10}} = \text{Shs } \mathbf{1{,}500{,}000}$$

Therefore the depreciation per year will be **= Shs.150,000**

NB: If an asset is not bought on 1st January of a given financial year, the asset should only be depreciated for the months the asset has been used but not the whole year ***unless it is stated in the question***

[3] Reducing balance or declining or diminishing balance method; in this method, a fixed percentage of depreciation is written off the current value of the asset (book value) per year.

It implies that the amount computed as depreciation keeps on diminishing since the asset book value also keep on diminishing

E.g; A tractor was bought at a cost of shs. 6,000,000 on 01st/01/2017, it was to be depreciated at a rate of 10% using the reducing balance method. Calculate the depreciation for the years 2017, 2018 and 2019.

Solution: Cost of the tractor = 6,000,000 Depreciation per year = 10%

Depreciation year 1 (2017) $= \frac{\textbf{Percentage rate of depreciation}}{\mathbf{100}} \times \textbf{Costthetractor}$

$= \frac{\text{XV}}{\text{XVV}} \times 6{,}000{,}000 = 600{,}000$

Book value $= 6{,}000{,}000 - 600{,}000 = \mathbf{5{,}400{,}000}$

Depreciation year 2 (2018) $= \frac{\text{XV}}{\text{XVV}} \times 5{,}400{,}000$

Book value $= 5{,}400{,}000 - 540{,}000 = \mathbf{4{,}860{,}000}$

Depreciation year 3 (2019) $= \frac{\text{XV}}{\text{XVV}} \times 4{,}860{,}000$

Book value $= 4{,}860{,}000 - 486{,}000 = \mathbf{4{,}374{,}000}$

Therefore the asset book value will be **= shs 4,374,000** at the end of it useful life

[4] Sum of the years-digits method (SYD); depreciation under the SYD method is only slightly more complicated, the SYD factor shown below must be calculated by adding the digits of the years in the useful life.

For instance, if a 5 year useful life was specified, the factor would be 1 + 2 +3+ 4+ 5 = 15.

Depreciation would then be calculated using 5 for YR in the first year, 4 for YR is the second YR, 3 in the third, and so on.

$$\textbf{Depreciation} = \frac{\text{Yr}}{\text{SYDfactor}} \times \textbf{Depreciable base}$$

A rice farmer in Bugiri District bought a threshing machine at a cost of 45000 with a lifespan of 4 years and estimated salvage value of 5000, the asset depreciated yearly. Determine the depreciation of the machine in four years.

Solution: ***Cost*** = 45,000 ***Salvage value*** = 5000 ***Useful life in years*** = 4

Sum of the year's digits (SYD) = 1 + 2 + 3 + 4 = 10

Depreciable base = 45000 – 5000 = 40000

Depreciation year 1 $= \frac{\text{m}}{\text{XV}} \times 40000 = \mathbf{16{,}000}$

Depreciation year 2 $= \frac{\text{II}}{\text{XV}} \times 40000 = \mathbf{12{,}000}$

Depreciation year 3 $= \frac{\text{V}}{\text{XV}} \times 40000 = \mathbf{8{,}000}$

Depreciation year 4 $= \frac{\text{X}}{\text{XV}} \times 40000 = \mathbf{4{,}000}$

Exercise; SCOUL bought a disc plough at a cost of 1,000,000 with a lifespan of 3 years ant it was estimated to depreciate with a salvage value 100,000. Calculate the depreciation of the machine in 3 years

FARMING ORGANIZATIONS

- **Co-operatives;** these are referred to as registered groups of people who voluntarily come together to achieve some common purpose or goal.

The major aim of coming together is to pool their resources together in order to achieve a common objective intended to achieve the social and economic affair or welfare of members which would be difficult with individuals.

They are owned and controlled by those who formed them and these people are entitled to share any profits made

Principles of cooperatives

1. **Open and voluntary membership;** it should not be restricted, voluntary and open to any one of good characters as well as being of legal age and resident within the geographical areas of the co-operative.

2. **Democratic control;** all members must have an equal say i.e. one man one vote, therefore no member should have greater voting power and management is done by elected individuals and nobody should be forced into registration
3. **Share of profits;** interests and profits are shared by members according to their participation in the activities
4. **Promotion of education;** co-operatives should promote basic education to promote literacy to all members especially in governance of a co-operative society
5. **Promotions and other responsibilities;** must be on merit, therefore no tribal, religious and other forms of biases
6. **Co-operation;** there should be co-operation with other organized groups in order to learn from them to ensure improvement
7. **Restricted business;** trade is restricted to members who undertake to deal with the co-operative
8. **Cash dealing;** dealing of co-operatives should be on cash and services given should be at a cost

Types of co-operatives

1. **Producers' co-operatives** (growers); these are owned and operated by producers and are involved in primary production i.e. they produce what is taken to the market
2. **Consumer co-operatives;** these are involved in selling or distributing consumer goods to members at reduced prices (minimum possible price)
3. **Savings and credit co-operatives;** these encourage members to save with them and later obtain loans to generate interest which is shared at the end of the financial year
4. **Service co-operative (building societies);** these give services to members like construction of houses, farm purchases among others
5. **Marketing co-operatives;** these collect produce from growers and transport them to market

Roles or importance of co-operatives

1. They provide transport facilities to members and this helps to improve on the marketing of their produces as the produces reach the market on time
2. They help members in processing of their produces which helps them to fetch high prices from the market
3. They help members in reducing the cost of production by providing them with inputs at subsidized prices (relatively lower prices)
4. They help members in the marketing of their products as they participate in trading, handling and storing of the produces
5. They offer employment opportunities to the public especially of skilled labour enabling them to improve on their standards of living by improving their income level
6. They provide education and technical advice to rural farmers as regards agronomic and livestock rearing techniques through extension agents, this helps them to improve on their skills of production which promotes efficiency
7. They promote price stabilization by eliminating middlemen that exploit the farmers

8. They provide storage facilities or services to members' produces, this enables them to avoid effects of price fluctuation through buying and storing of the excess produce and later remitting some of the profits to the farmers
9. They help to improve the commercial attitude of farmers by equipping them with business skills therefore they promote investment amongst members
10. They lobby the government on behalf of the farmers to provide the necessary services like transport infrastructure and financial assistance
11. They reduce rural-urban migration as they are oriented to developing the rural areas
12. Members of the co-operatives share the overhead costs e.g. depreciation on machinery, house rent (for storage), permanent labour etc hence reducing the financial pressure on individuals

- Describe the functions of agricultural co-operatives in Uganda. ***[UACE 2003; No. 9 (b), 2010; No. 9 (b), 2000; No. 3 (a)]"***

Problems faced by co-operatives

1. Lack of skilled management personnel, this is because most of the co-operatives are run by illiterate peasants with no skills of modern production and financial management
2. Inadequate funds to finance their objectives as most of the members are poor and consequently earn very little (financial bottlenecks)
3. Corruption and embezzlement of funds by some officials leading to irregularities in the transacting of the co-operatives business activities
4. Lack of proper transport for the farmer's produce, most co-operatives don't have enough vehicles to transport farm produce (transport bottlenecks)
5. Shortage of proper storage and marketing facilities which leads to spoilage and hence financial losses particularly for the perishable produce
6. Price fluctuations, this discourages farmers especially when prices are very low compared to the equilibrium price. This reduces the financial inputs for financing the co-operative activities
7. High risks and uncertainties in the agriculture sector which discourages farmers as well as the potential investors in the sector
8. Delay and irregular payment for farmer's products due to bureaucracy which discourage farmers effort and hence the fall of co-operatives
9. Government interference in the running of the co-operatives that discourage most members especially those that may not be supporting the government
10. High defaulting rates of members of the loans given to them, this weakens the financial muscle (financial abilities) of the co-operatives
11. Co-operatives often deal in specific products and neglect others, so they lack flexibility and initiativeness hence some discouraging some farmers to produce
12. Members are often reluctant to pay high subscriptions and they often pay very late thus disabling co-operatives to accumulate enough working capital to compete favourably with other traders
13. Seasonal operation, most co-operatives operate on a seasonal basis yet the officials are paid throughout the year which is uneconomical as capital is encroached upon.

- Discuss the problems that co-operatives in Uganda face today. ***[UACE 2000; No. 3 (b)]***

Solutions to the problems facing the co-operatives

1. Storage facilities should be improved by collecting funds from members of the co-operative to setup modern structures
2. Defaulting should be discouraged by co-operatives through ensuring that farmers provide substantial security before being granted loans
3. Basic education should be provided to the farmers to ensure that they can adequately participate in the running of the co-operatives (improving their management ability)
4. Strict anti-corruption legislation to reduce corruption and embezzlement of co-operative finances
5. Members should be encouraged to contribute more capital towards the society to overcome the problem of limited capital
6. Employing highly skilled and qualified personnel to efficiently run the activities of the co-operatives effectively
7. Improvement in the transport and communication facilities so that products reach the market on time before they are spoilt
8. Expansion of markets (both local and external) for broader markets of farm produce, exportation of the produce should be more emphasized to increase the marketability of product
9. Provision of extension services to increase the quality and quantity of farm produce and to ease marketing
10. More research should be undertaken in the field of technological development so that better production techniques are used for better output
11. Tribalism and sectarianism should be controlled using the most appropriate approach to ensure that there is democratization of co-operative business
12. Training of the management staff through seminars and in service training to strengthen the management capacity of the officials

Factors necessary for the success of co-operative societies

1. Plenty or adequate funds (finance) to invest in the business
2. Specified, measurable, achievable, realistic and time bound **(SMART)** goals, aims and objectives should be set and clearly stipulated to every member of the co-operative
3. Adequate volume of business to benefit from the economies of scale
4. Freedom from interference by the government in the management of the co-operatives
5. A favourable and conducive political atmosphere (political stability) to facilitate sound production
6. Mass education for all members of the society to ensure swift management, accountability, equality, sound production etc.
7. Good will from all members of the co-operatives to ensure participation in the running and management of the co-operatives

- **Marketing Boards;** these are statutory (government) organizations set up to buy specific commodities from producers, process them and resell them on local market or as exports

Marketing boards in Uganda

1. Produce marketing board
2. Lint marketing board (cotton)
3. Uganda Tea Authority
4. Coffee marketing board

Reasons for establishment of marketing boards

1. To promote the expansion of cash crops like coffee, tea, sugarcane and to reduce the vulnerability of the economy to world market conditions arising from overdependence on one cash crop
2. To strengthen the bargaining power of farmers as marketing boards provide for collective bargaining
3. To boost state participation in economic affairs and public investment in order to prevent recurrence of economic regression
4. To establish producer prices in the face of fluctuating world prices caused by insurgences like in Juba, Republic of Southern Sudan
5. To undertake education of expert farmers or producers

Advantages of marketing boards

1. They reduce exploitation of producers by middle men or private traders who have a tendency of paying less for farmers' produce immediately after harvest and later resell them at higher prices when demand rises
2. They possess the capacity to ensure quality control for the products both for local and for export
3. Marketing boards provide suitable means of levying taxes since all produces are channeled to one point
4. They operate using fixed prices; therefore they guarantee fixed prices which keep the farmers' income constant irrespective of price fluctuation on the world market
5. Government can guarantee the production of an important crop by guaranteeing the price of the crop through marketing boards
6. Distant farmers in remote areas where demand may be restricted can still receive reasonable prices
7. Marketing boards have better facilities for storage and transportation, therefore they ensure stability of the flow of essential foodstuffs at reasonable prices
8. They are usually backed up by government resources like finance and personnel enabling them to perform functions which farmers wouldn't afford to perform due to lack of capital and expertise

Disadvantages of marketing

1. Their establishment creates a situation where by there is no competition and can therefore offer low prices due to absence of competitors thus reduced efficiency
2. They are situated in specific places leading to location imbalances in supply when boards start to sell off their products resulting into artificial shortages and surplus in different places thus encouraging illegal trade

3. They may fix prices out of step with equilibrium due to lack of enough market information leading to losses in both directions i.e. if prices are fixed below equilibrium point farmers are paid less than they would have received in a free market and if prices are fixed above the equilibrium point the boards make losses as consumers will be discouraged from consumption of the commodity
4. Lack of management ability by officials leading to mismanagement of board resources e.g. produce may be stored for a long period or poor timing of the sale of the produce

Revision Questions

1. (a). What is meant by co-operative societies and marketing boards?
   (b). Identify the various types of co-operatives and explain the principles of co-operatives
   (c). Explain the problems faced by co-operatives and the causes of their collapse in Uganda
2. (a). Suggest the possible solutions to the problems facing the co-operatives
   (b). Mention and explain the factors necessary for the success of co-operative societies

LAND AND LAND REFORMS

Land: Is a basic resource in terms of the space it provides, the environmental resources it contains and supports and the capital it represents and generates. It is a commercial asset that can be used and traded, an essential part of the national patrimony and a key factor in shaping individual and collective identity through its history, the cultural expressions and idioms with which it is associated.

Ways of acquiring land

1. Inheriting land from one's parent or a relative
2. Buying a piece of land with or without a land title
3. An individual can apply for a state lease land for a specified period of time i.e. 49 years, 99 years or 999 years
4. Renting or hiring a piece of land from an individual or families which have plenty of land
5. An individual can also acquire land by being settled or resettled by the government in places where there is plenty of lands. (e.g. government's effort to resettle the landslide victims of Bududa through the ministry of disaster preparedness to disaster free area, however it is impossible to be given the same piece of land like the one owned initially)
6. Borrowing a piece of land from members of the community who have plenty of land

- Describe the ways of acquiring land for farming in Uganda. ***[UACE 2010; No. 9 (b)]***

Features of land

1. Its supply is fixed or limited but supply for agricultural land can be increased through reclamation and its quality can be improved through irrigation, use of fertilizers, better farming methods but its supply may however be reduced by erosion

2. It's a free gift of nature that is of no use unless labour is applied onto it
3. Its geographically immobile but occupationally mobile
4. Its productivity can be varied or increased using greater units of other factors like capital and labour

LAND TENURE SYSTEM

This the term is used to mean particularly the nature of organization of ownership, occupancy, transfer, renting, and land use among others by an individual(s)

Act 16: (The Land Act 1998). This was a formal product of Parliament from a controversial land bill which became Act 16 on 2nd July, 1998. It provides for the tenure, ownership and management of land. It amended the Land Decree 1975. According to the land act, all land in Uganda shall belong to the citizens of Uganda and shall be owned in accordance with 4 (four) land tenure systems

Types of land tenure system

a) **Customary (communal) land tenure:** under this tenure; land belongs clearly to a group of people (clearly defined) like the clan or at times the whole community in specified areas such as in Karamoja.

All members posses the right to use land according to rules and regulations directing or governing its use, clan or community leaders allocate land to individuals who freely pass it on descendants or to other members of the community, its most common in pastoral areas

Merits of Customary (communal) land tenure

1. Every member of the community has equal access to the land which eliminates landlessness of some members of the community
2. Cases of land-related conflicts such as boundary discrepancies, ownership wrangles, inheritance and succession wrangles and illegal occupation are minimal since regulations or guidelines on usage and occupancy are very clear to all member of society or community
3. Land fragmentation is eliminated since individuals are not allowed to demarcate part of the land he or she uses

Demerits of customary or communal land tenure

1. Poor utilization of land resources for example in pastoral areas cases of overstocking and overgrazing are very high due to failure to control livestock numbers, over cultivation or over cropping is also likely to occur especially in areas where cropping is practiced
2. Land users have no interest in maintaining the fertility and productivity of land because it belongs to the entire society
3. Land users do not invest in long-term projects and modern farming techniques due to risks of losing the land resources anytime because land belongs to the entire community.

4. The farmer may not be allowed to use land as he wishes as everyone has to use land in line with the general guidelines laid down by the entire community
5. Under this tenure, land registration and acquisition of title deed is difficult, therefore it becomes difficult for such a user to get financial support (loans) from banks due to lack of substantial security
6. It is not easy to control crop and livestock diseases, pests and parasites since land is utilized by the entire community

b) Freehold Tenure (Individual ownership)**;** the land owner (landlord) can register the land and get a certificate (land title deed) that allows him or her to own and utilize the land as he/she wishes. The landlord may have acquired land through inheritance from parents or purchasing it.

The landlord is free to sell or transfer the land title to another person. He or she can rent the land or part of it to other people, who are then referred to as **tenants** and are expected to pay **rent** to the landlord

Advantages of freehold tenure system

1. The owner of land uses it with care so as to conserve its fertility and productivity for a long period
2. The land owner feels secure and is free to set up long-term developmental projects on the land
3. The land owner can use the title deed as security to get loans or financial support (in form of credit) from the cooperatives or banks
4. If the owner of the land does not sell off the land, his or her children and grand children are assured of having land for future developments

Disadvantages of freehold tenure system

1. The land owner may fail to pay back the loans and end up losing the land and its title to the banks
2. Land-related disputes or conflicts are likely to erupt between landlord and tenants in case they fail to pay the rent or in circumstances where the landlord decides to sell the land to another person without the consent of the land user
3. The landlord may lack capital to set up projects on land leaving the land to stay idle (under) developed
4. Landlordism encourages unfair land distribution among members of the society because some people have plenty of land and others have little or nothing, those with no land at all costs are likely to encroach that of the landlord

c) Leasehold Tenure; under this tenure, landlord or state gives land to an individual to use it for a specified period of time and when the lease period expires, it can be renewed or ended (dissolved).

The holder of the lease pays rent to the owner or the government.

When the individual leases land from the government, the lease period is usually 49, 99 and 999 years, the longer the lease, the more secure the leaseholder and the more encouraged he is to invest in long-term projects

Advantages of leasehold tenure

1. It gives an opportunity to those who are unable to purchase land or buy land for farming and other activities
2. It enables the landlords or government to earn income inform of rent from the land that would otherwise remain idle
3. The leaseholder is given certificate and he or she is able to obtain loans from money lending institutions
4. The leaseholder feels free or secure to invest in long-term projects like growing of perennial crops and setting up long term farm structures

Disadvantages of leasehold land tenure

1. The landlord or the state can refuse to renew the lease when it expires and so the leaseholder loses the property especially if he invested heavily on the land
2. The landlord or the state can terminate the lease before the period expires and decides to compensate the leaseholder

d) **Co-operative land tenure;** under this tenure system; land is owned by a group of farmers who come together to form a co-operative society, the society is given a land title deed, therefore no individual can claim sole ownership. Each individual is given a share in accordance with his or her contribution to the purchase of that land. Individuals may own plots within the block or the whole land may be operated on a co-operative basis

Advantages of Co-operative land tenure

1. Sound management and co-operative spirit can enable farmers to succeed in their farming enterprises, because individual farmers may not be able to raise capital for setting up enterprises especially those that require more capital and technical management skills
2. Land-related conflicts or disputes are minimized because no person can claim to be the sole owner

Disadvantages of Co-operative land tenure

1. The co-operative may fail to achieve its objectives in case of failure of some members to be hard working
2. Poor management and embezzlement of funds by the leaders may lead to the collapse of the society

Characteristics of a good land tenure system

1 Encourages commercialization of agriculture
2 Allows or permits better resettlement schemes
3 Enables optimum output to be produced from the available land
4 Allows occupational mobility
5 Leads to high level of production and productivity

6 Allows and promotes the process of industrialization

LAND FRAGMENTATION

This refers to the practice of partitioning of land into small pieces. The farmer owns a number of small plots that are scattered in different places. It is common in areas which are densely populated and in areas where customary laws of property inheritance encourage sharing of land among the siblings

If registered land is to be shared out or sold off, the current owner has to apply to the District Land Board so that the transfer of ownership is approved and recorded in the Land Registrar's Office and after approval and implementation of the transfer; a new land title is given to the new owner

Causes of land fragmentation

1. Customary inheritance of property, land is partitioned into pieces to be shared out among the siblings.
2. Increasing population pressure on the limited land resources results into division of land among the family member resulting into individuals owning small plots
3. Desire or need to increase the size of farming land for increased production especially when farmer's capital increases; he or she may wish to acquire more land from those who are willing to sell resulting into owning scattered plots
4. Allocation of land to settlers in new areas by the government, a large piece of land is divided among the landless people who have allowed to settle in an area for example in Uganda people were transferred from Bududa to other areas to safeguard them against landslide tragedies
5. Polygamous marriages among families in different localities leading to increased population in an area resulting into increased population pressure on land hence partitioning of land

Disadvantages or effects of land fragmentation

1. It becomes difficult for farmers with scattered plots of land to have access to all plots especially when using machinery as there may be no direct route from one plot to another
2. It's very difficult for the farmer to efficiently supervise the activities in progress on each of the plots
3. It is very difficult for the farmer to carryout soil conservation as this requires collective effort by all farmers. The run-off from other farmers' fields cannot spare the conservation measures implemented on other small plots
4. It results in low agricultural productivity leading to low standards of living and slow national economic development attributed to low income
5. It is time wasting because the farmer has to move or travel from one plot to another
6. It becomes difficult for the farmers to control pests and diseases of livestock and crops on his plots because of the neglected plots in the neighborhood act as a source of infestation

7. It becomes very difficult to make and follow the farm plan for all the plots especially when the distances between them are great and to get advice from the agricultural extension service

LAND REFORMS

A land reform refers to the deliberate attempt to change the land tenure system with the intention of improving the distribution of agricultural incomes thereby leading to rural development

They are programs undertaken by the government to reorganize ownership of land (tenure) and to allow for better utilization (usage) of land resources as the capital input of production. It may involve taking away land from the current owners and redistributing it to people so that they can also have an opportunity to get land for production.

Reforms may be intended to consolidate land that has been fragmented into small plots which cannot be used to carry out sound agriculture

Reasons/objectives/need for land reforms

1. To attain efficient utilization of land and labour resources, reforms such as land consolidation and redistribution promote efficient utilization of land and labour e.g. land consolidation can allow setting up estates and plantations leading to increased output, these estates may also provide employment opportunities to the local population thus making use of human labour that would otherwise be redundant. Redistribution of land enables individuals interested in farming to acquire land for production
2. To stimulate and promote the commercialization of agriculture, reforms like land consolidation encourages production for market because farmers are able to produce more than what would be consumed at home
3. To promote the conservation and improvement of the land, if landowners are assured of tenure security, they can take full responsibility of making sure that its productivity is sustained for a long time and can also invest in long-term erosion control practices like terracing, agro-forestry, and conservation practices like irrigation
4. To attain flexibility in agriculture, needs and interests of people keep on changing from time to time, for example there may be an increase in demand for maize and fall in demand for cassava
5. To promote increased production, farmers are always able to produce more if they have full rights to freely use land, land registration and title acquisition gives security to those who feel insecure and unable to invest in long-term programs like agro-forestry, beef production, growing of perennial crops. Idle land can also be put to use when distributed to those who are able to make use of it

Forms of land reforms

1) **Land consolidation;** this refers to land reform programs which involves joining together of scattered plots owned by individuals so as to get one large piece of land. It involves exchange of plots where each farmer surrenders plots that are far away in

exchange for those that are near the homestead. It enables farmers to acquire bigger units of land which can be economically operated

- **What is land consolidation?** ***[UACE 2010; No. 9 (a) (i)]***

Merits of Land Consolidation

1. Farmers acquire large single units of land that can be used to carry out large agricultural production
2. It becomes possible for the farmers to carry out soil conservation measures like soil erosion
3. It stimulates mechanized agriculture leading to increased output and increased income to the farmers hence economic growth
4. Reduces time wastage as the time that would be wasted moving from one plot to another is reduced
5. Makes supervision of farm activities easier, economical and efficient
6. Land consolidation makes it possible for the farmers to embark or carryout proper or sound farm planning before commencing any farm operation or activity
7. Since the farming activities being undertaken are planned, it is possible for extension service officials to offer expert advice to farmers based on spot inspection to the farmer

- Outline the advantages of land consolidation. ***[UACE 2010; No. 9 (a) (ii)]***

2) Settlement and Resettlement schemes; these involve movement of people to new areas with the major aim of boosting agricultural development in such areas.

A settlement scheme is an area which was previously not habited or settled on, where people have established their homesteads for the first time.

A resettlement scheme is a planned transfer of people from densely populated areas where there are acute shortages of land to sparsely populated areas to reduce the land pressure. It's practiced with the aim of giving land to landless people so that they can engage in economic activities like farming

Reasons or objectives of establishing settlement schemes in Uganda

1. To relieve some areas of the population pressure, resettlement programs which were carried out from 1945 to 1954 were aimed at redistributing people so that they could get more access to land for agricultural production. People were moved from Kigezi to Ankole, Bunyoro and other parts of Uganda
2. To stimulate and promote mechanized agricultural production, the strategy was to encourage farmers to unite and engage in economic activities as groups. This was expected to facilitate the delivery of services like education, electricity, water, storage and transport facilities for agricultural products to farmers in groups than to individual scattered farmers however shortage of manual labour especially during harvest time made the group farming schemes to collapse
3. To prevent re-infestation by tsetse flies, the1955 to 1961 was aimed at preventing re-infestation of the cleared areas of Kigumba and Busoga by tsetse flies

4. To resettle the displaced people, some settlement were set up to serve as temporary homes for refugee for example Agago refugee camp in Northern Uganda and Oruchinga Valley settlement in Isingiro for the genocide refugees from Rwanda
5. To assess the feasibility and economic returns from setting up large irrigation schemes e.g. the setting up of Mubuku irrigation scheme in Kasese

- Suggest reasons for the resettlement of population schemes. ***[UACE 1995; No. 2 (a)]***

Factors that favour the success of land settlement schemes

1) **Proper planning:** careful planning prior to establishment of a settlement scheme is very essential. The following should be taken care of during the planning process

a. Objectives of the scheme; these should be achievable within a specified period of time, clearly spelt out and any anticipated problems resolved

b. Suitability of the proposed enterprises; this concerns the adaptability of the enterprise to be selected like crops to be grown or livestock species to be reared

c. Thorough analysis of the available data, all data related to factors such as the physical features of the area, climate, socio-economic and political factors among others should be studied objectively and critically so as to discover the hindrances that may put the project to a halt

d. Availability of social services such as schools, health centers, recreation centers among others and if they are unavailable efforts should be made to put them in place, interested members and relevant authorities should be contacted to offer the services

e. The origin and number of the perspective settlers, it's important to estimate the expected number of settlers in order to plan for them and to avoid being overwhelmed by numbers. Knowing their origin is also important to establish whether they will stay in the settlement permanently or temporary

f. Social and cultural characteristics of prospective settlers, such as economic status, literacy levels, farming experience, traditional beliefs and values etc. All these in one way or another will affect the performance of the settlers and therefore their success in whatever enterprises they undertake

2) **Selection of settlers:** interested participants in the scheme established should be the only ones selected; these should be made aware of the objectives of the scheme and should be involved in the planning process so that they accept the scheme as their own

3) **Land tenure system in the proposed area:** it's vital to determine the land tenure system that will be adopted by the settlers

4) **Efficient and effective communication:** accessibility to the market centers to sell their products and to buy other necessities of life should be considered, the distance from the nearby town and the condition of the roads must be put into consideration. Accessibility to market information by settlers must be paramount so as to be aware of the market situation in order for them to determine what and how to produce for the market

5) **Land holdings:** land size should be reasonable to support large or medium scale farming other factors held constant e.g. settler's plot in Kigezi settlement scheme were up to 40 hectares
6) **Supportive services:** these include agricultural extension, credit facilities like farm inputs or cash, training facilities for farmers to improve their farming techniques, marketing facilities like stores and vehicles for transporting the produce among others, these services can boost the performance of the settlers and enable them to have a good beginning
7) **Profitability of the enterprises to be undertaken:** cost/benefit analysis of the enterprises to be undertaken should be carried out to determine its profitability. The success of the scheme will only be realized if settlers are able to earn reasonable income from the enterprises they are to undertake. For example one of the reasons why the South Busoga scheme collapsed was due to lack of market for the products from the scheme. It was earlier assumed that the growing of industrial town of Jinja would buy the products, which never happened as food supply for Jinja was easily met from the surrounding traditional farming areas.

- Discuss the factors that should be taken into account when planning a settlement scheme. ***[UACE 1995; No. 2 (b)]***

Benefits of settlement and resettlement scheme in relation to agricultural productivity

1. Land that would otherwise be idle is put under productive use resulting into increased production of different products
2. Settlers of farmers can easily benefit from the technical (advisory services) and financial (credit facilities) services provided to them and boost their production capacities
3. Social services are more easily provided to the settler's in the scheme
4. Large scale commercialized and mechanized production can be easily achieved since individuals farmers are allocated reasonably large land holdings
5. Possibilities of farmers or settlers taking new farming innovations and technologies for example irrigation, soil and water conservation measures are increased due to accessibility to expert advice from extension workers
6. Settlers are saved or relieved from densely populated areas (congestion) and the related problems experienced by people who live in highly populated areas. This gives the farmers or settles the capacity and the opportunity to plan and concentrate on their farming enterprises

3) **Land registration;** this refers to the process of obtaining a certificate of ownership known as the land title deed

Merits of land registration

1. The owner of land gets security of tenure
2. The land title can be used by the farmers as security to access financial assistance (loans) from banks
3. It reduces the land ownership wrangles

4. It sets out clear demarcation of the land there by reducing the boundary discrepancies or disputes
5. Land can easily be leased out to obtain extra income from idle land

Limitations of land registration

1. The process of land registration requires some money and therefore expensive to some farmers
2. To process of land registration is characterized by bureaucracy
3. Some farmers are not informed about land registration
4. It takes a lot of time for an individual to get the land title

Information contained in the land title deed

1 Title/land parcel number or location
2 Size of the land
3 Name and identity number of the land owner
4 Type of ownership e.g leasehold, mailo, freehold etc
5 Date of registration
6 Seal and signature of the issuing officer
7 Conditions of ownership

Revision Questions

1. (a). Define the term land tenure system
(b). Mention and explain the land tenure systems that are common in Uganda
(c). Give the merits and demerits of each land tenure systems
2. (a). What do you understand by the term land fragmentation?
(b). Explain the causes and effects land fragmentation
3. (a). Define the term land reforms
(b). As an agricultural student, give reasons why it is necessary to undertake land reforms?
4. (a). Differentiate between settlement and resettlement
(b). Explain the reasons or objectives of establishing settlement schemes
5. Discuss how settling and resettling of farmers in new areas can promote agricultural productivity in Uganda.

GENDER AND AGRICULTURE PRODUCTION IN UGANDA

Gender refers to the socially and culturally constructed roles, duties and responsibilities of girls/women and boys/men in a given society

- ✓ It's the socially constructed roles, behaviors, activities and attributes that a given society considers appropriate for men and women, boys and girls.
- ✓ It refers to the manner in which boys/men/males and girls/women/females are differentiated and ordered in a given socio-cultural system

Sex refers to the self-evident biological difference between females/women and males/men

Differences between gender and sex

	Gender	Sex
1	Is learned from the surrounding of an individual	Is inborn in an individual or organism
2	It is man made	It is natural
3	Changes from time to time, place to place, generations to generation	Remains the same every where thus constant
4	It is social and cultural	It is biological
5	Gender can easily be changed	Difficult to changes to another sex
6	Invisible but exhibited as masculine and feminine qualities	Visible differences in general organs
7	Relates to responsibilities or roles performed	Relates to differences in reproductive function

Common terms and concepts used in Gender

1. **Affirmative action**; its efforts to promote the rights or progress of disadvantaged persons.
2. **Gender accountability**; it exists when all women are able to get explanation from those in power for actions that affect them and can set corrective measures when those responsible fail to promote their rights.
3. **Gender gap**; it's the difference between women and men especially as reflected in social, political, intellectual, cultural or economic attainment.
4. **Gender analysis**; it's the systematic gathering and examination of information on gender differences and social relations in order to identify and redress inequalities based on gender.
5. **Gender based discrimination**; its unequal treatment due to the fact that one is women or men.
6. **Gender bias**; it's the unfair difference in treatment of men and women because of their sex.
7. **Gender equality (parity**); it refers to equal rights and opportunities for men and women.
8. **Gender equity**; it involves fairness and justice in the discrimination of resources and benefits between men and women, boys and girls.
9. **Gender mainstreaming**; it's a process of assessing implications for women and men of any planned action, including legislation, programs and policies in all areas and at all levels.
10. **Gender budgeting**; it's a practice of allocating resources taking in considerations the different needs, interests and constraints of women , men, boys and girls. To determine inequalities and setting development plans and address them

11. **Gender balance** this refers to the equal sharing of responsibilities and opportunity by men and women or boys and girls.

Gender roles; it deals with particular economic, social and cultural roles considered appropriate for men and women, boys and girls in production in a given society

Roles of men or boys in agriculture production

1 Buying or inheriting land.
2 Opening up the land in preparation for planting
3 Felling of trees, ploughing with oxen or tractors
4 Digging planting holes.
5 Spraying crops and livestock on the farm
6 Milking of cows and goats on the farm.
7 Budgeting for farm inputs.
8 Providing security on the farm.
9 Looking for markets and sale of produce
10 Purchasing farm inputs for use on the farm
11 Construction and repairing of fences and other farm structures.
12 Branding, dehorning and castration of male animals on the farm.
13 Treating and caring for the sick animals on the farm.

Roles of women or girls in agriculture production

1 Planting seeds vegetable crops in the garden.
2 Weeding of crops on the farm.
3 Mulching of crops on the farm.
4 Pruning and de-suckering in banana plantations
5 Harvesting of farm produce
6 Rearing of small animals like goats, sheep, pig and poultry rearing.
7 Taking care for children.
8 Carrying out house hold work.
9 Feeding and watering zero grazed livestock.
10 Drying and processing of produce i.e. seed selection, winnowing etc. to improve its quality for marketing
11 Preparation of food for the worker doing agriculture

Importance of gender equality in agriculture production

1. It improves security for women and eliminates all forms of social-cultural barriers.
2. It allows women and men equal opportunities in policy formulation.
3. It attracts more women into agriculture production.
4. It improves participation of women in decision making leading increase in women's interest in agriculture.
5. It enriches agriculture skills through shared experiences from women and men

Qn: State the importance of gender equality in agriculture production.

Assumptions for targeting women in agriculture production (Reasons for involving women in agriculture)

1. Women have special power over cash received from sale of produce.
2. Women are largely responsible for management of animals and crops on the farm
3. It leads to increased equitable distribution of food within the households.
4. Most homes are headed by women and yet these women are not fully empowered to produce to their capacity.
5. It increases production and efficiency in the farm.
6. Women are majorly responsible for post-harvest handling of farm produce.

Qn: Give reasons for involving women in agriculture production.

Gender issues in agriculture sector

1. Inequitable land access; men own large pieces of land than women therefore, women cannot practice commercial farming, cannot use land as security of loan
2. Land tenure access to land; divergent land tenure systems and high costs involved in land acquisitions have negative effect on different gender and investment in agriculture sector.
3. Involvement in agriculture activity; men play a big role in choosing and planning of farm enterprises while women play just supportive role.
4. Managing enterprises and their products; men manage high value enterprises while women are involved in management of less profitable enterprises.
5. Use of improved farm inputs; men always attempt to use improved inputs and women hardly use improved inputs.
6. Agricultural extension; the male head households tend to have more access to extension services than female headed households.
7. Market access and availability; farmers in urban areas have ready markets for their products and higher prices than farmers in rural areas.
8. Sharing of profits from sale of farm produce; men always have full control over profits earned and little is given to women which is spent on family basics like clothing and paying fees
9. Access to agriculture credits; both men and women have faced a challenge of accessing affordable credits to help them invest in agriculture. However, women farmers find it even more difficult since they do not have collateral security.
10. Gender roles within household and agriculture sector; both men and women contribute to agriculture production but women are majorly responsible for food production while men produce cash crops.

Qn: Explain the various gender issues in agriculture sector

Efforts undertaken to engender in agriculture sector

1. Promotion of labour saving technologies like animal traction.
2. Formation of women farmer groups to ease access to extension service by women.
3. Cooperating with other ministries to put up laws that promote gender equality.
4. Increasing income and promoting equity among farmers.

5. Identification of gender sensitive activities and incorporate them in policy statement for considerations by government, donors and civil societies.

Factors limiting gender equality (responsiveness) in the agriculture sector

1. Inequality in land ownership and use; this is the main gender based constraint limiting gender equality.
2. Limited market and market access; women and men allocate most of their land primarily for agriculture production. Most markets are far from the farmers and market dues demanded by the local government councils are high.
3. Low market prices; men and women normally invest large sums of money in farming. However, low market price at harvest seasons makes it difficult for farmers to recover invested funds.
4. High costs of inputs; the use of improved inputs remains low among women farmers due to their high costs.
5. Inadequate extension services; access to extension services is generally low among men and women farmers. Agriculture production cannot increase without increase in access to extension services by all farmers.
6. Limited availability of improved inputs; use of improved inputs has remained low generally among women farmers due to lack of knowledge about improved inputs and unavailability of improved inputs.
7. Lack of gender analysis to inform the policy formulation, planning and budgeting process in the agriculture sector.
8. Decline in the agriculture growth; this has contributed to low earning among the rural areas exacerbating poverty levels, food and nutrition insecurity and also loss of interest in agriculture by both men and women.

Qn: Explain the factors limiting gender equality in agriculture production

Reasons why women participation in large commercial farming is still low

1 In most cases women do not own large pieces of land that is required for large scale agriculture
2 Women are not involved in agricultural policy formulation and development making their participation in implementation of such policies limited
3 Most widows are denied the right to inherit land for farming due to cultural nom
4 Inability to use big machines compared to men because women are weak
5 Limited education makes women feel shy and reluctant to attend and speak in extension meeting
6 Traditionally women believe that large scale production is for man
7 Women activities are usually limited by their spouses or families
8 Some physiological conditions e.g pregnancy affect their active participation in farming
9 Large scale production requires adequate time which is lacking among women due to many domestic chores
10 Most women do not own the land and lack collateral security required by the banks or money lenders to acquire capital for large scale production

11 Long distance to markets and poor roads limits the ability of women to participate in
12 Poor incomes of women makes it hard for women to raise the required capital to engage in commercial agriculture
13 Gender imbalance i.e. women do not control the production resources and this hinders their effort to invest in acquiring resources
14 Cultural norms in African societies limit women participation in large scale agriculture i.e. women emancipation
15 Middle men who deal in agriculture are usually males who are dishonest to female farmers
16 Most women lack adequate skills to participate in large scale farming
17 Inequalities in sharing benefits from crop cultivation can frustrate female farmers
18 Therateofreturnonsmallplotsoflandorsubsistencecropsproducedbymostwomenmaybe toosmalltoattractformalmoneylenders
19 Inability to use big machines compared to men because women are weak

Ways of improving women participation in agriculture sector/**large scale production**

1 Sensitize/educate both women and men on modern agricultural practices
2 Women farmers should be encouraged to participate more in the farmer extension vistas and farmers' field days
3 Encourage women to join or form saving groups (cooperatives) through which they can easily raise capital
4 There is need for more women graduates in agriculture to serve as extension agents in the field to reach out to more women farmers
5 Encouraging education to women i.e. teach/train women to be assertive i.e. to be ready to take up challenges, to make decisions, keeping record and bear risks
6 Promoting women access to credits to encourage active participation
7 Women should be given equal opportunities to participate in agricultural programs e.g. NAADS
8 Women should participate more in marketing in order to motivate them
9 Promoting women rights e.g. access to land and other resources used in production even after the death of their spouses (husbands)
10 Encourage women to attend extension meetings
11 Tools and equipment should be light and friendly (light technology) to use by women farmers
12 Women given equal opportunities to participate in government programmes
13 Developing gender policies that empower women and eliminate gender barriers
14 Establishment of career development programs that build research and leadership skills of women agricultural scientist
15 Ensure that all trainings are conducted in nearby places so that women whose mobility is limited participate.
16 Improving women access to information by using appropriate media tailored to women real-life situations.

17 Remove all social and customary barriers that prevent full participation of women in agriculture.
18 Encourage women to produce high value crops to raise their household income.
19 Providing free and subsidized farm inputs to poor household women
20 Encouraging women to own production resources like land

AGRICULTURAL POLICIES

Introduction: these refers to a set of laws relating to implementation of activities of domestic agriculture and imports of foreign agricultural products

Policies can also be defined as legal schemes/approaches formulated by the government to guide implementation of activities related to the agricultural sector in the country and importation of agricultural inputs/products to achieve set national objectives. Governments usually implement agricultural policies with the goal of achieving a specific outcome in the domestic agricultural product markets. Outcomes can involve for example, a guaranteed supply level, price stability, product quality, product selection, land use or employment

Agricultural policy instruments: these are methods of state intervention aimed at implementing the set agricultural policies so as to realize national development objectives

Agricultural policy concerns: *The major challenges and issues faced by the agricultural sector to necessitate policy concerns include:*

1) **Marketing challenges and consumer tastes:** The international trading environment (World market conditions, barriers to trade, quarantine and technical barriers and the maintenance of global competitiveness and market image).
2) **Bio-security (pests/parasites and diseases);** issues affecting imports and the safety status of exports such as Bovine Spongiform Encephalopathy (BSE), avian influenza/bird flu, foot and disease, citrus canker, and sugarcane smut).

The bio-security concerns facing industrial agriculture can be illustrated by:

- The threat to poultry and humans from H5N1: possibly caused by use of animal vaccines
- The threat cattle and humans from Bovine Spongiform Encephalopathy; possibly caused by the artificial feeding of cattle to minimize costs
- The threat to industry profits from diseases like foot and mouth disease and citrus canker which increasing globalization makes harder to contain.

3) **Infrastructure** (e.g. transport, ports, telecommunications, energy and irrigation facilities)
4) **Management skills and labour supply:** (with increasing requirements for business planning, enhanced market awareness, the use of modern technology and better agronomic management, modern farm managers shall need to be increasingly skilled).
5) **Coordination challenges** (in agricultural sector between research in agriculture and development, research-extension-farmer linkages, active involvement of research

coordination of research activities across industries, research organizations and issues, and investment in human capital for a skilled pool of research personnel in future

6) **Technology challenges/issues:** these include research, adoption, productivity, genetically modified crops/animals, investment in technology etc
7) **Water:** includes issues like access rights, water trade, providing water for environmental outcomes, accounting for the resources and allocation of water etc
8) **Resource access issues:** these include management of native vegetation, the protection and enhancement of biodiversity and sustainability of productive agricultural resources

Objectives of the agricultural policies

The overall objective of any national agricultural policy is to make the nation self sufficient in food through increasing production of all crops including cereals and ensure a dependable food security system for all

Specific objectives of agricultural policies

1 To ensure a profitable and sustainable agricultural production system and raise the purchasing power by increasing real income of the farmers (to increase income of households from agribusiness
2 To preserve and develop land and water productivity for sustainability
3 To increase production and supplies of more nutritious food crops and thereby ensuring food security and improving nutritional status
4 To take effective steps to ensure input supplies to the farmers at fair prices in a competitive market and remove difficulties at the famers levels which have arisen out of privatization of input distribution system
5 To preserve existing biodiversity of different crops
6 To introduce an appropriate institutional system of providing credit to ensure the availability of agricultural credit in time
7 To develop marketing system to ensure fair prices of agricultural commodities
8 To take up programs for the introduction, utilization and extension of bio- technology
9 To produce and supply agricultural commodities as required by the agricultural sector
10 To reduce imports of agricultural commodities and find out newer opportunities for increasing exports as well (to promote domestic, regional and international trade in agricultural products in a way that creates favourable B.O.P of the country)
11 To take necessary steps to ensure environmental protection as well as environment - friendly sustainable agriculture through increased use of organic manure and strengthening of the integrated pest management (IPM) programs
12 To take appropriate steps to develop an efficient irrigation system and encourage farmers in providing supplementary irrigation during drought with a view to increasing cropping intensity and yield
13 To establish agriculture as a diversified and sustainable income generating sector through strengthening of farming system based agricultural development

14 To develop human resource for agricultural development
15 To protect interests of the small marginal and tenant farmers
16 To update the agricultural system in the light of the agreement on agriculture under WTO, SAFTA and other international treaties by protecting the national interests
17 To develop contingency management system to combat natural disaster,
18 To reduce excessive dependence on any single crop to minimize the risk
19 To promote development of agricultural research, information dissemination for quick responsiveness to agriculture problem such as productivity, pests and diseases and weather
20 To enhance the potential of agriculture to provide employment opportunities to nationals

AGRICULTURAL POLICIES IN UGANDA

(1) OUTPUT POLICIES; this includes the output price policy and the marketing policy

a) Output price policy

Objectives output price policy

1 To influence agricultural output
2 To achieve desired changes in income generation
3 To influence the role and contribution of the agricultural sector to the overall process

Secondary objectives

1 To increase aggregate agricultural production across all enterprises
2 To stabilize agricultural prices to reduce uncertainty for farmers (hence rise in output) and to ensure stable food prices for farmers
3 To increase output of individual crops or output (e.g. export vs. food crops)
4 To stabilize farm income
5 To achieve food self-sufficiency
6 Generate or save foreign exchange (B.O.P)
7 Generate government tax revenue (export or import tax)
8 To supply cheap food and raw material to the manufacturing sector so as to accelerate the pace of industrial growth.
9 To tap commodity taxation (change in terms of trade) in order to maximize investible surplus extracted from agriculture for investment in the manufacturing sector.

Instruments of price policy: these are the trade policy instruments. They affect domestic agricultural prices through prices or quantities of either exports or imports. They include:

1 **Import taxes/subsides:** These increase or lower domestic prices by raising or lowering the cost imports in domestic /local currency.
2 **Export taxes:** lower the domestic price.
3 **Quantitative restrictions on imports:** these raise domestic price above imports price.

4 **Exchange rate policy:** this has a major impact on tradable agricultural commodities. It influences strength of local currency.
5 **Taxes and subsidies:** in addition to import and export taxes, farm output price can be affected by domestic tax or subsidy imposed at various points of the marketing chain

b) Marketing policy: marketing plays a dual role of transmitting prices between consumers and producers and physical transmission of the commodity from point of production to points of purchase by consumers. There are 3 dimensions of physical movement of the commodity i.e. time, space and form

Marketing margin: refers to the overall difference between the sell price by the producers and the purchase price of the commodity by the consumers

Objectives of the marketing policy

1 To protect farmers or consumers from parasitic traders
2 To stabilize or increase farm-gate prices
3 To reduce marketing margin the state may intervene to specifically narrow the gap between the consumer and the producer prices (consumer price protection).
4 To improve quality and minimum standards i.e., raise quality of farm output especially of export crops which confront rigorous quality norms in international market
5 To increase food security this can be achieved by eliminating hoarding and speculation by traders. Hoarding exacerbates food shortages and increases price instability.

Government market intervention approaches/strategies

These include the following

1 **Tariffs:** a tariff is an additional tax on imports. Tariffs protect domestic procedure without creating as much damage to the world as a whole
2 **Quotas:** a quota is a restriction on the quantity of a specific type of import. It benefits producers of a good in a domestic economy at the expense of all consumers of the good in that economy
3 **Subsidies:** are government financial contributions at the producer/suppliers end to lower the price of a commodity to benefit consumers they encourage use of particular goods but are very expensive to maintain by LDCs
4 **Price ceiling and price flooring:** price ceiling benefits producers while price flooring benefits consumers
5 **Exchange rate control:** this maintains the strength of local currency relative to foreign currency
6 **Trade bans:** a commodity sale may be banned for a purpose of consumer health protection or local industry and environmental protection
7 **Internal trade treaties e.g** W.T.O, AGOA, COMESA etc

Objectives of market intervention by the government

1 **To promote national security:** significant dependency on foreign food producers makes a country strategically vulnerable in the event of war, blockade or embargo. Maintaining adequate domestic capability allows for food self sufficiency that lessens the risk of supply shocks due to dual political events. Agricultural policies may be used to support domestic producers as they gain domestic and international market share.

2 **To encourage growth of local based agro industry** until it is large enough to thrive without aid or it may be an ongoing subsidy designed to allow a product to compete with all undercut foreign competition. This may produce a net gain for a government despite the cost of interventions because it allows a country to build up an export industry or reduce imports. it also helps to form the nation's supply and demand market

3 **To promote sustainable environmental protection and learned management:** farm or undeveloped land composes the majority of land in most countries. Policies may encourage subsidies that may be given for particular farming methods, land clearance or pollution abatement

4 **To reduce rural poverty and provide for poverty relief:** subsidizing farming may encourage people t o remain on the land and obtain some income. This might be relevant to a third world country with many peasant farmers by reducing the very high unemployment rates, price controls may also be used to assist poor citizens

5 **To promote organic farming assistance:** organic agriculture which uses little pesticides and experiences relatively little nitrate run off, possess little health risks upon consumers. This may be encouraged with subsidies and also with funding for better research to promote its feasibility

6 **To promote fair trade:** fair trade rules help to ensure that poor farmers in developing nations that produce crops primarily for export are not exploited or negatively impacted by trade policies, practices, tariffs and agreements which benefits one competitor at the expense of another

(2) IRRIGATION POLICY: policy issues irrigation include:-

a) Cost of irrigation for irrigation technologies available (cost and labour requirements)
b) Institutional choice in management of large irrigation schemes
c) Charges farmers for irrigation water which is linked to the economic problem of resource allocation in the presence of market failure

Objectives of the irrigation policy

1 To reduce risk by reducing the impact of rainfall variation on crop growth and yields

2 To increase crop yields directly by reducing the incidence of water stress, and indirectly through raising the productivity of other inputs

3 To permit a raise in multiple cropping index by providing water in the dry seasons and permits flexibility in the timing of sowing

4 To extend the margin of cultivation into semi arid or arid regions

5 To enhance increasing farm output by allowing households shift to higher value crops

(3) MECHANISATION POLICY

Objectives of the mechanization policy

1 Encourage adoption of modern machinery in farming
2 Encourage fabrication of locally adaptable machinery and spare parts
3 To promote higher aggregate production for commercial farm production
4 To reduce labour requirements/costs incurred by the farm
5 To increase productivity of land
6 To encourage quality production and value addition

PROGRAMMES ADOPTED BY `THE GOVERNMENT TO IMPLEMENT THE AGRICULTURAL POLICIES

(1) Poverty eradication action plan/programme for elimination and alleviation of poverty (PEAP): this is an action plan developed by the government as guiding framework through which other sectors work together in investment and management of the economy with the ultimate goal of eradicating poverty.

Key areas of PEAP

- ✓ Economic management;
- ✓ Production competitiveness and incomes;
- ✓ Security, conflict resolutions and disaster management;
- ✓ Good government; and
- ✓ Human devolvement

(2) Rural development programmes

a) Plan for modernization of agriculture (PMA): this is a holistic strategic framework for eradicating poverty in Uganda by transforming subsistence agriculture into commercial agriculture so as to increase per capita incomes, increase food security and improve quality of life of the poor subsistence farmers

It is part of the government's broad PEAP of 2000 through which different sectors involved in the poverty eradication through agriculture transformation are involved including farmers, NGOs, universities, research institutions, ministries of government, private sector and donors

Benefits of transformation from subsistence to commercial agriculture to farmers

1 Produce and sell more to the market without compromising household food security.
2 Have access to information on market process and be well linked to both product and input market
3 Live on well-planned and managed farms and to readily adopt new proven technologies
4 Manage farm activities in a manner that does not degrade the environment.

Objectives of PMA

1 To improve household food security
2 To improve household incomes and quality of life
3 To create employment through the secondary benefits of PMA implementation such as agro-processing factories and services
4 To promote sustainable use and management of natural resources

Intervention targeted for government action through PMA (key areas of focus by PMA) Seven interventions by government through PMA expected to achieve the above objectives include:-

1 **Research and technology development:** this is aimed at developing appropriate information and technology for increased agriculture production and productivity.
2 **National Agricultural Advisory Services (NAADS):** to create a farmer-led demand driven approach to extension services so as to increase farmers' participation in farm planning and as a business enterprise
3 **Agricultural education:** PMA is tasked with developing human capital by increasing access to information, production and financial management skills of all stakeholders in agriculture which, in turn, will transform agriculture and consequently eradicate poverty
4 **Improving access to rural finance:** subsistence farmers need reliable and effective financial services to invest in their farming enterprises and also cope with risks and uncertainties. So development of a variable and sustainable rural finance system as one of the key intervention measures in agriculture transformation is paramount
5 **Agro- processing and marketing information:** good reliable markets are essential in agricultural transformation. Approaches to solve marketing constraints are a key target area for PMA. On the other hand, promotion of agro-processing industries is crucial for improving market access both in the rural areas and national level by increasing demand for raw materials and increasing export earnings

Measures for increasing agro-processing

- ✓ Development of infrastructure and provision of low cost energy source and water
- ✓ Strengthening market information on production, supply and demand for products
- ✓ Levying favourable taxes for the agro-processing sector
- ✓ Establishment of appropriate grade and standard for agro-industrial products
- ✓ Promotion of agro-industrial sector through training and support to processors and their associations
- ✓ Promotion of rural electrification through the provision of rural electrification fund as provided for under the electricity la w
- ✓ Establishment of appropriate policies and laws in areas of contracting and contract enforcement in support of the agro industrial products

6 **Development of supportive physical infrastructure:** physical infrastructure development is crucial in agricultural transformation for example

- ✓ Roads and railways open up the rural areas to the product and input areas
- ✓ Communication facilities like radio stations, mobile phones, internet connectivity increase access to input and produce market information

- ✓ Rural electrification promotes processing, preservation and storage of high value products
- ✓ Water facilities promote irrigation farming, agro processing and livestock rearing

7 **Sustainable natural resource management and utilization** so as to meet the food and welfare demands of the present and the future

b) National Agricultural Advisory Services (NAADS)

This is a component of PMA that was formed and passed by law through the NAADS act of 2001. It aimed at developing a demand-driven and farmer-led agricultural service delivery system by rectifying past shortcomings in the provision of agricultural extension services

Objectives of the NAADS programme

1 To improve food security
2 To improve nutrition and household incomes through increased productivity and market oriented farming
3 To empower all farmers, more so the women, youth, disabled and other marginalized groups to access and utilize agricultural advisory service providers for extension services and market oriented farming
4 To promote farmer groups to develop capacity to manage their farming enterprises
5 To create options for delivery of advisory services for different types of farmers
6 To develop private sector capacity and professional capability to supply agricultural advisory services
7 To create avenues for financing and delivery of agricultural advisory services for the subsistence farmers, women farmers, youths, disabled and those living with HIV/AIDS
8 To develop systems to ensure quality advice and to stimulate the participation of the private sector in funding agricultural advisory services

Benefits farmers get from the support from NAADS; farmers have got opportunity through NAADS to

1. Form legally recognizable viable farmer groups with a common farming interest
2. Elect members from the group to represent them in the sub county and district farmers' forum
3. Select NGOs to assist them to form and develop farmer's groups i.e. high level farmer's organizations (HLFOs)
4. Take advantage of the market information availed to guide them in selecting more profitable and marketable enterprises and technologies
5. Increase their farm productivity and profitability through improved management practices
6. Demand advisory services to promote new or improve existing enterprises and technology in response to their needs and appropriate to their circumstances
7. Share and learn from experiences with other farmers through exchange field visits and study tours in order to come up and adopt best practices
8. Manage and own demonstration sites

9. Participate in research to develop new technologies and practices that match their needs and circumstances

How NAADS is implemented; it is implemented through the following components

1. Providing advisory and information services to the farmers
2. Promoting technology development and linkages with the market by enabling farmers to participate in technology development and capacity development and creating access to market information
3. Ensuring that quality services are delivered to farmers by establishing minimum standards of advisory services and inputs procured
4. Promoting private sector institutional development e.g retraining extension staff to increase their services delivery efficiency
5. Undertaking programmed management, monitoring and evaluation. This is done by the central and local government institutions and all other stakeholders
6. Integrating cross-cutting issues into NAADS activities e.g poverty eradication, HIV/AIDS, natural resources management and gender mainstreaming

Guiding principles of the NAADS programme implementation

1 Farmer empowerment to enable farmers to organize themselves and act collectively
2 To intensify decentralization and capacity development by equipping stakeholders at sub county levels with skills to plan, fund, monitor and evaluate the outcomes.
3 Improving linkages to researchers and markets
4 Commercialization (promoting market-oriented production)
5 Increasing institutional efficiency
6 Poverty alleviation through improving farm total production and productivity
7 Gender mainstreaming to ensure that both men and women are empowered and uplifted
8 Managing natural resource productivity by reducing environmental degradation
9 HIV/AIDS mainstreaming i.e., NAADS activities also focused on uplifting livelihood of households affected by HIV/AIDS scourge.
10 Harmonization of programmes with PMA principles to enable rapid spread of NAADS in liaison with other development agencies.

Challenges of the NAADS programme implementation: NAADS has been implemented in three phases i.e., phase 1, phase 2, and phase 3 (operation wealth creation) by the end of 2015. Implementing phases 1 and 2 of NAADS, a number of challenges that impinged on achievement of programme objectives were observed. These included;

1 **Corruption:** like any other department or institution in the government, NAADS war for some time facing the problem of the embezzlement of resources. Corruption in NAADS was 90% procurement-related. NAADS officials and some local officials in the procurement deparments of the districts connived with the suppliers to provide either air-supply or sub standard inputs.
2 **Fraud:** there were allegations/cases of people adding say an extra zero to one hundred to make it one thousand.there were cases of farmers who compromised

with NAADS officials and sometimes with the procurement departments. The criminal investigation and intelligence directorate was investigating such cases.

3 **The expectations of the public were sometimes outside NAADS mandate:** NAADS mandate was mainly to provide extension services. The inputs that were provided by NAADS were supposed to be strictly for demonstration. There were people who would ask NAADS officials for free seeds and some tractors. There had been extreme cases whereby some farmers could and ask for money to buy land that NAADS could not provide for

4 **Poor staffing level in the local government:** at one time there was a ban on recruitment. That meant NAADS did not have sufficient staff to provide extension services.

5 **Lazy extension staff:** there were so many complaints from farmers that some of the contracted NAADS extension workers would not work as required. In addition, some of them were ill-skilled to help farmers out of their farming problems.

6 **Lack of transport facilities** e.g., motorcycles for extension service provides. This made reaching out to farmers very hard and limited

7 **Inadequate funds to establish and maintain:** viable and suitable demonstration projects at sub-county and parish levels

8 **Lack of motivation and commitment by farmers:** so many complaints about farmer's commitments to properly manage of the technology disbursed to them and non-attendance of advisory training meetings were reported which might have had a negative bearing on performance of the system

9 **Interference by politicians:** right from parish level.

10 **So many risks experienced by the farmers:** at farm level e.g theft, natural disasters such as weather affected output, pests and diseases causing livestock mortality or yield failure, accidental disasters such as fire etc. These affected pay-back for passing on inputs to other farmers

Solutions that can be adopted to improve efficiency and effectiveness of the NAADS programme

1 The government should provide subsidies to the farmers in order to motivate them in their agricultural activities.

2 More service providers (extension workers in particular) should be employed in order to teach farmers new technologies in farming.

3 More demonstration sites should be set up which could act as learning sites for farmers.

4 The government should improve on infrastructure like road, railways to ease transport and communication between the farmers and the service providers.

5 Sensitization of the farmers about the importance of attending NAADS meetings

6 The government should also make sure that it pays the service providers in time and above all, relatively good pay.

7 The government should be in position to provide motorcycles to the service providers so that they could be in position to reach most of the farmers in their respective sub - counties

8 Strict laws on corruption, fraud and embezzlement should be reinstated to discourage other potential perpetuators of the vice.
9 Retooling extension workers with new skills related to the recent technologies. This is likely to improve their relevance in developing farmers.
10 Encouraging farmers to carry out cooperative farming so as to reduce costs of production
11 The government should open up new markets to absorb the likely increase in output due to NAADS interventions

RESEARCH EXTENSION AND AGRICULTURAL DEVELOPMENT

Research: Agriculture research refers to investigations on crops, livestock and machinery aimed at improving the quality of output using economically viable, means

Agricultural Research Stations

These are centers established by the national agricultural research policy to carry out specialized investigations on production of crops and livestock and development and use of machinery to improve the quality and quantity of output using economically viable means

Agricultural research stations in Uganda

1 Kawanda agricultural research station for crops
2 Namulonge agricultural research station for crops
3 National semi arid resources research institute (NaSARRI) -Serere for crops
4 Namalere agricultural research station for mechanization
5 National animal genetic resource centre Entebbe (NAGRC) for livestock
6 Makerere University Agricultural Research Institute Kabanyoro (MUARIK) for crops, livestock and mechanization
7 Zonal Agricultural Research Development Institute (ZARDIs) e.g, Mukono ZARDI, Ngetta for crops and livestock etc

Roles of research stations in agricultural development

1 They develop new crop varieties through crop breeding e.g., Kawanda Agricultural Research Station, Namulonge Agricultural Research Station etc
2 Improvement of existing crop varieties
3 Testing of new varieties to determine how they perform in local conditions e.g NaSARRI, Kawanda, Namulonge etc.
4 Improving livestock through breeding, they promote artificial insemination, embryo transfer and surrogate mothering technologies e.g, national animal genetic resources institute-Entebbe
5 Comparing two or more varieties to observe their performance in a particular environment
6 Soil testing and determination of optimum fertilizer requirements e.g., Kawanda Research Station

7 Developing appropriate methods of protecting crops against pests, diseases and weeds
8 Testing new farm machinery to observe its performance in local conditions
9 Evaluation and testing of agrochemicals for use in crop and livestock production
10 They develop new farming machinery or improve existing ones e.g, Namalere research station
11 They develop ways of preventing/managing livestock parasites and diseases
12 They conduct trials on the best animal and crop husbandry practices e.g, MUARIK
13 They promote environmental protection and conservation through tree breeding and forestry
14 They act as study/training centers for agriculture professionals from whom they acquire practical skills e.g, MUARIK, Mukono ZARDI etc. they also train farmers on modern farming techniques.
15 Evaluating and developing better ways of post-harvest handling of crop and animal products
16 They carry out testing and certificate of seeds before they are released to marketing companies e.g, Kawanda, Namulonge etc
17 They carry out weather studies and forecasting.

Problems faced by agricultural research in Uganda:

1. Limited/inadequate funding: research is an expansion process requiring huge capital input. Unfortunately, research stations find themselves to rely on external donor support whose priorities may not match with local demands.
2. Inadequate skilled man power: credible research requires a number of well-skilled personnel. However, there are few individuals capable of carrying out reliable research. The high staff mobility intensifies the problem.
3. Poor government policies directed towards the research sector.
4. Limited contact between farmers and researchers: this has led to development of new technology that doesn't serve the interests of the farmers (irrelevant technologies)
5. It is expensive for ordinary farmers; most farmers cannot afford services offered by research e.g. inputs because of low per capita income
6. Political instabilities may disrupt continuity of the process
7. Mismanagement of funds by research is often funded by foreign donors whose priorities may not be in agreement with national agricultural development objectives
8. Political instabilities may disrupt continuity of the process
9. Unfavourable agricultural policies for research e.g. recently, researchers have been voicing out their frustration over the lack of biotechnology law in the country. This makes them unable to experiment their innovations and propagate new technology to farmers

AGRICULTURAL EXTENSION

This is the dissemination (passing on) of relevant information, techniques and skills/practices from research agencies to farmers and vice versa for agricultural development

Roles of agricultural extension personnel in agricultural development

1 Training farmers on modern farming methods stimulating adoption of new/modern technology
2 Stimulating adoption of new modern/technology
3 Interpreting and presenting information from research agencies to benefit farmers
4 Collecting agricultural information from farmers for further uptake by research agencies
5 Guiding farmers on enterprise selection, enterprise mix and farm planning
6 Guiding farmers on marketing by providing appropriate market information
7 Stimulating unity among farmers by initiating group formation, farmer field schools and farmer-farmer learning visits
8 Inspection and quality monitoring of agricultural inputs supplied to farmers and providing necessary advice to them
9 Developing budgets and programs of work for agriculture department at sub county levels

Methods used in extension to disseminate information

a. Technology demonstrations
b. Group trainings
c. Farmers field visits
d. Farm visits
e. Film shows/cinemas
f. Farmer field schools
g. Seminars and workshops
h. Brochures and banners messages
i. Exhibitions and shows
j. Mass media e.g news papers and radio talk shows
k. Drama acting and plays

Strategies for improving agricultural extension system

1 Provision of legal and policy frame work preferably an act of parliament, to create extension as an important activity in pursuance of national development, state the structure for extension in the country, indicate the sources, levels and methods of farming, identify source sand types of programme, determine functions that constitute extension, provide the quality of manpower needed, and identify which agencies can participate and how.
2 It will help streamline the confusion currently existing in the effort to transfer agricultural knowledge to farmers, particularly in the areas of service provision, programme development and funding
3 Establishing links to market opportunities: the old practice of asking farmers to produce without providing the means but to meet specific market demands have not worked Extension is valuable when it is linked to specific, market opportunities, when producers are being equipped to respond particular market demands
4 Recognizing indigenous knowledge: there is need to harness indigenous knowledge for the development of extension service, a country's knowledge base needs to be developed and

fostered to both improve its competitive position and to contribute to human and sustainable development goals. This is evident when local, scientific and technical information are properly managed and used. Special emphasis should be placed on developing and disseminating local content, improving the relevance of the information to local development, as well as capturing and auditing all relevant local resources.

5 Targeting and gender sensitivity: targeting is the understanding of who the farmers are in terms of their capabilities (gender, resources, markets, culture, and e.t.c) and ensuring that only technologies that are relevant to each farmers capability is targeted at him or her. targeting compels the extension service provider and, indeed, research to properly examine the audience and the technology, and identify farmers that have a greater likelihood of benefiting from the technology based on the characteristics (technical, social and market) of similar technology

6 Networking and enhancing the capabilities of extension of service providers: agricultural extension by its nature is a service that relies on linkages and networks. The new thinking is that for extension to succeed, it must enhance its linkages and networks with research, farmers, and among extension providers (public and private). This way the capability of extension to transfer agricultural technology farmers will be improved. National and regional associations of extension service providers have proved a good tool in this regard.

7 Increased use of information and communication technologies in extension: the promise to ICTs is agricultural extension is that they can energize the collection, processing and transmission of data, resulting in faster extension of quality information to more farmers in a bottom up and interactive channel of communication. thus ICTs may be the only way in which farmers can access a variety of information sources that are accessible, affordable, relevant and reliable but also narrow the gender disparities in terms of access to agricultural information e.g use of the internet to enable farmers to become part of the information flow process that even to instigate the process of information flow rather than waiting for the information to be presented to them via radio, TV, news papers, or other ICTs

8 Increased use of private extension service providers: increased involvement of the private sector either in delivery, funding, or management of agricultural extension broadens the focus of extension personnel and makes extension services more responsive to client needs and changing economic and social conditions. It offers farmers value for their money. The result of increased private sector participation is higher in those aspects of extension service that are always profit -driven: for example, input procurement and distribution, cash crop extension, and veterinary extension. For services that are more of publicly oriented, for example, adoptive formulation should continue to operate under the ambit government.

9 Ensuring adequate and efficient transport facilities; extension involves extension personnel linking up with farmers at their production sites and proper transport infrastructure and facilities becomes indispensable.

Agricultural research, extension and farmers linkages

Linkage refers to the mutual and reciprocal connection between research, extension and farmer. Research, extension and farmers are the three main pillars of agriculture system and their effectiveness largely depends on strong linkage among each other. hence interaction and effective collaboration among all the stakeholders are essentially needed to achieve the

common objective of increasing agricultural production and uplift the living standard of the rural poor .agricultural researches without appropriate linkages to extension may neither be aware of the difficulties faced by farmers (knowledge of which is crucial to formulating appropriate research) nor know how their findings are applied.

The existence of weak linkages among the research, extension and farmers have been identified as a major drawback to generation , wider testing, dissemination and adoption of improved agricultural technologies by blocking the flow of information either from research to extension or from extension to farmers thereby adversely affecting agricultural production and productivity . For agro technologies to be relevant to local needs, researchers, extension workers and farmers should have to work together in identifying research problems, adapting the recommendations to local conditions and providing feedback to researchers about the innovations that have been developed

How well researchers, extension agents, and farmers communicate and cooperate has a strong influence on whether agricultural science succeeds or fails as a catalyst of national development and as a tool for eliminating poverty.

Factors affecting research, extension and farmers linkages:

The main causes of weak research- extension- farmer linkages include top down nature of research and extension management, administrations of research and extension in separate institutions, lack of incentives for linkages activities, high turnover of development agents, poor infrastructural development, lack of budget linkage activities and lack of adequate employees' skills

Organizational and institutional factors

1 Top down extension and research management; both research and extension approaches are centralized and follow a top down approach. Extension programs and policies have been formulated without the due consideration of farmers' opinion. As a result, farmers lack adequate opportunity to decide on research and extension priorities
2 Administrative problems; agricultural research institutes and extension organizations are managed and administered as separate entities with very limited contact and working relationships. while extension fails under the MAAIF, most research activities falls under the Ethiopian institute of NARO and the regional ZARDIs, in resource limited situations, linkage activities suffer most, as they have to compete with research and extension function to obtain a share of the available resources. Added to this, there is inefficient monitoring and evaluation of existing linkage systems
3 Lack of incentives for linkage activities; individuals have little/no incentives to perform linkage activities. At the field level the incentives for extension workers to stay in their position and to perform as expected is often weak. as a result, extension workers are continuously leaving the extension systems looking for better paying jobs, further, the incentives mechanisms for farmers to actively use the training centers are also not necessarily effective, therefore, extension workers are forced to searched better incentive jobs instead of striving for agricultural development through working with farmers and researchers

4 Turnover of employees; the extension agent's position suffers from high turnover and looking for better salary paid jobs. a high turnover of staffs creates a difficult situation to establish long- term relationships and linkages among the researchers extension workers and farmers

Financial Factors

5 Lack of adequate budget for linkage activities; sufficient financial resources for linkage functions such as publications, testing of research results and training of extension workers are often lacking in. moreover research institutes and ministry of agriculture are competing with each other for budgets rather than complementing to attain common development goals. This tendency to compete for the same resource leads to neglect of linkage activities
6 Low employee's salary; extension agents are a key source of appropriate agricultural information to farmers since they are working closely with farmers beside to their profession than other stakeholders in agriculture. However, development agents found working under areas characterized by extremely low salary and lack of incentives such as per diems, overtime and holyday payments. The presence of law salary and incentives creates low development agents motivation which contributes for the presence of weak linkage either with farmers and/or researchers
7 Infrastructural factors; road networks are limited and do not reach many villages in the rural areas/farmers do not get fair prices for their produces. This discourages farmers from adopting new technologies

Personal and Psychological factors

8 Lack of adequate skills; capacity is a major issue within the extension system; many development agents and experts have low technical capacity and morale. Moreover, development agents, extension administrators and department heads lack skills to effectively participate in priority setting, planning and evaluation of extension programmes
9 Lack of motivation; motivation is a description of person's motive to action. When development agents are motivated at their workplace they are working for the best researchers and farmers. on the contrary to these ideas motivation and morale of extension workers are very low due to low incentives, high duties/burden of extension workers are very low due to low incentives, high incentives, high duties/burden of extension workers and low infrastructural development

Measures to improve research extension farmer linkages include

Policy makers and planners should pay utmost attention to;

1 Allocating adequate funds for linkage activities
2 Expanding infrastructural services like access roads
3 Information communication technologies (ICT) and construction of farmers training centers
4 Providing adequate incentives for linkage activities
5 Adopting more decentralized research extension management systems
6 Providing on job training for development agents/extension staff

7 Employ capable research and extension staffs
8 Empowering and encouraging farmers to take active participation in the planning and execution of extension and research programs
9 Strong formal liaison, coordination and cooperation among research centers, development agents and farmers need to be created

Role of non government organizations in agriculture development

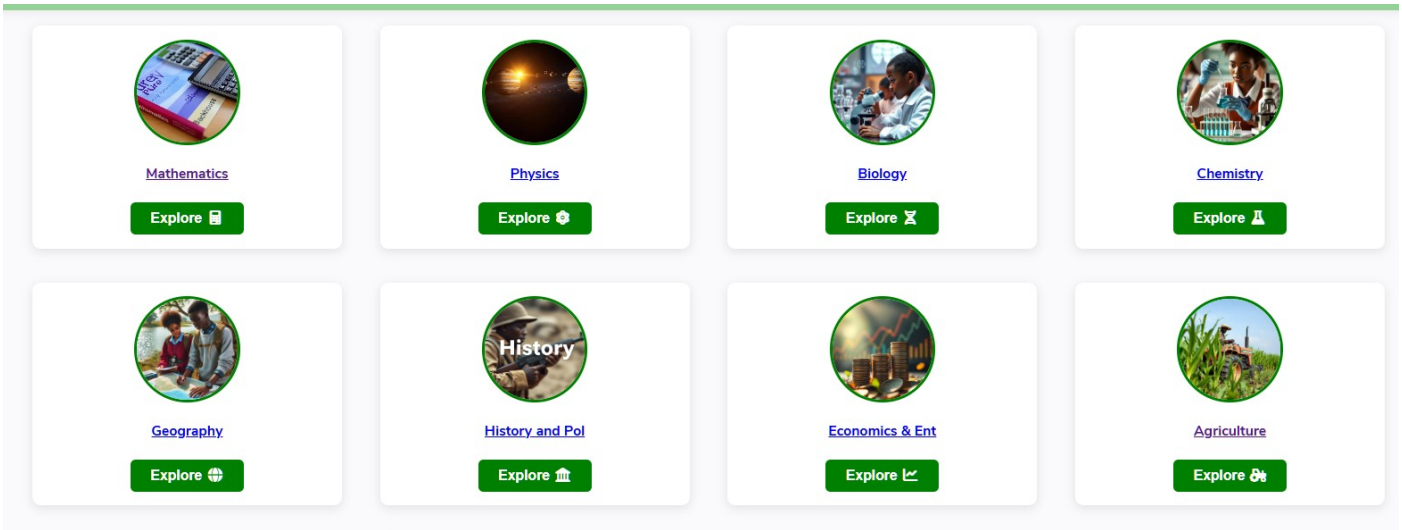
NGOs play an important role in the lives of people and in supporting economic development in different ways. One of the areas that receive support from NGO's is the agricultural sector. Through this, people get employment, earn a living, lives improve and the economies grow in understanding the role of NGO's in agricultural development, it is important to note that natural calamities (drought, floods, landslides, pests and diseases) violent conflicts, including civil and military have negatively affected agriculture in most parts of Uganda and other areas in the world. There is poor agricultural research capacity resulting from market inefficiencies and the collapse of extension services to the public, largely affect access and use of farm inputs thus reducing agricultural production

Life has to go on in the aftermath of any conflict/calamity because people recollect their broken pieces of life and begin a new journey, without such reestablishments people rely on aid making the population food insecure and highly exposed to high food prices. Most donors consider NGO's since they establish themselves within a short time, are flexible, accountable and objective in handling their mandate. some of the NGO's with inclination towards agriculture that are working in Uganda include SASAKAWA GLOBAL 2000, KULIKA- UGANDA, FAO, ONE ACRE FUND, OXFAM, WFP, World Vision, JICA, VEDCO, ASARECA, USAID-feed the future, ICRISAT, heifer international, send a cow, ACDI VOCA, IFAD, hunger project, SNV, CRS, APEP, Africa 2000 network, CGIAR, etc

1 Enhancement of crop and livestock productivity; this is done by use of demonstration plots to share farming skills and agricultural technologies, including enhanced seeds and fertilizers .e.g one acre fund, Kulika etc
2 Enhancing farmers access to information; relevant for agricultural development ranging from land rights to research results which is often difficult for the local population to access, for instance through the internet, organizing excursions, linking services etc
3 Organizing farmers for group action in farming and marketing; smallholder farmers are seldom organized in functioning farmers' organization and have no political voice. NGO's can support farmers' organizations by providing knowledge and training in organizational development such as awareness raising accountancy, legal advice, internal regulations etc
4 Conducting agricultural adaptive research; public agricultural research and extension service often do not have capacity to conduct adaptive research and to reach out to all farmers. NGO's can organize such services in cooperation with research institutes, public extension organizations and the private sector
5 Advocacy in research and development; NGO's can advocate for small farmers interests in agricultural R and D, communicate their problems and create awareness on how agriculture especially small holder agriculture can promote rural development. NGO's can form a (constructive) counterforce to the state and hold the national governments accountable for their strategies and activities

6 Post harvest and agro processing efforts; in order to reduce post harvest losses, some NGO's promote mechanized processing and improved storage techniques and technologies to enhance production of processed goods of sufficient quality to market
7 Enhancing public-private partnership and market access; NGO's act as development brokers to establish linkages between the rural population and public and private institutions that provide such services to support agricultural development e.g provide general knowledge on credit, market a and availability of insurance and safety nets e.g SG2000
8 Human resource development; many NGO's are involved in improving the skills and expanding the influence of agricultural extension workers in collaboration with universities to build effective curricula that provide extension workers with strong theoretical knowledge and meaningful hands on experience e.g Sasakawa Africa Funds for extension education (SAFE) by SG2000
9 Supporting infrastructural development e.g markets, feeder roads etc which are key to agricultural and national development
10 Influencing agricultural policy development; NGO's inclined towards agriculture have a big stake in influencing national agricultural policy formulations by the government. They are consulted and offer advisory services that contribute significantly to the government's reform processes in the agricultural sector, donor coordination and the dialogue between donors and the government also improve.
11 Providing emergency food supplies; NGO's and the sector are responsive to emergency situations in the country that threatens food security. Emergency food supplies help the community to cope with difficult times that disrupt agricultural activities until such calamities subside e.g WFP, FAO, feed the future etc
12 Availing credit and equipment for farming; credit and equipment are crucial for farming operations. Such may be given as loans, grant or donation to boost farm productivity
13 Offering extension services; many NGO's recruit technical personels that are tasked with providing professional extension services as field officers e.g World Vision, Kulika Uganda, UGACOF, ONE ACRE FUND, heifer international, SNV, SG2000, Africa 2000, VEDCO ETC

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