

IASBABA



[GEOGRAPHY VALUE ADD SET 4 – BLOCK 3-PART 3]

Integrated Learning Programme 2018 is a step towards 'Enabling a person located at the most remote destination a chance at cracking AIR 1 in UPSC/IAS'

CONTENTS

Industries

Classification of Industries

1. Based on Raw Material
2. Based on Ownership
3. Based on Size

Factors responsible for location of Industries

Major Industrial Regions of India

World Industrial Regions

Industrial Disasters

Important Industries

1. Automotive Industry
2. Cement Industry
3. Engineering Industry in India
4. Pharmaceuticals
5. Textile Industry
6. Steel Industry

Transportation in India

Roadways

Indian Railways

- High-speed rail
- India's Frontier Railways
- Metro
- Government initiatives

Aviation in India

- Government Initiatives

Ports and Waterways in India

- Ports

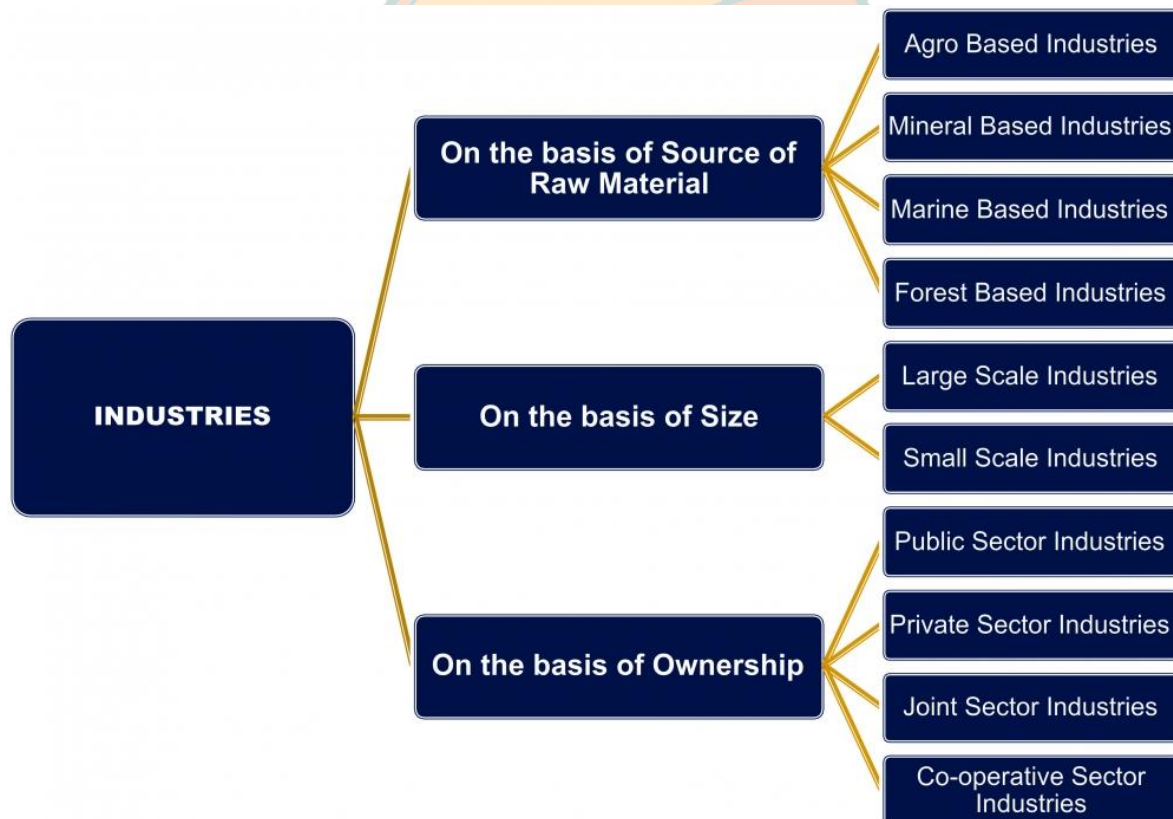
Inland Waterways

Industries

An industry is a manufacturing unit which converts raw materials into usable goods. (Goods can be classified as final goods or Capital goods. This will be covered in detail in Economics). This is called the Secondary sector of economy.

An industry is at the heart of a country's economy; it includes manufacturing of goods, extraction of metals and provision of services. All the products available for use in the market are finished products, and are the result of some industry.

Classification of Industries:



Classification

An industry can be classified on the basis of raw material, size and ownership

Based on Raw Material

Any material that we get from our natural surroundings to be used by an industry is called **raw material**. Plant- and animal-based products are used as raw material in food processing, vegetable oil, cotton textile, dairy and leather products, which are all examples of agro-based industries.

There is another type of industry that is based on the produce derived from forests. This is known as forest-based industry, and is responsible for producing paper, pharmaceuticals, furniture, equipment and buildings.

Based in Ownership

Industries are classified on the basis of **ownership** as well, i.e. privately owned, cooperative or state-owned. Privately owned industry means it is owned by an individual or a group like the Tata group. State-owned or public sector, means they are owned and operated by the government like Bharat Heavy Electricals Limited (BHEL).

A partnership between the state and an individual or a group is called the joint sector like Maharashtra Scooters Limited, which is a partnership between the Government of Maharashtra and the Bajaj Group.

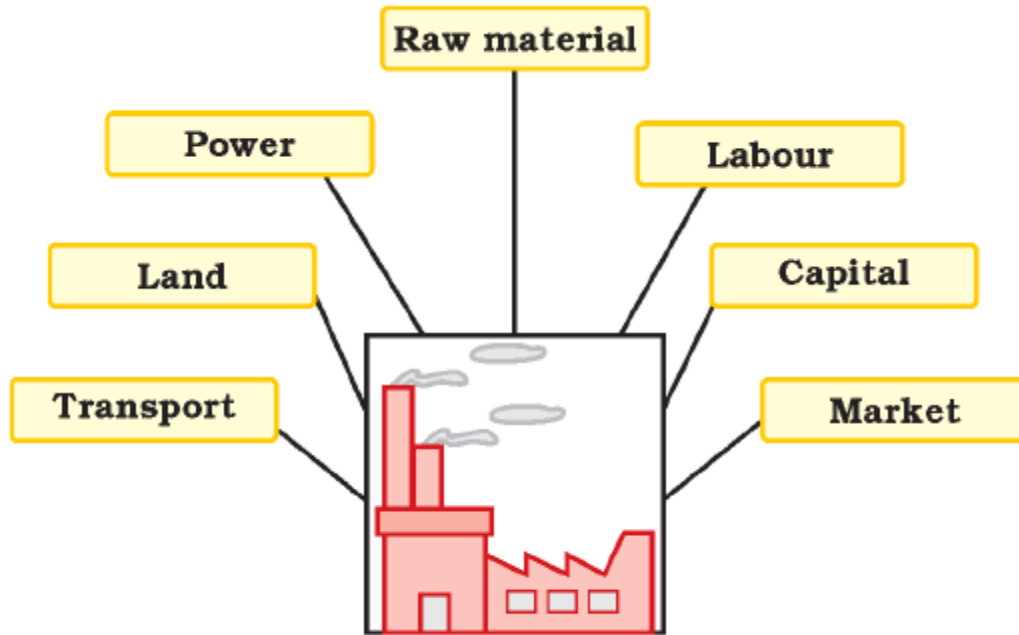
The cooperative sector was formed to play a major role in the advancement of agriculture and related industries. In this sector, the state facilitates the producers, suppliers and even workers to own the enterprise like the Amul Dairy.

Based on Size

Industries are classified as **large-scale or small-scale** depending, on the amount of capital invested, the number of people employed and the volume of production.

A small-scale industry needs a lesser amount of capital and technology inputs. A large-scale industry has automated production, and is capital- and manpower-intensive, requires heavy investment in plant and machinery.

Factors responsible for location of Industries:



Locational factors for industries

According to a geographical theory, the location of an industry is largely influenced the transportation cost of raw materials and finished product.

If an industry is a **weight losing** industry, i.e. the net weight of product is less than the net weight of raw material, then the industry is **located near the raw materials**. Eg. Iron and steel industry, glass industry etc.

If there is no loss or gain in the net weight of raw material and product, then the industry can be placed anywhere between raw material and market. Other factors become more important.

Eg. Cotton, leather etc.

If an industry is **weight gaining industry**, i.e. the net weight of final product increases, then the industry is **located near the market**. Eg. Automobile, heavy machinery etc.

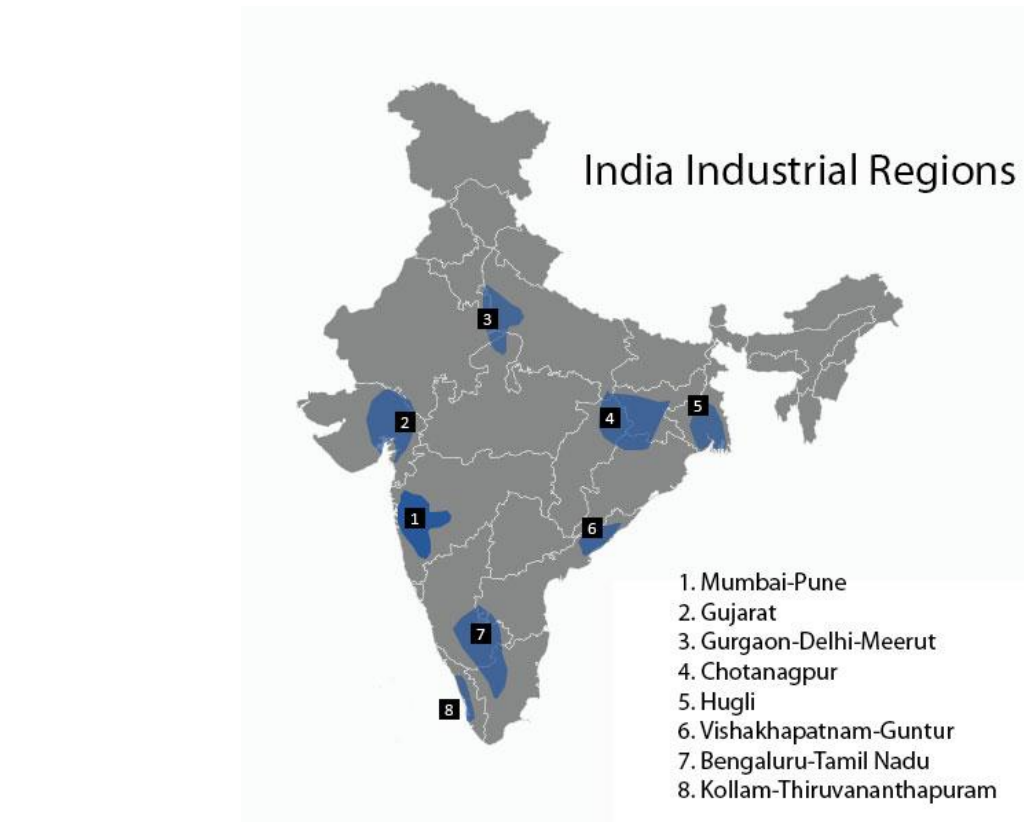
Industries are usually located in temperate areas, sea ports and coal mines. When many industries are located close by, the place becomes known as an industrial region.

This is the reason why a government provides incentives like subsidised power, low transport cost and infrastructure to industries located in the backward regions of the country.

The three steps involved in an industrial cycle are: **Input, Processes and Output.**

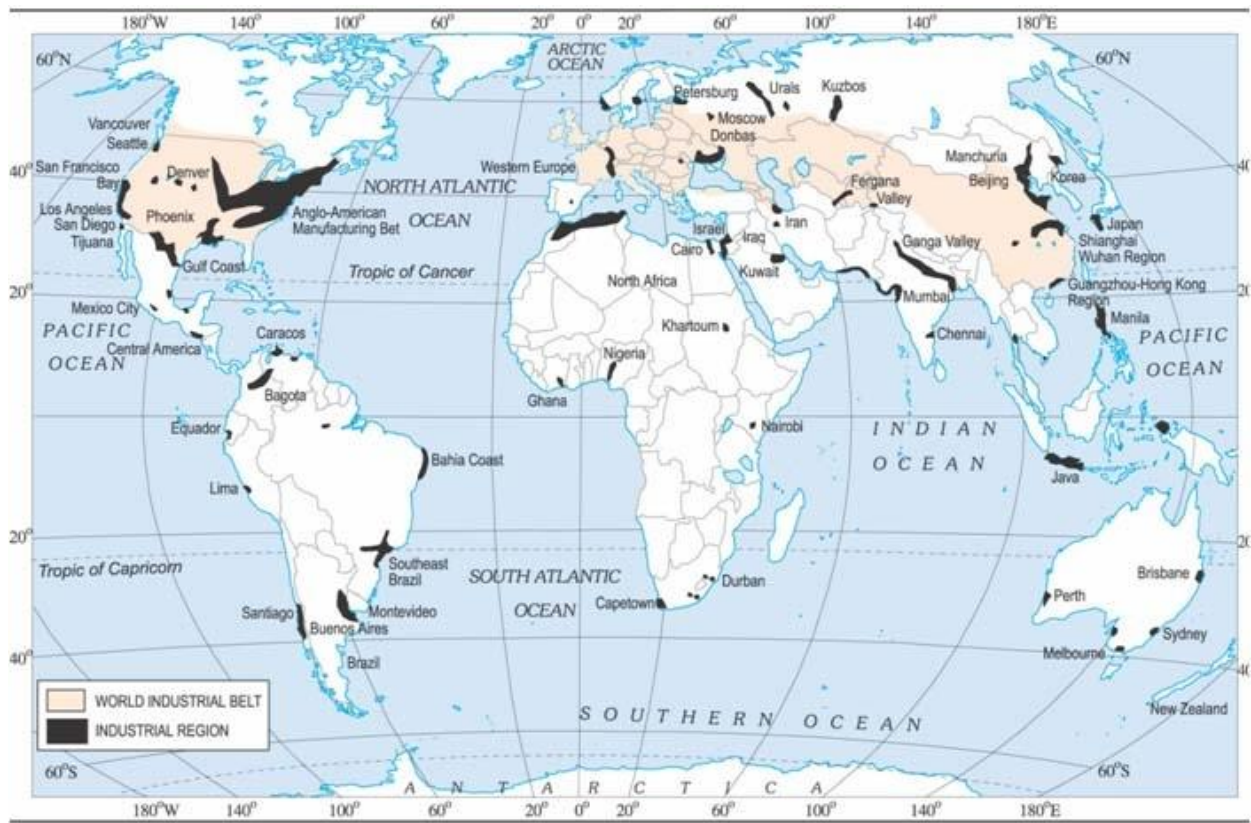
The first step is putting together the inputs, like raw material, labour, cost of land, transport, power and other infrastructure. The second step is the process, which includes a wide range of activities that convert the raw material into finished goods like ginning, spinning, weaving, dyeing and printing. The final step is the finished product or the output that we use.

Major Industrial Regions of India:



The major industrial regions in India are the Mumbai-Pune region, Bangalore–Tamil Nadu region, Hugli region, Ahmadabad–Baroda region, Chhota Nagpur industrial region, Vishakhapatnam–Guntur belt and the Kollam–Thiruvananthapuram industrial belt.

World Industrial Regions:



Industrial Disasters:

Industrial workers are sometimes required to work in a dangerous environment. Any lapse in the regular maintenance of technical equipment or irresponsible handling of hazardous material may lead to accidents.

There are some risk reduction measures, which, if followed, can prevent large-scale disasters like:

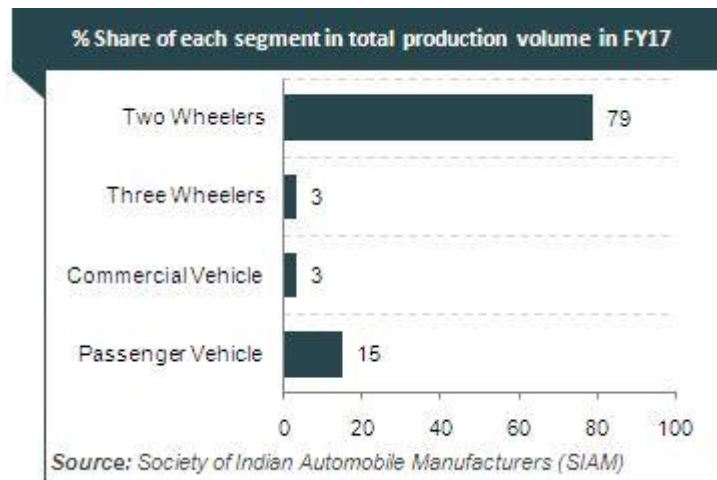
- Industrial areas should be on the outskirts of a city or town, or located far away from residential areas.
- People in the vicinity of the industrial area should be aware of the hazardous materials handled in these industries and their effects on humans in case of an accident.
- Improvement in the fire warning systems, fire fighting systems and in pollution dispersion qualities and limiting toxic storage capacity within these industries will reduce the risk of a large-scale disaster considerably.

Some of the important Industries in India's perspective are:

Automotive Industry

The Indian auto industry is one of the largest in the world. The industry accounts for 7.1 per cent of the country's Gross Domestic Product (GDP). The Two Wheelers segment with 80 per cent market share is the leader of the Indian Automobile market owing to a growing middle class and a young population. Moreover, the growing interest of the companies in exploring the rural markets further aided the growth of the sector. The overall Passenger Vehicle (PV) segment has 14 per cent market share.

India is also a prominent auto exporter and has strong export growth expectations for the near future. In April-March 2017 exports of PV and Commercial Vehicles (CV) registered a growth of 16.20 per cent and 4.99 per cent respectively, over April-March 2016. In addition, several initiatives by the Government of India and the major automobile players in the Indian market are expected to make India a leader in the 2W and Four Wheeler (4W) market in the world by 2020.



Government Initiatives

The Government of India encourages foreign investment in the automobile sector and allows 100 per cent FDI under the automatic route.

Some of the major initiatives taken by the Government of India are

- Government is planning to introduce biofuel vehicles for road and water transportation. India needs to cut fossil fuel imports and look for alternative and cheaper fuels like methanol.
- Government of India extended support to the industry by increasing custom duty on CBUs of commercial vehicles from 10 per cent to 40 per cent and reducing duty on chassis for ambulance manufacturing from 24 per cent to 12.5 per cent.
- The Government of India plans to introduce a new Green Urban Transport Scheme with a central assistance of about Rs 25,000 crore (US\$ 3.75 billion), aimed at boosting the growth of urban transport along low carbon path for substantial reduction in pollution, and providing a framework for funding urban mobility projects at National, State and City level with minimum recourse to budgetary support by encouraging innovative financing of projects.
- Government of India aims to make automobiles manufacturing the main driver of 'Make in India' initiative, as it expects passenger vehicles market to triple to 9.4 million units by 2026, as highlighted in the Auto Mission Plan (AMP) 2016-26.
- The government has formulated a Scheme for Faster Adoption and Manufacturing of Electric and Hybrid Vehicles in India, under the National Electric Mobility Mission 2020 to encourage the progressive induction of reliable, affordable and efficient electric and hybrid vehicles in the country.

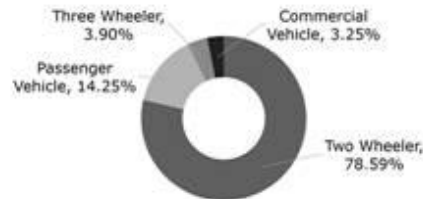


AUTOMOBILES



Sector Snapshot –Automobiles

Market share by volume (FY16)



Key Policy Initiatives

FDI Policy 2016-2020	Government of India heavily promotes foreign investment in the automobile industry by allowing 100 per cent FDI, under automatic route. The industry is delicensed & allows free import of automotive components. Also, the Indian government does not lay down any minimum investment criteria for this industry.
Automotive Mission Plan	The Automotive Mission Plan 2016-26 (AMP 2026) targets a fourfold growth in the automotive industry.
Make in India	The government aims to develop India as a global manufacturing as well as R&D hub

Key Points

The passenger vehicle sales grew by 14.68 per cent in April 2017 to reach 277,000 units, from 242,000 in April 2016

Commercial vehicle sales expanded by 4.16 per cent in FY17

Between April 2000 to March 2017, Indian automobile industry attracted foreign direct investment (FDI) of around **USD16.67 billion**

Sector Advantages

Passenger vehicle Production



Road Ahead

The automobile industry is supported by various factors such as availability of skilled labour at low cost, robust R&D centres and low cost steel production. The industry also provides great opportunities for investment and direct and indirect employment to skilled and unskilled labour.

The Indian automotive aftermarket is estimated to grow at around 10-15 per cent to reach US\$ 16.5 billion by 2021 from around US\$ 7 billion in 2016. It has the potential to generate up to US\$ 300 billion in annual revenue by 2026, create 65 million additional jobs and contribute over 12 per cent to India's Gross Domestic Product.

Cement Industry



India is the second largest producer of cement in the world. No wonder, India's cement industry is a vital part of its economy, providing employment to more than a million people, directly or indirectly. Ever since it was deregulated in 1982, the Indian cement industry has attracted huge investments, both from Indian as well as foreign investors.

India has a lot of potential for development in the infrastructure and construction sector and the cement sector is expected to largely benefit from it. Some of the recent major government initiatives such as development of 98 smart cities are expected to provide a major boost to the sector.

A significant factor which aids the growth of this sector is the ready availability of the raw materials for making cement, such as limestone and coal.

Government Initiatives

In the 12th Five Year Plan, the Government of India plans to increase investment in infrastructure to the tune of US\$ 1 trillion and increase the industry's capacity to 150 MT.

The Cement Corporation of India (CCI) was incorporated by the Government of India in 1965 to achieve self-sufficiency in cement production in the country. Currently, CCI has 10 units spread over eight states in India.

In order to help the private sector companies thrive in the industry, the government has been approving their investment schemes. Some such initiatives by the government in the recent past are as follows:

- The State Government of Chattisgarh has auctioned one block of Limestone (Kesla II) in Raipur District having estimated reserves of 215 million tonnes valued at Rs 10,367 crore (US\$ 1.61 billion), and would earn a cumulative revenue of Rs 11,894 crore (US\$ 1.85 billion) to State Government over the lease period.
- The Union Budget proposed to assign infrastructure status to affordable housing projects and facilitate higher investments and better credit facilities, in line with the government's aim to provide housing for all by 2022 which will boost cement demand.
- The Finance Minister, Arun Jaitley, said that the National Housing Bank will refinance individual housing loans of about Rs 20,000 crore (US\$ 3 billion) in 2017-18. The Finance Minister proposed to complete 1 crore houses by 2019. All these developments are expected to boost cement demand.
- The increased allocation to rural low-cost housing under Pradhan Mantri Awaas Yojana-Gramin scheme to Rs 23,000 crore (US\$ 3.45 billion) from Rs 16,000 crore (US\$ 2.4 billion) in FY17 is likely to drive a 2 per cent increase in cement demand, Ambit Capital said in a report.

Road Ahead

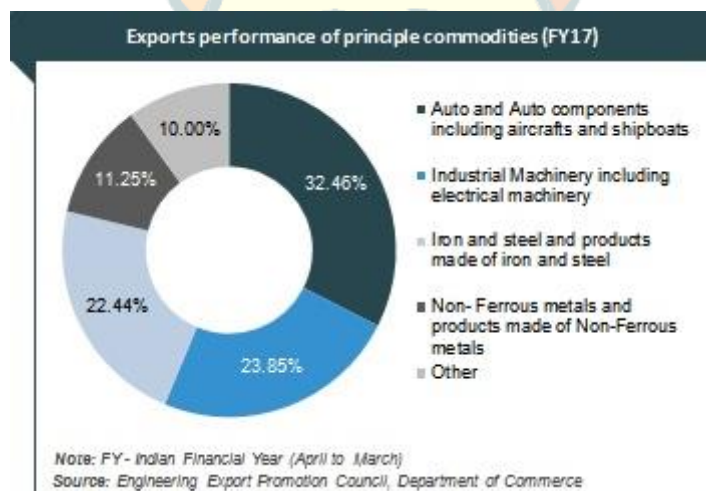
The eastern states of India are likely to be the newer and virgin markets for cement companies and could contribute to their bottom line in future. In the next 10 years, India could become the main exporter of clinker and gray cement to the Middle East, Africa, and other developing nations of the world. Cement plants near the ports, for instance the plants in Gujarat and Visakhapatnam, will have an added advantage for exports and will logistically be well armed to face stiff competition from cement plants in the interior of the country.

Due to the increasing demand in various sectors such as housing, commercial construction and industrial construction, cement industry is expected to reach 550-600 Million Tonnes Per Annum (MTPA) by the year 2025.

Engineering Industry in India

The Indian Engineering sector has witnessed a remarkable growth over the last few years driven by increased investments in infrastructure and industrial production. The engineering sector, being closely associated with the manufacturing and infrastructure sectors, is of strategic importance to India's economy.

India on its quest to become a global superpower has made significant strides towards the development of its engineering sector. The Government of India has appointed the Engineering Export Promotion Council (EEPC) as the apex body in charge of promotion of engineering goods, products and services from India. India exports transport equipment, capital goods, other machinery/equipment and light engineering products such as castings, forgings and fasteners to various countries of the world. The Indian semiconductor industry offers high growth potential areas as the industries which source semiconductors as inputs are themselves witnessing high demand.



Government Initiatives

The Indian engineering sector is of strategic importance to the economy owing to its intense integration with other industry segments. The sector has been de-licensed and enjoys 100 per cent FDI. With the aim to boost the manufacturing sector, the government has relaxed the excise duties on factory gate tax, capital goods, consumer durables and vehicles.

- In the Union Budget 2017-18, the Government of India increased the allocation for incentive schemes like the Modified Special Incentive Package Scheme (M-SIPS) and the Electronic Development Fund (EDF) to Rs 745 crore (US\$ 111 million) for providing a boost to the semiconductor as well as the electronics manufacturing industry.

- The Union Cabinet has approved incentives up to Rs 10,000 crore (US\$ 1.47 billion) for investors by amending the M-SIPS scheme, in order to further incentivise investments in electronics sector, create employment opportunities and reduce dependence on imports by 2020.
- The Ministry of Electronics and Information Technology plans to revise its policy framework, which would involve the government taking a more active role in developing the sector by providing initial capital, with the aim to attract more private players and make India a global semiconductor hub.
- The Government of India is planning to merge 6 engineering consulting Public Sector Units (PSUs) to create a mega consultancy firm that can take up projects across sectors and compete with the likes of Bechtel of the US and domestic majors like Larsen & Toubro (L&T).

Pharmaceuticals



The Indian pharmaceuticals market is the third largest in terms of volume and thirteenth largest in terms of value, and it accounts for 20 per cent in the volume terms and 1.4 per cent in value terms of the Global Pharmaceutical Industry as per a report by Equity Master. India is the largest provider of generic drugs globally with the Indian generics accounting for 20 per cent of global exports in terms of volume. Of late, consolidation has become an important characteristic of the Indian pharmaceutical market as the industry is highly fragmented.

India enjoys an important position in the global pharmaceuticals sector. The country also has a large pool of scientists and engineers who have the potential to steer the industry ahead to an

even higher level. Presently over 80 per cent of the antiretroviral drugs used globally to combat AIDS (Acquired Immuno Deficiency Syndrome) are supplied by Indian pharmaceutical firms.

Government Initiatives

Some of the initiatives taken by the government to promote the pharmaceutical sector in India are as follows:

- In the Union Budget 2017-18, the Department of Biotechnology (DBT) received Rs 2,222.11 crore (US\$ 333.31 million), an increase of 22 per cent, to continue implementing the department's national biotech strategy.
- In an attempt to revive the active pharmaceutical ingredient (API) and bulk drug market in India, the Government of India has proposed peak customs duty on the import of APIs and also plans to set up mega drug parks to give a boost to domestic production.
- The Government of India unveiled 'Pharma Vision 2020' aimed at making India a global leader in end-to-end drug manufacture. Approval time for new facilities has been reduced to boost investments.
- The government introduced mechanisms such as the Drug Price Control Order and the National Pharmaceutical Pricing Authority to deal with the issue of affordability and availability of medicines.
- Mr Ananth Kumar, Union Minister of Chemicals and Petrochemicals, has announced setting up of chemical hubs across the country, early environment clearances in existing clusters, adequate infrastructure, and establishment of a Central Institute of Chemical Engineering and Technology.

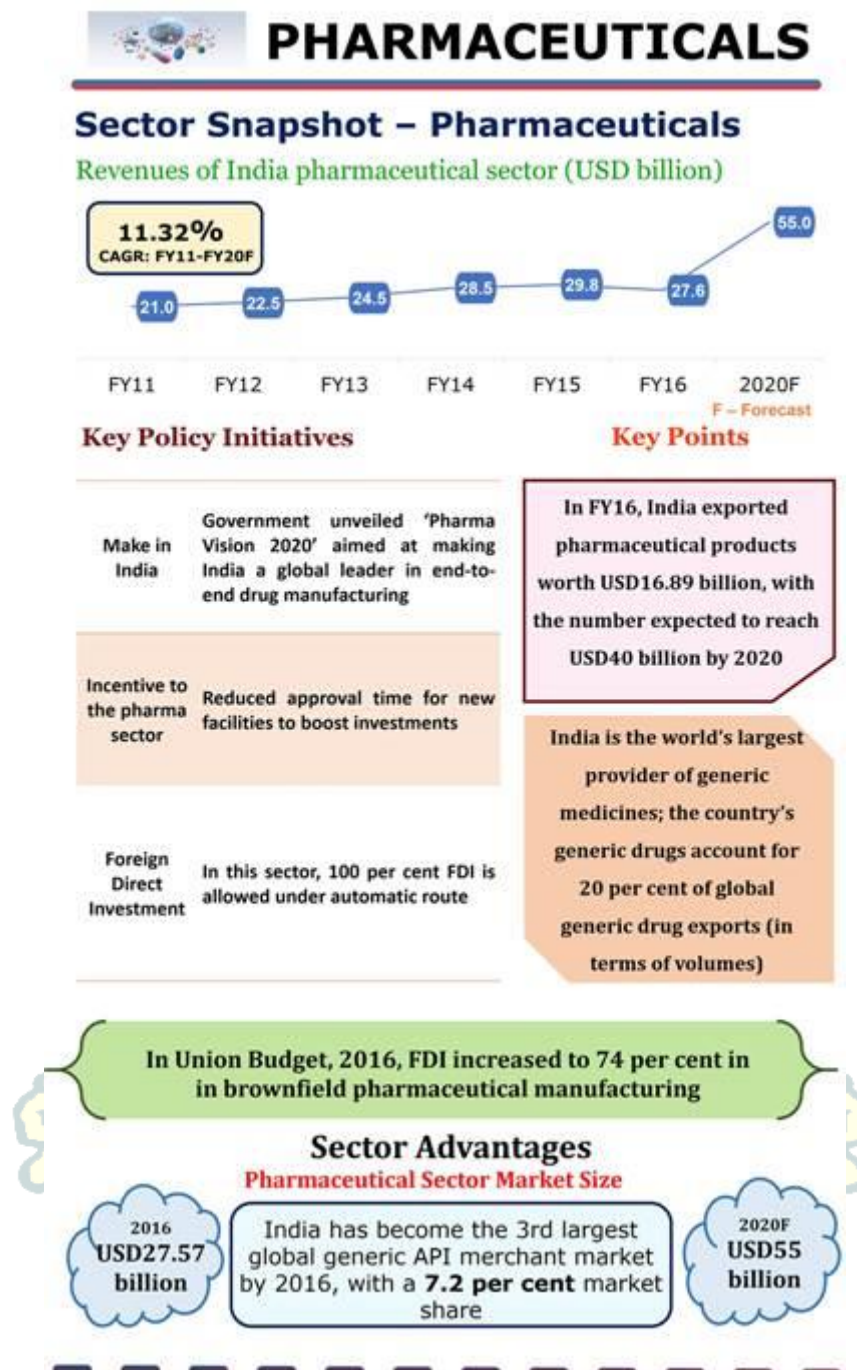
Road Ahead

The Indian pharmaceutical market size is expected to grow to US\$ 100 billion by 2025, driven by increasing consumer spending, rapid urbanisation, and raising healthcare insurance among others.

Going forward, better growth in domestic sales would also depend on the ability of companies to align their product portfolio towards chronic therapies for diseases such as cardiovascular, anti-diabetes, anti-depressants and anti-cancers that are on the rise.

The Indian government has taken many steps to reduce costs and bring down healthcare expenses. Speedy introduction of generic drugs into the market has remained in focus and is expected to benefit the Indian pharmaceutical companies. In addition, the thrust on rural

health programmes, lifesaving drugs and preventive vaccines also augurs well for the pharmaceutical companies.

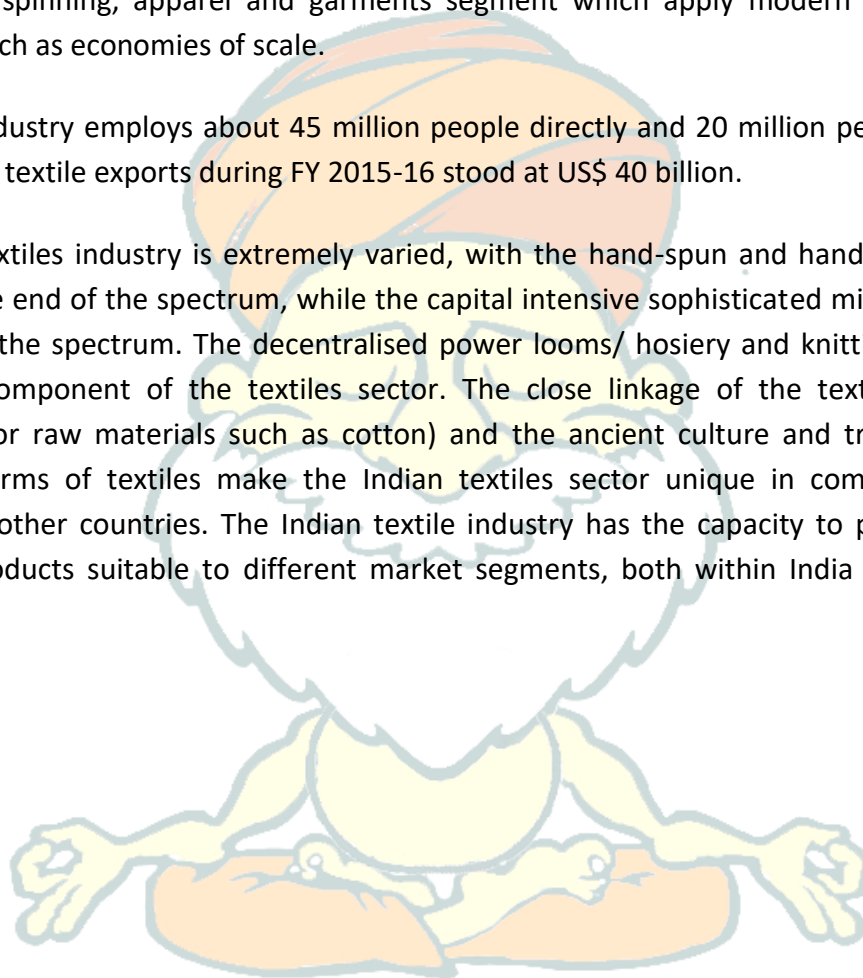


Textile Industry

India's textiles sector is one of the oldest industries in Indian economy dating back several centuries. Even today, textiles sector is one of the largest contributors to India's exports with approximately 13 per cent of total exports. The textiles industry is also labour intensive and is one of the largest employers. The textile industry has two broad segments. First, the unorganised sector consists of handloom, handicrafts and sericulture, which are operated on a small scale and through traditional tools and methods. The second is the organised sector consisting of spinning, apparel and garments segment which apply modern machinery and techniques such as economies of scale.

The textile industry employs about 45 million people directly and 20 million people indirectly. India's overall textile exports during FY 2015-16 stood at US\$ 40 billion.

The Indian textiles industry is extremely varied, with the hand-spun and hand-woven textiles sectors at one end of the spectrum, while the capital intensive sophisticated mills sector at the other end of the spectrum. The decentralised power looms/ hosiery and knitting sector form the largest component of the textiles sector. The close linkage of the textile industry to agriculture (for raw materials such as cotton) and the ancient culture and traditions of the country in terms of textiles make the Indian textiles sector unique in comparison to the industries of other countries. The Indian textile industry has the capacity to produce a wide variety of products suitable to different market segments, both within India and across the world.



TEXTILE & APPAREL



Sector Snapshot – Textile & Apparel Industry

India's textile market size (USD billion)



Key Policy Initiatives

Foreign Direct Investment	FDI of up to 100% is allowed in the textile sector through the automatic route
Integrated Parks	Under Union Budget 2016-17, the government has allocated USD7.43 million for setting up integrated parks in India
Technical textile industry	Government has planned an increase in outlay for technical textiles industry to more than USD117 million during the 12th Five Year Plan
Amended Technology Upgradation Fund Scheme	USD0.23 billion has been allocated for Amended Technology Upgradation Funds Scheme for FY16-17, under Union Budget 2016-17

Key Points

In India, sales of khadi products increased at a YoY of 33 per cent, to reach USD298.23 million in 2016-17 from USD224.6 million in 2015-16

As of November 2016, the Central Board of Excise & Customs has extended draw back facility for textiles industries from 7.3 per cent to 7.5 per cent

FDI inflows in textiles sector, inclusive of dyed & printed textile, stood at USD2.47 billion from April 2000 to March 2017

Sector Advantages

Revenue of Textile & Apparel Industry

2016
USD 137
billion

Production of yarn grew to 5664.04 million Kgs in FY17 from 4712 million Kgs in FY11, implying a CAGR of 3.11 per cent

2023F
USD 280
billion

Government Initiatives

The Indian government has come up with a number of export promotion policies for the textiles sector. It has also allowed 100 per cent FDI in the Indian textiles sector under the automatic route.

Initiative will be taken into consideration by Government of India.

- The Government has planned to connect as many as 5 crore (50 million) village women to charkha (spinning wheel) in next 5 years with a view to provide them employment and promote khadi and also, they inaugurated 60 khadi outlets which were renovated and re-launched during the completion of KVIC's 60th anniversary and a khadi outlet.
- The Textiles Ministry will organise 'Hastkala Sahyog Shivirs' in 421 handloom-handicrafts clusters across the country which will benefit over 1.2 lakh weavers and artisans.
- The Gujarat government's decision to extend its textile policy by a year is set. It is believed to attract Rs 5,000 crore (US\$ 50 billion) of more investment in sectors across the value chain. The government estimates addition till now of a million units of spindle capacity in the spinning sector and setting up of over 1,000 units in technical textiles.

The key initiatives announced in the Union Budget 2017-18 to boost the textiles sector are listed below:

- Encourage new entrepreneurs to invest in sectors such as knitwear by increasing allocation of funds to Mudra Bank from Rs 1,36,000 crore (US\$ 20.4 billion) to Rs 2,44,000 crore (US\$ 36.6 billion).
- Upgrade labour skills by allocating Rs 2,200 crore (US\$ 330 million)

Some of initiatives taken by the government to further promote the industry are as under:

- The Government of India plans to introduce a mega package for the powerloom sector, which will include social welfare schemes, insurance cover, cluster development, and upgradation of obsolete looms, along with tax benefits and marketing support, which is expected to improve the status of power loom weavers in the country.
- The Ministry of Textiles has signed memorandum of understanding (MoU) with 20 e-commerce companies, aimed at providing a platform to artisans and weavers in different handloom and handicraft clusters across the country for selling their products directly to the consumer.
- Memorandum of Understanding (MoU) worth Rs 8,835 crore (US\$ 1.3 billion) in areas such as textile parks, textile processing, machinery, carpet development and others, were signed during the Vibrant Gujarat 2017 Summit.
- The Union Minister for Textiles inaugurated Meghalaya's first-ever apparel and garment making centre to create employment opportunities in the region. The Union Minister for Textiles also mentioned Meghalaya has been sanctioned Rs 32 crore (US\$ 4.8 million) for promotion of handlooms.
- The Government of India has announced a slew of labour-friendly reforms aimed at generating around 11.1 million jobs in apparel and made-ups sectors, and increasing

textile exports to US\$ 32.8 billion and investment of Rs 80,630 crore (US\$ 12.09 billion) in the next three years.

Road Ahead

The future for the Indian textile industry looks promising, buoyed by both strong domestic consumption as well as export demand. With consumerism and disposable income on the rise, the retail sector has experienced a rapid growth in the past decade with the entry of several international players like Marks & Spencer, Guess and Next into the Indian market. The apparel market in India is estimated to grow at a Compound Annual Growth Rate (CAGR) of 11.8 per cent to reach US\$ 180 billion by 2025.

High economic growth has resulted in higher disposable income. This has led to rise in demand for products creating a huge domestic market. The domestic market for apparel and lifestyle products, currently estimated at US\$ 85 billion, is expected to reach US\$ 160 billion by 2025.

The Indian cotton textile industry is expected to showcase a stable growth in FY2017-18, supported by stable input prices, healthy capacity utilisation and steady domestic demand.

Steel Industry



India was the world's third-largest steel producer in 2016. The growth in the Indian steel sector has been driven by domestic availability of raw materials such as iron ore and cost-effective labour. Consequently, the steel sector has been a major contributor to India's manufacturing output.

The Indian steel industry is very modern with state-of-the-art steel mills. It has always strived for continuous modernisation and up-gradation of older plants and higher energy efficiency levels.

Indian steel industries are classified into three categories such as major producers, main producers and secondary producers.

Government Initiatives

Some of the other recent government initiatives in this sector are as follows:

- Steel demand is set to rise in the coming period owing to increased public sector spending by the Government of India.
- The Union Cabinet, Government of India has approved the National Steel Policy (NSP) 2017, as it seeks to create a globally competitive steel industry in India. NSP 2017 targets 300 million tonnes (MT) steel-making capacity and 160 kgs per capita steel consumption by 2030.
- Metal Scrap Trade Corporation (MSTC) Limited and the Ministry of Steel have jointly launched an e-platform called 'MSTC Metal Mandi' under the 'Digital India' initiative, which will facilitate sale of finished and semi-finished steel products.
- The Ministry of Steel is facilitating setting up of an industry driven Steel Research and Technology Mission of India (SRTMI) in association with the public and private sector steel companies to spearhead research and development activities in the iron and steel industry at an initial corpus of Rs 200 crore (US\$ 30 million).

Road ahead

India is expected to overtake Japan to become the world's second largest steel producer soon, and aims to achieve 300 million tonnes of annual steel production by 2025-30.

India is expected to become the second largest steel producer in the world by 2018, based on increased capacity addition in anticipation of upcoming demand, and the new steel policy, that has been approved by the Union Cabinet in May 2017, is expected to boost India's steel production. Huge scope for growth is offered by India's comparatively low per capita steel consumption and the expected rise in consumption due to increased infrastructure construction and the thriving automobile and railways sectors.

Transportation in India

Transport in India consists of transport by land, water, and air. Public transport remains the primary mode of transport for most Indian citizens, and India's public transport systems are among the most heavily used in the world.

Motor vehicle population in India is low as per international standards, with only 24.85 million cars on the nation's roads as of 2013. In total, about 21 per cent households have two wheelers whereas only 4.7 per cent of households in India have cars/jeeps/vans as per the 2011 Census. Despite this, the number of deaths caused by traffic is amongst the highest in the world and increasing. The automobile industry in India is currently rapidly growing with an annual production of over 4.6 million vehicles, with an annual growth rate of 10.5% and vehicle volume is expected to rise greatly in the future.

India's rail network is the 3rd longest and the most heavily used system in the world, transporting 8.225 billion passengers and over 970 million tonnes of freight annually, as of 2015. The railways transport about 18 million citizens daily.

In 2015–16, Government of India, declared 6 *National Waterways* (NW) under Inland Waterways Authority of India to reduce the cost of transportation and lower the carbon footprint by moving the traffic from surface roads and railroads to waterways.

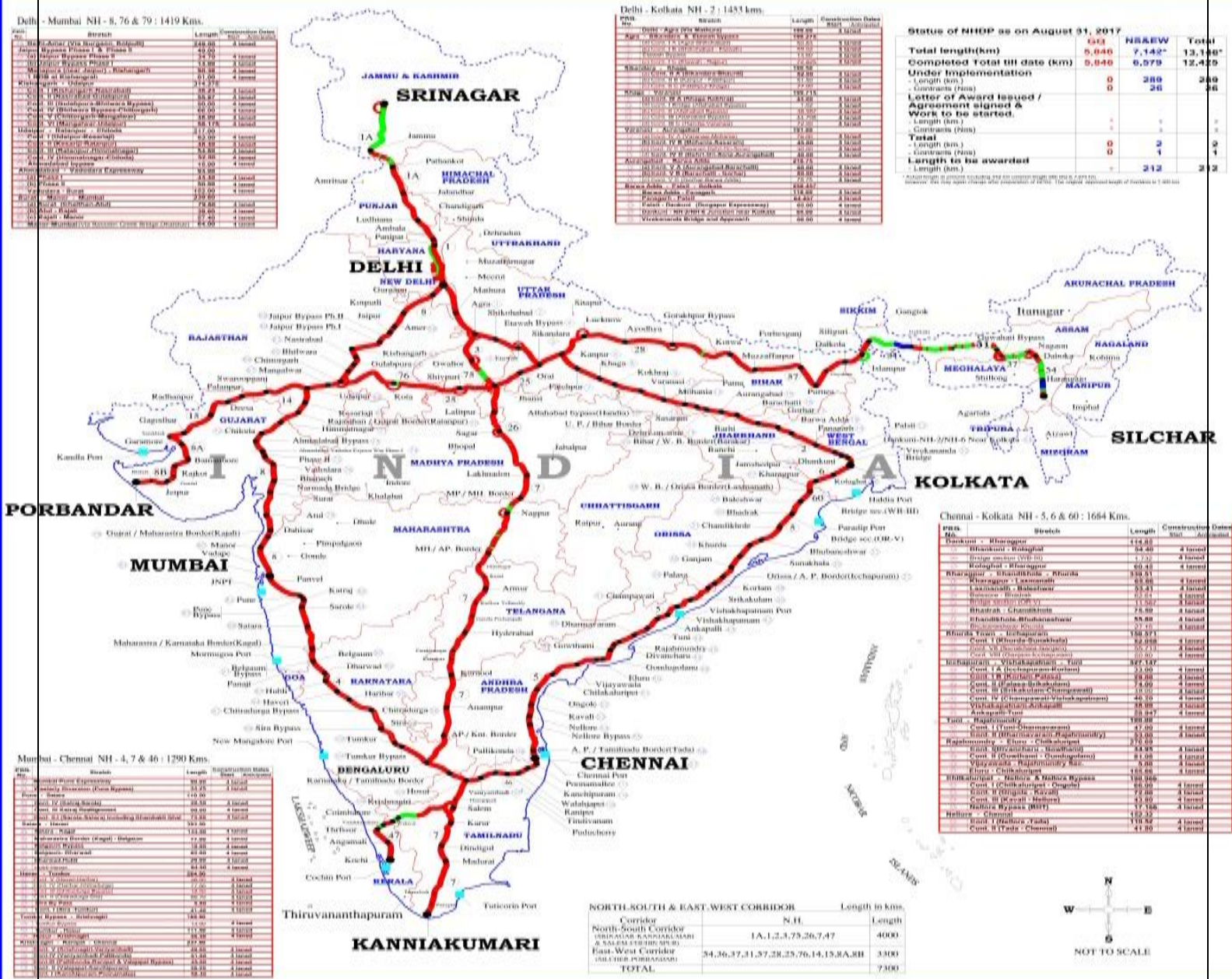
Despite ongoing improvements in the transport sector, several aspects of transportation are still riddled with problems due to outdated infrastructure and lack of investment in less economically active parts of the country. The demand for transport infrastructure and services has been rising by around 10% a year with the current infrastructure being unable to meet these growing demands.

Roadways

As per 2013 estimates, the total road length in India is 4,689,842 km (2,914,133 mi); making the Indian road network the second largest road network in the world after the United States. At 0.66 km of highway per square kilometre of land the density of India's highway network is higher than that of the United States (0.65) and far higher than that of China's (0.16) or Brazil's (0.20).

NATIONAL HIGHWAYS DEVELOPMENT PROJECT

Status as on August 31, 2017



NOTE

- 1- Based upon Survey of India map with the permission of the Surveyor General of India.
- 2- The responsibility for the correctness of internal details rests with the publisher.
- 3- The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line.
- 4- The external boundaries and coastline of India agree with the Record/Master Copy as certified by Survey of India.
- 5- Certified for Publication by Survey of India vide letter no. dt 407 162-AA/ra/cenr - XXX Dated 13/3/2003

C. Government of India

Prepared By: Information Technology & Planning Division NHAI

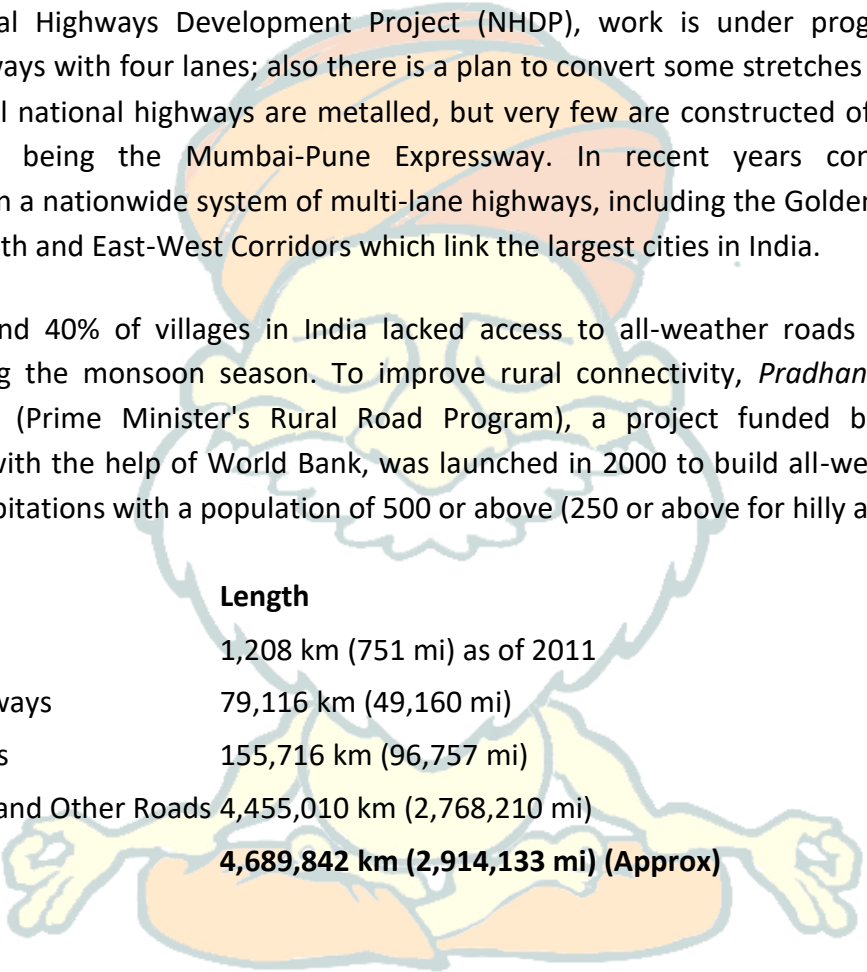
Image Reference- [Click Here](#)

India has a network of National Highways connecting all the major cities and state capitals, forming the economic backbone of the country. As of 2013, India has a total of 70,934 km (44,076 mi) of National Highways, of which 1,208 km (751 mi) are classified as expressways.

As per the National Highways Authority of India, about 65% of freight and 80% passenger traffic is carried by the roads. The National Highways carry about 40% of total road traffic, though only about 2% of the road network is covered by these roads. Average growth of the number of vehicles has been around 10.16% per annum over recent years.

Under National Highways Development Project (NHDP), work is under progress to equip national highways with four lanes; also there is a plan to convert some stretches of these roads to six lanes. All national highways are metalled, but very few are constructed of concrete, the most notable being the Mumbai-Pune Expressway. In recent years construction has commenced on a nationwide system of multi-lane highways, including the Golden Quadrilateral and North-South and East-West Corridors which link the largest cities in India.

In 2000, around 40% of villages in India lacked access to all-weather roads and remained isolated during the monsoon season. To improve rural connectivity, *Pradhan Mantri Gram Sadak Yojana* (Prime Minister's Rural Road Program), a project funded by the Central Government with the help of World Bank, was launched in 2000 to build all-weather roads to connect all habitations with a population of 500 or above (250 or above for hilly areas).



Type of Road	Length
Expressways	1,208 km (751 mi) as of 2011
National Highways	79,116 km (49,160 mi)
State Highways	155,716 km (96,757 mi)
District, Rural and Other Roads	4,455,010 km (2,768,210 mi)
Total Length	4,689,842 km (2,914,133 mi) (Approx)

India has the second largest road network across the world at 5.4 million km. This road network transports more than 60 per cent of all goods in the country and 85 per cent of India's total passenger traffic. Road transportation has gradually increased over the years with the improvement in connectivity between cities, towns and villages in the country.

The Indian roads carry almost 90 per cent of the country's passenger traffic and around 65 per cent of its freight. In India sales of automobiles and movement of freight by roads is growing at a rapid rate. Cognizant of the need to create an adequate road network to cater to the

increased traffic and movement of goods, Government of India has set earmarked 20 per cent of the investment of US\$ 1 trillion reserved for infrastructure during the 12th Five-Year Plan (2012–17) to develop the country's roads.



Government Initiatives

In the Union Budget 2017-18, the Government of India has allotted Rs 64,000 crore (US\$ 9.55 billion) to NHAI for roads and highways and Rs 27,000 crore (US\$ 4.03 billion) for PMGSY.

Some of the recent developments are as follows

- Road projects worth Rs 34,000 crore (US\$ 5.32 billion) are being undertaken by the central government to decongest the road network connecting the National Capital Territory of Delhi. *
- The Ministry of Road Transport and Highways, Government of India, invested Rs 14,916 crore (US\$ 2.32 billion) for the Special Accelerated Road Development Programme for North East (SARDP-NE) and Rs 4,095 crore (US\$ 635.6 million) for the National Highway

(Original) over the past two years to improve the road infrastructure in India's north eastern region.

- The Cabinet Committee on Economic Affairs, Government of India, has approved the development of 19 kms long four laning from Pandoh Bypass end to Takoli section of National Highway (NH) -21 in Himachal Pradesh, which is estimated to cost Rs 2,775.93 crore (US\$ 430.27 million).
- The Road Transport & Highways Ministry has invested around Rs 3.17 trillion (US\$ 47.55 billion), while the Shipping Ministry has invested around Rs 80,000 crore (US\$ 12.0 billion) in the past two and a half years for building world class highways and shipping infrastructure in the country.

Road Ahead

The government, through a series of initiatives, is working on policies to attract significant investor interest. The Indian government plans to develop a total of 66,117 km of roads under different programmes such as National Highways Development Project (NHDP), Special Accelerated Road Development Programme in North East (SARDP-NE) and Left Wing Extremism (LWE). The government has identified development of 2,000 km of coastal roads to improve the connectivity between ports and remote villages.

The National Highways Authority of India (NHAI) plans to build 50,000 km of roads worth US\$ 250 billion by 2022 as part of a long-term goal of doubling the length of the national highway network to 200,000 km.

Indian Railways



The Indian Railways is among the world's largest rail networks. The Indian Railways network is spread over 115,000 km, with 12,617 passenger trains and 7,421 freight trains each day from 7,172 stations plying 23 million travellers and 3 million tonnes (MT) of freight daily. India's railway network is recognised as one of the largest railway systems in the world under single management.

The railway network is also ideal for long-distance travel and movement of bulk commodities, apart from being an energy efficient and economic mode of conveyance and transport.

The Government of India has focused on investing on railway infrastructure by making investor-friendly policies. It has moved quickly to enable Foreign Direct Investment (FDI) in railways to improve infrastructure for freight and high-speed trains. At present, several domestic and foreign companies are also looking to invest in Indian rail projects.

High-speed rail



Gatimaan Express

India does not have any railways classified as high-speed rail (HSR), which have operational speeds in excess of 200 km/h (120 mph). The fastest train in India is the Gatimaan Express with a top speed of 160 km/h (99 mph), which runs between Delhi and Agra.

Prior to the 2014 general election, the two major national parties (Bharatiya Janata Party and Indian National Congress (INC)) pledged to introduce high-speed rail. The INC pledged to connect all of India's million-plus cities by high-speed rail, whereas BJP, which won the election,

promised to build the Diamond Quadrilateral project, which would connect the cities of Chennai, Delhi, Kolkata, and Mumbai via high-speed rail. This project was approved as a priority for the new government in the incoming prime minister's speech. Construction of one kilometer of high speed railway track will cost ₹100 crore (US\$16 million) – ₹140 crore (US\$22 million) which is 10-14 times higher than the construction of standard railway.

India's Prime Minister approved the choice of Japan to build India's first high-speed railway. The planned rail would run some 500 km (310 mi) between Mumbai and the western city of Ahmedabad, at a top speed of 320 km/h (200 mph). Under the proposal, construction is expected to begin in 2017 and be completed in 2023. It would cost about ₹980 billion (US\$15 billion) and be financed by a low-interest loan from Japan. India will use the wheel-based 300 km/hr HSR technology, instead of new maglev 600 km/hr technology of the Japan used in Chūō Shinkansen. India is expected to have its HSR line operational from 2025 onwards, once the safety checks are completed.

India's Frontier Railways



Samjhauta Express between India and Pakistan

Rail links between India and neighbouring countries are not well-developed. Two trains operate to Pakistan—the *Samjhauta Express* between Delhi and Lahore, and the *Thar Express* between Jodhpur and Karachi. Bangladesh is connected by a biweekly train, the *Maitree Express* that runs from Kolkata to Dhaka. Two rail links to Nepal exist—passenger services between Jaynagar and Bijalpura, and freight services between Raxaul and Birganj.

Metro

The first modern rapid transit in India is the Kolkata Metro and started its operations in 1984, this is also the 17th Zone of the IR. The Delhi Metro in New Delhi is India's second conventional

metro and began operations in 2002. The Namma Metro in Bangalore is India's third operational rapid transit and began operations in 2011.

The operational systems are Kolkata Metro, Delhi Metro, Namma Metro, Rapid MetroRail Gurgaon, Mumbai Metro, Jaipur Metro, Chennai Metro, Kochi Metro and Lucknow Metro.

The planned systems are Noida Metro, Ghaziabad Metro, Navi Mumbai Metro, Hyderabad Metro, Nagpur Metro, Metro-Link Express for Gandhinagar and Ahmedabad, Varanasi Metro, Kanpur Metro, Pune Metro, Vijayawada Metro, Patna Metro, Meerut Metro, Guwahati Metro, Chandigarh Metro, Bhopal Metro, Kozhikode Light Metro, Indore Metro, Thiruvananthapuram Light Metro, Agra Metro, Coimbatore Metro, Visakhapatnam Metro, Dehradun Metro, Surat Metro, Srinagar Metro, Greater Gwalior Metro, Jabalpur Metro and Greater Nashik Metro.

Currently, rapid transit are under construction or in planning in several major cities of India and will be opened shortly.



Delhi Metro

Government initiatives

Finance Minister of India announced the following reforms in the Railway sector in the Union Budget 2017-18.

- The Government will provide Rs 55,000 crore (US\$ 8.25 billion) towards capital and development expenditure of Railways
- A fund named Rashtriya Rail Sanraksha Kosh worth Rs 100,000 crore (US\$ 15 billion) will be created, which will be directed towards passenger safety
- All the coaches of the Indian Railways will be fitted with bio toilets by the year 2019
- Railway lines of 3,500 kms will be commissioned in 2017-18.

The other initiatives taken up by the Government are:

- The Ministry of Railways is working on building the world's highest railway bridge over the Chenab river in Jammu and Kashmir at a cost of around Rs 1,100 crore (US\$ 170.79 million), which is expected to be 359 meters (m) above the river bed, 35 m taller than the Eiffel Tower.
- The Indian Railways has introduced various initiatives to improve passenger travel experience, which include finalisation of first reservation chart at least 4 hours before departure, and numerous online booking facilities like wheelchair and disposable bedrolls through Indian Railway Catering and Tourism Corporation (IRCTC) website, among other initiatives
- The Railway Minister of India has launched the first phase of station redevelopment programme, covering commercial redevelopment of 23 out of 400 A1 and A category stations across the country.
- Union Ministry of Railways plan to cover the length and breadth of Arunachal Pradesh by rail network requiring an initial investment of around Rs 50,000 – 70,000 crore (US\$ 7.4 - 10.4 billion) at an elevation range of 500 to 9,000 feet.
- The Ministry of Railways has signed a memorandum of understanding (MoU) with the Ministry of Urban Development, under which railway stations in each city included in the SMART Cities and AMRUT scheme will be redeveloped to create an integrated public transit hub around the railway stations and encourage transit oriented development.
- The Government of India and The World Bank have signed a US\$ 650 million loan agreement for the Eastern Dedicated Freight Corridor-III (EDFC-III) project, which is expected to enhance railway transport capacity, improve service quality and boost freight carriage on the 401-km- long Ludhiana-Khurja section of the EDFC, along with developing institutional capacity of Dedicated Freight Corridor Corporation of India Ltd (DFCCIL) to build, maintain and operate the entire network.

Aviation in India

Directorate General of Civil Aviation is the national regulatory body for the aviation industry. It is controlled by the **Ministry of Civil Aviation**. The ministry also controls aviation related autonomous organisations like the Airports Authority of India (AAI), Bureau of Civil Aviation Security (BCAS), Indira Gandhi Rashtriya Uran Akademi and Public Sector Undertakings including Air India, Pawan Hans Helicopters Limited and Hindustan Aeronautics Limited.



Air India is India's national flag carrier after merging with Indian (airline) in 2011 and plays a major role in connecting India with the rest of the world. IndiGo, Jet Airways, Air India, Spicejet and GoAir are the major carriers in order of their market share. These airlines connect more than 80 cities across India and also operate overseas routes after the liberalisation of Indian aviation. Several other foreign airlines connect Indian cities with other major cities across the globe. However, a large section of country's air transport potential remains untapped, even though the Mumbai-Delhi air corridor was ranked 10th by Amadeus in 2012 among the world's busiest routes.

The civil aviation industry in India has emerged as one of the fastest growing industries in the country during the last three years. India is currently considered the third largest domestic civil aviation market in the world.

According to **International Air Transport Association IATA**, India will displace the UK for the third place in 2026.

The Civil Aviation industry has ushered in a new era of expansion, driven by factors such as low-cost carriers (LCCs), modern airports, Foreign Direct Investment (FDI) in domestic airlines, advanced information technology (IT) interventions and growing emphasis on regional connectivity.

Government Initiatives

- In the Union Budget 2017-18, the Civil Aviation Ministry received a substantial increase of over 22 per cent in budgetary allocation at Rs 5,167.60 crore (US\$ 775.14 million) for the next financial year.

Some major initiatives undertaken by the government are:

- Constructing 17 highways-cum-airstrips are the government's priorities and it will start work on them this year, Union Minister Nitin Gadkari has said. The projects are designed in such a fashion that the roads will double up as airstrips and traffic will be stopped when an airplane lands or takes off. The road and air connectivity will also provide better access to remote areas.
- Airport building and modernization projects worth over Rs 19,300 crore (US\$ 2.99 billion) have been recommended green clearance, in line with the Government of India's focus on improvement in regional air connectivity.
- Indian airline companies like Air India, Air Deccan, SpiceJet, Air Odisha and Turbo Megha, have been awarded with the right to fly to 128 routes across India, requiring them to cap half the seats at nearly 50 per cent of the fare, under the Government of India's regional aviation scheme named UDAN.
- The Government of India has approved the construction of 18 Greenfield airports in the country, which would be executed and financed by the respective airport promoters, and are estimated to require an investment of Rs 30,000 crore (US\$ 4.66 billion).
- The Cabinet Committee on Economic Affairs, Government of India, has approved the proposal to revive 50 un-served and under-served airstrips in three financial years starting from 2017-18 at an estimated cost of Rs 4500 crore (US\$ 698.7 million).
- The Government of India has started a new regional connectivity scheme (RCS) called Ude Desh ka Aam Nagrik (UDAN) under which fares will be capped at Rs 2,500 (US\$ 37.5) for half the seats in an one-hour flight, as per Mr Jayant Sinha, Minister of State Civil Aviation. The Government of India has also received bids from 11 airlines for the same.

- The Ministry of Civil Aviation along with Airports Authority of India (AAI) plans to develop small airports with frugal facilities, and encourage private airlines to bid for routes connecting these small airports with existing larger airports, thereby increasing regional air traffic.
- AAI plans to increase its capital expenditure for 2017-18 by 25 per cent to Rs 2,500 crore (US\$ 375 million), primarily to expand capacity at 12 airports to accommodate rising air traffic, as per Mr Guruprasad Mohapatra, Chairman, AAI.
- The Ministry of Civil Aviation has revised its air services agreement with Netherlands, which would enable air carriers from both the countries to operate up to 28 flights each week, up from current weekly limit of 21 flights, which would benefit regional carriers as well as enhance connectivity between the countries.
- The Executive Development Programme of Rajiv Gandhi National Aviation University in collaboration with Indo US – American Cooperation Program, inaugurated by Mr Ashok Gajapathi Raju, Minister for Civil Aviation, aims to promote skill development of senior leadership and close the gap of increasing demand for trained people in the aviation sector.

Road Ahead

India's aviation industry is largely untapped with huge growth opportunities, considering that air transport is still expensive for majority of the country's population, of which nearly 40 per cent is the upwardly mobile middle class.

The industry stakeholders should engage and collaborate with policy makers to implement efficient and rational decisions that would boost India's civil aviation industry. With the right policies and relentless focus on quality, cost and passenger interest, India would be well placed to achieve its vision of becoming the third-largest aviation market by 2026.

In the coming 20 years, Indian companies will buy 2,100 new planes worth US\$ 290 billion.

Ports and Waterways in India

Ports

According to the Ministry of Shipping, around 95 per cent of India's trading by volume and 70 per cent by value is done through maritime transport.



about 7,517 km. The Indian Government plays an important role in supporting the ports sector. It has allowed Foreign Direct Investment (FDI) of up to 100 per cent under the automatic route for port and harbour construction and maintenance projects. It has also facilitated a 10-year tax holiday to enterprises that develop, maintain and operate ports, inland waterways and inland ports.

Government Initiatives

Some of the major initiatives taken by the government to promote the ports sector in India are as follows:

- Home Minister, Government of India, and Minister for Shipping, Road Transport and Highways, inaugurated a new sea route to Baratang Island and initiated various shipping projects in the Andaman and Nicobar (A&N) Islands; along with announcement of addition of 14 new ships in the A&N Islands over the next three years.
- The Ministry of Shipping, Government of India, has announced plans to execute 199 residual maritime projects worth Rs 800,000 crore (US\$ 124 billion) over the next two years, via government funding.
- Mr Narendra Modi, Prime Minister of India, has launched several projects of Kandla Port Trust, including Dr Babasaheb Ambedkar Convention Centre, 14th and 16th General Cargo Berth and Interchange-cum-ROB at Kutch Salt Junction among others.
- The Union Cabinet has approved the proposal of Ministry of Shipping to replace the 'Major Port Trusts Act, 1963' by the 'Major Port Authorities Bill, 2016', which will empower major ports to perform with greater efficiency by having full autonomy in decision making and by modernising the institutional structure of major ports.
- The Ministry of Shipping plans to undertake development of 37 national waterways (NWs), out of the 111 NWs declared under the National Waterways Act 2016, in the next three years, which would have positive impact on reduction of overall logistics cost.
- The Union Cabinet has approved a new productivity-linked reward (PLR) scheme for 37,870 Port and Dock workers in all the Major Port Trusts for the years 2015-16 to 2017-18 at an annual cost of Rs 49.58 crore (US\$ 7.4 million).
- Mr Nitin Gadkari, Minister for Road Transport and Highways and Shipping, has stated that India would like to collaborate with Germany for projects worth Rs 1 trillion (US\$ 15 billion), aimed at enhancing port rail connectivity and identifying environment-friendly technology for scrapping of old vehicles.

Road Ahead

Increasing investments and cargo traffic point towards a healthy outlook for the Indian ports sector. Providers of services such as operation and maintenance (O&M), pilotage and harbouring and marine assets such as barges and dredgers are benefiting from these investments.

The capacity addition at ports is expected to grow at a CAGR of 5-6 per cent till 2022, thereby adding 275-325 MT of capacity.

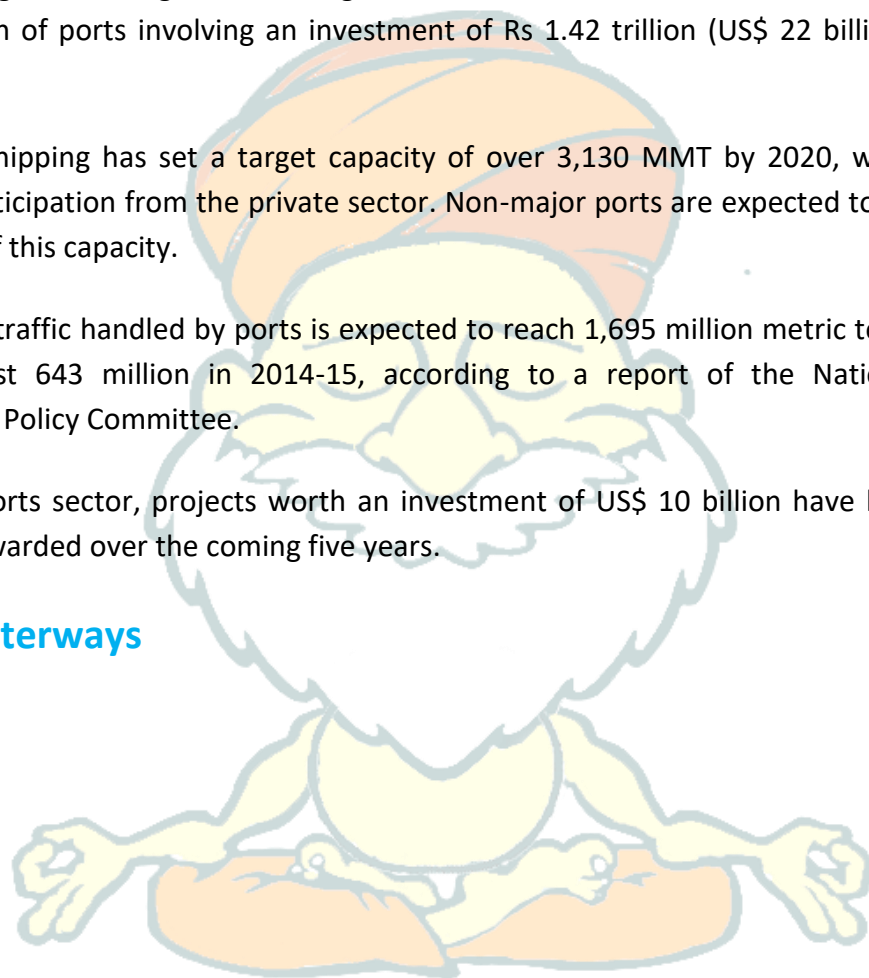
Under the Sagarmala Programme, the government has envisioned a total of 189 projects for modernisation of ports involving an investment of Rs 1.42 trillion (US\$ 22 billion by the year 2035).

Ministry of Shipping has set a target capacity of over 3,130 MMT by 2020, which would be driven by participation from the private sector. Non-major ports are expected to generate over 50 per cent of this capacity.

India's cargo traffic handled by ports is expected to reach 1,695 million metric tonnes by 2021-22, as against 643 million in 2014-15, according to a report of the National Transport Development Policy Committee.

Within the ports sector, projects worth an investment of US\$ 10 billion have been identified and will be awarded over the coming five years.

Inland Waterways





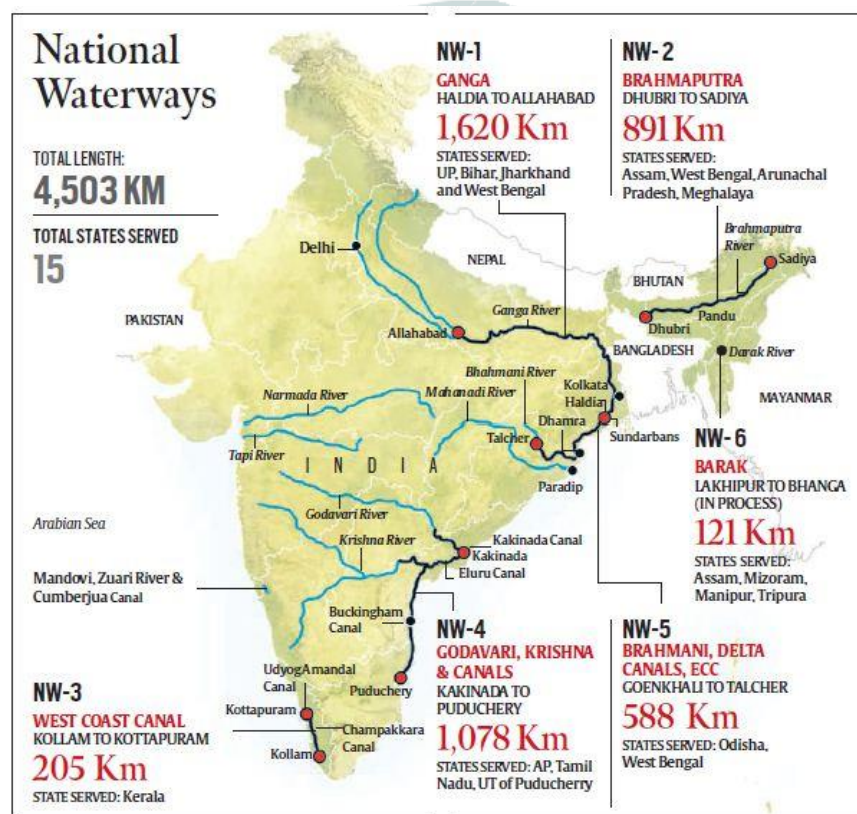
India has an extensive network of inland waterways in the form of rivers, canals, backwaters and creeks. The total navigable length is 14,500 kilometres (9,000 mi), out of which about 5,200 km (3,231 mi) of river and 485 km (301 mi) of canals can be used by mechanised crafts. Freight transport by waterways is highly under utilised in India compared to other large countries. The total cargo moved by inland waterways is just 0.15% of the total inland traffic in India, compared to the corresponding figures of 20% for Germany and 32% for Bangladesh.

Cargo that is transported in an organised manner is confined to a few waterways in Goa, West Bengal, Assam and Kerala. The Inland Waterways Authority of India (IWAI) is the statutory authority in charge of the waterways in India. It does the function of building the necessary infrastructure in these waterways, surveying the economic feasibility of new projects and also administration and regulation.

The following waterways have been declared as National Waterways:

- **National Waterway 1:** Allahabad–Haldia stretch of the Ganga – Bhagirathi – Hooghly river system with a total length of 1,620 kilometres (1,010 mi) in October 1986.
- **National Waterway 2:** *Saidiya*–Dhubri stretch of the Brahmaputra river system with a total length of 891 kilometres (554 mi) in 1988.
- **National Waterway 3:** Kollam–Kottapuram stretch of the West Coast Canal along with Champakara and Udyogmandal canals, with a total length of 205 kilometres (127 mi) in 1993.

- **National Waterway 4:** Bhadrachalam–Rajahmundry and Wazirabad – Vijaywada stretch of the Krishna – Godavari river system along with the Kakinada – Pondicherry canal network, with a total length of 1,095 km (680 mi) in 2007.
- **National Waterway 5:** Mangalgadi–Paradeep and Talcher–Dhamara stretch of the Mahanadi–Brahmani river system along with the East Coast Canal, with a total length of 623 km (387 mi) in 2007.
- **National Waterway 6:** waterway between Lakhimpur and Bhanga of the Barak River. This was announced in the Budget 2013-14.



Note: We have tried to cover in detail, the resources, agriculture, industries and transport in India. Generally candidates try to mug up the facts and numbers for everything and finally end up in writing wrong facts in the exam. Try not to do that. Numbers are put so that you can see the trend. If not the exact numbers, remember the trend.

Try to make a note or a mind map of Schemes related to various sectors. This will help you to write a very good answer in GS as well as in Essay.

We will also provide GS 3- related VAN for Agriculture and Infrastructure in upcoming blocks. Do not put emails asking for the same ☺

Copyright © by IASbaba

All rights are reserved. No part of this document should be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without prior permission of IASbaba.

