5

RAILWAYS IN INDIAN LOGISTICS

Railways are the main form of transportation of passengers and freight in India. A network of connections connects the entire country. Apart from being an imperative mode of transport, IR has been a driving force for more than 150 years. The Indian Railways started its function on16 April 1853 and it plays an main role in transportation. Trains are the most preferred made of transportation for people, and commodities can be easily transported by them. Railways also make it feasible to conduct several activities like business, pilgrimage, sightseeing along with transportation of cargoes over long distances. It has the capability to carry enormous consignments and bulky commodities for long distances. It also provides employment opportunities for a significant number of people. Railways plays a significant role in developing nations. In India railways link the economic life of the nation and accelerate the progress of agriculture and industry.

LEARNING OUTCOMES

After studying this lesson the learner:

- identifies different types of railways;
- differentiates modes of rail transport;
- explains railways in Indian economy;
- explains innovative railway methods in logistics;
- finds the significance of railways in the logistics value chain.

5.1 INTRODUCTION TO INDIAN RAILWAYS

Indian Railways refers to a Department of the Government of India, under the Ministry of Railways, tasked with operating the rail network in India. The Indian Railways, being a state monopoly on rail transport, constitutes one of the leading and busiest rail systems

in the world it transporting around six billion passengers a year. Indian Railways operates both long distance as well as suburban rail structures. In view of the rapid growth in the industrial as a whole the port sector, the State Government is glancing for strategic alternatives to enhance transport amenities. In this sector the State Government is looking for private sector collaboration as much as also foreign direct investments. It carries the largest number of passengers around 6.7 billion in a year and the leading volumes of goods (794 million tonres in the year 2007-08) between the world's major rail structures. The Government of India has concentrated on investing in railway infrastructure by creating investor-friendly policies. To enhance freight infrastructure as well as high-trains, it has moved quickly to facilitate Foreign Direct Investment (FDI). Currently, numerous domestic and foreign firms are also looking to invest in Indian rail projects.

5.1.1 Major investments and developments in India's railways sector:

- Anticipated to commence 102 semi-high-speed Vande Bharat Expresses.
- Prepared to begin 500 multi-modal goods terminals under the 'PM GatiShakti' programme.
- Modernization of infrastructure.
- Received bids from the private and public sectors to operate trains.
- Re-improvement of railway stations throughout the nation.
- Undertake electrification of Broad Gauge (BG) rail lines.
- Commissioned Wi-Fi at 6,000 railway stations.
- Signed a finance contract with European Investment Bank (EIB).
- Aimed to reduce carbon footprint.
- NHSRCL signed a contract with L&T to design and construct.
- All Non-AC sleeper coaches will be replaced by AC coaches (based on speed).

5.1.2 Government initiatives

- Some of the recent initiatives taken up by the Government are:
- India and Nepal signed an MOU for a proposed US$ 3.15 billion railway line project.

- Government sanctioned the implementation of a 235 km semi-high-speed rail corridor.
- Planned to use 4G technology to modernise communication networks in railway stations.
- Enhance the safety and security of train journeys.
- Electrification of 6,015 Route Kilometres (RKM).
- Arch closure of the Chenab bridge the world's highest railway bridge is completed.
- Identified 56 new projects in various railway zones.
- Minister of Railways dedicated 88 railway projects to the nation.
- For the redeveloping of the New Delhi railway station in competion with a public-private joint venture a 'request for qualification (RFQ)' being sent.
- Establishment of a National Rail Plan.
- A 'New Online Vendor Registration System' has been launched by the Research Designs & Standards Organisation (RDSO).

5.1.3 The Road Ahead

- The Indian Railway system is developing at a healthy rate. It is anticipated that in the next few years, the Indian railway market will be the third largest, accounting for 10% of the global market.
- The Indian Railways, one of the nation's biggest employers, can create one million jobs.
- With the potential of bringing an investment of over US$ 7.5 billion, the government has announced two key initiatives for seeking private investments- running passenger trains by private operators across the railway network and redevelopment of railway stations across the nation.
- 'Adarsh' Station Scheme has been launched to enhance railway stations. Under this scheme, 1253 stations have been identified for improvement, of which 1201 have been developed so far.
- It is also evaluating other revenue generation avenues, including: a) Modifying the composition of coaches to drive more profitable coaches, b) revenues from its digital booking IRCTC; and c) disinvesting in it.

- IR Launched the National Rail Plan, Vision 2024, to accelerate execution of significant projects, such as multitask congested paths, attain 100% electrification, enhance the speed to 160 kmph on Delhi-Howrah and Delhi-Mumbai paths, promote the pace to 130 kmph on all other golden quadrilateral-golden diagonal (GQ/GD) paths and eradicate all level crossings on the GQ/GD path, by 2024.

INTEXT QUESTIONS 5.1

1. During the year 1853, the British initially introduced railways to India _____.
2. RFQ refers to _____ .
3. The Indian Railways, being a state _____ on rail transport, constitute one of the leading and busiest rail systems in the world.
4. _____Station Scheme has been started to enhance the railway stations.

5.2 MERITS AND DEMERITS OF RAILWAYS

5.2.1 Merits

1. Dependable:

The utmost merit of the railway transport is it that is considered as the most reliable mode of transport as it is the least affected by weather conditions such as rains, fog etc. In contrast to other modes of transport.

2. Better Organised:

Rail transport is more organised than any other form of transport. It has fixed paths and schedules. Its service is more definitive, uniform and regular as compared to other modes of transport.

3. High speed over Long Distances:

When it comes to long distances, its speed is more than any other mode of transport. As a result, it is the best option for long distance traffic.

4. Appropriate for Bulky and Heavy Cargoes:

Railway transport is reasonable, fast and best suitable for carrying heavy as well as bulky cargoes over long distances.

5. Economical Transport:

It is a reasonable mode of transport because most of the working and operating costs of railways are in the nature of fixed costs. Every boost in railway traffic is followed by a decline in the average cost. Moreover, in the use of labour, it seems reasonable because in a train, one driver and one guard are adequate to carry much more consignments.

6. Safety:

Railway is the safest structure of transport. The possibility of accidents and breakdowns of railways are least as compared to other modes of transport. Furthermore, the traffic can be sheltered from the exposure to sun, rains, snow etc.

7. Better Capacity:

The carrying capability of the railways is inomence large. In addition, its capacity is elastic which can simply be improved by adding more wagons.

8. Public Welfare:

IR is considered one of the leading public undertakings in the nation. They provide out several public utility services. They charge what the traffic can bear, helping the poor. In reality, it is a national necessity.

9. Administrative Facilities of the Government:

Railways offer administrative services to the Government. The defence forces as well as the public servants derive their mobility mainly from the railways.

10. Employment Opportunities:

The railways offer greater employment opportunities for both skilled and unskilled labour. Nearly 16 lakh people rely on the railways for their livelihood.

5.2.2 Demerits

Even though railway transport has several merits, it suffers from certain serious limitations:

1. Huge Capital Outlay:

The railway is in need of large capital investment. Construction, maintenance and overhead costs are very high as compared to other modes of transport. Investments are also precise and immobile. In case the traffic is not adequate, the investments might mean a large amount of money is wasted.

2. Lack of Flexibility:

The inflexibility of rail transport is another form of demerit. The reason is, its paths and timings cannot be tuned to individual requirements.

3. Lack of Door to Door Service:

Rail transport cannot offer door to door service as it is attached to a particular track. Intermediate stuffing or destuffing involves a huge cost, more wear, tear and waste of time. The cost and time of terminal operations are a huge drawback of rail transport.

4. Monopoly:

As railways need massive capital outlay, they might provide rise to monopolies and work against public interest. Desbite government control and administration lack of competition might lead to inefficiency and high costs.

5. Not suitable for Short Distance and Small Loads:

For short distance and small cargoes traffic the railway transport is unsuitable and uneconomical.

6. Booking Formalities:

It takes more time and labour to book and deliver of cargoes through railways when compared to motor transport.

7. No Rural Service:

Railways cannot function economically in rural sectors because of enormous capital requirements and traffic; therefore, large rural sectors have no railway service even today. This creates much inconvenience for the public living in remote areas.

8. Under-utilised Capacity:

For its perfect and economic operation, the railway should have full load. As it has a very large carrying capability, when it is under-utilised, in such cases, most of the regions lead to significant financial issues and loss to the economy.

9. Centralised Administration:

Railways, being the public utility service, have a dominant position and as such there exists a centralised administration. Local authorities failto meet the personal necessities of the people as compared to roadways.

INTEXT QUESTIONS 5.2

1. Railway transport is best suitable for short distance -True / False.
2. Define the economical transport.
3. Railways cannot function economically in rural areas because of huge _____ requirements and traffic.
4. IR is considered one of the leading _____ undertakings in the nation.

5.3 DIFFERENT TYPES OF RAIL TRANSPORTATION

5.3.1 Rail transport:

Rail transport has been around since the 6th Century BC during ancient Greek times. Rail transport is ever-evolving, and accounts for a huge percentage of surface transportation. It refers to any form of transferring passengers and goods on or in wheeled vehicles running on rails, which are positioned on tracks. Rail vehicles are directed by the tracks on which they operate.

5.3.2 Types of rail transport

There are several types of rail transport, summarised below.

1. Urban rail transport

One of the overarching farms of rail transport is urban rail– transport; it can be divided into several other types of rail transport, which are all laid out in terms of specifics. The term 'Urban Rail' is utilised for various types of local rail structures which offer a passenger service in and around urban or suburban regions. This transport consists of trams, fast transport trains, light rail, monorails, cable cars, funiculars as well as commuter rail.

2. Rapid transit

The most-capable public transport trains are referred to as rapid transit. In general it is known as the subway, the metro, the tube, the underground or similar. They are electric railways which operate in and through regions which cannot be accessed by pedestrians. The London Metropolitan Railway, a conventional railway which commenced in 1863 is considered as the first rapid transit structure in the World. At present, China has the majority of rapid transit systems in the world. These are typically utilised by commuters and those travelling to cities for either leisure, education or shopping purposes. They are also used by tourists.

3. High-speed railways

When compared to other types of rail transport, high-speed railways run at significantly faster speeds. They use system of rolling stock as well as designated tracks. Furthermore there is no single pace standard that exists internationally but if a train is capable of travelling quicker than 160 mph it is considered to be an HSR. Tokaido Shinkansen Japan's 'bullet train', is very popular in the world. It began its operations in 1964. At present several nations have high-speed rail infrastructures: to name a few Russia, Italy, Denmark, UK, Italy, South Korea ,Germany and the US.

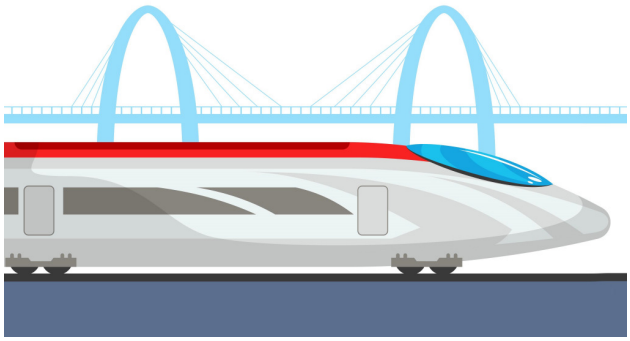

Fig. 5.1: **High-speed railways**

4. Commuter rail

Fig. 5.2: **Commuter rail**

Commuter rail is a similar structure to rapid transit trains. Commuter rail refers to rail services surrounded by metropolitan areas connecting commuters between suburbs, towns and cities As heavy rails, they run on electric or diesel. Most of the British commuter rail services share their tracks with other passenger and freight trains too.

5. Monorail

Fig. 5.3: **Monorail**

A monorail is a type of railway where the track has a singular beam. While the name spotlight refers to the type of track, the colloquially term 'monorail' is used to refer to elevated rail vehicles. These rails can be seen in zoos and theme parks such as Granby Zoo, Canada and Flamingo Land, UK. This facilitates transport inside the zoo or park, without the requirement to take up additional ground space. Even though the first monorail prototype was created in the 1820s, they didn't arrive at their intended use until the 1900s.

6. Elevated railways

The elevated railways are a farm of rail transport that moves above ground level more than at or below ground level. Mostly they are used in urban areas to evade congestion and the requirement for level crossings. The first elevated railway was built in London and Greenwich between 1836 and 1838, which was on a brick viaduct with 878 arches.

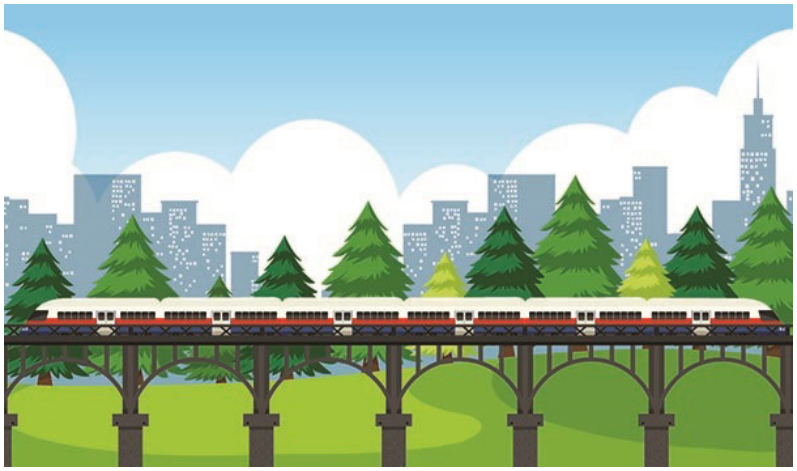

Fig. 5.4: **Elevated railways**

7. Trams and streetcars

Tram operate on tramway tracks beside the public streets on tramways. In the past, they were refered to in the past as 'electric street railways', or light rail. When compared to the main line or rapid transit, these trains are short and light. Furthermore, they mostly operate through electric power from the overhead lines, which indicates that they are not as environmentally freindly for the environment when compared to cars or buses which are frequently operated in similar road areas. In certain European cities, trams play an important role in transporting people around the main areas such as Prague, Vienna etc. In areas like San Francisco, the cable car structure which is a tram network is popular among tourists.

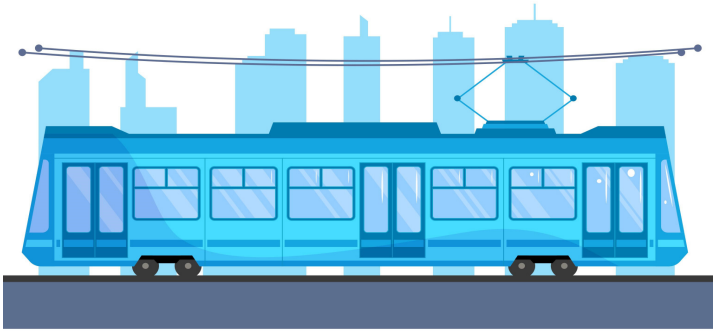

Fig. 5.5: **Trams and streetcars**

8. Funiculars

The most interesting sort of rail transport is a funicular. They are powered by cable traction, and designed exclusively for steep inclines. There exist two counterbalanced

Fig. 5.6: **Funicular**

passenger cars which travel in concert such that one rises up and the other comes back down. At present, the funiculars are mostly tourist attractions and they provide a fun way to see at new scenery when visiting a particular location. Some are used for commuting as well as for general transport also. "The Flying Dutchman" is one of the world's best funiculars in Cape point, south Africa. Besides this, there are immense funiculars to visit in nations like Switzerland, Scotland and Italy.

9. The Fell mountain railway system

The first third-rail system to be introduced ways Fell Mountain. It was for railways that were too steep to utilise just two running rails. This is becouse a third, elevated centre rail flanked by the two running rails offers extra traction and simplicity of braking. It refers to these types of trains only that one suitable for use on the fell system, since they have extra brake shoes. This system was designed and developed in the 1860s by a British engineer named John Barrowclough Fell. They initially operated this train at Cromford railway and in the High Peak Railway in Whaley Bridge, Derbyshire.

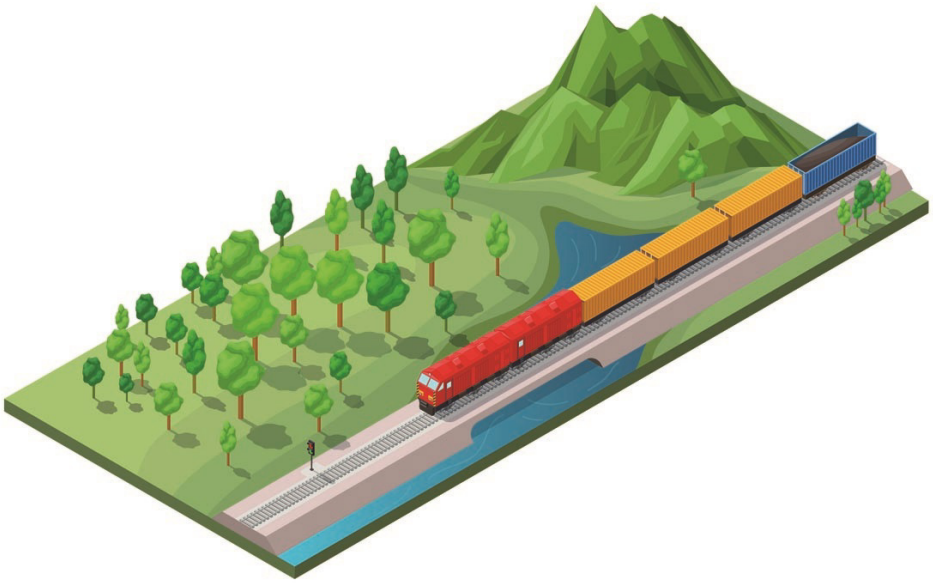

Fig. 5.7: **The fell mountain railway system**

10. Mountain railway

As the name suggests, a mountain railway is a railway which operates in a mountainous location. Whether offering transport to and from the summit or sightseeing, these mountain trains tend to utilise narrow gauge tracks owing to the tight curves created by the contours

of the mountain. They frequently use steep grade railway technology which offers an immense opportunity to glance at mountain scenery without hiking. The following nations are the home to most of the mountain railways:

- Germany
- Romania
- Switzerland
- The UK
- The US

Fig. 5.8: **Mountain railway**

11. Heritage railways

Fig. 5.9: **(a)Heritage railway**

One of the loveliest forms of rail transport is heritage railways and they are pieces of living history. Visitors learn about rail history by recreating or conserving historical railway

scenes. They are often also referred to as 'tourist railroads' and can be seen across the world. A nation like the UK is home to several beautiful heritage railways. Among the more the West Somerset Railway, Severn Valley Railway as well as the North Yorkshire Moors Railway. Countries like Canada, Slovakia, Argentina, the US and India also have several fantastic heritage railways and tourist railroads.

Fig. 5.9: **(b) Heritage railway**

As one of the first forms of rail transport in the UK,. Plate ways were introduced by John Curr. These rails were constructed with the help of cast iron, and they were utilised for around 50 years between 1780 and 1830. Plate ways one generally L-shaped rails that used to be horse-drawn. Plateways were fashionable in locations like South Wales, Gloucestershire, Surrey, Derby as well as Cornwall at the time.

12. Rack railways

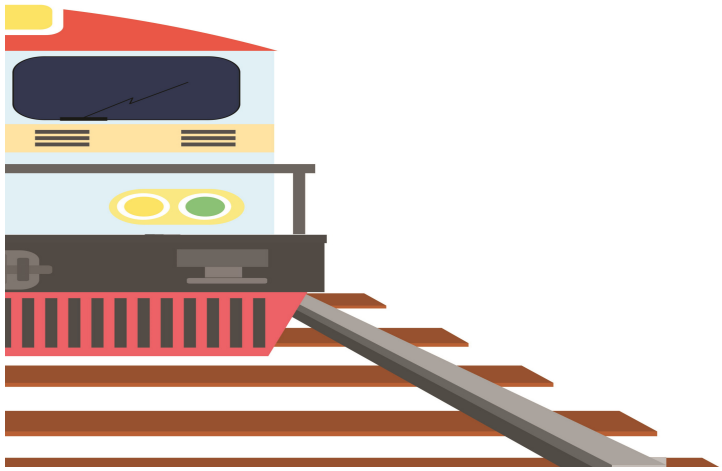

Fig. 5.10: **Rack railway**

A rack railway, also referred to as a cog railway, is a sort of steep grade railway. It normally has a toothed rack rail, and these trains are fitted with a cog that meshes with this rack rail. These mountain railways are regularly rack railways, as are a few transmit railways and tramways operated in steep urban regions. The Middleton Railway which is located in West Yorkshire, England was considered the first rack railway. It was invented, designed and patented by John Blenkinsop in 1811.The Mount Washington Cog Railway, presently operating in the US, is the first mountain rack railway which commenced its operation in 1868.

13. Wagon ways

The earliest of all forms of rail transport are the wagon ways . It is the combined term for the horses, tracks and equipment used for hauling wagons prior to introduction of the railways.

It is noteworthy that the first track structure was built on the narrow land bridge called the Isthmus of Corinth. The peloponnese was divided from mainland Greece by this inancient times. In the past, hait were transported across the Isthmus by a trakway that was 6 to 8.5 km long. The tracks were constructed by wheeled vehicles with grooves carved into limestone. This helped to prevent the wagons from getting off track as they followed a some route. Moreover, evidence of wooden rail tracks can be seen as far back as 1556, in Germany.

14. Container Train

Fig. 5.11: **Container Train**

Containerization is a structure of intermodal freight transport utilising standard shipping containers (also referred to as 'ISO containers' or 'isotainers') that can be stuffed with cargo, sealed and placed onto container trains, vessels, and trailers.

INTEXT QUESTIONS 5.3

1. The first third-rail system to be introduced is the _____.
2. The plate way was introduced by _____.
3. The high-capacity public transport trains are referred to as _____ transit.
4. The earliest of rail mode are the _____ ways.

5.4 ROLE OF RAILWAYS IN INDIAN LOGISTICS

The backbone of the nation's logistics system is the Indian Railways. A network of 68000 kms carried more then 1.2 billion tonnes of freight every years. This network touches nearly every nook and corner of the nation. Moreover they play an essential role in assisting the balanced and comprehensive socio economic growth of the nation. They used to carry all the cargoes comprising bulk commodities like Iron, Steel, Iron ore, Food grains, Fertilisers, Cement, Petroleum products and other goods carried in containers. Land transportation structures like these are considered the most eco friendly. They are dedicated to competitive charges and timely delivery of goods.

- Daily Rake Loadings - 1325
- Intents per day - 3356
- Wagons -3052531
- Locomotives -14276
- Commodities -662
- E-payment customers - 1417

This rail service focuses on competently moving bulk material between long distances over the railroads of the vast network of tracks which is running throughout India. While the rail service has to stay on the tracks, they can easily move among the rail-served buildings or yards to handle bulk freight. Their service is much different and as a result it will not be suitable for everyone, but while it is for bulk material, there will be fabulous

cost savings. In addition operating tracks off the main line to a rail-sided building is costly and time-consuming. Therefore, these circumstances can be overcome by aligning with any number of logistics firms which can offer cross docking services. This involves shifting the freight from a trailer into rail equipment. Basically, any firm that requires shifting heavy, bulk material constantly utilises the railroad network for its logistics requirements. In addition several firms also use these services for special bulk project requirements.

These projects which are special in nature can save firms around tens of thousands of dollars. However, while a firm does not play in the rail service space, they never consider the opportunity or know where to turn to obtain help.

5.4.1 Types of Equipment Used for Rail Logistics Service

There are several types of equipment the railroads use on their lines to move freight. Everyone has their own specific use, so let us glance over the types and identify what they're used for:

Table 5.1: **Types of Equipment Used for Rail Logistics Service**

S.No	Types of Equipment Used	Features
1	Automotive Racks	Designed to move automobiles, trucks, SUVs and minivans
2	Boxcars	The most common type of rail service. Designed to transport created, palletized or large bulk items, such as paper stock rolls
3	Centerbeams	Used to transport bundled building supplies. It has a centre partition that secures the product in place
4	Covered Hoppers	Designed to handle free-flowing dry bulk commodities that are loaded from the top and product is dispersed from the bottom
5	Coil Cars	Designed for coiled steel and steel plate, along with other high-grade ores

6	Flatcars	Interesting piece of equipment, in that, these are designed in a variety of lengths, tonnage capacities for various commodities that are not subject to damage from the outdoor elements
7	Gondolas	Used to transport heavy bulk materials like scrap metal, aggregates, coal, lumber and many of other similar commodities that cannot be damaged from the elements
8	Refrigerated Boxcar	Similar to boxcars, but with adjustable temp, refrigerated units can ship fresh fruits and vegetables, frozen foods and other perishable products that need to be temp controlled
9	Open Top Hoppers	These are used to ship heavy, dry bulk commodities that are not affected by the outdoor elements. The product is loaded on the top and discharged through bottom gates that dump into storage pits below
10	Tank Cars	Designed to ship liquid or compressed commodities. Think of chemical and petroleum-based products. Non-railroad companies own most of these tank cars
11	Specialised Rail Equipment	There are many specially designed rail equipment used on the railroad to move specific commodities for a particular company

INTEXT QUESTIONS 5.4

1. Define boxcars.
2. Explain the Gondolas.
3. The backbone of the nation's _____ division is Indian Railways
4. _____ cars are designed to transport liquid or compressed commodities.

5.5 ROLE OF RAILWAYS IN INDIAN ECONOMY

By integrating the markets and increasing trade, the railways play a major role in Indian economic development. They are indeed a climate-smart and competent way to transport people and freight. Railways support economic growth and also reduce greenhouse gas emissions. They are a very clean and compact way to move millions of passengers and millions of tons of cargo across nations and continents. Additionally, Indian Railways play a pivotal role in the lower and upper middle class sectors. Among the prevailing travel modes in India, IR serves as the most economical mode of transport. With a modest creation in India from 1853, the Indian Railways has come out as the main vehicle for socio-economic development of the nation. By having a workforce of over 13.6 lakhs employees, Indian railway has become a labour intensive business. Furthermore it is one of the largest employment service providers in India. In India, IR contributes exteensively to employment generation as one of the imperative objectives of development planning. Rail transportation has a number of constructive characteristics as compared to other modes of transportation. It is four times more economical and six times more energy efficient than the road. The social charges in connection with environmental damage or degradation are significantly lower in rail. Rail construction costs are around six times lower than roads at comparable levels of traffic. It is the only transport form capable of using any form.

5.5.1 Indian Railway Organisation Structure

Indian Railways is an Indian state-owned railway firm headquartered in New Delhi, India. It is operated and owned by the Government of India through the Ministry of Railways. Indian Railways has a total track of 114,500 kilometres (71,147 mi) with a route of 65,000 kilometres (40,389 mi) covering 7,500 stations. In the world railway sector, next to the United States, Russia and China, India has the world's fourth largest railway network.

5.5.2 Role of Indian Railway Contributing towards Nation's Economic Development

- Service segment plays an crucial role in the development of the Indian economy. Railway being a vital part of the service division also contributes to the nation's economic development directly and indirectly.
- Indian railways, through their forward and backward linkages, are not only generating formal employment but also creating a huge scale of informal employment.

- Competence building on existing paths will assist in carrying more and more freight, as well as increasing the passenger traffic too.
- Ratio development will be emphasized which will assist in better financing of projects in the future.
- E- Catering services in India are assisting in fueling the development of Indian Railways and in turn creating superior employment opportunities. This has appeared as a major boon for employment generation and in turn facilitates the development of the Indian economy.
- The widespread network expansion through the ***"Diamond Quadrilateral Scheme"*** will assist in movement of cargoes and decrease the lead time for trade. This huge project is aimed at generating high speed rail network in India which would link four metro cities in India i.e. Delhi, Mumbai, Kolkata as well as in Chennai. In the initial phase, separating rail corridors will be improved by using conventional technology to train speeds of 160 to 200 km/h. In the second stage, main intercity corridors will be recognized and state of the art high speed corridors will be developed up to 350 km/h by using the state ownership and public -private partnership. The main intention is to enhance at least 4 corridors of 2000 km and have at least 8 other corridors in diverse stages of advancement. the present development is focused on creating six corridors:

Table 5.2: **Seven different corridors and its route**

S. No.	Corridor	Route
1	Delhi -Kolkata	New Delhi – Aligarh – Agra – Kanpur – Lucknow – Sultanpur – Varanasi – Buxar – Gaya – Patna – Dhanbad – Asansol – Burdwan – Kolkata
2	Delhi-Mumbai	New Delhi – Gurugram – Rewari – Jaipur – Ajmer – Bhilwara – Udaipur – Himmatnagar – Ahmedabad – Anand – Vadodara – Surat – Vapi – Boisar – Virar – Thane – Mumbai
3	Mumbai -Chennai	Thane – Navi Mumbai – Lonavala – Pune – Kolhapur – Belgaum – Hubli – Davangere – Tumkur – Bangaluru – Banagarpet – Chennai

4	Kolkata -Chennai	Kolkata – Haldia – Cutttack – Bhubaneswar – Vizianagaram – Visakhapatnam – Rajahmundry – Nellore – Chennai
5	Delhi -Chennai	New Delhi – Agra – Gwalior – Guna – Bhopal – Itarsi – Betul – Nagpur – Nizamabad – Hyderabad – Vijayawada – Ongole – Chennai
6	Mumbai -Kolkata	Thane – Nashik – Aurangabad – Akola – Nagpur – Durg – Raipur – Bilaspur – Rourkela – Kharagpur – Kolkata

- The social costs in terms of environmental damage are significantly lower in rail.
- Rail construction cost are roughly six times lower than road construction changer for comparable stages of traffic.

Thus we see that Indian Railway contributes significantly to GDP through employment creation, freight collection, catering services etc. Further more the move towards e-tendering will assist in evaluatin the profitability and contribution to growth on an overall basis.

INTEXT QUESTIONS 5.5

1. Corridor of Mumbai –Kolkata.
2. Environment damage is significantly reduced in rail transport -True / false.
3. Railways support economic growth and also reduce greenhouse gas emissions.
4. The _____ scheme will facilitate the movement of cargoes and decrease the lead time for trade.

5.6 ROLE OF RAILWAYS IN LOGISTICS VALUE CHAIN

A. Logistics Value Chain

The concept of the value chain originates from a business management perspective. In every company, value chain managers look for opportunities to add value to their business. They may look for ways to cut back on shortages, prepare product strategies, and work with other related intermediaries in the chain to add value to their customers.

In the value chain process there are five steps. They offer a firm the ability to generate value beyond the cost of offering its cargoes or services to customers. In any of the five steps, a competitive edge over its competitors. The steps and activities are as follows:

Table 5.3: **Logistics Value Chain**

S. No.	Steps	Activities
1	Inbound Logistics	Receiving, warehousing, and inventory control
2	Operations	Value-creating activities that transform inputs into products, such as assembly and manufacturing
3	Outbound Logistics	Activities required to get a finished product to a customer. These include warehousing, inventory management, order fulfilment, and shipping
4	Marketing and Sales	Activities associated with getting a buyer to purchase a product
5	Service	Activities that maintain and enhance a product's value, such as customer support and warranty service

In order to facilitate and streamline the five important steps, Porter had mentioned the value chain also is in need of a series of support activities. These consist of procurement,

technology development, human resource management as well as infrastructure.

B. Supply Chain

The supply chain envolves the coordination of how and when goods are manufactured and how they are transported. The main concerns of supply chain management are the handling of materials and efficient distribution. Proper distribution chain management can decrease consumer charges and increase revenues for the manufacturer.

C. Value Chain Model

A business model that describes the complete range of activities required to generate a product or service is referred to as a value chain. To distribute maximum value for the least possible cost, a value-chain analysis aims to develop production competence. The significance of the Indian railway structure, a centuries-old form of transportation that's still chugging and remains at the heart of the distribution chain. It is a nail of the 19th century that leads to 21st century logistics via the utilisation of sophisticated systems and digital technologies.

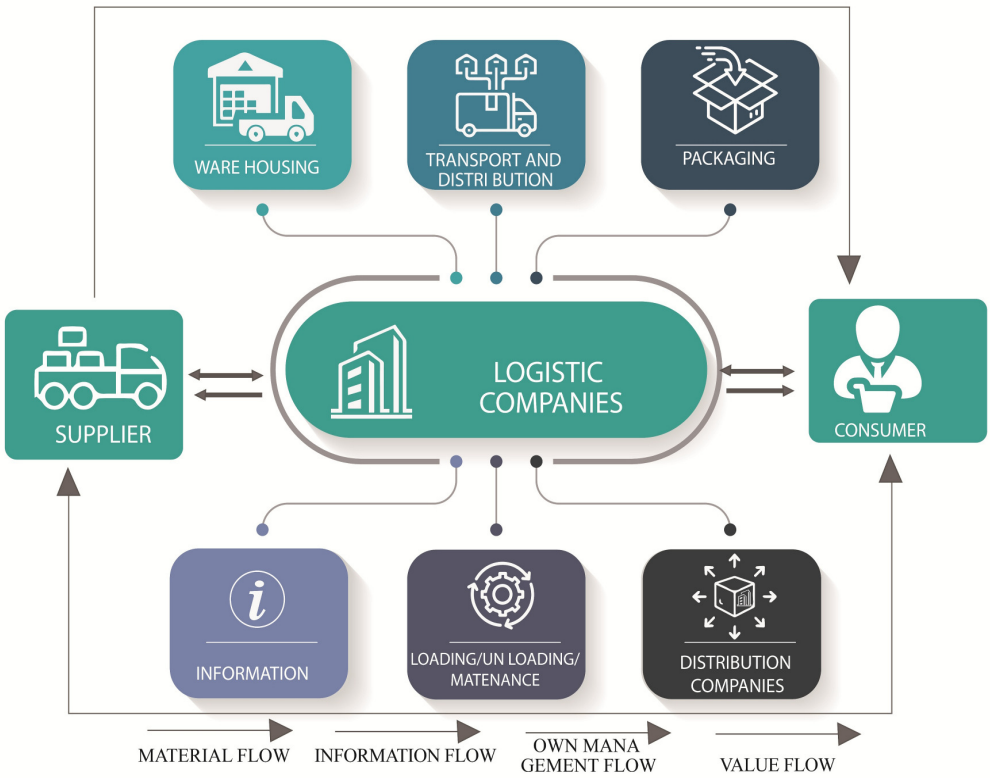

Fig. 5.12: **Value Chain Model**

Moving cargoes by rail is often much deaper, more efficient and less environmentally damaging than sending cargoes by road. As a result, several firms will continue to utilise the train mode to move cargoes for many years to come. Rail is transferring a significantly amount of freight each year, and sophisticated technologies are empowering the distribution chain to fully embrace the new precision railroading model.

Through the optimization of data-driven, superior automation, and increased acceptance of intermodal freight, consumers can continue to rely on trains to meet supply and demand. More significantly, utilising technology such as this can develop and build up production in order to assist the overcome of the following confronts and make sure that the Indian railway structure is working as smothly as possible and add value to the consumers in the following ways:

a. Visibility

b. Capacity

c. Payables

d. Technology

e. Standardisation

f. Efficiency:

a. Visibility:

At present, consumers demand end-to-end consignment visibility among all transportation forms, reports of real-time status updates and evidence of delivery.

b. Capacity:

To meet the ever-increasing capacity requirements, maintaining and growing capability with carrier partners is an absolute must.

c. Payables:

Complex payables procedures with extensive cycle times among time of service to being paid by numerous shippers can take as long as 60 to 90 days.

d. Technology:

The legacy IT structures have become a resource strain on internal teams and the manual procedures have become labour intensive.

e. Standardisation:

Working along with frequent carrier partners who have their own technology remedies and stages of maturity, necessitate a streamlined and standardised process.

f. Efficiency:

The models such as decentralised and fragmented which are used for account management and manual carrier scorecard procedures are tiring and demand better.

INTEXT QUESTIONS 5.6

1. Supply chain
2. In the value chain process there exist _____steps
3. A business model which describes the complete range of activities required to generate a product or service is referred to as a _____.
4. At present, consumers demand _____ consignment visibility among in all transportation modes.

WHAT YOU HAVE LEARNT

- Indian Railways refers to a Department of the Government of India, under the Ministry of Railways, tasked with operating the rail network in India. While the Railway Board manages the department, a cabinet Minister Railways directs the Ministry. The Indian Railways, being a state monopoly on rail transport, constitutes one of the leading and busiest rail systems in the world. It transporting around six billion passengers a year. The railways pass through the length and breadth of the nation.
- The merits of railways are 1.Dependable:, 2. Better organised, 3. High pace over long distances, 4. Appropriate for Bulky and heavy cargoes,5. Economical transport 6. Safety, 7. Better capacity 8.Public welfare 9.Administrative facilities of Government and 10. Employment opportunities.

- Rail transport has been around since the 6th Century BC during ancient Greek times. Rail transport is ever-evolving, and accounts for a huge percentage of surface transportation. It refers to any form of transferring passengers and goods on or in wheeled vehicles running on rails, which are positioned on tracks. Rail vehicles are directed by the tracks on which they operate and there are several types of rail transport.
- This rail service focuses on competently moving bulk material between great distances over the railroads of the vast network of tracks which is running throughout India. While the rail service has to stay on the tracks, they can easily move among the rail-served buildings or yards to handle bulk freight. Unlike the intermodal, the rail service is not a direct competitor to trailer load on transit or price.
- Railways play a major role in Indian economic development by integrating he markets and increasing trade. They are indeed a climate-smart and competent way to transfer people and freight. Railways support economic growth and also reduce the greenhouse gas emissions. They are a very clean and compact path to move millions of passengers and million of tons of cargoes across nations and continents
- The concept of the value chain originates from a business management outlook. In every firm the value chain managers look for opportunities to add value to their business. They may glance for paths to cut back on shortages, prepare product strategies, and work with other related intermediaries in the chain to add value to their customers.

KEY TERMS

Railways	Transit	Equipments	Value chain
Freight	Passengers	Wagons	Customer
Commodity	Logistics	Carrier	Traffic

TERMINAL EXERCISE

1. Write a note on Indian Railways
2. What do you understand by Rapid transit
3. Mention any two type of equipments used in Indian railways
4. Define Funiculars
5. Briefly explain the urban rail transport
6. Highlight the investments and developments in India's railways sector
7. Point out any two demerits of railways
8. Bring out the organisation structure of Indian railways
9. Outline the concept of logistics value chain
10. Distinguish between the mountain and heritage railways
11. Explain the different types of rail transportation
12. List out the merits of railways
13. Discuss the Role played by Railways towards Nation's Economic Development
14. Sketch the value chain model with suitable examples
15. Explain the role of Indian railways in logistics sector

ANSWER TO INTEXT QUESTIONS

5.1

1. 1853.
2. Request for Qualification.
3. Monopoly
4. Adarsh

5.2

1. True.
2. Reasonable mode of transport
3. Capital
4. Public

5.3

1. The most common type of rail service which is designed to transport crated, palletized or large bulk items, such as paper stock rolls
2. Used to transport heavy bulk materials like scrap metal, aggregates, coal, lumber and many of other similar commodities that cannot be damaged from the elements
3. Rapid
4. Wagon

5.4

1. The most common type of rail service. Designed to transport created, palletized or large bulk items, such as paper stock rolls.
2. Used to transport heavy bulk materials like scrap metal, aggregates, coal, lumber and many other similar commodities that cannot be damaged from the elements.
3. Logistics
4. Tank

5.5

1 Thane – Nashik – Aurangabad – Akola – Nagpur – Durg – Raipur – Bilaspur – Rourkela – Kharagpur – Kolkata

2. True
3. Greenhouse gas
4. Diamond Quadrilateral

5.6

1. The supply chain engages with the coordination of how and when the goods are manufactured and how they are transported
2. Five
3. Value chain
4. End-to-end

DO AND LEARN

Learners can undertake their activity work in the areas of Railways / CONCOR / CFS / Railway Intermediary organisations.