LAND RECLAMATION

Land reclamation is the process of converting wasteland into farm land for growing of crops and keeping of animals while land rehabilitation is the process of restoring land to its former productive state.

Importance

1. Intensify food production to feed the ever increasing population 2.
To overcome land shortage and pressure.

Methods of Land Reclamation

Irrigation

-Artificial method of supplying water to a region which doest receive adequate rainfall or to ensure continuous crop production.

-Done in dry areas with low rainfall and regions experiencing dry periods to sustain growth of crops.

-Dams are used to store water.

Advantages

(a) Can be used for HEP generation

(b) For fish farming

(c) Supply water for domestic use (d) Control floods.

Negative effects

a) Can be a cause of deaths by drowning

b) Breeding ground for mosquitoes which transmit Malaria.

c) breakage can cause destruction of life and property

Factors Determining the Amount of Water Required for Irrigation

a) Climate: Areas receiving low rainfall require more water.

b) Soils: Sandy soils require more water than clays due to low water retention ability.

c) Crop: Paddy rice requires water logged soils while vegetables require wet and well drained soils.

d) Size of fields: Small plots require small amounts of water while large plots require large amount of water.

Methods of Irrigation

(a) Water lifting method

- Lifting water from a source by using a bucket or watering can and pouring it on the crops.
- Used widely in market gardens and on farms adjacent to the water. **(b)** Flood/basin irrigation
- Diverting river water into a canal then to plots where it's flooded. - Commonly used in irrigation schemes.

(c) Sprinkler or overhead irrigation

-Taking water to the fields by pipes and applying it on crops by rotating sprinklers mounted on vertical pipes.

-Used on golf courses and market gardening.

(d) Trickle irrigation

-Plastic pipes with holes laid in the fields through which water trickles to the base of plant.

-Popular where fruits and flowers are grown.

(e) Canal irrigation

-Directing water through canal to farms.

-Commonly used in areas experiencing low rainfall e.g. Yatta in Machakos

(f) Drip irrigation

- Inverting bottles filled with water into the roots of a plant.
- Used in low rainfall areas to grow trees, fruits and flowers.

Drainage of Swamps

- Process of draining excess water from the land.
- Problems of land with excess water are:

a) Is breeding ground for disease causing vectors.

b) Is water logged and unsuitable for agriculture.

c) Is prone to flooding which destroys life and property.

Processes Involved

(a) Digging ditches for water to ooze into and flow away by gravity

(b) Planting eucalyptus which takes up a lot of water e.g. at Kakuzi in Makuyu.

(c) Laying perforated pipes in ditches which water will seep into and flow away by gravity.

- Areas in Kenya with have been reclaimed by draining are:

(a) Yala on lower courses of R.Yala

(b) Bunyala on lower courses of R.Nzoia.

- The project was conceived in 1970.

Objectives of the Project of Draining Them

(a) Free the area of pests.

(b) Prepare land for settlement and agriculture.

(c) Ease population on Kano plains.

(d) Reduce flooding and associated hazards.

(e) Develop the otherwise remote area.

Achievements

(a) Flooding has been controlled.

(b) About 800 hectares are available for agriculture and settlement.

(c) Water borne diseases have been brought under control. **Control of Pests**

Mosquitoes

(a) Fumigation

(b) Draining of stagnant water

(c) Spraying

(d) Clearing of bushes near settlements.

Rodents, birds, squirrels and porcupines

(a) trapping

(b) poisoning

(c) hunting

(d) Scaring away Tsetse flies

-They thrive in damp areas with high temperatures and prefer bushy vegetation as breeding grounds.

-Examples of tsetse fly infested areas are Lambwe valley in Kenya and Miombo woodland in Tanzania.

-The control of tsetse fly at Miombo woodland was aimed at:

-The control was done by The International Centre for Insect Physiology and Ecology (ICIPE). a) Eliminating the pest to obtain land for agriculture.

b) To treat the sick people and animals to check the spread of resultant diseases.

Measures Taken Bush

Clearing

-Selective clearing of bushes was applied to prevent soil degradation.

-Caused tsetse fly to lack a place to breed and killed adult flies and pupae due to low humidity.

Bush Spraying

-Spraying from the ground or from a low flying aircraft.

-Doesn't affect other organisms.

Disadvantages

a) Some insecticides such as DDT have serious environmental effects.

b) The fly develops resistance and a high dose of chemicals has to be used.

c) Kills other useful organisms.

Sterilisation males

- Making the insect unable to reproduce by obstructing its reproductive organs.
  - Luring the male flies to some chemical substance which sterilises them.
    - When they mate with the females fertilisation doesn't occur which reduces insect population.

Traps

(a) Square of black cloth coated with glue on which the insects stick.

(b) Traps impregnated with insecticides which kills the insects.

Creation of Buffer Zones

-Belt of 5 km wide with dense cultivated vegetation to create barrier which the fly couldn't cross.

Killing of the Hosts

Wild animals which the fly fed were selectively hunted and killed.

Methods of Land Rehabilitation

Afforestation and Reafforestation

-Improve the productivity of land in the following ways: a) Controls soil erosion by:

-Acting as wind breakers

-Leaves reduce impact of raindrops on the soil - Roots hold/bind the soil particles together.

b) Vegetation reduces runoff and increases the rate of infiltration of rain water ensuring there is a complete water cycle.

c) Decayed vegetation provides humus which restores soil fertility.

d) Roots help moisture to percolate deeply into the ground.

e) Modifies the climate of an area by moisture being released to the atmosphere causing higher rainfall and lowering the temperature.

Bush Fallowing

-Cultivating a field for a period of 2-3 years then abandoning it for another so that it may regain fertility naturally by wild vegetation adding humus into the soil.

Grass Strips and Cover Crops

-Grass and cover crops e.g. sweet potato vines, beans and peas reduce the speed of running water thus helping to check soil erosion.

Mulching

-Covering the soil using crop residues or artificial materials such as polythene sheets.

-Helps to conserve the soil in the following ways:

a) Reduces evaporation helping to conserve moisture in the soil.

b) Help to check the speed of running water.

c) Reduces the splashing effect of rain drops.

d) Reduces runoff and increases infiltration ensuring more moisture is going to be available for plants growth.

e) Mulch from crop residues decomposes releasing nutrients into the soil. f) Controls weeds.

Application of Manure and Fertilizer

- Replenishing nutrients depleted from the soil by constant application of manure or chemical fertilizers.

Controlled Grazing

To solve the problem of overgrazing:

a) The government is advising the farmers through extension officers on the importance of matching the number of livestock with the carrying capacity of land.

b) Emphasizing on quality than quantity by introducing exotic breeds and cross breeds.

c) Establishing ranches in livestock farming regions e.g. Kaptuei group ranch.

d) The land should be subdivided into paddocks so that different sections have time to regain pasture at different intervals.

Filling Quarries

-Filling the pits with rocks and topping with fertile soils e.g. Bamburi Nature Trail where trees have been planted and animals introduced.

Drainage Trenches

Flooded areas can be rehabilitated by:

-Digging trenches to drain off excess water to rehabilitate flooded areas.

-Another method is to construct dams across rivers.

Planting Drought Resistant Crops

-Planting in Arid and Semi Arid Lands drought resistant and quick maturing crops which take advantage of the short wet season e.g. Pigeon peas, cassava, millet, sorghum, Katumani maize etc.

Irrigation Schemes in Kenya

Mwea Irrigation Scheme

-Located in Kirinyaga district in central province in Mwea plains on the foot of Mt. Kenya.

-Started by the colonial government in 1954.

Objectives

a) To reclaim the unproductive land from semi-arid conditions.

b) To occupy detainee labour since Mwea was a detention camp for political detainees during 1952s state of emergency.

c) To settle former detainees and the landless.

d) To create employment for former detainees.

e) To increase agricultural production.

Factors Which Influenced the Location of the Scheme

Physical Factors

a) Availability of extensive land which made created room for future expansion.

b) Black cotton soils with high water retention capacities suitable for rice growing.

c) Freely draining clay loamy soils suitable for growing of other cash and food crops.

d) Gently sloping land which allows use of tractors and allows water to flow by gravity reducing the cost of pumping it to the fields.

e) Availability of plenty of water from permanent rivers Thiba and Nyamindi draining the area.

f) Experiences warm weather during the second part of the year suitable for rice growing.

Human Factors

a) The land was not inhabited due to its arid conditions therefore there was no displacement of people from the area.

b) Availability of labour for rice growing to presence of former detainees.

c) Desire by the colonial government to start a project that could occupy detainees.

d) Location near major urban centres such as Nairobi, Embu, Nyeri and Kerugoya which provide immediate market for rice.

Irrigation/Cultivation Method Used

a) Basin irrigation.

-The ground is levelled.

-Embankments are constructed.

-Water to the enclosed sections.

-The paddy fields are flooded to a depth of 10 cm. b) Furrow irrigation. o Water flows from irrigation canals to furrow which are in between rows of crops wetting them.

Crops Grown

1. Wet paddy (rice).

a) Basmati/Pishori which more valuable.

b) Sindano which is resistant to diseases.

2. Subsistence crops e.g. maize, peas and beans in small scale. Horticultural crops e.g. tomatoes, French beans, melons, etc.

Organization of the Scheme

-The scheme is divided into Mwea, Thiba, Wamumu and Tebere sections.

-6000 hectares are under rice cultivation.

-Tenants live in 36 small villages.

-There are 17 primary schools and more than 5secondary schools one of which is for disabled and one mission hospital (Karira).

-The area under rice cultivation is divided into one acre which is surrounded by a bank of earth (bund) for keeping water within the field.

-Each tenant is given 4 acres of land and expected to maintain a nursery covering 1/8 of an acre.

Marketing

Farmers sell rice to local consumers in the urban centres especially Thika and Nairobi.

Benefits of the Scheme

a) Saving the country foreign exchange by contributing most of Kenya's rice production.

b) Providing income to farmers, traders etc. which alleviates poverty and raises the living standards.

c) Provided land to thousands of landless.

d) Reservoirs created have helped in controlling flooding.

e) Improvements of infrastructure as roads have been built to transport rice from the fields to market.

f) Provision of social amenities such as schools and hospitals which have improved the people's standard of living.

g) Provision of employment to many people in farms, local mills and trading.

Problems Facing the Scheme and Possible Solutions

Stagnant water has become a breeding ground for mosquitoes and snails which transmit malaria and Bilhazia respectively.

Insecticides should be sprayed on stagnant water to reduce the breeding rate the vectors hence rate of infection.

Shortage of water due to excessive droughts and diversion of water into 'Jua Kali' rice farms.

More reservoirs should be built and farmers should pay a fee to facilitate maintenance of water distribution.

Pests and diseases e.g. case warm and leaf miner which attack crops lowering the yields and Quelea birds which feed on rice leading to a major loss of the crop.

Using clean planting seeds, burning residues after harvesting and use of explosives to scare birds.
Inadequate capital on the part of farmers since the co-operatives collapse making them unable to acquire inputs forcing them to lease out all or part of their farms. The solution is to take politics out of co-operatives so that they can be empowered to supply inputs and credit to farmers.

Shortage of labour during the planting and harvesting season which forces the farmers to hire labour from outside at a high cost.

- Improved marketing by NCPB to resume so that farmers can earn enough money to meet their expenses.

Siltation and growth of weeds in the canals which interferes with the flow of water. -
Control weeds using chemicals and farmers to avoid cultivating on the river banks.

Inadequate health centres which necessitates travelling for long distances losing many working hours.

Construction of more health centres.

Poor access roads which make transport expensive.

Government to improve the existing roads and construct new ones.

Perkerra Irrigation Scheme

Established in 1954.

Located in Marigat division in Baringo in the RV province.

Aims of Setting up the Scheme

(a) To utilize detainee labour.

(b) To develop land for agricultural production.

(c) To settle the pastoralists as farmers.

(d) To control the seasonal floods of R. Perkerra this used to affect the area.

(e) To utilise the excess water of R. Perkerra this used to go to waste.

Factors which Influenced the Establishment of the Scheme

Physical Factors

Gentle slope of the area which allows mechanisation and flow of water to the fields by gravity.

Presence of fertile loamy soil on which a variety of crops can be grown and which also reduces use of fertilizers.

Semi arid conditions of the area which necessitated the use of irrigation as the only way to make food production possible.

Extensive area of land meaning large scale cultivation of crops was possible. R. Perkerra which ensures a constant supply of water for irrigation.

Human Factors

Sparse population due to harsh climate which made it easy to establish the scheme.

Large population of detainees which required to be occupied in a productive way. Desire of colonial government to start a project to occupy political detainees.

Irrigation/Cultivation Method

-Ridges and furrows are made.

-Crops are planted on the ridges.

-Water is directed to the furrows and allowed to soak slowly. - Seed maize is planted in male and female maize lines.

-From male lines it's taken for consumption.

-That from male lines goes for processing.

Crops

They grow seed maize for Kenya Seed Company and paw paws are gradually being reintroduced.

Organisation of the Scheme

Management is under NIB which provides infrastructural facilities, accounting and extension services.

Each house hold is allocated 3-4 acres and an additional ½ acre for the homestead. Farmers are tenants but plans are underway to issue them with title deeds.

Marketing

(a) Seed maize is graded, dried and delivered for shelling.

(b) Shelled maize is delivered to Kitale for further processing.

(c) The seed is delivered to KSC which pays on delivery.

(d) Scheme management pays farmers after deducting the fees for services given.

Achievements of the Scheme

Has turned arid land into a productive land.

Source of livelihood for farmers and their dependents.

Seed maize raises revenue for the government.

Has settled previously landless people.

Has improved infrastructure and led to provision of social amenities such as schools, shops, electricity, etc.

Has created employment opportunities for local people.

Source of foreign exchange when sees maize is exported.

Problems of the Scheme and possible solutions

(a) Fluctuation of water in R. Perkerra due to droughts and obstruction causing crop stress and reducing the acreage that can be cultivated.

- Dam construction on the upstream side.

(b) Livestock human conflict when farmers go to graze in the region due to attractive vegetation. - Solving the conflict through elders.

(c) Intense ethnic conflict between Tugen and Jemps tribes because the scheme lies on the Jemps' land while Tugen are the majority.

- Government to issue farmers with title deeds.

(d) Financial problems causing the farmers to be unable to prepare the land.

- Start co-operatives to offer affordable credit facilities.

(e) Poor transport and communication which hinders production of perishable crops.

- Government to improve the existing roads and construct new ones.

(f) Limited market for products because the surrounding areas are sparsely populated.

- Transporting produce to distant markets with dense population.

Significance of Irrigation Farming in Kenya

(a) Resettlement of landless people e.g. in Mwea.

(b) It has made barren land reproductive.

(c) Enables farmers to earn an income when they sell farm produce.

(d) Provision of employment opportunities which has alleviated poverty and improved the standard of living.

(e) Creation of settlement for landless.

(f) Earning of foreign exchange by the country after exportation chillies, flowers, peas, fruits, etc.

(g) Saves some foreign exchange that would be used to import the entire amount of food needed in the country.

(h) Development of infrastructure and social amenities e.g. roads,

(i) Promoted industrial development through providing raw materials e.g. rice mills, pineapple processing, sugarcane factories, etc.

(j) Has assisted in the control of environmental hazards such as droughts and floods.

(k) Has enhanced food security in the country by encouraging growing of food crops such as maize, beans, rice, etc.

Problems Experienced in irrigation Farming in Kenya

Physical Problems

Destruction of crops when excess water goes to the fields causing flooding. Pests and diseases lead to low cotton yields.

Inadequate water as a result of catchment areas receiving unreliable rainfall meaning the land can't be fully utilised.

Growth of weeds on furrows and canals causing reduced water flow to the farms.

Silting of the canal which prevents water from flowing smoothly to the farms.

Sheet erosion resulting from overhead irrigation when practiced on hot dry regions.

Salinisation as a result of application of excess water in dry regions.

Leaching taking nutrients to the lower horizons where they can't be accessed by some plants leading to lower yields.

Human Problems

(a) Diseases such as Bilhazia and malaria transmitted by vectors living in stagnant water which weaken and even kill farmers.

(b) Payment of low prices to the farmers which kills the morale of farmers and sometimes causing them to lease out part or whole of the field.

(c) High cost of production making the farmers to sell their produce at high cost meaning the produce can't compete favourably in the world market since the buyers will prefer cheaper produce.

(d) Exhaustion of soil nutrients as a result of continuous cultivation leading to poor yields.

(e) Mismanagement of irrigation bodies leading to losses, lack of credit and low prices as each farmer tries to market his or her own crop.

(f) Farmers lack the necessary technical advice to enhance their agricultural production as there are very few extension officers.

(g) Shortage of labour during planting, weeding and harvesting giving the farmers the burden of hiring labour at high cost.

(h) Limited markets as a result of some schemes being located in sparsely populated areas e.g. Perkerra.

Land Reclamation in the Netherlands/Holland

-Most of coastal land has been reclaimed from the sea.

-Land reclaimed from the sea and enclosed by walls is called a polder.

-The work of reclaiming land was done under 2 main projects namely:

Zuider Zee Project

-Project of Zuider Zee area to the north of Holland.

-Assignment was given to a Dutch called Cornelius Lely in 1927-1932.

-Aim was to increase land for cultivation and control further flooding. Sections

1. Creation of a high dam across the highland of Wierengen and between provinces of N. Holland and Friesland.
2. Reclamation of 4 polders that would not be affected by rising tides and creation of a fresh water lake from R.Ijsel a tributary of R.Rhine converting the inland tidal sea into L. Ijsel.

Stages in the Reclamation of Land from the Sea in Netherlands o Dykes were constructed to protect the land from getting flooded during high tide. o Ring canals were constructed to carry water from the area to be reclaimed into the sea. o Pumps were installed to pump out water from the area enclosed by dykes. o Reeds were sowed to use up excess water. o Drainage pipes were laid in ditches to drain water from the water table.

o The soil was treated with chemicals to lower salinity. o
Drained land was flushed with fresh water to remove salt from the soil.

Benefits of Zuider Zee Project

a) Increased arable land by 10%.
b) Fresh water lakes created provide fresh water for domestic and industrial use.
c) Ensured better drainage for reclaimed area in the former Zuider Zee.
d) Reduced the risk of flooding.
e) Shortened road connection between the provinces of N. Holland and Friesland.

Delta Plan Project

-Intended to reclaim the S.W region of the country.

-Involved closing estuaries namely Haringvliet, Brouwersha, Venschegat, Scheldt and Veersche by means of dams.

Benefits of the Delta Plan

(a) Controlled pollution and salinisation of inland water.

(b) Improvement the soil thus increasing land for agriculture..

(c) More recreational lakes created by the newly formed lakes.

(d) Fresh water reservoirs created provides S.W region with water for irrigation, domestic and industrial use.

Comparison of Land Reclamation in Kenya and Netherlands

Similarities

-In both countries flooding was a common problem.

-Drainage ditches were used in both countries.

-Canals were used in both countries.

-The intention in both countries was to increase land for settlement and agriculture and control flooding.

Differences

-Canals, dams and dykes were used to reclaim land in Netherlands while Kenya used ditches, irrigation, clearing of bushes, etc.

-In Netherlands land was reclaimed from sea while in Kenya, it was above the sea level.

-Netherlands had two projects while Kenya had more.

-In Netherlands it was large scale while in Kenya it was in small scale.

-In Netherlands it involved use of advanced technology such as dams, dykes, pumping stations etc. while in Kenya it involved less advanced methods such as irrigation, afforestation, clearing of bushes etc.

-In Netherlands the coastal land was being reclaimed while in Kenya, land distant from the sea was reclaimed.

FISHING

-The act of catching fish and other aquatic animals.

- Fisheries are fishing grounds or areas where water resources such as fish, seals, clubs, whales, etc. are exploited.

Factors Influencing Fishing

Physical Factors **Presence of Plankton**

-Large shoals of fish are found in shallow waters of lakes and seas where there is plenty of plankton. They thrive where depth of waters less than 180 m deep because it is up to where suns rays can reach.

Nature of the Coastline

-There is more fish on coasts with sheltered inlets and estuaries because of calm water and shelter from natural enemies like predators e.g. Fiords of Norway. **Relief**

-People in some countries engage in fishing due to mountainous landscape which hinders other economic activities such as agriculture e.g. Japan, Norway and Alaska. **Climatic Conditions**

-In temperate regions there is more fish because there is cool waters which plankton requires to grow while in tropical lands there is less fish due to high temperatures resulting in warm waters which hinders plankton growth.

Convergence of Cold and Warm Ocean Currents

-There is plenty of fish in areas where warm and cold ocean currents meet because upwelling takes nutrients to the surface and improves the circulation of oxygen and cold ocean currents cool waters in tropical regions resulting in conducive conditions suitable for plankton thriving e.g. the coast of Namibia washed by the cold Benguela current.

Human Factors **Supply of Labour**

-Fishing is intensively carried out in Europe, Asia and N. America due to labour availability as its labour intensive.

Market

-Fishing is done extensively in highly populated and developed regions with a ready market because fish is a perishable commodity e.g. in Norway, Japan, China, etc. **Fish Eating Culture**

-Fishing is extensively done in areas where there is a habit of eating fish e.g. Norway and Japan. **Transport and Preservation Facilities**

-Fishing is done extensively in countries with transport and refrigeration facilities because fish is perishable and has to be transported in refrigerated lorries and ship. **Capital**

-Fishing is extensively done in developed countries because they can afford huge sums of money required for hiring labour force, buying fishing equipment and preservation facilities.

Technology

Rapid growth of fishing industry in developed countries is as a result of presence of advanced equipment like large refrigerated ships, trawl nets, fish detecting equipment, etc.

Types of Fishing

Pelagic Fishing

-Catching of fish which live close to the surface e.g. mackerel, menhaden, herring, sardines and tuna.

-Best method to catch pelagic fish is drifting and seining.

Demersal Fishing

-Catching fish that live at the bottom of deep water bodies e.g. cod, haddock, Pollock and halibut.

-Methods are trawling and long lining.

Inshore Fishing

-Fishing close to the shores in shallow sheltered coastal waters and the lower stretches of rivers.

-Fish caught are shell fish, lobsters, prawns, shrimps and crabs.

-Methods involved are casting nets, hooks and line.

Fresh Water Fishing

-Fishing done in fresh water bodies such as streams, rivers, lakes, ponds and paddy fields.

-Examples of fresh water fish are sturgeon, carp, tilapia and trout.

-Methods are line and drifting methods.

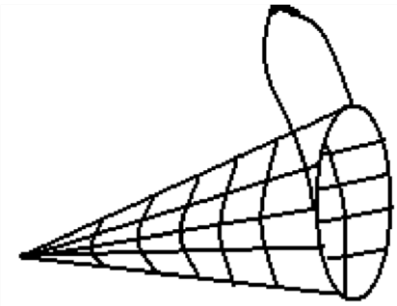
Methods of Fishing

Traditional Fishing Methods

- Commonly practised in tropical areas along the African coast and the inland fisheries.
- Fishing is mainly done for subsistence purposes.
- Simple hand- made equipments are used. - The methods are employed in small scale.

Types

Basket Method

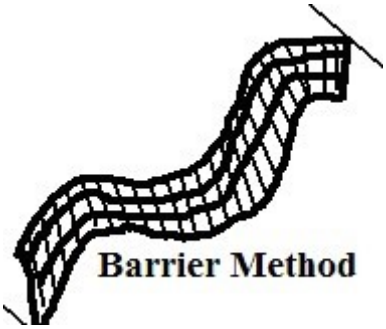


- A basket with a cone opening with bait inside is used.
- It is placed at the shallow end of the water.
- The fish are attracted by the bait.
- Fish run to hide in the basket get inside and are trapped. - The catch is relatively small.

Harpooning

- Using a sharpened arrow or stick to strike Fish.
- One fish is caught at a time.
- Dangerous in waters infested with crocodiles and hippopotamuses.

Barrier Method



-Using Barriers made of reeds or sticks to catch fish in flood waters.

-Are placed on the downstream side of a flooded region and when water levels drop the fishermen scoop the fish. ***Herbs***

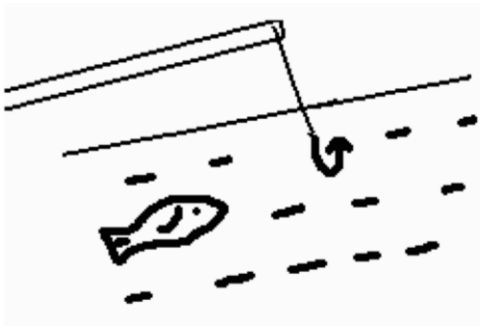
-Sprinkling crushed herbs in waters making fish to become unconscious then the fishermen collect fish from the river using hands.

Use of Lamp and Net

-Placing a lit lamp on the edge of the boat to attract fish.

-Fish swim towards the light and are caught using net.

Hook and Line



- Throwing a line with a baited hook into the water.
- The fish are attracted by the bait which they swallow together with the hook.
- The line is pooled from the water together with the fish. ***Gill Nets***

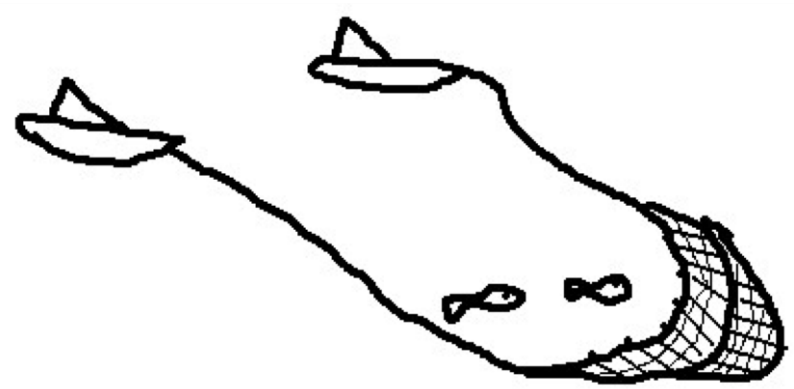
-Nets with mesh which lets only the head of a fish through and then traps it by the gills.

-They can be swerved across or round the river on the path of fish.

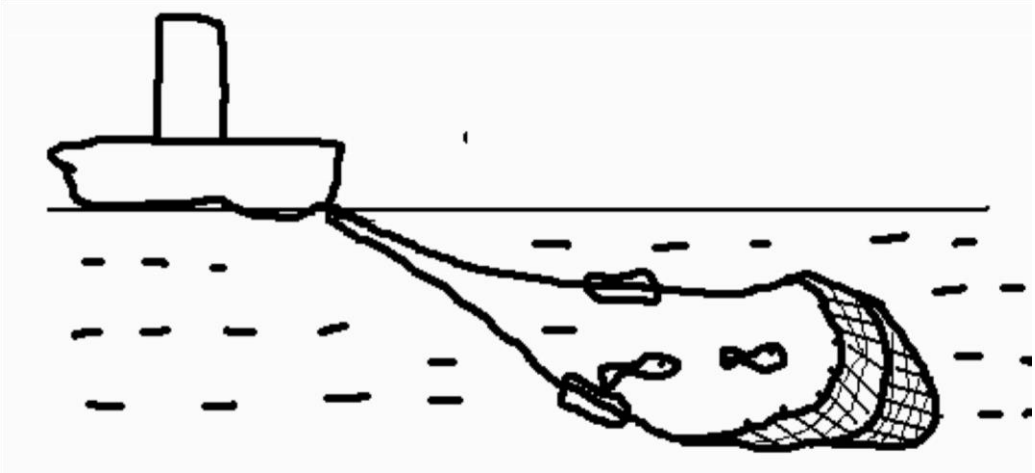
Modern Fishing Methods

Seining

- Method is used to catch pelagic and anadromous/migratory fish which swim in shoals.
- A Bag like nets with small meshes (seine) attached to two boats on each end is cast into the sea.
- It's kept open and held in position by floats on top and weights at the bottom. - Fish move towards the net and get trapped.
- The net is hauled over and fish emptied onto the ship or the net is hauled to the shore (haul seining).
- Leads to overfishing because it doesn't discriminate the ages of fish caught.



Trawling



-Mainly used to catch demersal fish.

-A bag shaped net is attached to a trawler (ship) is is cast into deep waters - The upper part is kept open by floats and lower part kept down by weights.

-The net is dragged by the trawler along the sea bed.

-The trawl net sweeps in the fish.

-The net is hauled into the trawler and the fish is emptied onboard.

-Also catches immature fish. ***Line Fishing***

-The method is used to catch demersal fish.

-Fishing boats spread out long line with several baited hooks on them.

-Floats keep the lines suspended and also show the fishermen where the lines are.

-Baited hooks catch the fish as they compete to feed.

-Hooks are drawn and fish unhooked and put in refrigerated containers.

Distribution of Major Fishing Grounds in the World

The Atlantic Fishing Grounds

N.W. Atlantic Fishing Grounds -

Located along the E. coast of N. America.

-Fishing grounds are Grand bank, Sable bank, George bank and Nova Scotia.

-Fish caught are cod, herring, mackerel, lobsters, etc.

Factors That Have Led To High Development of Fishing

(a) Large continental shelf providing an extensive area over which plankton can grow.

(b) Convergence of warm Gulf Stream current and cold Labrador Current resulting in cool temperatures favourable for the thriving of plankton and which also makes the area to be ice free most of the year.

(c) Adjacent lands have a cold climate and a rugged landscape unfavourable for agriculture making the alternative to be exploitation of fishing grounds.

(d) There is a dense population in the surrounding areas which provide a ready market for fish e.g. Massachusetts and Connecticut.

(e) There is a highly developed technology which allows fishing to go on throughout the year e.g. large and self contained ship with radar to forecast storms, wireless communication and processing and storage facilities

N.E. Atlantic Fishing Grounds

-Location in W. coast of Europe.

-Major fishing grounds are coasts of France, Germany, Denmark, Britain and Norway. - Fish caught are herring, mackerel and cod.

Factors That Have Led To High Development of Fishing

a. Numerous sea inlets which provide shelter for the spawning of fish and anchoring of fish boats e.g. fiords of Norway.

b. Ruggedness of landscape by glaciated features which is unfavourable for agriculture making fishing another economic activity.

c. Warm Atlantic Drift Current which raises the temperature making conditions to be favourable for plankton growth and making fishing possible throughout the year.

d. Large continental shelf providing an extensive area for plankton growth.

e. Land derived minerals brought by the icebergs from the land which provides plenty of food for plankton which fish eat.

f. Dense and affluent population of W. Europe which provides ready market for fish.

g. There is a highly developed technology which allows fishing to go on throughout the year

S. Atlantic Fishing Grounds

1. N.W Africa

- Located along the Coastland of Mauritania

Factors

(a) Presence of cold canary current that cools the warm ocean waters.

(b) Wide and fairly shallow continental shelf providing an extensive area for the growth of plankton.

2. S.W. Africa

- Located in and Cape Province of S. Africa.

Namibia

Factors

(a) Washed by cold Benguela current which cools the warm tropical waters hence favouring the growth of plankton**.**

3. West Coast of S. America

- Location is the coast of Peru.

Factors

(a) Presence of a continental shelf.

(b) Prevailing Peruvian current which favours plankton growth.

Pacific Fishing

N.E. Pacific Fishing Grounds

-Located along the W. Coast of N. America.

-Fishing grounds are from Alaska, British Columbia, Oregon states to California.

-The main fish caught is salmon.

Factors

(a) The coast is washed by N. Pacific current which makes water favourable for plankton growth and ice free enabling fishing to be done throughout the yea.

(b) Many inlets which form favourable shelter for breeding of fish and good sites for fish ports e.g. fiords and river estuaries.

(c) Presence of several rivers and lakes which form suitable breeding grounds for species such as salmon.

(d) Rugged mountainous landscape and dense forest cover which has made the area unconducive for agriculture and forced people to carry out fishing as an alternative economic activity e.g. British Columbia.

(e) Ready market because of sound economies of the industrialised USA and Canada enabling people to have economic power to purchase fish and capital for the development of fishing industry.

N.E. Pacific Fishing Grounds -

Located along the coast of N.E. Asia.

-The world's largest fishing ground.

-Stretches from Beijing southwards to China Sea in Japan, Malaysia and Indonesia.

-Fish caught are salmon, mackerel, cod, sardines, eels, trout etc.

Factors

(a) Broad continental shelf which favours plankton growth leading to more fish.

(b) Convergence of cold Oya Siwo and warm Kuro Siwo currents which result in cool well oxygenated and ice free waters ideal for fishing throughout the year.

(c) Numerous islands, bays and sheltered inlets which favour fish breeding and provide good fishing ports.

(d) Mountainous landscape especially in Japan which hinders development of agriculture making fish an alternative source of food and income.

(e) Large and ready market due to high population in the Asian countries.

(f) Advanced technology e.g. Japan has large modern vessels with refrigeration facilities, Processing equipment, electronic communication making fishing to be very efficient.

Fresh Water and Marine Fisheries in East Africa

Marine Fishing

-Fishing grounds found in oceans and seas.

-Carried off the coast of Kenya and Tanzania in the Indian Ocean.

-Uganda doesn't have marine fisheries because she is landlocked.

Kenya and Tanzania

-Contributes only about 10% in Kenya and 13% of the total catch in Tanzania.

-Relatively warm waters of the tropics don't favour breeding of a large number of fish. - Indian Ocean is warmer and hence has little plankton.

-Continental shelf is narrow with little fish resources.

-Warm Mozambique current and deep continental shelf discourages the flourishing of fish.

-They use simple tools.

-Fish caught include pelagic fish such as tuna, kingfish, mullet, bonito and sardines.

-Fishing is done in small scale for both subsistence and commercial purposes.

-In Kenya small boats and a few of them motorised without refrigerators are used while in Tanzania, fishermen use small rarely motorised dhows which are guided by trade winds which travel into deep sea.

-In Tanzania most of the coastal communities take part in fishing industry particularly in the islands of Mafia, Pemba and Zanzibar and along the coast around Tanga, Mtwara, and DaresSalaam.

-Dense coastal population provides a ready market for fish.

-Fish is more popular than beef in Pemba and Zanzibar.

Problems Facing Marine Fishing

a) Inadequate market due to low purchasing power of the surrounding community, Poor transport network to the interior of the country and availability of agricultural products in some coastal areas which reduces the rate of fish consumption.

(f) Inadequate capital which causes fishermen unable to afford expensive equipment used in deep sea fishing which restricts them to fish near the shore hence the low catch.

a) Stiff competition from industrialised countries mainly Japan and Korea which have modern fishing equipment and are able to tap fish in the deep sea.

b) Lack of refrigeration facilities to enable them transport fish to distant markets.

c) Unpopularity of fishing as an economic due to fish prices being high which discourages people from eating it regularly.

d) Strong sea tides which are a great menace to local fishermen who use small boats which are not motorised which forces them to go fishing when the sea is calm making them to catch only a limited stock.

Fresh Water Fisheries

-Found in inland in lakes, rivers and ponds. **Kenya**

-Lakes are the main suppliers of fish and their resources are more exploited than those of the Indian Ocean because they are calm than seas enabling fishermen to reach deep areas where there is a large catch.

The fresh water lakes containing fish are Lakes Victoria, Naivasha, Baringo, Jipe, Chala, Balisa and Shakababo in lower Tana and Kanyaboli and Sare in Yala Delta.

-The only alkaline lake containing fish is L. Turkana,

-Most fishermen use simple equipment but around L. Victoria trawlers are used.

-Many fishermen don't belong to a co-operative hence they sell their catch to the middlemen at minimal prices.

-The middlemen with refrigerated lorries transport the fish to urban centres where they make a huge profit while the rest of the fish is smoked, salted or sun dried and transported to local markets.

-L. Victoria forms the main centre for inland fishing contributing the largest fresh water catch.

-The main species of fish is tilapia and others are herring, Nile perch and omena.

Factors Which Have Favoured Fishing in L.Victoria

2. Shallow waters which allow plankton to thrive in abundance.
3. Several beaches and highlands within the lake which provide good landing sites for fish boats e.g. Asembo and Mbita.
4. Large and ready market within major towns because of dense population e.g. Kampala, Kisumu and Mwanza.
5. Presence of a variety of species which are of economic value.
6. Presence of fish eating culture as it is a traditional diet of the people around. 7. Fishermen have formed co-operatives which help them in marketing of fish.

Problems Facing Inland Fishing

1. Overexploitation due to accessibility of L. Victoria. Tilapia from L. Turkana is cheap and thus in high demand.
2. Indiscriminate fishing leading to catching even immature fish.
3. Boundary conflict over L. Victoria especially with Uganda e.g. recently over Migingo 4. Water hyacinth in L. Victoria.
5. Lack of capital leading to lack of modern fishing equipment which restricts the catch per day.
6. In L. Victoria Nile perch preys on the other fish such as tilapia lowering their stock.

7. Communities neighbouring L. Turkana such as Turkana, El Molo, and Rendile are pastoralists and sparsely populated so they can't provide reliable market for fish.

8. The damming of river Omo in Ethiopia has reduced the amount of water flowing into L. Turkana drying of Ferguson bay which is the main fishing area.

Fish Farming in Kenya

-Rearing of fish in ponds where the farmer provides an environment conducive for the survival of fish.

-Fish farms are mainly found in Nyanza, Western, Central, Coast and parts of Rift Valley.

-Fish ponds are built in areas with heavy clay or loamy soils which are usually impervious.

-The ponds must be located near a river to ensure a steady supply of water to ensure the water remains fresh providing natural environment for fish.

-After establishing a pod the farmer gets fingerings from hatcheries set up at Sagana, Kabaru, Kibos, and Aruba and put them in the pond.

-The main types of fish kept are tilapias which are more popular because they breed fast, are resistant to diseases and can survive in different environments, trout suited to cool areas such as the slopes of Mt. Kenya and mudfish.

-Fish are fed regularly on grass, vegetables, grains, compost manure and remains of processed fish.

-Some plants are grown in the pod to provide oxygen.

Fishing in Tanzania

-More intensive than in Kenya and Uganda.

-Inland fishing grounds include lakes Victoria, Tanganyika and Rukwa which form substantial fishing grounds, Lakes Rukwa and Malawi and rivers Mara, Malagasi, Ruvu, Pangani, Ruaha, Rufiji, Kagera and Wami.

L.Victoria

-About 49% of L.Victoria is in Tanzania.

-There are many fishermen who use modern techniques and equipment.

-Fishing boats are large and carry large stocks of fish which enables fishermen to travel deep into the lake where there is more fish.

The neighbourhood of the lake is densely populated with large towns as Bukoba, Mwanza and Musoma which provide a ready market and processing facilities for the fish.

-Lack of well developed transport limits the marketing of fish to the interior towns.

-L.Tanganyika deep and is the richest in the region in fish.

-Fishing has been an old tradition of the people living around the lake.

-The main type of fish caught is dagaa usually caught at night when attracted by light using special nets with small meshes.

-The factory at Kigoma preserves and processes fish for sale to other parts of the country while some of the fish is smoked or dried and exported to Zambia.

-Fishing is concentrated along the shore because rough storms discourage fishermen from going far into the lake.

-Sparse population around the lake doest offer a ready market for fish but the large surplus is transported by rail to other parts of the country.

-Rukwa's biggest problem is fluctuation of water levels which affect survival of fish.

-A section of L. Malawi is in Tanzania enabling Tanzanian fishermen to catch a lot of fish which is dried and sold in the southern districts of Mbeya and Songea.

Fishing in Uganda

-Inland fishing grounds include lakes Victoria, Kyoga, Albert, George, Edward, Katwe and in rivers Nile, Kagera, Kafu, Semliki and Katonga.

-Fishing industry has been interrupted by a long civil strive in the country reducing it to a subsistence economy.

-L.Victoria is the main fishing ground.

-46 % is in Uganda.

-Many fishermen own motorised boats enabling them to travel deep into the lake and catch a lot of fish.

-Numerous highlands provide anchoring and resting places for fishermen.

-The fishermen sell their fish to co-operatives which organise processing and marketing.

-The dense population around such as in major towns of Entebbe, Kampala and Njinja provide a ready market for fish.

-Fish is also dried and sold in other parts of Uganda.

-Fish is popular as a diet of majority of Ugandans.

-There are fish processing factories in Njinja where fish is filleted.

Significance of the Fishing Industry in Kenya

(a) A source of income to fishermen and traders when they sell their catch to co-operatives and customers at a profit.

(b) A source of employment such as for those employed to catch fish, in fishing related industries such as making and repairing of boats and officers and clerks of co-operatives.

(c) It is a tourist attraction as it is a sporting activity done for enjoyment which is a source of foreign exchange and revenue to the government.

(d) A source of protein and food because it's a major dish to some communities such as around L.Victoria and along the coastal strip.

(e) Has led to development of industries such as those depending on fish as a raw material e.g. fertilizer plants, for making cod liver oil, etc.

(f) A source of medicine whereby cod liver oil is used in alleviation of chest problems a **(g)** Fish oil is used directly or indirectly as a source of cooking fat.

(h) For biological control of mosquitoes by introducing it in water so as to feed on mosquito larvae thereby reducing mosquitoes and hence incidents of malaria transmission.

(i) Has led to development of transport system by e.g. an all weather road from Kitale to Kalokol has made it easier for the fish from L.Turkana to get to the market.

Problems Facing Fishing Industry in Kenya and Their Possible Solutions

(a) Overfishing resulting from use of small meshed nets and unlicensed fishermen resulting in extinction of such species.

-Restrictions should be made on the type of net that should be used.

-Licensing a selected number of fishermen and limiting their catch per day.

-Fish farming to ease pressure on natural fishing grounds.

(b) Pollution of water bodies by oil spillage and seepage of industrial and agricultural chemicals into water which kills marine organisms and prohibits introduction of fish into such waters.

- Agricultural activities should be prohibited close to fishing grounds.

Legislation should be put in place to check disposal of wastes from industries.

(c) Transport problem as key fisheries being far from centres of population which causes many places to rarely receive fresh fish e.g. L.Turkana.

- Roads should be tarmacked for efficient transportation of fish.

(d) Lack of adequate market due to many communities having not developed fish eating culture, availability of agricultural products such as beef and pork, many fishing grounds being found in sparsely populated areas, many fishing grounds being found far away from potential markets and inability by many people to afford fish due to being expensive due to transport costs being passed on to consumers.

-Roads to the potential markets should be improved.

-People should be educated on the importance of fish in the diet so as to develop fish eating culture,

(e) Inadequate capital making fishermen unable to afford fishing equipment with speed and greater capacity making them unable to venture into deep waters where there is more fish and modern preservation facilities limiting their catch per day.

- Fishermen should form co-operatives so as to get financial assistance.

(f) Location of marine waters within tropical latitudes where there is warm water limiting the growth of plankton.

(g) Narrow continental shelf hence less fish.

- Modern fishing methods and equipment can enable fishermen to go into deep waters where there is abundant fish.

(h) Fluctuation of volume of water in rivers and lakes due to seasonal variation of rainfall and prolonged droughts which causes fish death or migration e.g. Turkana after damming of R. Omo in Ethiopia.

- Conserving water catchment areas to ensure regular supply of water.

(i) Growth of weeds e.g. water hyacinth in L.Victoria which prohibits movement of vessels thereby lowering the catch.

- Mechanical or biological removal of weeds.

(j) Human activities near fishing grounds which cause soil erosion which causes siltation which lowers the depth of water affecting fish breeding.

- Discouraging agricultural activities near fishing grounds and planting of cover crops around fishing grounds to reduce siltation.

(k) Boundary conflict between Kenya and Uganda over Migingo.

- Survey the boundaries to establish the rightful owner of the island.

FISHING IN JAPAN

- The leading fishing nation producing 1/6 of the world's fish output.

Factors Making It to Be the Leading Nation

Physical Factors

1. Rugged mountainous landscape which doesn't offer favourable conditions for agriculture making fishing to be an alternative economic activity.
2. Extensive shallow continental shelf that hosts a lot of fish.
3. Convergence of warm Kuroshiwo and cold Oyashiwo currents providing a suitable habitat for plankton on which fish feed.
4. Natural indented coasts that provide good breeding ground as well as excellent natural fishing ports e.g. Yokohama and Nagasaki.

Human Factors

5. High technology such as large ships with refrigeration and processing facilities which carry large stocks and enable fishermen to carry out fishing in deep seas and over long periods and equipment to detect where there are abundant fish.
6. Large market for fish due to fish being a popular meal, population being large and with a high purchasing power.
7. Fish farming is carried out in the fresh waters and dams which are intensively managed allowing maximum returns.
8. Fish marketing is done through co-operatives which advance loans to fishermen to improve and expand their fishing.

Problems Facing Fishing in Japan

1. High pollution of Japanese waters by industrial effluent sand oil spillage which has interfered with aquatic life.
2. Overfishing along coastal waters as a result of increase in the fishing fleet which has resulted into depletion of some fish species.
3. Restriction of Japanese fleet from other nations territories e.g. to the west where they are kept away by the Korean government.

Comparison between Fishing in Kenya and Japan

Similarities

-Both countries carry out inland and marine fishing activities.

-There is overexploitation of fish resources in both countries.

-There is fish farming in both countries to supplement natural fisheries.

-Both countries experience the problem of pollution whereby in Kenya it's by industrial effluents and agricultural chemicals and in Japan by industries dumping mercury into the sea.

-Modern methods of preserving and processing fish such as refrigerated vessels and fish filleting are used in both countries.

-Fish is consumed locally and exported in both countries.

-In both countries fishermen have organised themselves into co-operatives.

-In both countries fishing faces the problem of restriction e.g. in japan by Korean Government while in Kenya they are restricted from Ugandan and Tanzanian waters.

Differences

-In Kenya fishing is mostly concentrated in inland waters while in japan fishing is mostly concentrated in the N.W. Pacific fishing grounds.

-In Kenya fishing is carried a few kilometres off the shore but in japan it is done in deep seas even far beyond their territorial waters.

-Less fish is found in Kenya due to warm waters and narrow continental shelf while in japan there plenty of fish in marine waters due to broad continental shelf and convergence of warm and cold current.

-In Kenya there is low demand for fish than in Japan.

-In japan the fish species caught are cod, Mackerel, Alaska Pollack while in Kenya it is Tilapia, Nile Perch Dagaa and black bass.

-In Japan marketing of fish is done mainly by co-operatives while in Kenya it's mainly done by individual fishermen although there are few co-operatives.

-Marine fishing in Kenya faces competition from other countries such as Japan and Korea while in japan it doesn't.

-Japan has more advanced technology than Kenya that ensures heavy catch while Kenya has limited technology leading to low catch.

Management and Conservation of Fisheries

-Management of fisheries refers to effective planning and control of fish resources and their habitats while conservation of fisheries is careful use and protection of fish resources from overexploitation by people.

Management Measures

(a) Establishment of research stations to come up with fish species which can do well in various conditions and know fish predators and separate them from fish.

(b) Educating people on the importance of fishing grounds and fish resources such as by advising farmers not to cultivate near fishing grounds to prevent siltation and industrialists to treat wastes before disposing them.

(c) Government inspecting inland water resources to ensure people don't interfere with regular flow of water through activities such as damming which lead to fluctuation of water which affects migratory fish and which may also cause their death

Conservation Measures

WHATSAPP 0770112040

THIS IS A PROPERTY OF LEC RAKDAFHA

FOR CONNECTIONS TEXT 0770112040


ALLIANCE BOY'S SEC. & HIGH SCHOOL
Lec Rakdafha
0742783642
BOARDNG
STRIVE
FOR
EXCELLENCE

SUCCESS