

## TRANSPORT AND COMMUNICATION IN THE WORLD

Transport is the movement of goods and passengers from one place to another finishing the process of production by enabling goods to reach the final consumer so as to provide utility.

Communication is the movement of information or transfer of information from one place to another using radios, TVs, Newspapers, internet due to improved science and technology.

### WATER TRANSPORT

Water transport is by use of water bodies like lakes, rivers, seas, oceans, canals using transport vessels like boats, ships, ferries, canoes. Water transport is cheap for transporting bulky, heavy goods for long distances like between continents like transportation exports, minerals, agricultural products, timber, machinery, tourists, oil and its products.

#### Types of water transport

- Inland water transport: is by use of inland water ways like lakes, rivers in the interior.
- Marine transport is by use of seas, oceans, water transport. Is mainly developed in MDCs like in Europe, North Africa, temperate region, parts of Asia, Scandinavian countries and less developed in LDCs like African, Austria, S. Africa, in the tropics, equatorial regions because physical and human problems.

#### Problems facing water transport in LDCs.

The problems are physical and human and include the following;

- Poor science and technology to develop ports making transport vessels and improving water ways.
- Limited capital to develop ports to purchase transport vessels because of low income.
- Shallow and narrow water bodies to accommodate big ships carrying exports, imports like the oil tankers.
- Presence of rapids and waterfalls causing accidents e.g. on R. Nile, Niger, Congo.
- Floating vegetation like water hyacinth, papyrus disrupting navigation like R. Congo, Nile, L. Kyoga.
- Presence of physical obstacles like potholes, gorges, rock out crop, river meanders e.g. on R. Congo, Niger.
- Limited government support in form of loans and poor policies like increased taxation on fuel making water transport expensive.
- Occurrence of accidents caused by strong waves, waterfalls, rapids, poor weather, over loading, scaring passengers and investors.

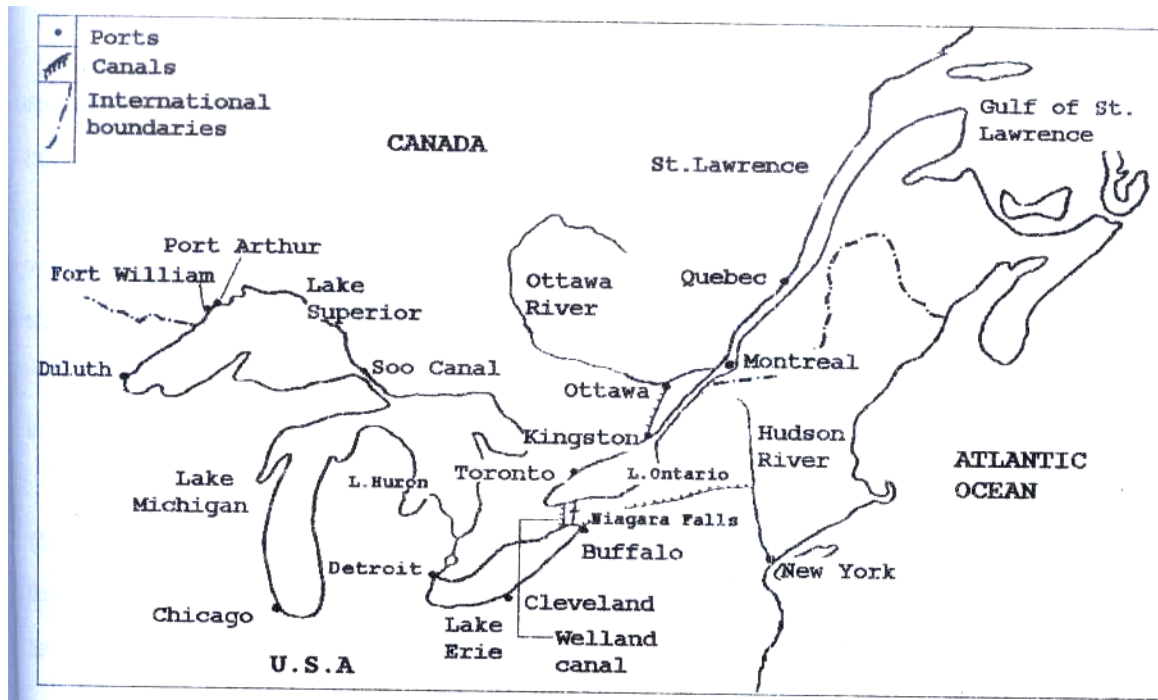
- Political instabilities and insecurity scaring investors and workers, coast of Somalia with sea pirates.
- Presence of wild animals like snakes, hippos, crocodiles causing accommodation and scaring passengers.
- Competition with other means of transport like using air, roads and railway lines because the water transport is slow and economical.
- Climatic changes causing fluctuation in water levels like seasonal rivers in dry areas.
- Presence of sand bars, lagoons, deltas, floating islands affecting development of ports and navigation like R. Nile in Egypt.
- Poorly developed ports with poor handling facilities affecting loading, offloading and causing inconveniences and delays.
- Poor international relations affecting joint investments like E. African community, COMESA, PTA.
- Low population densities in areas with water bodies affecting development and marketing like in the Congo basin, Amazon basin.
- Limited resources leading to limited economic activities like in the Sahel, Kalahari region and middle East countries.
- High costs of maintenance and rehabilitation like constant dredging like removing silts, sediments, deposits like on R. Nile.
- Presence of river meanders and high speed in the youthful stage causing accidents and affecting navigation.
- Presence of hostile tribes scaring investors and passengers like pygmies in DRC.

### **ST. LAWRENCE SEAWAY**

It is found around the great lakes like L. Huron, Erie, Michigan, Superior, Ontario. It is used by USA and Canada. The idea of construction was started by Canada and USA, first resisted it because of fearing to lose custom duties and having railway lines. Construction started in 1964 and ended in 1969.

Before the construction they were using Erie canal which connected to New York port.

**Sketch map of St. Lawrence Seaway.**



### **Problems faced before the construction of St. Lawrence Seaway.**

Navigation on the great lakes was affected by physical and human problems.

- Rapids and falls around Niagara, St. Marie, Uloquis which hindered navigation.
- Freezing during winter season because of temperate climate leading to increased expenses of using other routes, presence of physical obstacles, rocks potholes gorges between L. Ontario and Montreal port.
- Presence of shallow and narrow parts hindering the movement of big ships.
- Floating islands and vegetation navigation.
- Increased expenses for loading and offloading in areas with obstacles.
- Floods which caused siltation sedimentation and deposition leading to increased costs of constant dredging.
- Presence of mist and fog accidents because of poor visibility.
- Poorly developed ports with a lot of luggage and many passengers and causing inconveniences and delays.
- Increased expenses for using other routes (transport means) like using trains, Vancouver port.
- Fluctuating water levels affecting navigation.
- Presence of river meanders with sharp bends causing accidents and hindering the movement of big ships.
- Construction of dams.

### **Solutions / steps / measures**

- Construction of locks and gates and dams at Naigara, St. Marie regulating the flow of water.
- Blustering or removing of rocks between L. Ontario and Montreal using explosives.
- Constant dredging by removing silt, sediments, deposits through regular maintenance and rehabilitation.
- Widening the narrow parts and deepening the shallow areas to accommodate big ships.
- Using boats and ships with head lamps for proper visibility during winter season and in areas with mist and fog.
- Using ice breakers like ships and boats with warm conditions and melting ice.
- Removing floating islands and vegetation for proper navigation.
- Gazetting areas around St. Lawrence Seaway and Great lakes for transport.
- By limiting human activities which cause siltation.
- Development of alternative transport routes like roads, railway lines using other routes like Vancouver port reducing congestion.
- Developing modern ports with good handling facilities for easy loading and offloading like using cranes and lifts.
- Improvement in transport and infrastructure like around the Great lakes through construction of roads, railway lines, pipelines, ports for easy connection and supplement.

### **Importance / effects of St. Lawrence Seaway.**

- Improvement in transport and communication through navigation by constructing roads, railway lines, modern ports, canals around the Great lakes.
- Provision of employment opportunities like in the transport sector, industries and tourism in the areas of Chicago, Detroit, Toronto and trading activities.
- Provision of water for domestic, industrial purposes and for dumping wastes and sewage line in the towns of Duluth, Chicago, Butallo, Detroit, Cleveland.
- Source of government revenue by taxing people, companies, getting custom duties helping to improve the national income.
- Production of HEP like at Naigara falls, St. Marie, Iloquis dam used for domestic and industrial purposes.
- Development of trade both internal and external by connecting different towns like Chicago, Detroit, Toronto and different countries like USA and Canada.
- Economic diversification by influencing other activities like tourism, industrialization, trade, transport reducing on the dependence burden.

- Promotion of international relations and regional corporations like between USA and Canada leading to international trade.
- Growth of urban centres because of population increase, industrial activities leading to improvement in social services and development of trade.
- Development of tourism industries because of land forms like Naigara falls, industrial activities and high incomes leading to entertainment activities.
- Source of foreign exchange by paying custom duties at ports like Chicago, Montreal through export trade helping in importation and investments.
- Promotion of education and research because of landforms like Naigara falls, industrial activities, plants and animal species leading to better skills and technology.
- Improvement in social services like water, power supply, health facilities leading to increased standards of living around the Great lakes conurbation.
- Environmental protection through climate modification providing habitats for plants and animals.
- Alternative land use by suing the Great lakes like lakes Superior, Michigan, Ontario for navigation.
- Promotion of fishing activities in the Great lakes.

#### *Disadvantages*

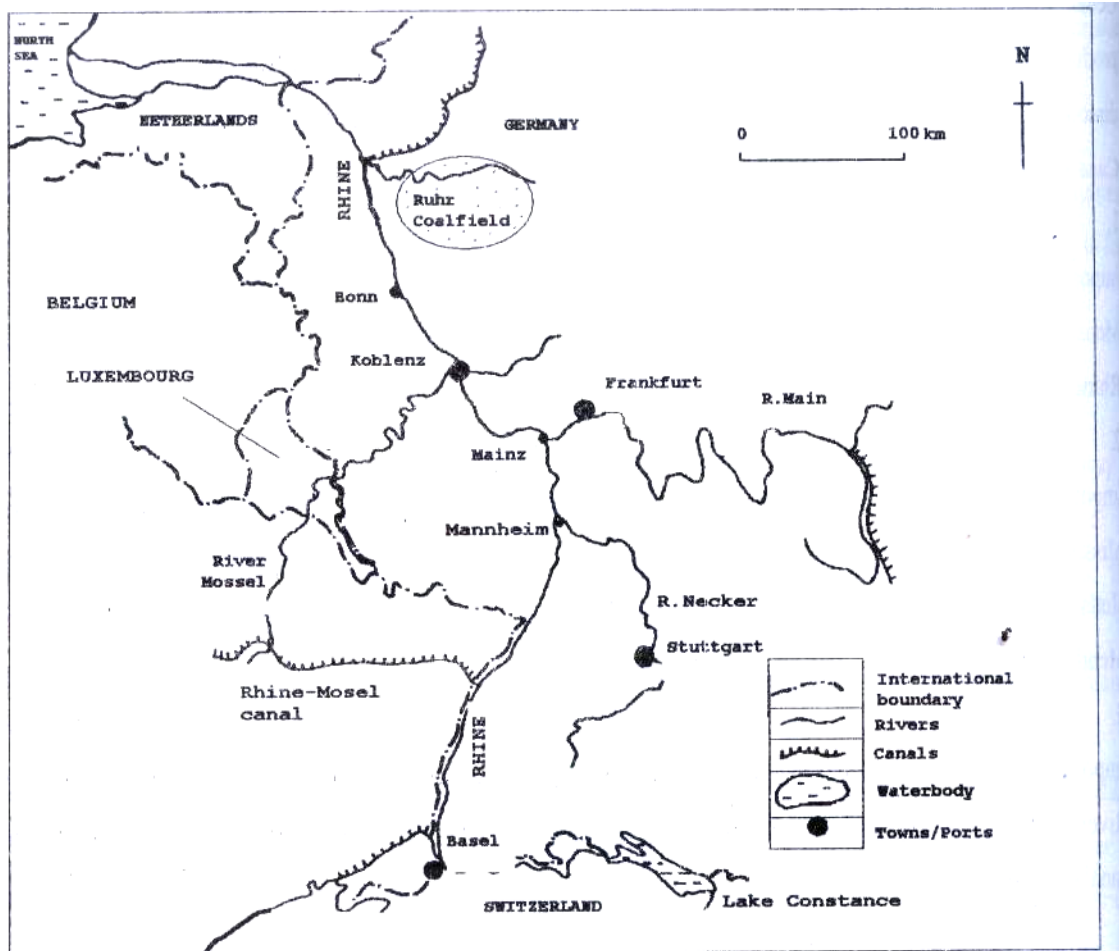
- Increased costs of maintenance in rehabilitation like constant dredging by removing silt, sediments, deposits.
- Displacement of people and activities by occupying big areas and being gazetted for transport.
- Promotion of accidents destroying people and property because of mist and fog causing poor visibility, strong waves, obstacles.
- Diversion of labour and capital into the transport sector affecting other economic activities.
- Pollution of air, water and land because of industrial wastes transport vessels, dense population affecting plants and animals.
- Competition with other means of transport making them uneconomic like road transport, air because water transport is cheap.
- Environmental degradation because of deforestation, swamp reclamation, destruction of the landscape because of construction work like St. Lawrence Seaway, Quebec, Toronto, Chicago, Detroit.
- Urban problems because of population increase like development of slums in Chicago, congestion, high crime rate, unemployment.

- Congestion at ports because of heavy traffic passengers causing inconveniences and delays.
- Regional imbalance causing economic problems like the Great lakes conurbation.
- Soil erosion, landslides and mass wasting because of steep banks and shores.
- Freezing during winter season causing delays and increasing on transport expenses.

### **RIVER RHINE WATERWAY**

It is most important inland water way in Europe. It starts from Basel port in Switzerland ends at Rotterdam and Amsterdam at the North sea. The countries using it are known as the Rhinelands which include Germany, Switzerland, Netherlands, Belgium, Luxemburg. The countries use R. Rhine and its tributaries like Ruhr, Wupper, Lippe, Main, Emscher and it has canals like Lippe canal, Dortmund canal, EMS canal and it has ports like Basel, Duisburg, Rotterdam, Amsterdam. It is described as a gateway because it opens Europe to other countries and an artery because of its economic importance.

### A sketch map of River Rhine waterway.



### Conditions / factors for the development of R. Rhine waterway.

There are physical and human factors.

- Limited waterfalls and rapids making it navigable from its source to its mouth including its distributaries.
- Deep and wide accommodating big ships like the oil tankers, ships handling exports, imports.
- Limited obstacles like gorges, sand banks, floating vegetation, islands leading to easy navigation.
- Constant water volume because of glaciations in the temperate climate and having many tributaries which add water like Ruhr, Wupper.
- It is ice free less affected by snow making it navigable throughout the year from its source to its mouth including its distributaries.
- The construction of canals like Dortmund, Lippe adds on luggage, passengers and connection to different parts of Europe.

- Strategic location in Europe serving the most industrialized in productive countries and near the north sea, Rotterdam port, Amsterdam port.
- Presence of modern ports with good handling facility like cranes, lifts, containers for the easy loading and offloading in a short time reducing on delays, inconveniences and congestion.
- Deep and natural harbours covering a big area well sheltered from strong waves accommodating big ships like Rotterdam with 17km.
- Presence of rich and productive hinterland with a lot of resources economic activities leading too many exports, imports, passenger like fish and timber from Scandinavian countries, like minerals from France (iron ore industries in Germany).
- Good international relations and regional corporation by European union member countries helping in marketing, maintenance e.g. Germany, Holland, Swiss.
- Positive and supportive government policies like gazetting areas where it passes providing capital for its development.
- High population density in Europe leading to many passengers exports, imports like Germany, Switzerland, Netherlands.
- Political stability and security leading to a favourable investment climate and diverting resources to economic activities like the transport sector, social services and infrastructure.

#### **Effects / contributions of R. Rhine waterway.**

- Provision of employment opportunities in the transport sector in industries, trading activities, in the Ruhr conurbation at Rotterdam port leading to increased standards of living.
- Source of water for domestic and industrial purposes, irrigation for dumping wastes and sewage.
- Improvement in transport and communication through Navigation like Switzerland which is land locked the construction of roads, canals, modern ports in the surrounding areas.
- Growth of urban centres around ports and industrial areas because of population increase helping in promoting trade and improving social services for example Basel, Rotterdam, Amsterdam, Duisburg.
- Source of government revenue by taxing people, companies, custom duties at ports like Rotterdam improving national income and leading to accumulation for other development projects.
- Development of tourism industry like Switzerland around Rotterdam because of land forms, industrial activities and increased income leading to entertainment activities.
- Promotion of international relations and regional corporation leading to international trade and political stability for European countries.

- Resource exploitation leading to economic growth and development in tourism in Switzerland, lumbering and fishing around the North sea.
- Development of industries like ship building and repairing, iron and steel in the Ruhr conurbation, oil refining at Rotterdam.
- Economic diversification by influencing other countries like trans, trade and reducing on dependency burden.
- Alternative land use by using R. Rhine and its tributaries for providing cheap transport.
- Environmental protection by providing habitats for plants and animals and through climate modification through sea and land breeze.
- Fishing for commercial and subsistence purposes in R. Rhine and around the North sea.
- It has led to production of H.E.P because of waterfalls, rapids leading to construction of dams in its upper parts e.g. in Switzerland.
- Promotion of education and research because of landforms, wildlife, construction work, industrial activities leading to better skills and technology.

***Positive effects / disadvantages or problems***

- Increased costs of maintenance like constant dredging, building walls and embankments to control flooding.
- Competition with other means of transport like road, air, water transport because water transport is cheap.
- Pollution of air, water and land because of heavy traffic, population increase, industrial activities discouraging activities like fishing.
- Congestion of ports like Rotterdam, Amsterdam, Basel because of heavy traffic, many passengers, luggage causing inconveniences and delays.
- Diversion of labour and capital into the transport sector discouraging other activities like agriculture.
- Regional imbalance causing economic problems like the Ruhr conurbation around Rotterdam, Basel, Dortmund port.
- Promotion of accidents destroying people and property because of mist and fog causing poor visibility, strong waves, presence of obstacles.
- Promotion of soil erosion, landslides, mass wasting because of floods and steep banks in its upper parts like Switzerland.
- Displacement of people and activities by occupying big areas which are gazetted around Rotterdam port, Duisburg, Basel, Dortmund.
- Environmental degradation because of construction work like at Rotterdam port, building walls and embankments destroying plants and animals.

- Urban problems because of population increase and industrial activities like slums, increased cost of living, in towns like Duisburg, Rotterdam, Amsterdam.
- Freezing during winter season leading to high costs of using ice breakers and alternative routes.
- Over exploitation of resources causing exhaustion like coal in Germany forest and fish from Scandinavian countries.
- Flooding causing submergency along R. Rhine and its tributaries.

## **PROBLEMS**

- The waters of R. Rhine and its banks have been heavily polluted by the running vessels and industries with exhaust fumes and industrial wastes respectively.
- With increasing of vessels and ships on the waterway, there is serious congestion especially at shipping terminals like Rotterdam, Duisburg, Essen and Basel. This is also determined by the size of the Cargo handled at every station.
- The Rhine water experiences stiff competition from other means of transport like roads, railways, canals like the Lippesite canal, the Dortmund, Elms canal and oil pipeline that run from Rotterdam to Basel through sharing incomes and limiting expansion and development.
- The Rhine water has shallow positions with average depth of a meter in the Rhine rift valley and sharp bends along the Rhine gorge thus restricting the movement of large ocean going vessels to the final terminals of Basel.
- The use of different sized vessels at different positions due to different in depth and water volumes call for drainage of goods and delays in delivery cargo.
- The Rhine waterway experiences frequent floods especially the Rhine rift valley and coastal delta region in Netherlands which make navigation loose the right course leading to accidents and destruction of property and lives.
- There are frequent accidents along the waterway by vessels and ships colliding capsizing, hitting rocks, banks and poor visibility leading to destruction of human lives and property.
- The Rhine waterway experiences season fluctuation in water levels with a drastic fall in winter and rise in summer affecting systematic flow of cargo consequently leading to a decline in output and incomes.
- The Rhine waterway is constantly silted by heavy run-off from the Rhine gorge, black forest saadt mountains leading to shallow waters hence a decline in cargo carriage.
- Parts of R. Rhine waterway freeze during the winter periods especially at Basel affecting the inflow and out of goods and services from the interior to Europe to the Rhine terminals of Rotterdam, Amsterdam and Hegues for export. This has consequently affected incomes and lowers people's standards of living.

- The Rhine waterway like Rotterdam and Amsterdam face stiff competition from sister and rival ports like Antwerp, Brest and Bordeaux in France leading to the drop in Cargo and incomes consequently.
- Some parts of the Rhine waterway are covered by rock shoals like the borders of Germany and Netherlands and the edges of the Rhine rift valley near Wuppertal and Cologne causing damages to the sailing vessels and destruction of property and human lives.
- At times the conflict like the Germany conflict, France etc influence poor relations among the user countries thus calling for diversion of the route courses to alternative parts calling for a decline in cargo carried and profit margins.
- The Rhine waterway has experienced inconsistent funding by user countries for repair and maintenance leading to neglect and decline in capacity usage.
- Along the Rhine waterway there are numerous waterfalls and rapids which require construction of locks, sluice gates and canals like at the Rhine gorge making it expensive for the user countries.

## **SOLUTIONS**

- The narrow and bottleneck positions of the Rhine waterway have been enlarged and widened to allow large ocean going vessels to access the extreme terminals of Cologne and Basel.
- The shallow points have been deepened to create considerable water depth for large and highly commercialized vessels for increased cargo output.
- The government of the Rhineland have constantly dredged and distilled the Rhine river channel for maintaining constant water depth for continuous navigation.
- Along the Rhine waterway embankments have been constructed to control floods and maintain water channels.
- Rock shoals and islands with water channels have been blasted in order to widen and deepen water passages for convenient navigation and cargo carriage.
- Channels have been constructed like the Lippe canal, the Dortmund-Elbe canal and the Dortmund canal for supplement cargo carriage on the congested waters of the Rhine, Lippe, Ruhr and Wuppertal as major feeder tributaries to the main channel.
- Modern ports like Rotterdam, Amsterdam, Basel, Duisburg with modern port handling facilities like containers, cranes, railway bridges have been constructed and development to facilitate increased cargo output and reduce congestion.
- Modern technology like containerization, polarization, electrified and increased powered vessels and ships has been developed in order to ease and solve the problem of congestion.

- The user countries especially Netherlands, Germany, Switzerland, France, Austria, Czech and Russia have maintained good international relations for consistent exportation and importation of goods and services through the waterway.
- The user countries have faithfully and equally had joint funding to meet costs of standardization assisting in maintenance for continuous exports and imports.
- Transport patterns like Netherlands, Germany and Switzerland have constructed roads, railways, pipelines, canals in order to reduce pressure on the waterway for easy and convenient handling of imports and exports.
- The sharp bends along the Rhine gorge have been straightened allowing large ocean going vessels sail through easily and conveniently.
- Ice breakers and ice smelters have been introduced near Basel to remove ice and allow perennial navigation and continuous inflow and outflow of cargo.
- Industrialisation wastes have been recycled in order to reduce on the rates of pollution and minimize environmental decline.
- Aforestation, creation of bush woods and planting cover croppers has been adopted in order to reduce on the increasing rates of erosion and siltation of waterways.
- Periodical discharge of cargo mainly on inland ports to reduce congestion of cargo e.g. Duisburgm Dusseldorf, Wuppertal and Basel.
- Industries have been constructed and developed along the waterway for easy and convenient handling of imports and exports.

## **RAILWAY TRANSPORT**

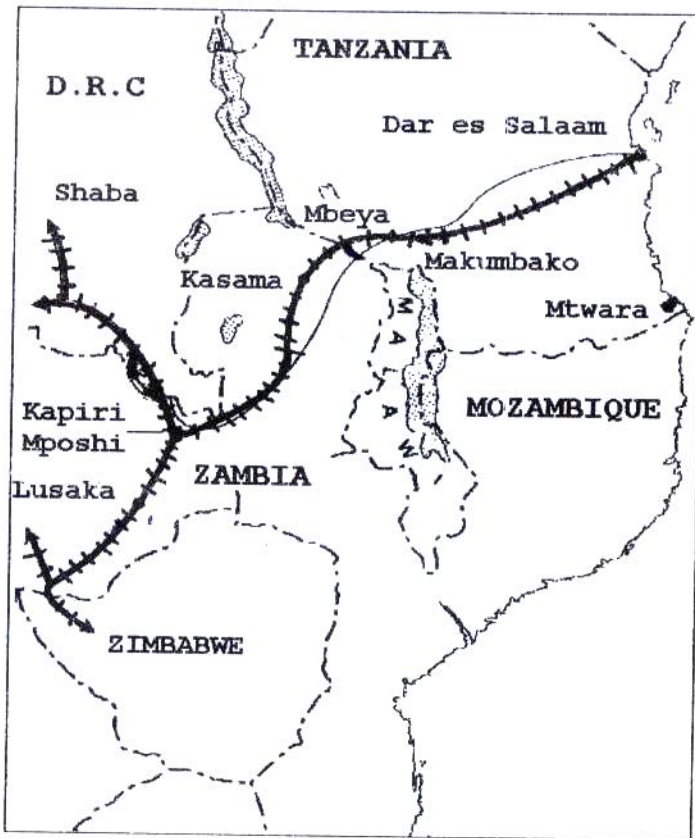
This is by use of trains on railway lines. It is mostly used in developed countries like USA, Switzerland and less common in LDCs because of physical and human problems.

It is good for transporting bulky and heavy goods like exports and imports, composed of timber, minerals, industrial products, oil, for long distance. However it is affected by climate and weather. Inconveniences because of following timetable, short distances and only stopping at stations.

## **TANZAM RAILWAY LINE**

It is found in Zambia and southern Tanzania. It was constructed by the Chinese in 1975. TD solve transport problems for Zambia which is land locked and for Southern Tanzania which had a lot of resources and it is remote and backward. It starts at Dar-el-Salaam port and ends at Kapiriposhi in Zambia. It has 147 stations, 310 bridges, 21 tunnels. It is used by countries like Zambia, Tanzania, DRC, Mozambique, Zimbabwe. The countries were using southern routes but they were affected by political problems e.g. South Africa, Angola, Namibia, Mozambique.

**A sketch map of Tanzam Railway line.**



### IMPORTANCES OF THE RAILWAY LINE

- Improvement on transport and reducing on transport costs for southern Tanzania and for Zambia.
- Provision of employment opportunities in the transport sector, industries, trading activities around stations like Dar-el-Salaam, Lusaka, Mbeya.
- Promotion of international relations and regional corporation between countries like Zambia, Mozambique, DRC leading to international trade and political stability.
- Exploitation of resources contributing to economic growth and development e.g. copper and cobalt mining in Zambia, Tin and lead and southern Tanzania and tourism and lumbering in S. Tanzania plus agriculture like growing tea and sugarcane in S. Tanzania.
- Source of government revenue by taxing people, companies like custom duties paid at Dar-el-salaam port leading to increased incomes and capital accumulation for development of other economic activities.
- Growth of urban centres at railway stations because of population increase, industrial activities, promoting trade and improving social services e.g. Mbeya, Lusaka, Faraka, Dar-el-salaam, Kasama, Kabwe.

- Development of tourism industries because of volcanic land forms in S. Tanzania, development of many urban centres and because of high incomes leading to entertainment activities.
- Economic diversification by influencing other activities like trade and communication, tourism, transport and communication, mining, Agriculture, industrialization.
- Development of industries e.g. ship building and repairing, oil refining, copper and cobalt smelting, tea processing, sugar refining.
- Promotion of education and research around railway stations because of land forms in S. Tanzania, copper mining in Zambia leading to better skills and technology.
- Promotion of agriculture like tea growing around Mbeya, sugarcane growing around Kilombero.

#### *Positive effects*

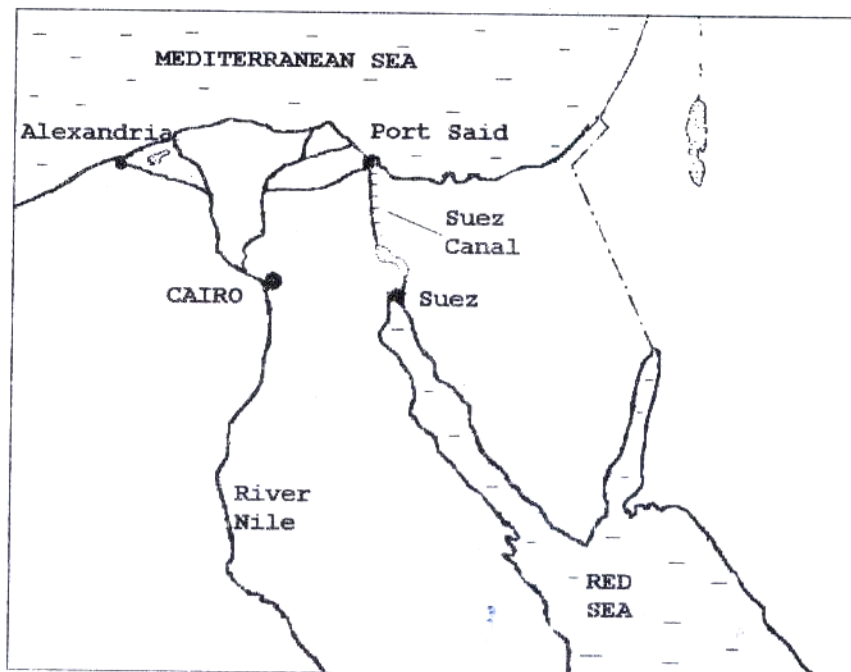
- Pollution because of heavy traffic, population increase affecting air, water and land e.g. around stations like Kabwe, Lusaka, Dar-el-Salaam.
- Promotion of accidents causing destruction of people and property in highlands with rugged and steep slopes, landslides, mass wasting because of fog and leading to poor visibility.
- Competition with other means of transport like air, road transport making them uneconomically because railway transport is cheap.
- Diversion of labour and capital into the transport sector, trading activities around stations like Lusaka, Mbeya affecting people's economic activities.
- Displacement of people and activities by occupying big areas, gazetted around railway stations, railway lines discouraging forestry and agriculture.
- Environmental degradation by constructing railway line stations causing deforestation, swamp reclamation and destruction of landscape like Zambia copper belt, S. Tanzania.
- Increased costs of maintenance and development causing diversion of labour and capital affecting other economic activities.
- Urban problems because of rural urban migration around railway stations like Mbeya, Kapingoshi like development of slums, lack of labour force in the area.
- Regional imbalance like Zambia copper belt, Dar-el-salaam port causing economic problems.
- Over exploitation of resources causing exhaustion like copper and cobalt from Zambia, Tin, lead and timber from S. Tanzania.
- Landslides, mass wasting like Rock fall, Rock slump and soil erosion (gulley) leading to soil exhaustion.

- Profit repatriation by the Chinese who constructed it and maintained it for some time causing capital outflow and lowering the national income.
- Economic dependence for Zambia because of loans during its construction and because of specializing on railway transport.
- Congestion at Dar-el-salaam port because of having many passengers, imports causing inconveniences and delays.

### **SUEZ CANAL IN EGYPT**

Suez Canal connects the Mediterranean Sea and Red sea covering a distance of 160km. It was constructed in 1969 by a French company. It has a width of 62km depth of 10m it accommodates 20,000 ships, 80,000 tonnes in a year and it is used by European countries, Middle East countries for handling exports and imports.

### **A sketch map of Suez Canal**



### **Importance of Suez Canal**

- Promotion of trade by exports, imports, passengers for Africa, Middle East and Europe.

- Promotion of transport and reducing on transport costs for Europe, Middle East and Africa.
- Source of government revenue by taxing people and companies like custom duties and at ports like port Said, Alexandria.
- Growth of urban centres because of population increase and industries activities like port Said and port Alexandria.
- Development of tourism industry like in Sinai peninsular, Persian gulf, construction work and because of increased income like Mt. Olive.
- Resource exploitation like mining of oil, iron ore around the Red sea, Persian gulf (Sinai peninsula)
- Employment opportunities like in the transport sector, industrial activities, trade, mining activities leading to increased standards of living.
- Land reclamation by promoting irrigation in the dry area and controlling floods, pests and diseases attracting people for settlement and agriculture.
- Source of water for domestic, industrial purposes, irrigation and for dumping wastes and sewage e.g. ports Sayyid.
- Education and research because of land forms, construction work leading to better skills and technology.
- Environmental protection by providing habitats for plant species and animal species through climate modification in the surrounding areas.
- International relations and regional corporation between Europe, Africa and Asia.
- Economic diversification influencing other economic activities like trade, mining reducing on the dependency burden
- Development of industries e.g. ship building, oil refining.

#### *Negative effects*

- Conflicts and tension like S. C crisis between France and Britain promoting scramble of Africa.
- Urban problems like slums, increased cost of living and around port Sayyid, Alxandras.
- Promotion of accidents destroying people and property due to strong waves.
- Profit repatriation by the French company causing capital outflow.
- Environmental degradation because of the construction work of ports canals.
- Pollution because of heavy traffic, many people, industries.
- Increased costs of maintenance and rehabilitation affecting other activities.
- Regional imbalance like port Sayyid, Alexandria, Persian Gulf causing economic problems.
- Over exploitation of resources like oil, iron ore in the Sinai peninsula.

- Congestion at port Sayyid, Alexandria because of heavy traffic, many passengers causing inconveniences and delays.
- Displacement of people and activities by gazetting areas discouraging settlement and agriculture.

## **ROAD TRANSPORT**

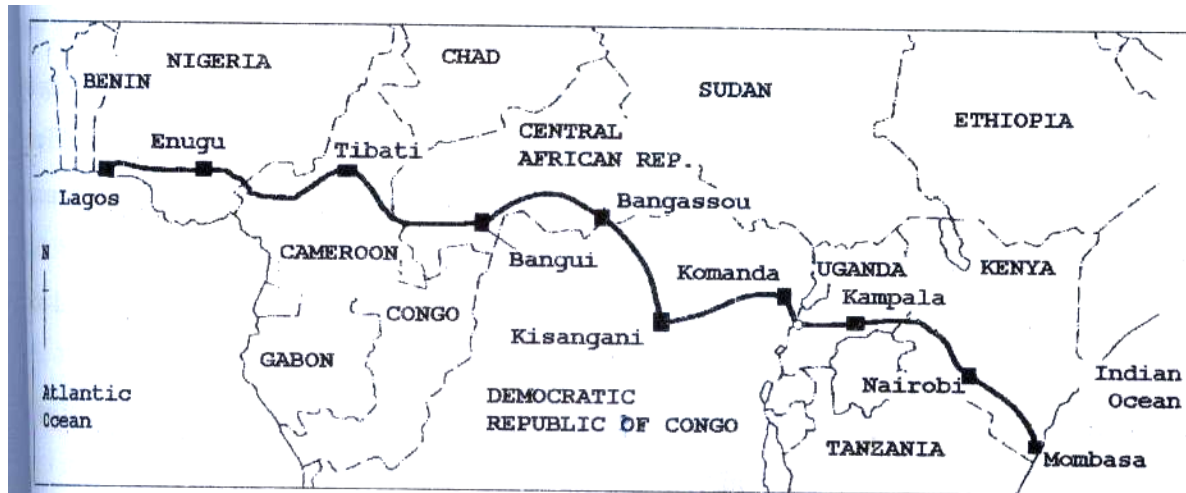
### **TRANS-AFRICAN HIGHWAY**

It starts from Mombasa and it ends at Lagos connecting E. African countries, central African countries and W. African countries with a distance of 6,500km. The idea for construction started in 1971 by OAU countries at a cost of 300m dollars with assistance from World Bank, European Union, OAU member countries. It covers over countries like Kenya, Uganda DRC, Central African Republic, Cameroon, Nigeria.

#### **Aims and objectives**

- To provide an alternative route for landlocked countries like Uganda suing the Indian ocean.
- To encourage interstate trade among countries where it passes e.g. Kenya, Nigeria.
- To help in exploitation of resources in the Congo basin e.g. minerals, forests tourism and fishing potentials.
- To promote international relations and regional corporation between E. Africa, West Africa and central African countries.
- To provide employment opportunities and improve people's standards of living.
- Diversity transport and communication reducing on dependence burden.
- Promote economic activities for employment and investment opportunities.
- To develop urban centres for trade, social services.

**A sketch map of the trans-African highway.**



## Problems

Trans-African highway is not yet successful, some areas in DRC, central African Republic, Gabon are not complete because it is affected by physical and human problems.

- Political instability and insecurity because of rebel activities in DRC scaring investors and workers.
- Presence of rugged and steep slopes in highlands and mountains increasing on expenses for construction.
- Equatorial forests in the DRC, Gabon, C.A.R delaying construction work.
- Wet equatorial climate affecting construction and increasing on expenses.
- Poor drainage around R. Congo and its tributaries like R. Kasai, Ubanju, Luluaba, Ehora and swampy areas.
- Poor international relations and regional corporation between Frank Forne countries and Anglo Forne countries.
- Poor science and technology leading to limited skilled labour leading to increased costs of using expatriates.
- Presence of wild animals in DRC, Gabon, CAR, animals like lions.
- Low population leading to shortage of labour and limited economic activities.
- Limited capital by OAU member countries to finance the construction.
- Presence of hostile tribes like the Pygmies scaring investors and workers
- Weakness of OAU in implementing its aims and objectives with a lot of conferences, meetings.
- Sabotage by developed countries and multinational companies like British Airways, Air France.

- Competition with other transport systems like Air, Water, railway transport and countries using Indian ocean like E. Africa countries and W. Africa countries using Atlantic ocean.

## **DEVELOPMENT OF PORTS**

### **ROTTERDAM PORT IN NETHERLANDS / PORTS**

A port is an area at the coast handling imports, exports, passengers connecting the interior the coast and other countries.

Rotterdam port is found in Netherlands. Holland at the North sea and mouth of R. Rhine. It is called Euro port because it's used in month it is used by European countries in the Rhine lands like Germany, Netherlands, Belgium, Luxemburg. It is called an eater port because of handling many ports and it serves the most productive industrialized and developed areas of Western Europe. It was constructed by Holland with assistance from other European union. Member countries.

**A sketch map of Rotterdam port.**

### **Factors for the location, growth and development of Rotterdam**

- Hard basement rocks composed of granite, quartz helping in the construction of buildings, transport and routes.
- Presence of natural harbours well sheltered from strong waves because of headlands, islands, bays, gulf.
- Presence of deep waters accommodating big ships carrying exports, imports like the oil tankers.
- Flat and gentle slopes helping in construction, transport and drainage.
- Strategic location near the North sea and mouth of R. Rhine making it good for navigation for the Rhineland countries.
- Rich and productive hinterland with a lot of exports and imports like minerals, fish, timber.
- Extensive land for its expansion around R. Rhine and the North sea.
- Climate like frost free conditions making it operational throughout the year.

- Limited physical obstacles like rocks, swampy vegetation, relief features making it easy approachable for navigation.
- Low tidal range leading to weak waves reducing on accidents and easy landing of ships.
- Improved transport like construction of roads, canals, railways, airports reducing on congestion and leading to easy connection and bringing a lot of exports and imports.
- Good international relations and corporation by European countries helping in marketing, construction and maintenance.
- Large capital base produced by Rhineland countries for investment in the port.
- Improved science and technology helping in its maintenance, improving infrastructure, economic activities and social services.
- Positive and supportive government policies like gazetting areas, providing capital and helping in marketing.
- Improved social services like power and water supply, health facilities attracting people for settlement and economic activities.
- Increased population density and insecurity in Europe leading to favourable investment climate and diverting resources to economic activities, infrastructure.
- Presence of economic activities like ship building, oil mining attracting dense population.
- Presence of entrepreneurs and big companies like shipping lines, clearing agents, providing capital and good management.
- Mining, fishing, forestry due to presence of natural resources leading to many economic activities.

### **Importance of Rotterdam port.**

#### *Positive*

- Employment opportunities leading to increased standards of living like traders in industries, transport sector.
- Promotion of trade both internal and external around Rotterdam with countries like Germany, Switzerland.
- International relations and regional corporation leading to international trade for Rhineland countries.
- Source of revenue like custom duties, taxes, improving the national income and capital accumulation.
- Development of industries like oil refining, ship building and repairing because of easy transportation of raw materials.
- Promotion of education and research because of land forms, industries, economic activities.

- Development of tourism industry because of land forms, industries and increased incomes leading to entertainment activities.
- Economic diversification by influencing other activities like resource exploitation like minerals, forests, fishing potentials.
- Provision of areas for settlement and accommodation, offices because of buildings, improvement in infrastructure like the construction of roads, railway, canals, airports.
- Improvement in social services since it is a few like water supply, power supply leading to increased standards of living.
- Source of foreign exchange because of custom duties, export trade, tourism helping in importation and investment.

#### *Negative*

- Pollution because of heavy traffic, population increase, industrial activities leading to destruction of plants, animals and the ozone layer.
- Congestion because of many exports, imports, passengers causing inconveniences and delays.
- Accidents because of obstacles, strong waves, mist and fog like during winter season leading to destruction of people and property.
- Increased costs of maintenance and rehabilitation removing silts, sediments, deposits.
- Urban problems like increased cost of living, congestion, development of slums.
- Temperate climate with winter and snow affecting labour and transport.
- Unemployment and under employment especially the unskilled labour, immigrants.
- Environmental degradation because of constructing buildings, transport routes destroying plants and animals.
- Poor social services because of dense population leading to low standards of living.
- Displacement of people and activities by occupying big areas.
- Floods causing siltation, sedimentation and deposition, siltation and sub-mergency.
- Poor urban planning because of many people with limited resources and facilities.
- Over exploitation of resources causing exhaustion e.g. minerals.

#### **Problems facing transport in LDCs.**

- Competition with other transport means like water, railway limiting on the effective use of roads.
- Presence of thick forests making the construction of roads very difficult.
- Presence of rugged relief especially steep slopes making the construction of transport routes like roads very difficult and costly.
- Limited capital for the development of better roads thus making transport on roads very difficult and costly or to develop transport routes and facilities.

- Limited government support in form of loans and poor road policies like high taxes on fuel making it expensive.
- High costs of maintenance and rehabilitation hence causing potholes and delays on roads.
- Corruption and embezzlement hence most of the roads are stolen hence delays in construction of better roads.
- Low level of technology used leading to construction of poor infrastructure that is weak hence leading to easy development of potholes.
- Countries are too big to be effectively served by road and railway network.
- Most LDCs experience an equatorial type of climate with heavy rainfall washing away vital sections and railway lines and making roads too muddy to be used/
- The presence of waterfalls and rapids along river courses and their tributaries thus making river transport difficult.
- Transshipment is costly due to costs incurred in loading and offloading from railway to water and vice versa.
- Problems resulting from transshipment such as delays and damage to the goods.
- Dependence on other countries for import and export of goods e.g. goods from Eastern Congo are largely imported and exported through Uganda and Kenya.
- Poor planning of transport services.
- Political instability caused by civil wars.

### **Solutions**

- Since large areas are covered by impenetrable rain forests, air transport for both domestic and international connections is being developed.
- Government policy to be linked to other countries of Africa like through the Trans-African highway.
- Containerization of the ports and harbours for effective handling of goods and reduce delays.
- Building of railway lines e.g. from Maunda to Matadi to avoid expenses of transshipment.
- Development of other ports e.g. at Banana to establish a straight link between Shab and Zaire port.
- Restoration of political stability through peace talks and other means.
- Encouraging acquisition of loans from banks to encourage the development and construction of better roads.

Qns:

*Examine the steps which have been taken to improve inland water transport on either on R. Rhine in Western Europe or R. St. Lawrence seaway in North Africa.*

*Compare and contrast Mombasa and New York port.*

*Explain the contribution of railway transport to the development of either Switzerland or Zambia.*

*Examine the factors which have favoured the development of either Rotterdam or Cape Town as an international port.*

*With reference to any one country in tropical Africa examine the problems faced by transport sector.*

*What are the solutions to the above problems.*

## **URBANISATION IN THE WORLD**

Urbanization is a process whereby large proportion of the country's population live in countries and towns. It is the growth of towns and ports characterized by population density, improved infrastructure, improved social services, presence of many economic activities having different functions and gazetted by the government e.g. Paris, New York, Nairobi, Switzerland.

There are different categories of towns depending on size, functions, infrastructure, social services, economic activities.

**Trading centre:** this is found in rural areas with small population and having retail traders e.g. Kilombe.

**Urban area or municipality:** This has organized management like a town council, town board, wholesalers, division headquarters e.g. Kampala, Mbarara, nakawa Tc, Bombo Tc, Kawempe, Kiira.

**Town:** This has headquarters of districts with improved infrastructure, social services like ports, regional headquarters, regional hospitals, higher institutions of learning e.g. Gulu, Mbarara, Kampala, Mbale, Jinja, Entebbe, New York city, Mombasa, Nairobi, Dar-el-salaam.

**Capital city:** This one has headquarters of the government like president's office, parliament, embassies e.g. Kampala, Washington DC, Abuja, Dodoma, Rome.

**Conurbation or Mega Polis:** This is formed by merging or amalgamating two or more neighbouring cities and towns forming a large city with increased population, many economic activities, improved infrastructure, social services e.g. Rand conurbation in S. Africa, Ruhr conurbation in German, Great Lakes conurbation in USA, Eastern sea board of USA, China (Eastern part) Japan (island of Pokaido).

**Sphere on influence of a town:** These are areas served by a town in terms of social services, infrastructure, marketing, commodities, purchasing goods (hinterland), Agglomeration e.g. Kampala (Uganda), Mombasa (Uganda, Kenya, Rwanda, DRC, BR-hinterlands) NYC (USA and Canada).

Qn:

*Urbanization is an unavoidable aspect. Discuss with reference to specific examples.*

*Examine the effects of urbanization or conurbation on the environment.*

### **Importance of urbanization**

- Provision of employment opportunities like in government offices, private companies, business enterprises leading to increased standards of living.
- Improvement in social services like health facilities, water and power supply, education institutions leading to increased standards of living.
- Development of trade both internal and external because of marketing centres, shopping centres having importers, exporters.
- Source of government revenue by taxing people and companies improving the national income and leading to capital accumulation.
- Improvement in transport and communication like the construction of roads, railway lines, modern ports, telephone services attracting people for settlement and economic activities.
- Development of tourism industries because of entertainment centres like hotels, beaches because of increased incomes.
- Development of industries because of cheap labour and market provided by increased population.
- Promotion of education and research by visiting economic activities, settlement patterns, traffic flow leading to better skills and technology.
- Provision of areas for settlement and accommodation like for government offices, NGOs, private companies (UN) in NYC EAC (Arusha).
- Promotion of national unity and regional corporation because of meeting different people, cultures making the world a global village.
- Exploitation of resources for economic growth and development by providing market, capital for mining, fishing and agriculture.
- Political stability and security because of army, police attracting people and investors for settlement.
- Alternative land use because of limited resources and land discouraging other activities.
- Economic diversification by influencing other activities like trade, transport, tourism.

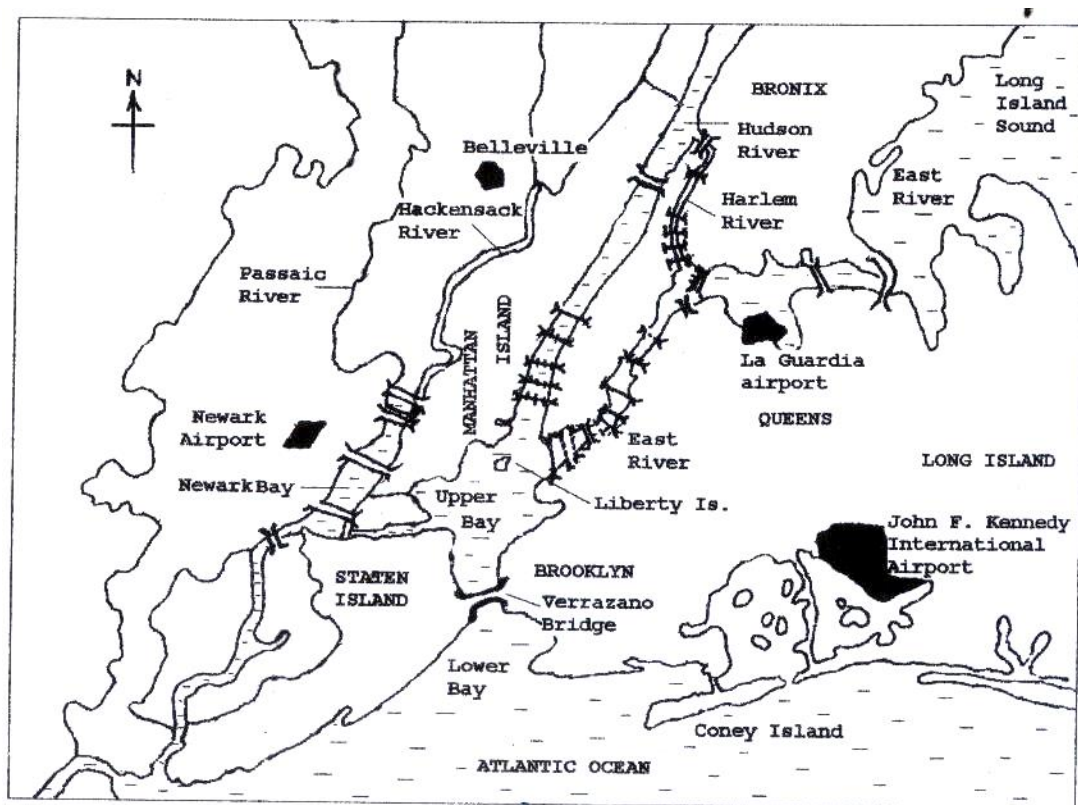
### *Negative*

- Easy spread of diseases and government policies because of easy interaction, communication.
- Pollution of air, water and land because of urban and industrial wastes destroying plants and animals and the ozone layer.
- Increased social problems and increased crime rate like prostitution, drug addiction, robbery.
- Rural urban migration causing urban and rural problems like slums in towns, lack of labour force in rural areas.
- Congestion in terms of traffic and housing causing inconveniences and delays.
- Unemployment and under employment leading to low standards of living especially the unskilled labour,, illiterate.
- Poor infrastructure, roads, drainage channels like in slum areas.
- Increased cost of living because of paying for basic needs leading to poverty.
- Poor urban management of limited resources like garbage collection.
- Promotion of conflicts and tensions like strikes, demonstrations.
- Over exploitation of resources like timber, fish causing exhaustion.
- Displacement of people and activities like areas for agriculture.
- Environmental degradation because of construction work (destroying wetlands, forests)
- Poor social services.
- Regional imbalance.
- Change of cultures.
- Development of slums.
- Increased cost of maintenance.

### **NEW YORK CITY IN NORTH AFRICA**

It is the largest city in the world found in USA, North America, it is serving as a port, a town and an industrial area. It is situated on Manhattan island and other surrounding islands like Staten, Brooklyn, Long, Richmond, Bronx, Queen's on the coast of Atlantic ocean. Eastern side of USA near Hudson river. It has a high population, many economic activities, improved infrastructure, social services and it is gazzeted as a city e.g. Boston, Providence, Philadelphia, Baltimore, Washington DC, Jacksonville, Orlando neighbouring countries.

### **A sketch map of New York City.**



### Factors for the growth and development of NYC

- Strategic location near Atlantic ocean making it good for navigation as a port.
- Presence of hard basement rocks composed of granite quartz leading to easy construction of storage buildings and transport routes.
- Flat and gentle slopes helping in construction, transport and drainage.
- Low tidal range because of weak waves reducing on accidents and making it good for navigation.
- Presence of natural harbours well sheltered from strong waves by headland and having deep waters for big ships.
- Approachable shore line because of limited obstacles like coastal features, swampy vegetation leading to easy anchoring of ships.
- Rich and productive hinterland because of having many exports, imports like wheat from Canada, industrial products from the Great lakes.
- Presence of power supply by using oil, natural gas for domestic and industrial purposes attracting many people for settlement and economic activities.
- Increased population density of over 10 million people providing enough labour, market for economic activities like industries.
- Political stability and security attracting many people for settlement, economic activities by using the pentagon in their defence i.e FBI, CIA.

- Improved social services like water and power supply, health facilities for increased standards of living like Columbia university.
- Improved science and technology leading to availability of skilled labour like engineers, technicians helping in constructing buildings, maintenance, rehabilitation.
- Presence of economic activities like trade, tourism, industrialization, transport attracting dense population for investment and employment.
- Improved transport and communication like the construction of roads, railway lines, canals, water ways, airports like Kennedy, New Ark, using internet services for communication purposes.
- Presence of international bodies e.g. UN, government offices, embassies attracting many people for employment and investment.
- Presence of entertainment centres, historical sites, cultural centres, museums for leisure and creation.
- Good international relations and regional corporation with Germany, Britain, Japan, Canada leading to development of trade.
- Positive and supportive government policies like gazetting areas for expansion, social services, maintaining security, infrastructure.
- Adequate capital provided by the government and private investors for financing developmental activities.
- Frost free conditions making it operational throughout the year as a portion attracting a dense settlement.
- Presence of water bodies providing water for domestic purposes like Hudson river, Atlantic ocean and also for dumping wastes and sewage.
- Nature of people being hardworking, investing, good planners, enterprisers helping in exploiting resources, developing economic activities, social services and infrastructure.
- Historical factors like early settlers from Europe, S. Africa, India who came to experience and skills like the Red Indians, Jews, Negroes.

#### **Problems facing New York City**

- Congestion in terms of traffic and housing causing inconveniences, delays, stress, pressure.
- Pollution of air, water and land because of wastes from industries and homesteads.
- Development of slums with poor living conditions occupied by unemployed people, immigrants.
- Increased crime rates and social problems like prostitution, drug addiction because of unemployed people like immigrants, pick picketers.

- Easy spread of diseases which are contagious because of population like cough, influenza, TB.
- Unemployment and under employment because of population leading to poor standards of living.
- Limited land for expansion on Manhattan island making land expensive.
- Racial discrimination like the Negroes, immigrants causing conflicts and tension.
- Increased cost of living because of paying on basic needs like food, shelter, health facilities causing poverty.
- Encroachment of gazetted areas for settlement, industrial expansion and for constructing transport routes.
- Environmental degradation because of deforestation, swamp reclamation, destruction of the landscape because of construction work.
- Poor urban planning and increased costs of urban management because of population with limited facilities.
- Poor infrastructure like drainage systems causing floods especially in summer.
- Increased government expenditure on social services and urban infrastructure like cost and maintenance, rehabilitation.

#### **Solutions / measures / policies**

- Vertical expansion by building storage houses by minimizing space like World trade centre.
- Modernization of transport and communication by constructing underground tunnels, highways, fly overs, traffic lights and using public transport like buses and trains.
- Restrictions on the number of immigrants by not giving visas and putting strict conditions.
- Population control using modern methods of family planning and setting population policies e.g. Age and times of marriage, number of children.
- Separating industrial areas from residential areas and shifting some of the urban services helping to decongest the city.
- Change on the constitution reducing on discrimination, conflicts and tension.
- Training skilled labour by promoting sciences leading to job creators.
- Giving loans to finance small income generating projects.
- Improvement in political stability and security like using the pentagon mostly of defence, FBI, CIA.
- Economic diversification leading to many economic activities reducing on dependence burden.
- International relations and regional corporation leading to export and import trade and foreign investment (coca cola, shell)

- Improvement in science and technology helping companies, maintenance, rehabilitation of the urban infrastructure and social services.
- Environmental protection through proper waste management for gazetted national parks, game reserves, planting grass, flowers.
- Improvement of infrastructure and social services like water supply, drainage systems, health facilities leading to increased standards of living.

## **GROWTH AND DEVELOPMENT OF CONURBATIONS**

A conurbation is formed by merging or amalgamating of two or more neighbouring cities or towns forming a large town or city covering a big area with many economic activities gazetted by the government with improved infrastructure and social services.

Examples of conurbation:

**Ruhr** – this is found in Germany in Europe around R. Rhine and its tributaries like R. Lippe, Ruhr, Wupper. It is formed by towns like Duisburg, Duisdorf, Essen, Cologne, Dortmund, Bonn, Wessel, Leverkusen, Wuppertal.

**Great lakes** – this is found in USA and Canada in North America around the Great Lakes e.g. L. Huron, L. Superior, L. Michigan, Erie, Ontario. Formed by towns like Chicago, Duluth, Buffalo, Quebec, Montreal, Detroit, Ottawa, Toronto, Pittsburgh.

**Rand** – this is found in the middle of S. America formed by towns like Johannesburg, Pretoria, Germiston, Springs, Uitenhage, Kimberley, Krugersdorp, Vereeniging around R. Limpopo in the mining areas of gold and diamond.

**Eastern seaboard of USA** at the coast of Atlantic ocean and it formed by towns like New York City, Washington DC, Philadelphia, Boston, Baltimore.

**Eastern seaboard of China** at the coast of Pacific ocean formed by towns like Beijing (Peking), Shanghai, Tianjin.

**Hokkaido region and Japan at the Island of Hokkaido** formed by towns like Tokyo, Yokohama, Kawasaki, Hitachi also found at the coast of Pacific ocean.

**Factors for the growth and development of conurbations.**

**Case study Rand conurbation in S. Africa.**

- Presence of natural resources like Gold at Witwatersrand, diamond at Kimberly attracting many people for employment and investments.
- Extensive land gazetted for the construction of urban areas or urban development e.g. Pretoria, Johannesburg.
- Flat and gentle slopes forming an undulating landscape leading to easy transport, construction and drainage.
- Presence of water supply from R. Limpopo used for domestic, industrial purposes and for dumping wastes and sewage.
- Limited obstacles like relief, drainage features, landforms making construction easy and cheap.
- Strategic location around the mining areas near transport routes like roads, railway lines leading to easy connection with the coastal towns.
- Ice and forest free conditions attracting many people for settlement and cool temperatures leading to limited pests and diseases.
- Presence of hard rocks composed of granite quartz, giving a hard basement for the construction of buildings, transport routes.
- Presence of power supply used for domestic purposes, industrial development, mining activities and providing social services like using coal, natural gas and HEP.
- Positive and supportive government policies like gazetting areas using Pretoria as the capital city attracting investors.
- Political stability and security attracting investors, people for settlement, employment because of good governance.
- Improved transport and communication like the construction of roads, railway lines, telephone services leading to easy movement of goods, passengers and easy interaction.
- History, culture and traditions making it good for tourism and because of mineral revolution.
- Improved social services leading to increased standards of living like water and power supply.
- Presence of capital provided by the government private investors, used for economic activities, infrastructure, social services.
- Improved science and technology leading to availability of skilled labour for developing economic activities improving infrastructure and social services.
- Nature of the population being enterprising, innovative, hardworking leading to economic growth and development.
- Rich and productive hinterland with a lot of resources like minerals, forests, fish with many exports, imports, passengers.

### **Problems faced around the Rand conurbation**

- There are problems because of population increase and because of its physical expansion and the problems are physical and human.
- Congestion in terms of traffic and housing causing inconveniences and delays like in Johannesburg, Pretoria.
- Development of slums with poor living conditions like Soweto in Johannesburg.
- Pollution of air, water and land because of wastes from industries, urban settlements causing destruction of plants, animals and the Ozone layer.
- Increased crime rate and social problems like prostitution, drug addiction, robbery.
- Unemployment and under employment leading to low standard of living especially uneducated people and unskilled labour.
- Increased cost of living because of paying for basic needs like food, accommodation, health facilities causing poverty
- Easy spread of diseases which are contagious because of poor sanitation and facilities.
- Increased government expenditure on the provision of social services and developing infrastructure.
- Limited land for expansion making land expensive.
- Encroachment of gazetted greens like national parks, game reserves, forest resources.
- Poor urban planning because of limited resources causing conflicts and tensions.
- Political instabilities and insecurity, strikes, demonstrations because of unemployed people being idle, limited facilities.
- Racial discrimination because of mixing different tribes and cultures i.e. the blacks, whites, Indians.
- Environmental degradation because of deforestation, swamp reclamation, destruction of the landscape causing destruction of plants and animals.
- Over exploitation of resources causing exhaustion of forests, minerals.

### **GROWTH AND DEVELOPMENT OF PORTS**

A port is an area at the coast used for handling exports, imports, passengers connecting the coast to the interior and other countries.

Mombasa a port is found at the coast of E. Africa, Indian Ocean. It is gazetted as an industrial area, port and town. It is situated on Kilindi harbour covering areas Bamburi, port and ferry, Fort Jesus, Mombasa central areas.

It serves countries like / Hinterland like counties, Uganda, Kenya, Northern Tanzania, Rwanda, Burundi, Eastern DRC, S. Sudan, S. Somalia for handling exports, imports and passengers. It is gazetted as a city with increased population, improved infrastructure, social services, economic activities like industries.

### **A sketch map showing Mombasa port**

#### **Factors for the development of Mombasa port**

- Presence of natural harbours well sheltered from strong waves due to the presence of coral reefs, headlands making it good for navigation.
- Hard basement rocks composed of coral reefs helping in the construction of buildings and coral reefs.
- Water supply from Indian ocean used for domestic, industrial purposes and for dumping wastes and sewage.
- Limited obstacles like coastal land forms, swampy vegetation making it easy and approachable.
- Rich and productive hinterland i.e. many imports, exports and passengers like from countries like Uganda (timber and coffee)
- Political stability and security leading to available investment climate and enough resources for its development.
- Deep waters leading to easy movement of ships carrying exports, imports, passengers.
- Flat and gentle slopes leading to easy construction, drainage, mechanization.
- Positive and supportive government policies like gazetted land for its expansion, good management providing capital for its development.
- Ice and forest free conditions because it is found in the tropics making it operational throughout the year.
- Improved transport and communication like the construction of roads, railway lines, pipelines leading to easy connection and reducing congestion.

- Strategic location at the coast of Indian ocean making it easy to connect with the interior of Africa, European countries and Asia.
- Extensive land for its expansion like for constructing industries, warehouses.
- Presence of entrepreneurs and big companies providing capital and good management like Mombasa Port Authority.
- Improved science and technology leading to availability of skilled labour for its development.
- Presence of historical sites like port Jesus attracting many people for tourism.
- Presence of economic activities like Bamburi cement, oil refining, clearing shipping companies.
- Adequate capital used for purchasing shipping equipment, paying workers.
- Improved social services leading to increased standards of living like water and power supply like at Mombasa.
- Good international relations with E. African countries, European countries and African countries.
- Power supply by using oil, coal, solar energy thermo for domestic, industry and transport purposes.
- Alternative land use because of limited land and resources for other activities.
- Hospitality helping in attracting foreigners for settlement and economic activities.

#### **Problems faced by urban areas in Low developed countries**

- Increased cost of living like paying for basic needs and necessities causing poverty.
- Pollution of air, water and land because of wastes and sewage from industries, urban settlement and because of heavy traffic.
- Unemployment and under employment especially the unskilled labour and uneducated people.
- Congestion in terms of traffic and housing hence delays and inconveniences.
- High crime rate and social problems like prostitution, robbery.
- Development of slums with poor living conditions like poor drainage, houses and ventilation, poor transport.
- High government expenditure on social services and infrastructure.
- Easy spread of diseases which are contagious like flue, cough.
- Environmental degradation because of deforestation, swamp reclamation through construction work.
- Poor drainage causing floods.
- Over exploitation of resources causing exhaustion of minerals, forests.
- Rural urban migration causing urban and rural problems.

- Change of cultures and traditions causing social problems.
- Limited land for expansion making land expensive.
- Poor social services because of increased population with limited facilities.
- Encroachment of gazetted areas like national parks and game reserves.
- Presence of conflicts and tensions like strikes, demonstrations because of people being idle.

### **Solutions / steps / measures**

- Proper urban planning by gazetting areas for settlement and industries.
- Vertical expansion by building stored houses minimizing space.
- Improvement in social services for increased standards of living.
- Population control using modern methods of family planning like pills and condoms.
- Economic diversification reducing on dependence burden.
- Environmental conservation by gazetting wetlands, national parks.
- Proper waste management like treating, recycling.
- Development projects in rural areas and better social services and infrastructure.
- Modernisation of transport like using highways, tunnels, flyovers, trains.
- Acquisition of loans for income generating projects.
- Positive and supportive government policies like gazetting land, attracting investors, good management.
- Privatization of urban services like garbage collection, street lights, cleaning.
- Mass education and mobilization about urban management.
- Improvement in security and political stability.

### **Questions**

- Examine the effects of conurbation on environment in either German or S. Africa.
- Account for the development of either NYC or Mombasa port as an urban area.
- Examine the problems faced around either Rotterdam port or Lagos port.
- What steps are being taken to solve the above problems.
- To what extent has transport influenced the development of either the Great lakes or Ruhr conurbations in Germany.