Fundamentals of Human Geography

Chapter-8 Transport and Communication

Transport

- Transport is a service or facility for the carriage of persons and goods from one place to the other using humans, animals and different kinds of vehicles
- Such movements take place over land,water and air
- Roads and railways form part of land transport; while shipping and waterways and airways are the other two modes
- Pipelines carry materials like petroleum, natural gas, and ores in liquidified form
- Transportation is an organised service industry created to satisfy the basic needs of society
- It is mainly used to carry people and goods, and to handle loading, unloading and delivery

MODES OF TRANSPORTATION

- The principal modes of world transportation are land, water, air and pipelines
- These are used for inter-regional and intra-regional transport, and each one (except pipelines) carries both passengers and freight
- The significance of a mode depends on the type of goods and services to be transported, costs of transport and the mode available
- Road transport is cheaper and faster over short distances and for door-to- door services
- Railways are most suited for large volumes of bulky materials over long distances within a country
- High-value, light and perishable goods are best moved by airways

Land Transport

- Most of the movement of goods and services takes place over land

- In early days, humans themselves were carriers
- Animals were also used for means of transportation
- With the invention of the wheel, the use of carts and wagons became important
- The revolution in transport came about only after the invention of the steam engine in the 18th century
- The first public railway line was opened in 1825 between Stockton and Darlington in northern England and then onwards
- Railways became the most popular and fastest form of transport in the 19th century
- It opened up continental interiors for commercial grain farming, mining and manufacturing in U.S.A.
- The newer developments in land transportation are pipelines, ropeways and cableways. Liquids like mineral oil, water, sludge and sewers are transported by pipelines
- The great freight carriers are the railways, ocean vessels, barges, boats and motor trucks and pipelines

Roads

- Road transport is the most economical for short distances compared to railways
- Freight transport by road is gaining importance because it offers door-to-door service
- The quality of the roads varies greatly between developed and developing countries because road construction and maintenance require heavy expenditure
- In developed countries good quality roads are universal and provide long-distance links in the form of motorways, autobahns (Germany), and inter– state highways for speedy movement
- The world's total motorable road length is only about 15 million km, of which North America accounts for 33%
- The highest road density and the highest number of vehicles are registered in this continent compared to Western Europe

Traffic flows

- City roads suffer from chronic traffic congestion
- Peak (high points) and troughs (low points) of traffic flow can be seen on roads at particular times of the day, for example, peaks occurring during the rush hour before

and after work
- Most of the cities in the world have been facing the problem of congestion

Highways

- Highways are metalled roads connecting distant places
- They are constructed in a manner for unobstructed vehicular movement
- These are 80 m wide, with separate traffic lanes, bridges, flyovers and dual carriageways to facilitate uninterrupted traffic flow
- In developed countries, every city and port town is linked through highways
- In North America, highway density is high, about 0.65 km per sq km
- Cities located on the Pacific coast (west) are well-connected with those of the Atlantic Coast (east)
- The cities of Canada in the north are linked with those of Mexico in the south
- The Trans-Canadian Highway links Vancouver in British Columbia(west coast) to St. John's City in Newfoundland (east coast) and the Alaskan Highway links Edmonton (Canada) to Anchorage (Alaska)
- The Pan-American Highway, a large portion of which has been constructed, will connect the countries of South America, Central America and U.S.A.-Canada
- The Trans- Continental Stuart Highway connects Darwin (north coast) and Melbourne via Tennant Creek and Alice Springs in Australia
- In Russia, a dense highway network is developed in the industrialised region west of the Urals with Moscow as the hub.The important Moscow-Vladivostok Highway serves the region to the east
- In China, highways criss-cross the country connecting all major cities such as Tsungtso (near Vietnam boundary), Shanghai (central China), Guangzhou (south) and Beijing (north). A new highway links Chengdu with Lhasa in Tibet
- In India, there are many highways linking the major towns and cities. For example, National Highway No. 7 (NH 7),connecting Varanasi with Kanya Kumari, is the longest in the country. The Golden Quadrilateral (GQ) or Super Expressway is underway to connect the four metropolitan cities i.e.New Delhi, Mumbai, Bangalore, Chennai, Kolkata and Hyderabad
- In Africa, a highway joins Algiers in the north to Conakry in Guinea. Similarly, Cairo is also connected to Cape Town Border Roads

- Roads laid along international boundaries are called border roads
- They play an important role in integrating people in remote areas with major cities and providing defence
- Almost all countries have such roads to transport goods to border villages and military camps

Railways

- Railways are a mode of land transport for bulky goods and passengers over long distances
- The railway gauges vary in different countries and are roughly classified as broad (more than 1.5 m), standard (1.44 m), metre gauge (1 m) and smaller gauges
- The standard gauge is used in the U.K
- Commuter trains are very popular in U.K.,.U.S.A, Japan and India
- These carry millions of passengers daily to and from in the city
- There are about 13 lakh km of railways open for traffic in the world

Distribution of Railway in the world

Europe

- It is one of the most dense rail networks in the world
- There are about 4,40,000 km of railways, most of which is double or multiple-tracked
- Belgium has the highest density of 1 km of railway for every 6.5 sq kms area
- The industrial regions exhibit some of the highest densities in the world
- The important rail heads are London, Paris, Brussels, Milan, Berlin and Warsaw
- Passenger transport is more important than freight in many of these countries
- Underground railways are important in London and Paris
- Channel Tunnel, operated by Euro Tunnel Group through England, connects London with Paris

Russia

- Railways account for about 90% of the country's total transport with a very dense network west of the Urals
- Moscow is the most important rail head with major lines radiating to different parts of the country's vast geographical area

- Underground railways and commuter trains are also important in Moscow

North America

- North America has one of the most extensive rail networks accounting for nearly 40% of the world's total
- In contrast to many European countries, the railways are used more for long-distance bulky freight like ores, grains, timber and machinery than for passengers
- The most dense rail network is found in the highly industrialised an urbanised region of East Central U.S.A. and adjoining Canada

Canada

- In Canada, railways are in the public sector and distributed all over the sparsely populated areas
- The transcontinental railways carry the bulk of wheat and coal tonnage

Australia

- Australia has about 40,000 km of railways, of which 25% are found in New South Wales alone
- The west-east Australian National Railway line runs across the country from Perth to Sydney
- New Zealand's railways are mainly in the North Island to serve the farming areas

South America

- In South America, rail network is the most dense in two regions, namely, the Pampas of Argentina and the coffee growing region of Brazil which together account for 40% of South America's total route length
- Chile, among the remaining countries has a considerable route length linking coastal centres with the mining sites in the interior
- Peru, Bolivia,Ecuador, Colombia and Venezuela have short single-track rail-lines from ports to the interior with no inter-connecting links
- There is only one trans-continental rail route linking Buenos Aires (Argentina) with Valparaiso (Chile) across the Andes Mountains through the Uspallatta Pass located at a height of 3,900 m

Asia

- In Asia, rail network is the most dense in the thickly populated areas of Japan, China and India
- Other countries have relatively few rail routes
- West Asia is the least developed in rail facilities because of vast deserts and sparsely populated regions

Africa

- Africa continent is the second largest, has only 40,000 km of railways with South Africa alone accounting for 18,000 km due to the concentration of gold, diamond and copper mining activities
- The important routes of the continent are: (i) the Benguela Railway through Angola to Katanga-Zambia Copper Belt; (ii) the Tanzania Railway from the Zambian Copper Belt to Dar-es-Salaam on the coast; (iii) the Railway through Botswana and Zimbabwe linking the landlocked states to the South African network; and (iv) the Blue Train from Cape Town to Pretoria in the Republic of South

Trans–Continental Railways

- Trans–continental railways run across the continent and link its two ends
- They were constructed for economic and political reasons to facilitate long runs in different directions

The following are the most important of these:
1) **Trans–Siberian Railway**

- This is a trans–siberian Railways major rail route of Russia runs from St. Petersburg in the west to Vladivostok on the Pacific Coast in the east passing through Moscow, Ufa, Novosibirsk, Irkutsk, Chita and Khabarovsk
- It is the most important route in Asia and the longest (9,332 km) double-tracked and electrified trans-continental railway in the world
- It has helped in opening up its Asian region to West European markets
- It runs across the Ural Mountains Ob and Yenisei rivers Chita is an important agro-centre and Irkutsk, a fur centre

- There are connecting links to the south, namely, to Odessa (Ukraine), Baku on the Caspian Coast, Tashkent (Uzbekistan), Ulan Bator (Mongolia), and Shenyang (Mukden) and Beijing in China

2) **Trans–Canadian Railways**

- This 7,050 km long rail-line in Canada runs from Halifax in the east to Vancouver on the Pacific Coast passing through Montreal, Ottawa, and Calgary
- A loop line from Winnipeg to Thunder Bay (Lake Superior) connects this rail-line with one of the important waterways of the world
- This line is the economic artery of Canada. Wheat and meat are the important exports on this route

3) **The Union and Pacific Railway**

- This rail-line connects New York on the Atlantic Coast to San Francisco on the Pacific Coast passing through Cleveland, Chicago, Omaha,Evans, Ogden and Sacramento
- The most valuable exports on this route are ores, grain, paper, chemicals and machinery

4) **The Australian Trans–Continental Railway**

- This rail-line runs west-east across the southern part of the continent from Perth on the west coast, to Sydney on the east coast passing through Kalgoorlie, Broken Hill and Port Augusta
- Another major north-south line connects Adelaide and Alice Spring and to be joined further to the Darwin–Birdum line

5) **The Orient Express**

- This line runs from Paris to Istanbul passing through Strasbourg, Munich, Vienna,Budapest and Belgrade
- The journey time from London to Istanbul by this Express is now reduced to 96 hours as against 10 days by the sea-route
- The chief exports on this rail-route are cheese, bacon, oats, wine, fruits, and machinery

WATER TRANSPORT

- Advantages of water transportation:(i) it does not require route construction. The oceans are linked with each otherand (ii) negotiable with ships of various sizes (iii) It is much cheaper because the friction of water is far less than that of land (iv)The energy cost of water transportation is lower
- Water transport is divided into sea routes and inland waterways

Sea Routes

- The oceans offer a smooth highway traversable in all directions with no maintenance costs
- Its transformation into a routeway by sea-going vessels is an important development in human adaptation to the physical environment
- Compared to land and air, ocean transport is a cheaper means of haulage (carrying of load) of bulky material over long distances from one continent to another
- Modern passenger liners (ships) and cargo ships are equipped with radar, wireless and other navigation aids
- The development of refrigerated chambers for perishable goods, tankers and specialised ships has also improved cargo transport
- The use of containers has made cargo handling at the world's major ports easier

Important Sea Routes

Major sea routes are:

1) **The Northern Atlantic Sea Route**

- This links North-eastern U.S.A. and North- western Europe, the two industrially developed regions of the world
- The foreign trade over this route is greater than that of the rest of the world combined
- One fourth of the world's foreign trade moves on this route
- It is one of the busiest sea route in the world
- It is also called the Big Trunk Route
- Both the coasts have highly advanced ports and harbour facilities

2) **The Mediterranean–Indian Ocean Sea Route**

- This sea route passes through the heart of the Old World and serves more countries and people than any other route
- Port Said, Aden, Mumbai, Colombo and Singapore are some of the important ports on this route
- The construction of Suez canal has greatly reduced the distance and time as compared to the earlier route through the Cape of Good Hope
- This trade route connects the highly industrialised Western European region with West Africa, South Africa, South-east Asia and the commercial agriculture and livestock economies of Australia and New Zealand
- Before the construction of the Suez Canal this was the route connecting Liverpool and Colombo which was 6,400 km longer than the Suez Canal route
- The volume of trade and traffic between both East and West Africa is on the increase due to the development of the rich natural resources such as gold, diamond, copper, tin, groundnut, oil palm, coffee and fruits

3) **The Cape of Good Hope Sea Route**

- This sea route is another important one across the Atlantic Ocean which connects West European and West African countries with Brazil, Argentina and Uruguay in South America
- The traffic is far less on this route because of the limited development and population in South America and Africa
- Only southeastern Brazil and Plata estuary and parts of South Africa have large-scale industries
- There is also little traffic on the route between Rio de Janeiro and Cape Town because both South America and Africa have similar products and resources
- Trade across the vast North Pacific Ocean moves by several routes which converge at Honolulu
- The direct route on the Great Circle links Vancouver and Yokohama and reduces the travelling distance (2,480 km) by half

4) **The North Pacific Sea Route**

- This sea route links the ports on the west-coast of North America with those of Asia
- These are Vancouver, Seattle, Portland, San Francisco and Los Angeles on the

American side and Yokohama, Kobe, Shanghai, Hong Kong, Manila and Singapore on the Asian side

5) **The South Pacific Sea Route**

- This sea route connects Western Europe and North America with Australia, New Zealand and the scattered Pacific islands via the Panama Canal
- This route is also used for reaching Hong Kong, Philippines and Indonesia. The distance covered between Panama and Sydney is 12,000 km
- Honolulu is an important port on this route.

Coastal Shipping

- Coastal shipping is a convenient mode of transportation with long coastlines, e.g. U.S.A, China and India States
- Shenzhen in Europe are most suitably placed for coastal shipping connecting one member's coast with the other

Shipping Canals

- The Suez and the Panama Canals are two vital man-made navigation canals or waterways which serve as gateways of commerce for both the eastern and western worlds

The Suez Canal

- This canal had been constructed in 1869 in Egypt between Port Said in the north and Port Suez in the south linking the Mediterranean Sea and the Red Sea
- It gives Europe a new gateway to the Indian Ocean and reduces direct sea-route distance between Liverpool and Colombo compared to the Cape of Good Hope route
- It is a sea-level canal without locks which is about 160 km and 11 to 15 m deep
- About 100 ships travel daily and each ship takes 10-12 hours to cross this canal
- A railway follows the canal to Suez, and from Ismailia there is a branch line to Cairo
- A navigable fresh-water canal from the Nile also joins the Suez Canal in Ismailia to supply fresh-water to Port Said and Suez

The Panama Canal

- This canal connects the Atlantic Ocean in the east to the Pacific Ocean in the west
- It has been constructed across the Panama Isthmus between Panama City and Colon by the U.S. government which purchased 8 km of area on either side and named it the Canal Zone
- The Canal is about 72 km. long and involves a very deep cutting for a length of 12 km
- It has a six-lock system and ships cross the different levels (26 m up and down) through these locks before entering the Gulf of Panama
- It shortens the distance between New York and San Francisco by 13,000 km by sea
- The economic significance of this Canal is relatively less than that of the Suez. However, it is vital to the economies of Latin America

Inland waterways

- Rivers, canals, lakes and coastal areas have.been important waterways since time immemorial
- Boats and steamers are used as means of transport for cargo and passengers
- The development of inland waterways is dependent on the navigability width and depth of the channel, continuity in the water flow, and transport technology in use
- Rivers are the only means of transport in dense forests
- Very heavy cargo like coal, cement, timber andmetallic ores can be transported through inland waterways
- In ancient times, riverways were the main highways of transportation as in the case of India
- But they lost importance because of competition from railways, lack of water due to diversion for irrigation, and their poor maintenance
- The significance of rivers as inland waterways for domestic and international transport and trade has been recognised throughout the developed world

The following **river waterways** are some of the world's **important highways** of commerce

1) **The Rhine Waterways**

- The Rhine flows through Germany and the Netherlands
- It is navigable for 700 km from Rotterdam, at its mouth in the Netherlands to Basel in Switzerland

- The Ruhr river joins the Rhine from the east
- It flows through a rich coalfield and the whole basin has become a prosperous manufacturing area
- Dusseldorf is the Rhine port for this region
- This waterway is the world's most heavily used
- Each year more than 20,000 ocean-going ships and 2,00,000 inland vessels exchange their cargoes
- It connects the industrial areas of Switzerland, Germany, France, Belgium and the Netherlands with the North Atlantic Sea Route

2) **The Danube Waterway**

- This important inland waterway serves Eastern Europe
- The Danube river rises in the Black Forest and flows eastwards through many countries
- It is navigable up to Taurna Severin
- The chief export items are wheat, maize, timber, and machinery

3) **The Volga Waterway**

- Russia has a large number of developed waterways, of which the Volga is one of the most important
- It provides a navigable waterway of 11,200 km and drains into the Caspian Sea
- The Volga-Moscow Canal connects it with the Moscow region and the Volga-Don Canal with the Black Sea

4) **The Great Lakes – St. Lawrence Seaway**

- The Great Lakes of North America Superior,Huron Erie and Ontario are connected by Soo Canal and Welland Canal to form an inland waterway
- The estuary of St. Lawrence River, along with the Great Lakes, forms a unique commercial waterway in the northern part of North America
- The ports on this route like Duluth and Buffalo are equipped with all facilities of ocean ports
- Here large ocean-going vessels are able to navigate up the river deep inside the continent to Montreal

- But here goods have to be trans-shipped to smaller vessels due to the presence of rapids
- Canals have been constructed up to 3.5 m deep to avoid these

5) **The Mississippi Waterways**

- The Mississippi-Ohio waterway connects the interior part of U.S.A. with the Gulf of Mexico in the south
- Large steamers can go through this route up to Minneapolis

AIR TRANSPORT

- Air transport is the fastest means of transportation, but it is very costly
- It is preferred by passengers for long-distance travel
- Valuable cargo can be moved rapidly on a world-wide scale
- It is often the only means to reach inaccessible areas
- In the Himalayan region, the routes are often obstructed due to landslides, avalanches or heavy snow fall. At such times,air travel is the only alternative to reach a place
- Travel by air can now be measured by hours and minutes instead of years & months
- Frequent air services are available to many parts of the world
- U.K. pioneered the use of commercial jet transport, U.S.A. developed largely post-War international civil aviation
- Today, more than 250 commercial airlines offer regular services to different parts of the world
- Recent development in air transport is Supersonic aircraft, cover the distance between London and New York within three and a half hour

Inter-Continental Air Routes

- Dense network exists in Eastern U.S.A., Western Europe and Southeast Asia. U.S.A. alone accounts for 60% of the airways of the world
- New York, London, Paris, Amsterdam,Frankfurt Rome, Moscow, Karachi, New Delhi, Mumbai, Bangkok, Singapore, Tokyo, San Francisco, Los Angeles and Chicago are the nodal points
- Africa, Asiatic part of Russia and South America lack air services. There are limited air services between 10-35 latitudes in the Southern hemisphere due to sparser

population, limited landmass and economic development

PIPELINES

- Pipelines are used extensively to transport liquids and gases such as water, petroleum and natural gas for an uninterrupted flow
- Not only water, Cooking gas or LPG is supplied through pipelines in many parts of the world
- Pipelines can also be used to transport liquidified coal
- In New Zealand, milk is being supplied through pipelines from farms to factories
- In U.S.A. there is a dense network of oil pipelines from the consuming areas
- Big Inch is one such famous pipeline, which carries petroleum from the oil wells of the Gulf of Mexico to the North-eastern States
- About 17% of all freight per tonne-km. is carried through pipelines in U.S.A
- In Europe, Russia, West Asia and India pipelines are used to connect oil wells to refineries, and to ports or domestic markets
- Turkmenistan is central Asia has extended pipelines to Iran and also to parts of China
- The proposed Iran-India via Pakistan international oil and natural gas pipeline willbe the longest in the world

Communication

- Human beings have used different methods long-distance communications of which the telegraph and the telephone were important
- During the early and mid-twentieth century, the American Telegraph and Telephone Company (AT&T) enjoyed a monopoly over U.S.A.'s telephone industry
- In fact, the telephone became a critical factor in the urbanization of America
- In developing countries, the use of cell phones, made possible by satellites, is important for rural connectivity
- Today there is a phenomenal pace of development. The first major breakthrough is the use of optic fiber cables (OFC)
- These allow large quantities of data to be transmitted rapidly, securely, and are virtually error-free

Satellite Communication

- Today Internet is the largest electronic network on the planet connecting about 1,000 million people in more than 100 countries
- Communication through satellites emerged as a new area in communication technology since the 1970s after U.S.A. and former U.S.S.R. pioneered space research
- India has made great strides in satellite development
- Aryabhatt was launched on 19 April 1979, Bhaskar-I in 1979 and Rohini in 1980
- On 18 June 1981, APPLE (Arian Passenger Payload Experiment) was launched through Arian rocket
- Bhaska Challenger and INSAT I-B have made long- distance communication, television and radio very effective
- Today weather forecasting through television is a boon

Cyber Space – Internet

- Cyber space is the world of electronic computerised space
- It is encompassed by the Internet such as the World Wide Web (www)
- It is the electronic digital world for communicating or accessing information over computer networks without physical movement of the sender and the receiver
- It is also referred to as the Internet
- Cyberspace exists everywhere. It may be in an office, sailing boat, flying plane and virtually anywhere
- The speed at which this electronic network has spread is unprecedented in human history
- There were less than 50 million Internet users in 1995, about 400 million in 2000 A.D. and over two billion in 2010
- In the last few years there has been a shift among global users from U.S.A. to the developing countries
- The percentage share of U.S.A. has dropped from 66 in 1995 to only 25 in 2005
- The majority of the world's users are in U.S.A., U.K., Germany, Japan, China and India
- Cyberspace will expand the contemporary.economic and social space of humans through e-mail, e-commerce, e-learning and e-governance
- Internet together with fax, television and radio will be accessible to more and more people cutting across place and time