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BOOKS

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Revised and Updated

ICSE GEOGRAPHY

Based on the latest ICSE syllabus

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ICSE GEOGRAPHY

Class 10

Chapter 21: India – Means of Transport

For a large and developing country like India, it is essential to develop a cheap and efficient system of transport.

- An efficient system of transport provides the basic strength to the national economy and an important link between production and consumption of goods.
- The growth of transport facilities accelerates the process of industrialisation and urbanisation.
- The transport helps in removing the scarcity of goods during the time of crisis.

India is a big country with long distances. India has great diversity in economic, social, cultural and ethnic structure. A well-knit system of transport is needed to bring about unity in diversity.

- The transport system in our country is divided into three modes – land, air and water.
- The land transport consists of roads and railways.
- The air transport is the fastest.
- The water transport is also divided into two types – inland waterways and sea or ocean transport.

ROADWAYS

India has a long tradition of building roads since the times of Chandragupta Maurya and Ashoka. The real progress was made during Mughal period, when Sher Shah Suri constructed a road between Peshawar and Kolkata. It is now called Grand Trunk (G.T.) Road.

IMPORTANCE OF ROADS

1. Roads are important for transporting goods and passengers for short and medium distances.
2. Roads are comparatively easy and cheap to construct and maintain.
3. Roads connect farms, factories and markets.
4. Roads provide door-to-door service.

Land transport (Roadways)

5. Roads can negotiate steep slopes and sharp turns.
6. Roads act as great feeders to railway.
7. Road transport is more flexible as bus and trucks can be stopped anywhere and any time for loading or unloading.
8. Roads can transport perishable goods (vegetables, fruits, milk, etc.) easily and quickly in comparison to railways.

GROWTH AND DEVELOPMENT

The first serious attempt to develop road network in India was made in 1943, through the **Nagpur Plan**. The aim was that no village in a developed agricultural region should be more than five miles (8 km) from a major road or two miles (3.2 km) away from any other road.

The Twenty Year Road Plan was drawn in 1961. It was aimed at increasing the road length from 6 lakh km to 12 lakh km, by 1981. The other main objectives of the Plan were to bring

a. every village in a developed agricultural area within 6.4 km (4 miles) of a metalled road and 2.4 km (1.5 miles) of any other road.
b. every village in a semi-developed area within 12.8 km (8 miles) of a metalled road.
c. every village in an undeveloped and uncultivated area within 19.2 km (12 miles) of a metalled road and 8 km (5 miles) of any other road

CLASSIFICATION OF ROADS

The Nagpur Plan classified the Indian roads into four categories on the basis of their functions. They were:

1. the National Highways,
2. the State Highways,
3. the District Roads and
4. the Village Roads.

THE NATIONAL HIGHWAYS

These are the main roads, which are constructed and maintained by the Central Government through National Highways Authority of India (NHAI), which was established in 1995. These roads are meant for interstate movement and connect the state capitals, important ports, major cities and railway junctions.

A number of National Highways run in the northsouth and east-west directions. NH-1 and NH-2, are old Sher Shah Suri Marg (G.T. Road). NH-1 is from Delhi to Amritsar and NH-2 is from Delhi to Kolkata.

- NH-7, about 2,369 km long, runs between Varanasi and Kanniyakumari. It is the longest National Highway in India.
- NH-5 and NH-17 run along the eastern and western coasts respectively.
- NH-15 represents the border road in Rajasthan desert and run through Kandla, Jaisalmer, Bikaner and joins the border road in Punjab.

The Government of India through NHAI, has launched a major road development project, linking Delhi-Mumbai-Chennai-Kolkata-Delhi. This is known as **the Golden Quadrilateral Super Highways**. This project will be looked after by the National Highway Development Project (NHDP). It was launched on 2 January, 1999. The total length of super highways in the project is about 5,846 km.

The government has involved several private companies in this project. These companies will invest money, and develop and maintain these highways. It is based on the concept of **Build, Operate and Transfer (BOT).**

India – Main National Highways

The State Highways

These highways are constructed and maintained by the State Governments through their respective Public Works Departments (PWD). The state highways join the state's capital with District Headquarters and other important cities within the state. These roads are also connected to the National Highways.

The District Roads

These roads are constructed and maintained by Zila Parishads and the Public Works Departments. The district roads mostly connect the district headquarters with the main towns and large villages within the districts. Maharashtra is on the top, followed by Uttar Pradesh, Madhya Pradesh, Rajasthan, Punjab, Karnataka, Assam, Haryana and Kerala.

The Village Roads

These roads are constructed and maintained by the Village Panchayats. They connect the villages with the neighbouring towns and cities. These roads made great progress under the Pradhan Mantri Grameen Sadak Yojana.

India – Golden Quadrilateral Super Highways

The Border Roads

The Border Roads Organisation (BRO) was established in 1960. Its main aim was to plan and construct roads of strategic importance in the northern and northeastern border areas of the country.

PROBLEMS OF ROAD TRANSPORT

The road transport in India is facing a number of problems. Some of them are as follows:

- About half of the Indian roads are unsurfaced. These can be used only in fair weather and they become muddy and unfit during the rainy season.
- Most of the National Highways suffer from inadequate capacity, weak pavements, old and broken bridges, unbridged level crossings, lack of by-pass roads and lack of amenities and safety measures.
- The network of traffic comprising high speed cars, trucks, buses, tractors, two wheelers, animal driven vehicles, cyclists, etc. increases traffic time, congestion, pollution and road accidents.
- There exist multiple check posts, toll tax, octroi duties and collection points on roads. They waste time and slow down the traffic movement and speed.
- Important amenities, such as repair shops, first aid centres, telephones, clean toilets, food outlets and rest places are lacking along the roads.
- The rules of road safety and traffic are wilfully violated by the drivers and there is no efficient system of checking.
- The road engineering and construction techniques are outdated and are not able to meet the challenges of the future.

- The participation of private sector in road development is very little due to high investments and low returns.
- The policy relating to highway development is not stable, as it changes with the change of government.
- A number of agencies are involved in the planning, construction and maintenance of different types of roads.
- There is a shortage of funds for the construction and maintenance of roads in India

RAILWAYS

From a very modest beginning in 1853, when the first train steamed off from Mumbai to Thane for a distance of about 34 km, the Indian Railways have grown into a vast network. It has a route length of about 67,956 km on which 13,523 trains run every day connecting more than 7,325 stations.

IMPORTANCE OF INDIAN RAILWAYS

The Indian railways have played a major role in the economic, industrial and social development of India.

- Railways provide the cheapest and convenient mode of transport for goods and passengers.
- Railways are useful for long distance travel and also for suburban traffic.
- Railways have helped in the growth and development of industries in India.
- Railways help in supplying raw materials, machinery and other facilities to factories and finished goods to the market.
- Railways have helped in the growth of agriculture, as the farmers can now sell the agriculture produce to far off markets and get better price.
- As railways are good for long distance journey, they provide a medium for national integration.
- Railways help people in times of floods, droughts, famines, earthquakes, etc. by transporting relief materials and rescue teams.
- Railways help in times of man-made social, religious, political disturbances, by easy movement of police, troops and defence equipment.
- Railways also help in saving country's freedom and integrity from external aggressions.
- Railways connect major ports to their hinterland and thus help in the prosperity of the coastal areas.
- The superfast trains and container services have ensured quick movement of men and material. u Railways are most suited for transporting bulky goods to long distances.

India – Major railway routes

RAILWAY GAUGES

On the basis of width of the track of Indian Railways, three categories have been made:

Broad Gauge

The distance between the rails in the broad gauge is 1.676 metres. The total length of broad gauge line is about 63,950 km, which accounts for about 94.1 per cent of the total length of rail routes in the country.

Metre Gauge

The distance between the rails in the metre gauge is one metre. The total length of the metre gauge line is about 2,402 km, which accounts for about 3.5 per cent of the total length of rail routes in the country.

Narrow Gauge

The distance between the rails in the narrow gauge is 0.762 metre or 0.610 metre. The total length of the narrow gauge is about 1,604 km, which accounts for about 2.4 per cent of the total length of rail routes in the country. The narrow gauge is generally confined to hilly areas.

- The railway gauges were originally devised during the colonial days keeping in mind the volume of traffic, goods movement, importance of places connected and the nature of terrain.
- After independence, it was realised that the different gauges of the railways are creating problems in the movement of goods and traffic.

- The passengers have to change trains at the break of gauge station and are put to great inconvenience.
- The movement of goods along different gauges results in loss of time, increased cost of transportation, pilferage and damage to the consignments.
- The Government of India nationalised the railways and adopted a policy of gauge conversion, mainly from metre gauge to broad gauge.
- The unigauge system of railways will ensure larger capacity, higher speed and consequently cheaper transportation.

RAILWAY TRACTION

Before Independence, the entire railway network was run by steam engines that used coal as the source of energy. This had poor efficiency and caused more environmental pollution. An urgent need was felt to replace these engines by diesel and electric locomotives which are more powerful and environment friendly.

DISTRIBUTION OF INDIAN RAILWAYS

The Northern Plains of India with level land, high density of population, fertile soils and intense agriculture activities present the most favourable environment for the development of railways. But the presence of many rivers and streams makes it necessary to build bridges. The relief of Himalayas and the plateaus is not suitable for the large-scale development of railway network.

- The present railway system in India is the legacy of British Rule.
- They planned the pattern of the railway network according to their needs.
- They wanted to exploit the raw materials of India for the growth of their industries.
- They also wanted to move their arms and troops quickly to maintain their supremacy.
- Thus, they connected the big ports with railways to increase the import and export of goods.

The Northern Plains of India, from Amritsar to Kolkata, have a dense network of railways. This densely populated region has highly developed agriculture and industries. Delhi is the main point from where railway lines radiate in all directions and are connected with major seaports of India.

The Peninsular India has undulating and hilly terrain which hinders the development of railways. There are some trunk route railway services connecting Kolkata, Mumbai, Chennai, Kochi, Delhi, Hyderabad, Nagpur, etc.

The Himalayan Mountain region has rugged terrain, hill and valley topography, backward economy and sparse population. There are only three narrow gauge railway lines in the Himalayan region. These are Kalka-Shimla, Pathankot -Kangra and Siliguri-Darjiling.

- There are few railway lines in the northeastern states of Meghalaya, Tripura, Arunachal Pradesh, Nagaland, Manipur and Mizoram.
- These areas have thickly forested rough terrain, sparse population and an extremely backward economy.
- The construction of railways is not only difficult but also a very costly affair.
- The conditions for the development of railways are better along the east coast than along the west coast.
- The east has a long trunk route from Kolkata to Chennai.
- The structure and relief of west coast have been hindering for such a development.
- However, the completion of Konkan Railway is a dream come true. Read about it in the box.

Dedicated Freight Corridor (DFC)

A plan for Dedicated Freight Corridor was started in 2009 to improve the freight carrying capacity of railways. It will reduce the cost of transportation and improve the quality of services. It consists of two corridors.

1. The Eastern Dedicated Freight Corridor (1839 km long) extends from Dankuni near Kolkata to Ludhiana in Punjab.

2. The Western Dedicated Freight Corridor (1499 km long) extends from Jawaharlal Nehru Port (Nhava Sheva) in Mumbai to Dadri in Haryana.

The main features of this project are:

- ❖ Only goods train at a speed of about 100 km/hour will operate on these corridors.
- ❖ They will run along existing railway routes and provide service to only railway junctions.
- ❖ These corridors will have provision of bypasses for thickly populated big cities.
- ❖ The track will have heavy and strong rails on concrete sleepers.
- ❖ The cost of transporting goods will be reduced by increasing work efficiency.
- ❖ The losses will be reduced by delivering goods at their destination well in time.
- ❖ The cheap and efficient transport will help the growth of industries in these regions.
- ❖ These corridors will ensure the carrying capacity with world's best systems

THE RAILWAY ZONES

At the time of Independence, there were 42 railway systems managed by 37 companies. The Railway board, in 1950, regrouped the Indian railways in six zones – Central, Western, Northern, Eastern, Southern and Northeastern. Later on three more zones were created.

PROBLEMS AND PROSPECTS OF INDIAN RAILWAY

Being the largest public sector undertaking, railways have varied and complex problems. Some of them are as follows:

- The present railway network is overburdened and inadequate to meet the new challenges of a fast developing economy.
- Some regions are beyond the reach of railways due to unfavourable geographical conditions. These areas need to be opened to railways for removing regional inequalities in economic growth.
- Railways are facing stiff competition from road transport and thus, their share in passenger and goods traffic is declining.
- Railways are overburdened with surplus staff on their regular pay roles. This burden hinders the further development of railways.
- The railways have to develop uneconomic projects due to political pressures and interferences.
- Railways have huge outstanding payments to diesel and electric power supply companies.
- The State Electricity Boards and NTPC increase the tariffs arbitrarily, and thus, add to the burden of railways.
- Railways are the largest consumer of diesel. Any increase in the rates of diesel, adversely affects the financial resources.
- Most of the equipment used by the railways are now obsolete and need immediate replacements.

- There is mounting deficit due to non increase in fares and tariffs by the government due to political reasons.

In the last few years, some administrative changes have been implemented to reduce the deficit. As a result of consistent efforts, the Indian railways are now generating surplus funds. Some of the measures taken are as follows:

1. Sharpening of marketing capability
2. Strengthening of high density network
3. Cutting down of unnecessary overheads
4. Commercial exploitation of railway lands
5. Participation by the private sector
6. Efficient use of available financial resources

AIRWAYS

The air transport is the fastest and costliest means of transport, which has reduced distances by reducing the travel time.

In India, air transport made a beginning, when air mail operations were started between Prayagraj and Naini (a distance of about 10 km) in 1911. The British, Dutch and French introduced air transport in India in 1930. The Indian National Airways was formed in 1933 for service between Lahore and Karachi.

At the time of Independence in 1947, there were four airways companies, namely, Indian National Airways, Tata Sons Limited, Air Services of India and Deccan Airways.

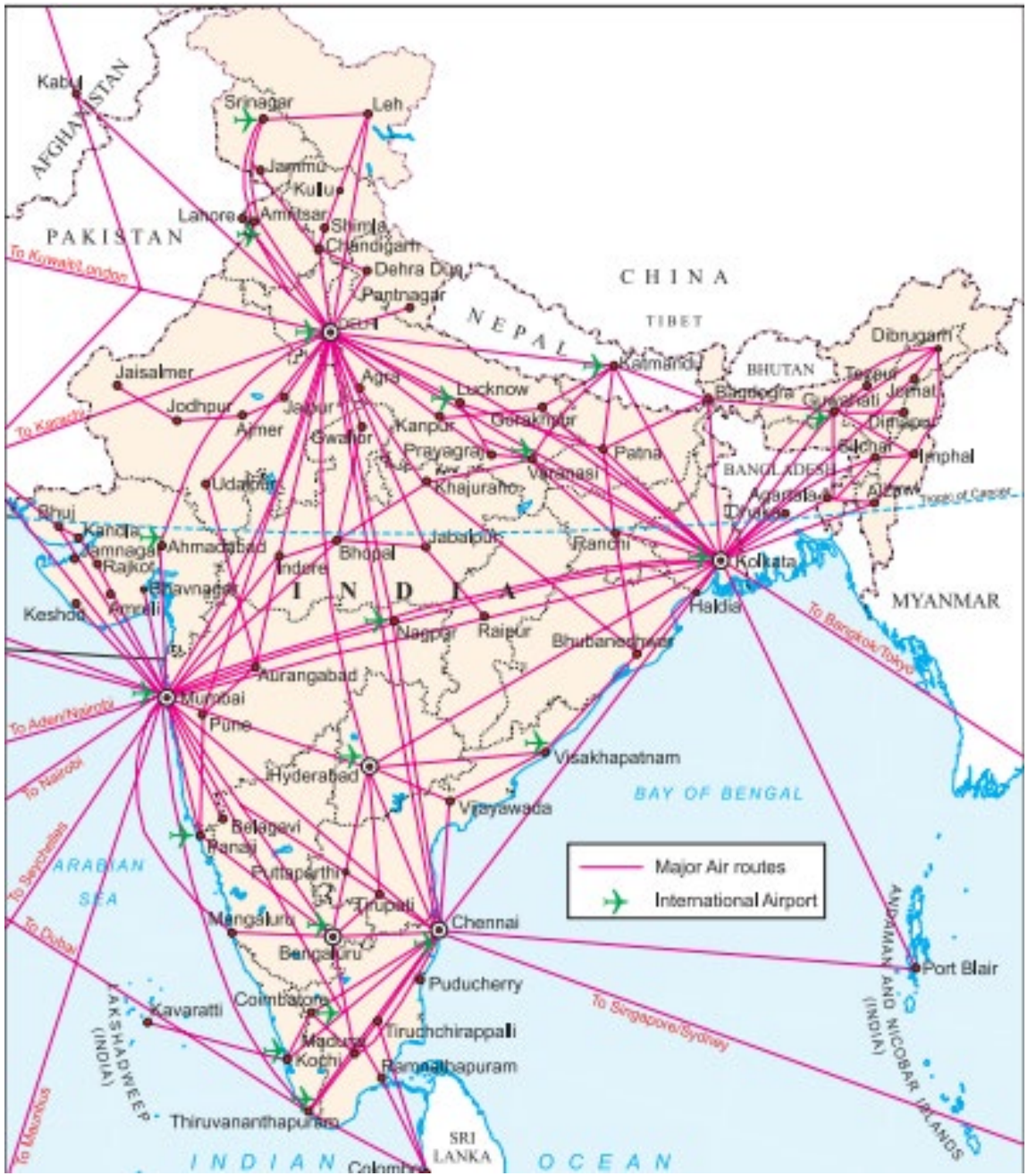
By 1951, four more companies, namely, Bharat Airways, Himalaya Aviation Limited, Airway India and Kalinga Airlines joined the air services. In 1953, the Government of India nationalised the air services and set up two companies, namely, Indian Airlines (domestic) and Air India (international). This has changed the face of air transport in India for a vibrant growth. Liberalisation has given unprecedented growth to air transport in recent years.

Vayudoot was set-up in 1981 to augment links with remote and inaccessible areas, which were not covered by Indian Airlines. Pawan Hans was set-up in 1985 to provide helicopter services to petroleum sector and connect places like Mumbai High.

Air transport

AIRPORT AUTHORITY OF INDIA (AAI)

The National Airports Authority and the International Airports Authority of India were merged in 1995, to form Airport Authority of India (AAI). It is responsible for providing safe and efficient air traffic and aeronautical communication services in India. In 1992, the Government of India introduced the Open Sky Policy for handling and transporting cargo in India. It was to help the Indian exporters to make their goods more competitive. Under this policy, foreign airlines or associations of exporters can bring any cargo aeroplane in the country.



India – Main air routes

CHARACTERISTICS OF AIR TRANSPORT

- Aeroplanes fly according to pre-decided time schedule.
- Aeroplanes fly through definite corridors while crossing over different countries due to safety reasons.
- Air transport is the most suitable mode of transport for long distances.
- It is not suitable for transporting heavy goods. However, under special conditions the aeroplanes can take army tanks with them.
- Light, costly and perishable goods are transported by aeroplanes.
- It is suitable for relief operations at any place, at the time of calamities and emergencies, such as floods, earthquakes, accidents, etc.
- Air transport is suitable for hilly, desert, or inaccessible areas where other means of transport cannot reach.

The private scheduled airlines, such as Spicejet, Indigo, Vistare, etc. now operate not only within India, but also have flights to many other countries of the world. In 2018, the domestic passengers were 126 million and the cargo was also more than 36 lakh tonnes. The share of the private sector airways has increased very rapidly.

WATERWAYS

The water transport is one of the oldest means of transport in India. Waterways are the cheapest means of transport and are most suitable for carrying low cost, heavy and bulky materials to long distances. These are a fuel-efficient and environment friendly mode of transport. Waterways are of two types – a. Inland waterways, and b. Seaways or Oceanways.

THE INLAND WATERWAYS

The inland waterways refer to using inland water bodies, such as rivers, canals, creeks, backwaters, etc. for transporting goods and people from one place to another.

The decline of river transport began with the development of roads and railways; as the water transport could not compete with the speed of rail and road transport.

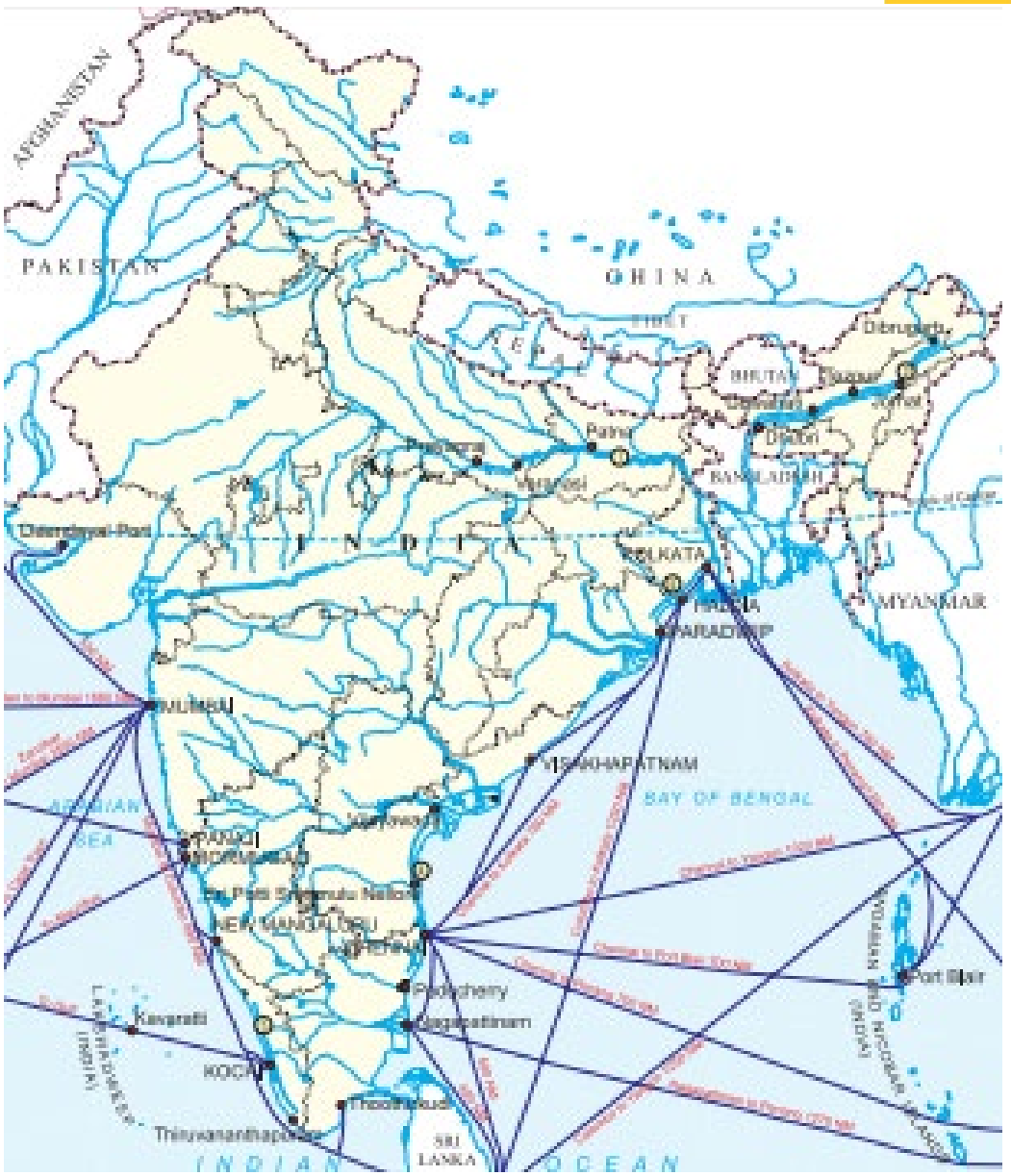
Waterways (Coastal)

In order to increase the role of inland waterways and to improve their efficiency, the Inland Waterways Authority of India (IWAI) was set-up in 1986. 111 inland waterways have been declared as National Waterways under the National Waterways Act, 2016.

NW-1 The Ganga river between Prayagraj and Haldia (1,620 km long). It is navigable up to Patna by mechanised boats.
NW-2 The Brahmaputra river between Sadiya and Dhubri (891 km long). It is navigable by steamers up to Dibrugarh and is shared by India and Bangladesh.
NW-3 The West Coast Canal in Kerala between Kottapuram and Kollam (205 km long).
NW-4 Kakinada to Puruchery (2890 km). **NW-5** Connects Odisha to West Bengal (623 km).

The Inland Waterways Authority of India has also identified many other inland waterways, which could be upgraded and developed. These include:

- the Barak river,
- the delta and lower courses of the Mahanadi, Godavari and Krishna rivers,



India – Main waterways

- the lower courses of Narmada and Tapi rivers,
- the Zuari and Mandovi rivers in Goa,
- the backwaters and lagoons in Kerala, and
- the Buckingham Canal in Andhra Pradesh and Tamil Nadu.

Uttar Pradesh has the maximum length of inland waterways, followed by West Bengal, Andhra Pradesh, Assam, Kerala and Bihar. The IWAI has drawn up a 20-year plan for the development of inland water transport in India.

Factors Affecting Inland Waterways

- The rivers and canals should have regular flow of water.
- The presence of waterfalls and sharp bends in the course of river hinders the development.
- Silting of the river bed reduces the depth of water and desilting of river bed is a costly affair.
- Diversion of river water for irrigation purposes reduces the quantity of water in the river.
- There should be enough demand to make the inland waterways economically viable.

SHIPPING OR OCEAN ROUTES

At the time of Independence, there were only 59 big and small ships with less than 2 lakh tonnes of GRT (Gross Registered Tonnage). The following recommendations were made by the Shipping Policy Committee appointed by the Government of India.

1. India should secure 100 per cent of its coastal trade.
2. India should secure 75 per cent of its trade with Myanmar, Sri Lanka and other neighbouring countries.
3. India should secure 50 per cent of its overseas trade.
4. India should secure 30 per cent of the Orient's trade.

India has 13 major and about 200 medium and small seaports. There are more than 80 shipping companies, out of which the Shipping Corporation of India is the largest. It operates overseas tanker and bulk carrier services on almost all ocean routes.

Water transport (Seaport)

COASTAL SHIPPING

It involves transportation of goods and passengers from one seaport to another within the country. The coastal shipping can reduce the burden on railways and roadways. It is pollution-free and less capital intensive. It can provide large-scale employment.

Apart from trade and commerce, coastal shipping involves continuous vigilance of the coasts and promotes sea-based industries, such as fisheries and luxury tourism. The geography of South India can help in the development of coastal shipping on a large scale.

The existence of big, medium and small seaports provides favourable environment for increasing and developing coastal shipping in India. There is great scope for the growth and development of coastal shipping. For example, a recent study made by the Department of Transport about the fuel cost involved in moving general or bulk cargo from Mumbai to Goa showed that sea route was nine times less expensive than the road route.

PROBLEMS OF SHIPPING

The Indian shipping industry is facing a number of problems. Some of them are as follows:

- Inadequacy of tonnage capacity.
- Shortage of container fleet.
- Overaged vessels resulting in high operation cost.
- Stiff competition with foreign shipping companies which provide better and cheaper service.

- Congestion at the major ports.
- Inadequate infrastructural support like ship-repair facility, dry-docking and cargo handling.

MAJOR SEAPORTS

The 13 major ports of India handle more than 95 per cent of our foreign trade. The major ports are Deendayal, Mumbai, Jawaharlal Nehru (Nhava Sheva), Mormugao, New Mangaluru, Kochi, Thoothukudi, Chennai, Visakhapatnam, Paradwip, Ennore, Haldia and Kolkata

Deendayal Port (erstwhile Kandla Port) was developed soon after Independence to make up the loss of Karachi to Pakistan. It is a tidal port and is located at the eastern end of the Rann of Kachchh. It handles crude oil, petroleum products, cotton, fertilizers etc.

Mumbai is the biggest natural harbour on the west coast of India. A new port Nhava Sheva has been developed near this port to decongest traffic at Mumbai port. It handles a large variety of cargo from Middle East and European countries.

Mormugao is an important port of Goa and handles the iron ore export from India. With the opening of Konkan Railway, its importance has been enhanced.

New Mangaluru is a new port developed about 9 km north of the old port. The port is well linked with Mumbai and Kanniyakumari. The main items of cargo from this port are iron, manganese, fertilizers, coffee, etc.

Kochi is a natural port located along the coast of Kerala. Kochi has sheltered backwater bay, and is open to traffic throughout the year. The main items of export and import are coir goods, copra, coconut oil, tea, rubber, spices etc. The Kochi Oil Refinery receives crude oil from this port.

Thoothukudi has been recently developed along the southeastern coast of Tamil Nadu. It has an artificial deep sea harbour and is well connected with railways and roads.

Chennai is the oldest artificial harbour on the east coast of India. It is often hit by cyclones in October and November, making the shipping difficult. It is not suited for large ships due to lesser depth of water.

Visakhapatnam is the deepest, land-locked, protected and the best natural harbour of India. Its main imports and exports are petroleum, fertilizers, chemical, machinery, metals, iron ore, timber, leather goods and food grains.

Paradwip is a deep water and all weather port, located about 100 km east of Cuttack. It has the deepest harbour in the country. This port handles iron ore and coal along with some dry cargo.

Kolkata-Haldia is situated along the Hugli river about 148 km away from seashore. Its importance has slightly declined due to the development of Paradip and Visakhapatnam ports.

Recently, another port **Haldia** (90 km downstream from Kolkata) has been developed, for handling the bulk cargo, and to relieve pressure on the old port.

THANK YOU