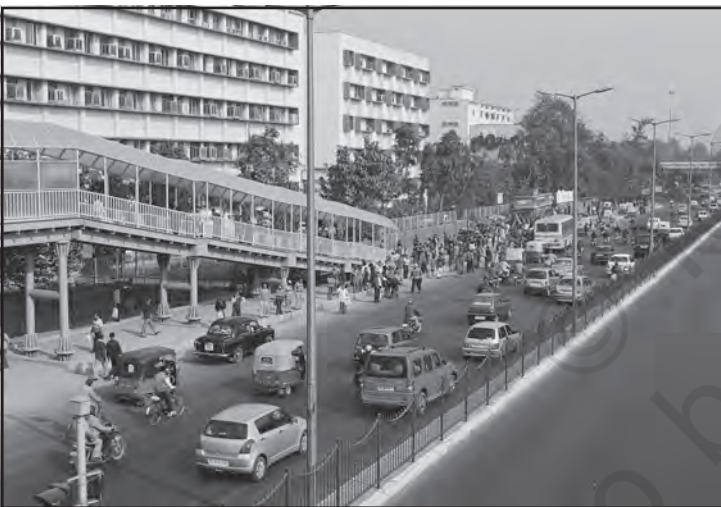


TRANSPORT AND COMMUNICATION

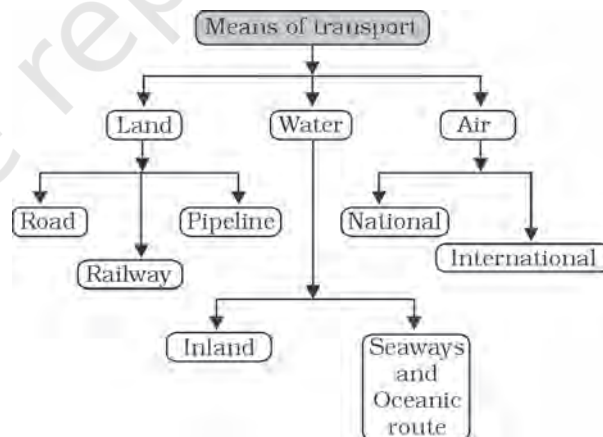


We use many items in our daily life. From tooth paste to our bed tea, milk, clothes, soaps, food items, etc. are required every day. All these can be purchased from the market. Have you ever thought as to how these items are brought from the site of production? All the production is meant for consumption. From the fields and factory, the produce is brought to the place from where consumers purchase it. It is the transportation of these items from the site of their production to the market which make them available to the consumer.

We not only use material things like fruits, vegetables, books, clothes, etc. but also use ideas, views and messages in our daily life. Do you know we exchange our views, ideas and messages from one place to another or one individual to another while communicating with the help of various means?

The use of transport and communication depends upon our need to move things from place of their availability to the place of their use. Human-beings use various methods to move goods, commodities, ideas from one place to another.

The following diagram shows the major means of transportation.



Land Transport

The pathways and unmetalled roads have been used for transportation in India since ancient times. With the economic and technological development, metalled roads and railways were developed to move large volume of goods and

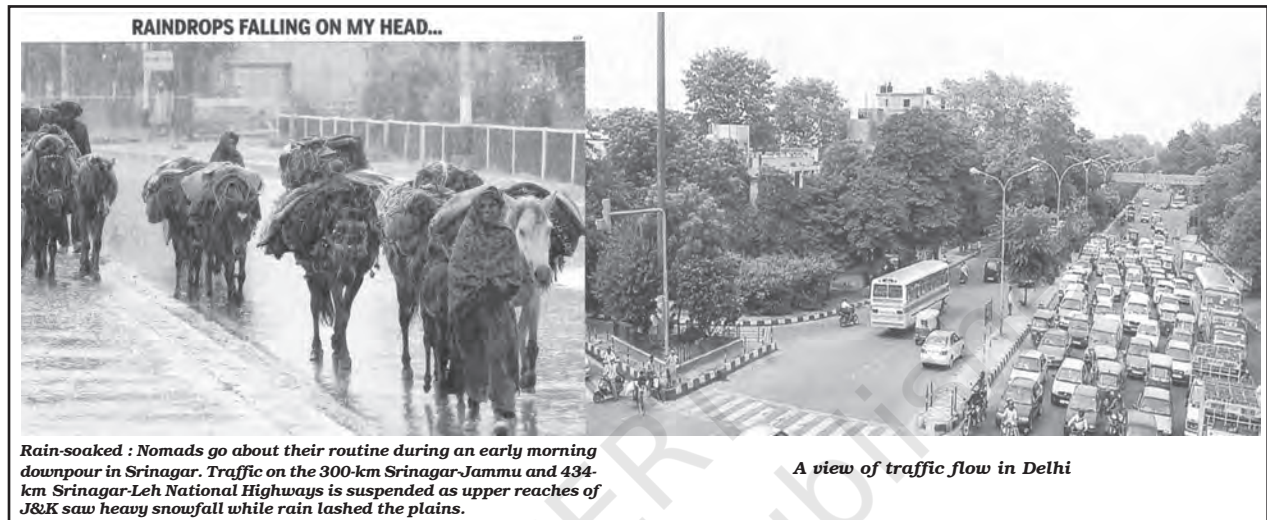
people from one place to another. Ropeways, cableways and pipelines were devised to cater to the demands of transporting specific goods under special circumstances.

Road Transport

India has one of the largest road networks in the world with a total length of 42.3 lakh km (2008-09). About 85 per cent of passenger and

(1961) was introduced to improve the conditions of roads in India. However, roads continue to concentrate in and around urban centres. Rural and remote areas had the least connectivity by road.

For the purpose of construction and maintenance, roads are classified as National Highways (NH), State Highways (SH), Major District Roads and Rural Roads.



Rain-soaked : Nomads go about their routine during an early morning downpour in Srinagar. Traffic on the 300-km Srinagar-Jammu and 434-km Srinagar-Leh National Highways is suspended as upper reaches of J&K saw heavy snowfall while rain lashed the plains.

A view of traffic flow in Delhi

Fig. 10.1

70 per cent of freight traffic are carried by roads every year. Road transport is relatively suitable for shorter distance travel.

DO YOU KNOW ?

Sher Shah Suri built the *Shahi* (Royal) road to strengthen and consolidate his empire from the Indus Valley to the Sonar Valley in Bengal. This road was renamed the Grand Trunk (GT) road during the British period, connecting Calcutta and Peshawar. At present, it extends from Amritsar to Kolkata. It is bifurcated into 2 segments : (a) National Highway (NH)-1 from Delhi to Amritsar, and (b) NH-2 from Delhi to Kolkata.

Road transport in modern sense was very limited in India before World War-II. The first serious attempt was made in 1943 when 'Nagpur Plan' was drawn. This plan could not be implemented due to lack of coordination among the princely states and British India. After Independence, twenty-year road plan

National Highways

The main roads which are constructed and maintained by the Central Government are known as the National Highways. These roads are meant for inter-state transport and movement of defence men and material in strategic areas. These also connect the state capitals, major cities, important ports, railway junctions, etc. The length of the National Highways has increased from 19,700 km in 1951 to 70,934 km in 2008-09. The National Highways constitute only 1.67 per cent of the total road length but carry 40 per cent of the road traffic. (Table 10.1)

The National Highways Authority of India (NHAI) was operationalised in 1995. It is an autonomous body under the Ministry of Surface Transport. It is entrusted with the responsibility of development, maintenance and operation of National Highways. This is also the apex body to improve the quality of the roads designated as National Highways.

Table 10.1 : Indian Road Network 2008-09

Serial No.	Road Category	Length in Km	% of total road length
1.	National Highways	70,934	1.67
2.	State Highways	154522	3.64
3.	Major District Roads	2577396	60.83
4.	Rural Roads	1433577	33.86
	Total	4236429	100

Source: Ministry of Road Transport Annual Report 2010-11.

National Highways Development Projects

NHAI has taken up some major projects in the country under different phases :

Golden Quadrilateral : It comprises construction of 5,846 km long 4/6 lane, high density traffic corridor, to connect India's four big metro cities of Delhi-Mumbai-Chennai-Kolkata. With the construction of Golden Quadrilateral, the time- distance and cost of movement among the mega cities of India will be considerably minimised.

North-South and East-West Corridors : North-South corridor aims at connecting Srinagar in Jammu and Kashmir with Kanyakumari in Tamil Nadu (including Kochchi-Salem Spur) with 4,076 km long road. The East-West Corridor has been planned to connect Silchar in Assam with the port town of Porbandar in Gujarat with 3,640 km of road length.

State Highways

These are constructed and maintained by state governments. They join the state capitals with district headquarters and other important towns. These roads are connected to the National Highways. These constitute 4 per cent of total road length in the country.

District Roads

These roads are the connecting link between District Headquarters and the other important nodes in the district. They account for 14 per cent of the total road length of the country.

Rural Roads

These roads are vital for providing links in the rural areas. About 80 per cent of the total road length in India are categorised as rural roads. There is regional variation in the density of rural road because these are influenced by the nature of the terrain?



Fig. 10.2 : Road constructed under the Pradhan Mantri Gram Sadak Yojna

Why are the rural roads' density very low in hilly, plateau and forested areas? Why does the quality of rural roads deteriorate away from the urban centres?

Other Roads

Other roads include Border Roads and International Highways. The Border Road Organisation (BRO) was established in May 1960 for accelerating economic development and strengthening defence preparedness through rapid and coordinated improvement of strategically important roads along the northern and north-eastern boundary of the



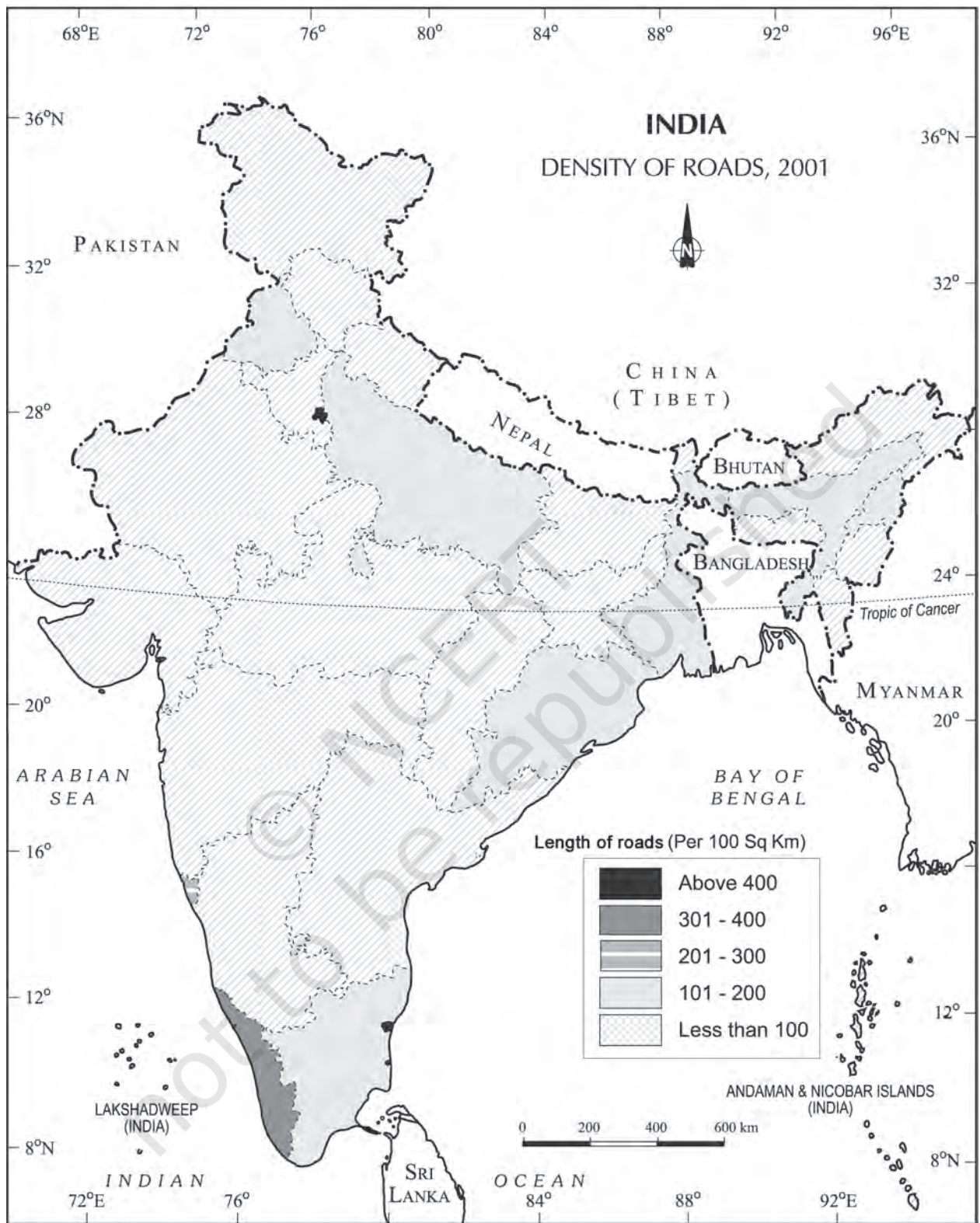


Fig. 10.3 : India – Density of Roads, 2001

country. It is a premier multifaceted construction agency. It has constructed roads in high altitude mountainous terrain joining Chandigarh with Manali (Himachal Pradesh) and Leh (Ladakh). This road runs at an average altitude of 4,270 metres above the mean sea level.



Fig. 10.4 : Khardung La Pass in Jammu & Kashmir

Apart from the construction and maintenance of roads in strategically sensitive areas, the BRO also undertakes snow clearance in high altitude areas. The international highways are meant to promote the harmonious relationship with the neighbouring countries by providing effective links with India. (Fig. 10.5 and 10.6)

The distribution of roads is not uniform in the country. Density of roads (length of roads per 100 square km of area) varies from only 12.14 km in Jammu and Kashmir to 517.77 km in Kerala with a national average of 142.68 km in 2011. The density of road is high in most of the northern states and major southern states. It is low in the Himalayan region, north-eastern region, Madhya Pradesh and Rajasthan. Why does this variation occur? Nature of terrain and the level of economic development are the main determinants of density of roads. Construction of roads is easy and cheaper in the plain areas while it is difficult and costly in hilly and plateau areas. Therefore, not only the density but also the quality of roads is relatively better in plains as compared to roads in high altitude areas, rainy and forested regions.

Activity

List the names of 10 important towns along NH-1 and NH-2.

Delhi-Lahore Bus



Fig. 10.5 : A Bus from Lahore to Delhi at Wagah Border



Fig. 10.6 : Aman Setu between Srinagar and Muzaffarabad



Which one is the longest National Highway in India?

Why have Bengaluru and Hyderabad in the South and Delhi, Kanpur and Patna in north India have emerged as important nodes?

Rail Transport

Indian railways network is one of the longest in the world. It facilitates the movement of both freight and passengers and contributes to the growth of economy. Mahatma Gandhi said, the Indian railways “brought people of diverse cultures together to contribute to India’s freedom struggle.”

Indian Railway was introduced in 1853, when a line was constructed from Bombay to Thane covering a distance of 34 km.

Indian Railways is the largest government undertaking in the country. The length of Indian Railways network is 64460 km. as on 31 March 2011. Its very large size puts lots of pressure on a centralised railway management system. Thus, in India, the railway system has been

Table 10.2 : Trends of Freight (in million tonnes) and Passengers (in millions) Handled by the Indian Railways

Commodities	1970-71	2010-11
		Provisional
Coal	47.9	268.3
Raw Material for Steel Plants	16.1	9.8
Pig Iron and Finished Steel	6.2	32.2
Iron ore	9.8	46.4
Cement	11	57.0
Food grains	15.1	52.0
Fertilisers	4.7	40.7
Petroleum	8.9	26.1
Other Goods	48.2	52.3
Total Traffic	167.9	584.7
Passengers Originating	2431	7651.1

Source : Economic Survey, Govt. of India, 2005-06, and 2011-12

divided into sixteen zones. Table 10.3 shows the zone-wise performance of Indian Railways.

Table 10.3 : Indian Railways Zone-wise income from passengers and goods (Rupees in lakhs)

Railway Zone	Headquarters	Earnings from Passengers %	Earnings from goods %	% of Total earnings
Central	Mumbai CST	13.62	8.36	10.07
Eastern	Kolkata	6.18	3.3	4.24
East Central	Hajipur	5.19	7.84	6.98
East Coast	Bhubaneswar	2.27	9.69	7.27
Northern	New Delhi	15.38	8.94	11.04
North Central	Allahabad	6.71	8.76	8.09
North Eastern	Gorakhpur	3.44	1.55	2.17
North East Frontier	Maligaon (Guwahati)	2.34	2.59	2.51
North Western	Jaipur	3.44	3.04	3.17
Southern	Chennai	8.74	3.78	5.4
South Central	Secunderabad	8.45	8.88	8.74
South Eastern	Kolkata	3.23	7.86	6.36
South East Central	Bilaspur	1.7	8.91	6.56
South Western	Hubli	3.5	2.27	2.67
Western	Mumbai (Church Gate)	12.16	7.32	8.9
West Central	Jabalpur	3.62	6.91	5.83
Total		100	100	100

Source : Statistical Abstract of India, 2004 pg. 243

DO YOU KNOW ?

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

Broad gauge: The distance between rails in broad gauge is 1.676 metre. The total length of broad gauge lines was 55188 km in 2011.

Metre gauge: The distance between rails is one metre. Its total length was 6809 km in 2011.

Narrow gauge: The distance between the rails in this case is 0.762 metre or 0.610 metre. The total length of narrow gauge was 2463 km in 2011. It is generally confined to hilly areas.

Indian Railways has launched extensive programme to convert the metre and narrow gauges to broad gauge. Moreover, steam engines have been replaced by diesel and electric engines. This step has increased the speed as well as the haulage capacity.

The replacement of steam engines run by coal has also improved the environment of the stations.

Metro rail has revolutionised the urban transport system in Kolkata and Delhi. replacement of diesel buses by CNG run vehicles along with introduction of metro is a welcome step towards controlling the air pollution in urban centres.

Konkan Railway

One of the important achievements of Indian Railways has been the construction of Konkan Railway in 1998. It is 760 km long rail route connecting Roha in Maharashtra to Mangalore in Karnataka. It is considered an engineering marvel. It crosses 146 rivers, streams, nearly 2000 bridges and 91 tunnels. Asia's largest tunnel which is nearly 6.5 km long, also lies on this route. The states of Maharashtra, Goa and Karnataka are partners in this undertaking.

Areas around towns, raw material producing areas and of plantations and other commercial crops, hill stations and cantonment towns were well-connected by railways from the British colonial era. These were mostly developed for the exploitation of resources. After the Independence of the country, railway routes have been extended to other areas too. The most significant development has been the development of Konkan Railway along the western coast providing a direct link between Mumbai and Mangaluru.

Railway continues to remain the main means of transport for the masses. Railway network is relatively less dense in the hill states, north eastern states, central parts of India and Rajasthan.

Water Transport

Waterways is an important mode of transport for both passenger and cargo traffic in India. It is the cheapest means of transport and is most suitable for carrying heavy and bulky material. It is a fuel-efficient and eco-friendly mode of transport. The water transport is of two types—(a) inland waterways, and (b) oceanic waterways.

Inland Waterways

It was the chief mode of transport before the advent of railways. It, however, faced tough competition from road and railway transport. Moreover, diversion of river water for irrigation



Fig. 10.7 : River navigation in the North-east



purposes made them non navigable in large parts of their courses. India has 14,500 km of navigable waterways, contributing about 1% to the country's transportation. It comprises rivers, canals, backwaters, creeks, etc. At present, 5,685 km of major rivers are navigable by mechanised flat bottom vessels.

For the development, maintenance and regulation of national waterways in the country, the Inland Waterways Authority was set up in 1986. The following waterways have been declared as the National Waterways by the Government (Table 10.4).

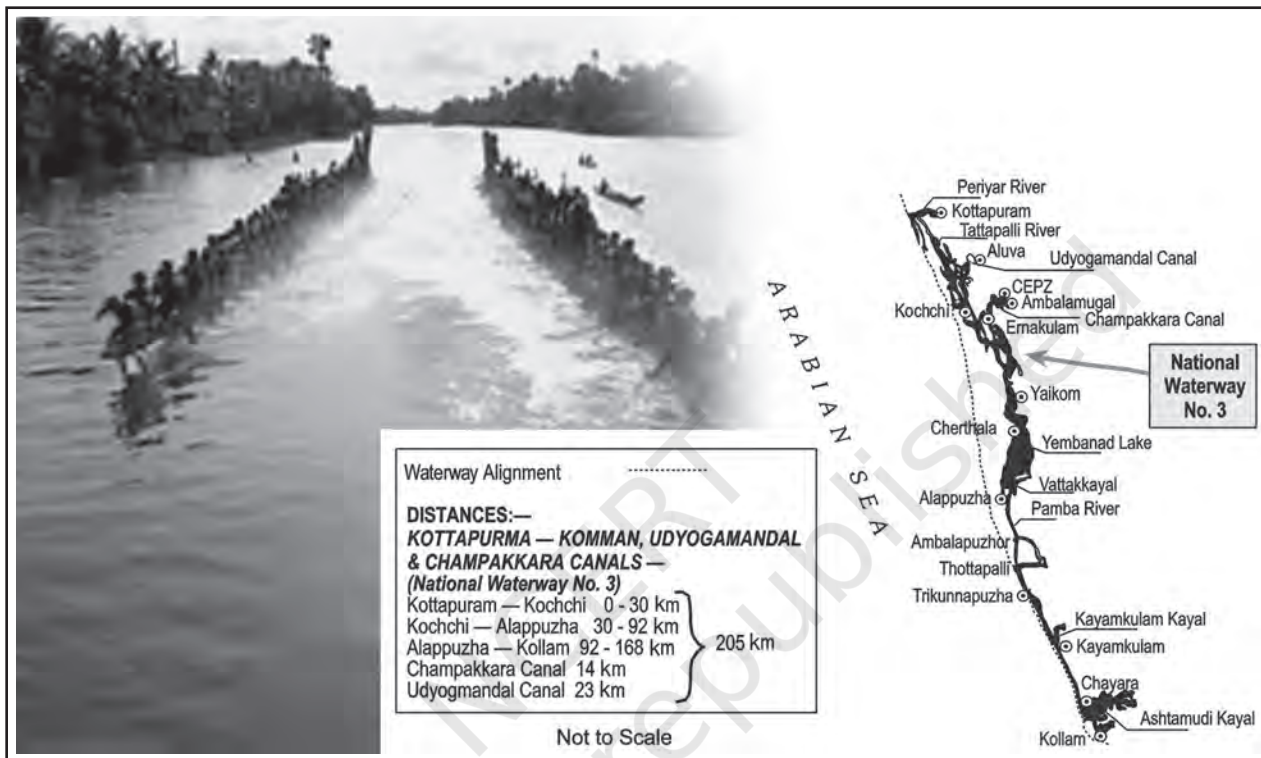


Fig. 10.8 : Natinal Waterway No.3

Table 10.4 ; National Waterways of India

Waterways	Stretch	Specification
NW 1	Allahabad-Haldia stretch (1,620 km)	It is one of the most important waterways in India, which is navigable by mechanical boats up to Patna and by ordinary boats up to Haridwar. It is divided into three parts for developmental purposes— (i) Haldia-Farakka (560 km), (ii) Farakka-Patna (460 km), (iii) Patna-Allahabad (600 km).
NW 2	Sadiya-Dhubri stretch (891 km)	Brahmaputra is navigable by steamers up to Dibrugarh (1,384 km) which is shared by India and Bangladesh
NW 3	Kottapuram-Kollam stretch (205 km)	It includes 168 km of west coast canal along with Champakara canal (23 km) and Udyogmandal canal (14 km).
NW 4	Specified stretches of Godavari and Krishna rivers along with Kakinada Puducherry stretch of canals (1078 km)	
NW 5	Specified stretches of river Brahmani along with Matai river, delta channels of Mahanadi and Brahmani rivers and East Coast canals (588km).	

Inland Waterways Authority has also identified ten other inland waterways, which could be upgraded. The backwaters (Kadal) of Kerala has special significance in Inland Waterway. Apart from providing cheap means of transport, they are also attracting large number of tourists in Kerala. The famous Nehru Trophy Boat Race (VALLAMKALI) is also held in the backwaters.

Oceanic Routes

India has a vast coastline of approximate 7,517 km, including islands. Twelve major and 185 minor ports provide infrastructural support to these routes. Oceanic routes play an important role in the transport sector of India's economy. Approximately 95 per cent of India's foreign trade by volume and 70 per cent by value moves through ocean routes. Apart from international trade, these are also used for the purpose of transportation between the islands and the rest of the country.

Air Transportation

Air transport is the fastest means of movement

from one place to the other. It has reduced distances by minimising the travel time. It is very essential for a vast country like India, where distances are large and the terrain and climatic conditions are diverse.

Air transport in India made a beginning in 1911 when airmail operation commenced over a little distance of 10 km between Allahabad and Naini. But its real development took place in post-Independent period. The Airport Authority of India is responsible for providing safe, efficient air traffic and aeronautical communication services in the Indian Air Space. The authority manages 125 airports.

The air transport in India is managed by two corporations, Air India and Indian Airlines after nationalisation. Now many private companies have also started passenger services.

Air India

Air India provides International Air Services for both passengers and cargo traffic. It connects all the continents of the world through its services.

History of Indian Airlines

1911 – Air transport in India was launched between Allahabad and Naini.

1947 – Air transport was provided by four major companies namely Indian National Airways, Tata Sons Limited, Air Services of India and Deccan Airways.

1951 – Four more companies joined the services, Bharat Airways, Himalayan Aviation Limited, Airways India and Kalinga Airlines.

1953 – Air transport was nationalised and two Corporations, Air India International and Indian Airlines were formed. Now Indian Airlines is known as 'Indian'.



The country's largest state-owned domestic carrier, Indian Airlines dropped the word 'Airlines' from its name and is known as 'Indian' w.e.f. December 8, 2005. The new brand name 'Indian' now appears on both sides of the fuselage. The logo on the orange tail depicting 'IA' has also been changed. It has been replaced by a new logo which is a partly visible blue wheel and is inspired by the Sun Temple at Konark (Odisha), symbolising timeless motion, convergence and divergence. It also embodies strength as well as trust that has stood the test of time.

In 2010, domestic movement involved 520.21 lakh passengers and about 23 lakh metric tonnes of cargo.

Pawan Hans is the helicopter service operating in hilly areas and is widely used by tourists in north-eastern sector.

In addition, Pawan Hans Limited mainly provides helicopter services to petroleum sector and for tourism.

Open Sky Policy

To help the Indian exporters and make their export more competitive, the government had introduced an Open Sky Policy for cargo in April 1992. Under this policy, foreign airlines or association of exporters can bring any freighters to the country.

Oil and Gas Pipelines

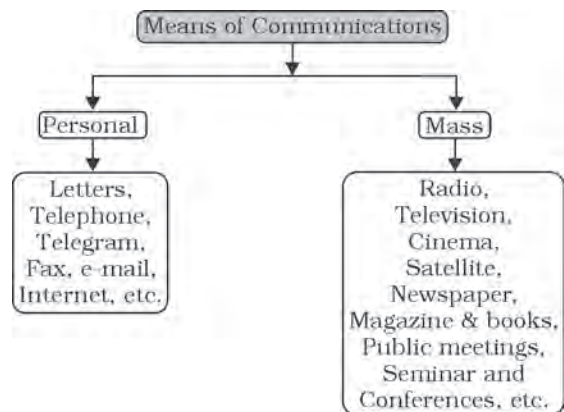
Pipelines are the most convenient and efficient mode of transporting liquids and gases over long distances. Even solids can also be transported by pipelines after converting them into slurry. Oil India Limited (OIL) under the administrative set up of the Ministry of Petroleum and Natural Gas is engaged in the exploration, production and transportation of crude oil and natural gas. It was incorporated in 1959 as a company. Asia's first cross country pipeline covering a distance of 1,157 km was

constructed by OIL from Naharkatiya oilfield in Assam to Barauni refinery in Bihar. It was further extended up to Kanpur in 1966. Another extensive network of pipelines has been constructed in the western region of India of which Ankleshwar-Koyali, Mumbai High-Koyali and Hazira-Vijaipur-Jagdishpur (HVJ) are most important. Recently, a 1256 km long pipeline connecting Salaya (Gujarat) with Mathura (U.P.) has been constructed. It supplies crude oil from Gujarat to Punjab (Jalandhar) via Mathura. OIL is in the process of constructing of 660 km long pipeline from Numaligarh to Siliguri.

Communication Networks

Human beings have evolved different methods of communication over time. In earlier times, the messages were delivered by beating the drum or hollow tree trunks, giving indications through smoke or fire or with the help of fast runners. Horses, camels, dogs, birds and other animals were also used to send messages. Initially, the means of communication were also the means of transportation. Invention of post-office, telegraph, printing press, telephone, satellite, etc has made the communication much faster and easier. Development in the field of science and technology has significantly contributed in bringing about revolution in the field of communication.

People use different modes of communication to convey the messages. On the basis of scale and quality, the mode of communication can be divided into following categories :



Personal Communication System

Among all the personal communication system internet is the most effective and advanced one. It is widely used in urban areas. It enables the user to establish direct contact through e-mail to get access to the world of knowledge and information. It is increasingly used for e-commerce and carrying out money transactions. The internet is like a huge central warehouse of data, with detailed information on various items. The network through internet and e-mail provides an efficient access to information at a comparatively low cost. It enables us with the basic facilities of direct communication. You might have noticed the proliferation of cyber cafes in urban areas.

Mass Communication System

Radio

Radio broadcasting started in India in 1923 by the Radio Club of Bombay. Since then, it gained immense popularity and changed the socio-cultural life of people. Within no time, it made a place in every household of the country. Government took this opportunity and brought this popular mode of communication under its control in 1930 under the Indian Broadcasting System. It was changed to All India Radio in 1936 and to Akashwani in 1957.

All India Radio broadcasts a variety of programmes related to information, education and entertainment. Special news bulletins are also broadcast at specific occasions like session of parliament and state legislatures.

Television (T.V.)

Television broadcasting has emerged as the most effective audio-visual medium for disseminating information and educating masses. Initially, the T.V. services were limited

only to the National Capital where it began in 1959. After 1972, several other centres became operational. In 1976, TV was delinked from All India Radio (AIR) and got a separate identity as Doordarshan (DD). After INSAT-IA (National Television-DD1) became operational, Common National Programmes (CNP) were started for the entire network and its services were extended to the backward and remote rural areas.

Satellite Communication

Satellites are mode of communication in themselves as well as they regulate the use of other means of communication. However, use of satellite in getting a continuous and synoptic view of larger area has made satellite communication very vital for the country due to the economic and strategic reasons. Satellite images can be used for the weather forecast, monitoring of natural calamities, surveillance of border areas, etc.

On the basis of configuration and purposes, satellite system in India can be grouped into two: Indian National Satellite System (INSAT) and Indian Remote Sensing Satellite System (IRS). The INSAT, which was established in 1983, is a multi-purpose satellite system for telecommunication, meteorological observation and for various other data and programmes.

The IRS satellite system became operational with the launching of IRS-IA in March 1988 from Vaikanour in Russia. India has also developed her own Launching Vehicle PSLV (Polar Satellite Launch Vehicle). These satellites collect data in several spectral bands and transmit them to the ground stations for various uses. The National Remote Sensing Centre (NRSC) at Hyderabad provides facilities for acquisition of data and its processing. These are very useful in the management of natural resources.





EXERCISES

1. Choose the right answers of the following from the given options.
 - (i) In how many zones has the Indian Railways system been divided?
 - (a) 9
 - (b) 12
 - (c) 16
 - (d) 14
 - (ii) Which one of the following is the longest highway of India?
 - (a) N.H.-1
 - (b) N.H.-6
 - (c) N.H.-7
 - (d) N.H.-8
 - (iii) On which river and between which two places does the National Water Way No. 1 lie?
 - (a) The Brahmaputra, Sadiya-Dhubri
 - (b) The Ganga, Haldia-Allahabad
 - (c) West Coast Canal, Kottapuram to Kollam
 - (iv) In which of the following year, the first radio programme was broadcast?
 - (a) 1911
 - (b) 1936
 - (c) 1927
 - (d) 1923
2. Answer the following questions in about 30 words.
 - (i) Which activity does transportation convey? Name three major modes of transportation.
 - (ii) Discuss advantages and disadvantages of pipeline transportation.
 - (iii) What do you mean by 'communication'?
 - (iv) Discuss the contribution of Air India and Indian in the air transport of India.
3. Answer the following questions in about 150 words.
 - (i) Which are the chief means of transportation in India? Discuss the factors affecting their development.
 - (ii) Give a detailed account of the development of railways in India and highlight their importance.
 - (iii) Describe the role of roads in the economic development of India.

Project

Find out the facilities that Indian Railways provide to the passengers.

