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COTTON TEXTILE INDUSTRY

Factors for the growth of cotton textile industry

The major factors on which the localization of cotton textile industry depends are as follows: 1. Climate 2. Power 3. Raw Material 4. Labour 5. Transport 6. Markets.

1. Climate:

Climate exercises the most powerful influence on cotton industry. Cotton yarn cannot be spun successfully under dry conditions. The humidity of the atmosphere must be considerable; otherwise the yarn breaks constantly during the process of spinning. The localization of the cotton spinning industry in UK has clearly been determined by climatic factors. It must be noted that so far as this climatic factor (humid atmosphere) is concerned, it has been overcome by the installation of 'humidifiers' in the cotton mills in dry areas. Thus, places far in the interior with dry climate, like Kanpur in India, in the summer months are able to carry on spinning independent of climate. Only the process of humidification raises slightly the cost of production. Another climatic factor in the localization of cotton industry is an abundant supply of water. Water is needed in so many operations connected with the industry. Water is necessary for use in the condensers of the steam engines, and in the numerous washing operations of the industry. The influence of this factor can be seen in the location of cotton mills in Lancashire along streams or canals.

2. Power:

Like any other industry cotton textile industry also requires constant and cheap sources of power. Most of the industries are located near sources of power. Earlier cotton textile industry was based on power obtained from coal; this can be seen in UK where all the cotton textile industry was established near coal mines. But afterwards hydropower has also been used and now all sources of power are being utilised in this industry.

3. Raw Material:

A historical analysis of the locational pattern reveals that, at its earlier period of growth, textile mills were developed near raw material sources, because at that time transportation system was ill developed. Away from the cotton-growing region, availability of raw cotton was also very low. Naturally, due to higher demand, price of raw cotton was high at the distant places. But in its second phase of development, rapid progress of transportation system facilitated easy accessibility within the region. At that time, price of raw cotton became same, both near the raw material source and the market. Naturally, market became the favourite site for plant location. The importance of raw material gradually lost its previous importance.

4. Labour:

Basically, cotton textile industry was a labour-intensive industry. The early history of localisation in any country shows that development of cotton textile industry was a pre-requisite. The need of clothing and requirement of low level of technology enabled the entrepreneurs to set up the industry. Minimum level of training was enough for the labourers

to be acquainted with the production system. At that time, wage rate of the labours was also very low. The wage rate of the labour was an important consideration for the location. A slight hike of the wage rate made a lot of difference between one place and another. For example, New England textile centres in USA shifted towards Piedmont because of the prevailing wage rate.

5. Transport:
Easy means of transportation are needed for all industries, and particularly for cotton, the product of which is cheap and for which the market is sometimes situated thousands of miles away. It is an interesting fact that all the leading cotton mill centres – unlike iron and steel industry – cater to distant markets. Lancashire manufactures primarily for India; and the East Japan manufactures for India, China and other Asiatic markets; and the United States manufactures mainly for the West Indies and the South American markets. Even in India, the mills of Mumbai and Ahmedabad produce primarily for inland markets. The effect of cheap transport can be easily seen in the opening of the Manchester Ship Canal. Easy means of communication, in importing machinery and coal by sea, getting raw cotton by rail, and disposing of the finished product to inland and foreign markets, have also been the dominating factors in localising the cotton industry in Maharashtra and Gujarat.

6. Markets:
Markets are a very potent factor in the location of the cotton industry. It has been one of the important factors in the growth of the British cotton industry. Britain's political influence over its colonies, particularly India, and the economic influence through investments, obtained for its large markets, the increasing demand from which naturally gave the British cotton industry an impetus which was denied to others. The cotton textile industry that developed in Japan and China as well as in other countries has both inland and world-wide markets.

Development of Cotton textile industry in the world
Cotton textile industry is quite widespread in the world and as many as 90 countries are producing cotton yarn and/or cloth in varying quantity. But the main concentration of textile industry is limited to few countries. There are two types of production related with cotton textile, one is the production of cotton yarn and another is the production of cotton cloth. Although many countries produce both the items. Apart from the above countries Germany, Portugal, Greece, Uzbekistan, Syria, France, Bangladesh, Turkmenistan and Iran are also notable producers of cotton yarn. The leading producers of cotton cloth in the world are China, India, Russia, USA, Japan, Italy, Germany, Hong Kong, Egypt, France and Romania. The other producers of cotton cloth in the world are Brazil, Spain, Pakistan, Turkey, Uzbekistan, Bolivia, Vietnam, Korea Republic, Czech Republic, Portugal, Belgium, Poland, South Africa and Syria. The cotton textile industry is fairly widespread in the world; however, there are areas of concentration. A brief description of the important areas of cotton textile industry is given here to explain the general pattern of distribution.

1. China:
Cotton textile is one of the oldest types of industry in China. Since very old days, weaving and spinning was normal practice of village weavers and most of the output was contributed by cotton industry. Several characteristics of this industry help to explain this locational diversity and concentration. In the first place, there is a ready market for its product. With its vast population, China has a vast domestic market for cheap cotton goods, and its low labour costs, based on its large labour supplies, enable to sell textile abroad. The first modern factory

was a textile mill in Shanghai built in 1888. Soon Shanghai had become a major textile centre along with South Manchuria. Besides the advantages of local supplies of raw materials, cheap labour, and regional consumer markets the cotton-growing tracts of Manchuria had an additional advantage of having the remarkable coal mines within the state. The first mainland cotton mill was located outside the coastal China – on the cotton-growing region of Manchuria at Tsing Kiang. Owing to its favourable geographical situation large quantities of cotton are grown in Liao river valley.

The textile industry had previously been concentrated in Shanghai and Tientsin. Production has improved, and new centres have been opened up in the cotton-growing belt in Honan, Hopei, Shansi and Shensi, as well as single factories serving local needs at Lan Chow, Urumchi, Kashgar, Chengtu, Taiyuan, Chengchow, Hongchow, Nanking, Kaiteng, Tientsin, etc. Cloth is now made at Taiyuan and looms are being constructed at Chengchow. Now, China has emerged as the largest cotton textile-producing country in the world. The Beijing-Hankow industrial conurbation including centres like Paoting, Singtai, and Chengchow has emerged as a leading textile centre. Of course, among all the textile-producing centres, Shanghai was the most important. At one stage, this region produced more than 70 per cent of the Chinese textile production.

2. India:

India is the second largest cotton textile producer in the world. The first cotton mill in India was erected in Calcutta in 1818, while first mill in Bombay (now Mumbai) was started in 1854, which was destined to become the home of the cotton mill industry. The early concentration of the cotton textile industry in Mumbai was governed not so much by natural and permanent factors as by other advantages, such as abundance of capital and credit facilities, the presence of cheap and speedy means of transport and the temporary growth of the demand for yarn from China, which Mumbai was in an exceptionally favourable situation to meet. The year 1877 marks the turning point in the development of the industry from the point of view of its distribution. It saw the beginning of a rapid construction of mills in upcountry centres like Nagpur, Ahmedabad, Sholapur, Kolhapur, etc., situated right in the heart of the cotton-producing tracts. This later distribution was influenced to a very much larger extent by natural factors, such as the vicinity of sources of raw material, plentiful labour and large marketing centres, and was made possible by the development of a railway communication.

The large patronage extended to the mill by the Government in respect of their military requirements in cotton goods in the Eastern theatres of the war, together with the shrinkage in the Lancashire imports into India due to the preoccupation of the Lancashire mills with war work and the sharp rise in the prices of imported cloth due to shortage of shipping, led to a considerable increase in home consumption, though the difficulty of importing machinery prevented speedy development which would otherwise have taken place. Recently, there has been a tendency on the part of the Indian mills to increase the manufacture of finer goods, and a certain amount of long-staple cotton is imported from the USA and elsewhere for this purpose. An improvement in the quality of the home-grown cotton will help the situation. It is significant to note that even within these particular areas or regions, the industry is predominantly localised within a few important industrial centres like Mumbai, Ahmedabad, Sholapur, Vadodara, Pune, Kanpur, Delhi, Indore, Gwalior, Coimbatore, Kalol, Bhagalpur, Warangal, Calcutta, Howrah, Serampur, Konnagar, Sodepur, Panihati, etc.

At present, there are more than 1,220 cotton mills in India; of these, 283 are composite mills and the remaining are the spinning mills. Production wise, Maharashtra tops with 16.4 per

cent yarn and 52.3 per cent cloth production in the country, followed by states of Tamil Nadu (30.4% yarn and 8.8% fabric), Gujarat, Uttar Pradesh, Madhya Pradesh, West Bengal, Rajasthan, Punjab, Karnataka, etc.

3. Russia:

Russia ranks third in cotton cloth production in the world and it produces about ten per cent of the total cotton cloth of the world. Although in Russia textile industry has not received priority in its development plans. Before Revolution (1917) the cotton textile industry was localised in Moscow and Ivanovo region but now it has developed in other regions also.

The important regions are:

(i) Moscow-Ivanovo Region is the oldest and the most important textile region. Ivanovo is having a large number of cotton spinning and weaving centres, also known as 'Manchester of Russia'.The other centres of this region are — Yoroslav, Kostromov, Shuya, Kovrov, Uro-Khavo-Zuyevo, etc. Moscow is another centre, around which Noginsk, Pavlovsky, Yegoryevsk, Serpukhov, etc., have developed.

(ii) Leningrad or St. Petersburg Region is also known for cotton textile industry. St. Petersburg, Narva and Tallin are important centres of this region.

(iii) Kalinin Region extends west of Moscow. Kalinin, Vishniye, Volochak are important textile centres.

(iv) Siberia Region has been developed on availability of cheap hydro-electricity, transport facility and labour. Several centres like Omsk, Novosibirsk, Barnaul, Briansk, Kamarovo, Kansk, Leninsk-Kuznetskiye, Kustney have cotton textile industry.

Volga basin and Ural region also have cotton textile units. The development of textile industry in Russia is due to huge domestic market, hydro-electricity, developed transport system and skilled labour.

4. USA:

USA is the leading cotton textile producer in the world. It ranks third in cotton yarn production and fourth in cotton cloth production in the world. The two factors responsible for its growth and development are: (a) capital, and (b) the local market.

In USA cotton textile industry is localised in the following regions:

(i) New England:

New England used to be the largest centre until a few years ago but the South has surpassed it now. Within New England, the mills are scattered, though a large number of spindles are concentrated within thirty miles of Providence in southern New England. Fall River is the largest centre, with New Bedford, only 30 km away, as the second largest centre. This region has developed earlier because of availability of hydro-power and suitable climate. In this region temperature is fewer variables and atmosphere more humid than in the neighbouring regions.

(ii) Mid-Atlantic:

The Middle Atlantic States cotton factories are located in Pennsylvania, New York and Maryland. But Philadelphia is the only point at which there is concentration. The existence of these mills in Philadelphia, and the character of their output is chiefly due to labour supply, supplemented by machine shops and market facilities.The Mid-Atlantic States are pre-eminent in the production of knitted goods. In both, New York and Pennsylvania, there is localisation of the knitting industry, around Cohoes in the Mohawk valley and at Philadelphia. Philadelphia has been the principal seat of the hosiery industry in the United States ever since the Germans settled in German Town.

(iii) Southern States:

The growth of cotton industry in the southern states has increased within recent years. The most extensive construction of mills in the South has been in three states – North Carolina, South Carolina, and Georgia. The Southern States have advantages such as proximity of raw cotton, water-power and cheap labour. The other advantage of the South in comparison with the New England states is its lower operating cost.

5. Japan:

After China and India, Japan is the third leading Asian country in cotton textile production. The first cotton mill in Japan was established in 1862 at Kagoshima, but it was about 15 years later that cotton mills began to be started in quick succession, especially in and around the city of Osaka. The main geographical factors helping in the establishment of a successful cotton industry in Japan are:

(i) A suitable climate,
(ii) Cheap water-power,
(iii) Transport facilities,
(iv) Supply of cheap and skilled labour, and
(v) The proximity to the large markets of China and India.

The Japanese industry is said to enjoy the following advantages over her competitors:

(i) Cheaper and efficient labour
(ii) Greater proximity to the large consuming markets
(iii) Better organisation
(iv) Better service from plant

Japan has to import almost all of the raw materials needed for textile industry. The pioneer attempts to set up industries were made around cotton-growing tracts of Nobi and Kanto regions. Now the major textile centres are located at Chukyo, Hanshin, Toyama, Kyushu and Keihin and also at Osaka and Nagoya. Spatially, majority of the cotton mills are located within the northern half of Japan. The bulk of the textile goods are produced in following regions:

(i) The Kwanto Plain,
(ii) Nagowa,
(iii) The Kinki Plain, and
(iv) Along the Northern Coast.

As the industry became more and more export-oriented, textile establishment gradually shifted towards coasts. At the beginning of the decade of 1990s, old obsolete mills closed down their productions. The new mills with updated machineries came into existence. Most of the Japanese textile mills are now using the latest technologies. The priority was given to reduce the cost of production. Soon, Japan became the exporter of not only textile products but also the textile machines. At present, a healthy competition is discernible between small-scale sectors and the big industrial estates of textile industry.

6. Germany:

Germany is one of the leading producers of cotton textile. The history of cotton textile industry in Germany is quite old. Initially, the industry was set up depending upon imported cotton and most of the industries were developed along Rhine river valley. But Ruhr industrial region soon became a leading textile centre. The cotton manufacturing centres of Germany are grouped into the following three groups:

1. North-Western:

Consisting of Rhine region towns like Barmen and Elberfield, and Ems-Vechta towns like Pheine and Gronau.

2. Central:
Consisting of towns along the three mountain ranges which separate Bohemia from Germany, Reichenbach, Chemnitz, Leipzig and Dresden
3. South-Western:
Consisting of towns like Augsburgh, Stuttgart and Mulhouse. The north-western region had the advantage of local market in the industrial populations which also provided it with cheap labour. The other centres had the advantage of water power, pure water and the cheap labour of the mountain populations.

7. Hong Kong:
Hong Kong ranks 7th in production of cotton cloth in the world. The industry in Hong Kong was set up by the refugees from communist China in 1949. Hong Kong is a free trade area and one of the principal entrepot ports of the world. Manufactured goods, particularly textile provide three-fourths of total export earnings. Three major parts of Hong Kong's giant textile industry – the spinning, weaving and finishing business are in a decline from which they may never fully recover. Employment in the industry has plummeted in the past years.

8. The United Kingdom:
UK was the leading cotton manufacturing country in the world, but it no longer dominates the world in cotton textile production. The history of cotton textile industry cannot be completed without describing the contribution of United Kingdom. The Industrial Revolution in the 18th century gave the impetus to the development of cotton textile industry in Great Britain. The subsequent invention of spinning machines encouraged the growth. The factors that helped in early development of textile industry in UK, especially in Lancashire region were — suitable humid climate, skilled local labours, abundant water resources, availability of local coal, cheap price of land and cotton import facility, etc. Apart from Lancashire, Manchester has also emerged as a leading textile centre. The relative position of UK in textile industry has been decreased considerably due to overall decrease of consumption of cotton goods, loss of overseas market and emergence of new textile-producing countries like China, India, Japan, etc.

9. Other Countries:
In Europe other cotton textile-producing countries are France, Italy, Switzerland, Romania, Czech Republic, Belgium, Poland and Spain. France's cotton textile industry has had a long The textile industry of France was developed on imported cotton, particularly from USA. The industry is concentrated in the north-eastern industrial region. The major centres of textile-producing centres are Belford, Kolman and Nausi.Italy has also emerged as an important cotton textile producer in Europe. The major centres of textile industry are located in the Po basin and in the Alpine valleys. Milan, Korno, Bergamo, Turin, Genoa, Breccia, Verona and Como are the main centres of cotton textile industry.Switzerland are having cotton textile industry in the northern part of the country. The most important centre is the Saint Galen. Romania is also significant in cotton textile production. It's important centres are located at Pitesi, Birlad, Oradea, Guirgui, Bukharest, Brasov, Sibiu, Baia, Mare and Timisoara.In Latin America, Mexico, Brazil, Argentina and Peru are important in cotton textile production. Mexico is the major cotton manufacturing country, not only in Latin America but also in the world. The textile industry was first developed in the Orizaba region and later in the Mexico City. The major centres of cotton textile in Mexico are Heroico, Nogales, Ciudad Juarez, Piedras Negras, San Louis Potos, Cudad de Mexico, Toluca de Lerdo and Cuernavaca.Brazil is another cotton textile-producing country of Latin America and is also important in the world. The important cotton textile centres of Brazil are: Rio Grande do Sul, Minasgerais and

Rio de Janeiro. In Argentina textile industry has developed at Buenos Aires, La Plata and Azul, while in Peru it has developed at Trujillo, Lima, Calao, lea and Cuzco. In Africa, Egypt and South Africa are the main cotton textile producers, although Nigeria, Ethiopia and Tanzania also produce some quantity of cotton fabric.Egypt is famous for its good quality of cotton and has also developed textile industry at Iskandaria, Tanta and Dumyat. Egypt ranks 10th in cotton yarn production and 8th in cotton cloth production in the world. South Africa also has developed cotton textile industry at Johannesburg, Bloemfontein, Durban, East London and Worcester. In Asia, apart from China, India and Japan, Pakistan, South Korea, Indonesia and Turkey are the leading producers of cotton textile. Pakistan is a major cotton-producing country in Asia and has also developed cotton textile industry. Cotton mills in Pakistan are located at Lahore, Lyallpur, Multan, Karachi, Sahadra, Montgomery and Peshawar.South Korea has made good progress in cotton textile industry in recent years. The major cotton textile centres are Inchou, Taegu, Masan, Pusan, Kwangju and Seol. Indonesia is also a textile exporting country of Asia. Similar is the case with the Philippines. Turkey is another Asian country having cotton textile industry in prominence. Turkey is a producer of good quality of cotton. Izmir, Izmit, Sivas, Kyseri, Bursa, Erzurum, Usak, etc., are the main centres of cotton textile industry in Turkey.

Indian scenario

Cotton plays an important role in the Indian economy as the country's textile industry is predominantly cotton based. India is one of the largest producers as well as exporters of cotton yarn. The Indian textile industry contributes around 5 per cent to country's gross domestic product (GDP), 14 per cent to industrial production and 11 per cent to total exports earnings. The industry is also the second-largest employer in the country after agriculture, providing employment to over 51 million people directly and 68 million people indirectly, including unskilled women. The textile industry is also expected to reach US$ 223 billion by the year 2021.

The cotton textile industry is widely distributed. Maharashtra, Gujarat and Tamil Nadu together account for about 60 per cent of the total cotton textile mills in India. Other important states are Uttar Pradesh, West Bengal and Madhya Pradesh.

1. Maharashtra excels all other states in the development of cotton textile industry. Mumbai, with about 60 mills, is the largest cotton textile mill centre in India and is rightly called the 'Cotton polis of India'. The following factors favoured the development of cotton textile industry in and around Mumbai.

i. The humid climate is useful, because the thread does not break so frequently.
ii. The port facilities help in the import of long staple cotton and machinery as well as the export of the finished product.
iii. Hydroelectricity as a cheap source of power is readily available from the nearby areas.
iv. It is located near the cotton producing belt.
v. Cheap labour is readily available from the nearby thickly populated areas
vi. City is well-connected by an efficient network of roads and railways, which helps in transporting raw cotton and finished cloth.
vii. The capital and financial resources are easily available in the Mumbai city.
viii. There is a ready market for cotton textiles both in the domestic and the foreign markets.
ix. Mumbai also enjoys the advantage of an early start.

Apart from Mumbai, the other important centres of cotton textile industry are Sholapur, Kolhapur, Satara, Nagpur, Wardha, Aurangabad, Pune and Jalgaon.

2. Gujarat is the second largest producer of cotton textiles in India. Ahmadabad, with about 70 textile mills, is the most important centre. It is also the second largest centre after Mumbai in India and is called the 'Manchester of India'. The following factors favoured the development of cotton textile industry in and around Ahmadabad.
i. It is very close to the cotton producing belt of India.
ii. The humid climate is well suited to the cotton textile industry.
iii. Land in and around Ahmadabad is much cheaper than in Mumbai.
iv. Cheap hydroelectricity is readily available.
v. Skilled and semi-skilled labour can be easily recruited from the surrounding region.
vi. Ahmadabad is located at the centre of rail and road network and is well-connected with every major town of India.
vii. Textiles from this region being priced low find ready market in every part of India.
viii. Most of the cotton textile mills are smaller in size than in Mumbai, but they produce cloth of finer quality.
Other important centres in Gujarat are Vadodara, Surat, Bharuch, Rajkot, Bhavnagar, Kalol, Nadiad, Cambay, Morvi, Porbandar, etc. Surat and Cambay have a large number of powerlooms.

3. Tamil Nadu has the largest number of cotton textile mills in South India. The state is the largest producer of mill-made cotton yarn and the third largest producer of mill-made cloth. Coimbatore is the most important centre and is rightly called the 'Manchester of South India'. The main factors responsible for the development of cotton textile industry are the easy availability of raw cotton, rich pool of skilled labour, cheap hydroelectricity from Pykara project and expertise in producing quality textile goods. Other important centres in Tamil Nadu are Chennai, Madurai, Salem, Tirunelveli, Tuticorin, Virudhnagar, Udmalpet, Perambur, etc.

4. Uttar Pradesh has about 50 cotton textile mills. Most of the cotton textile mills are in the western part of the state. Kanpur, popularly known as the 'Manchester of Uttar Pradesh', is the largest centre. The state enjoys a large home market, cheap and skilled labour, excellent transport network and easy availability of raw cotton from the nearby areas. Other important centres in Uttar Pradesh are Modinagar, Moradabad, Etawah, Varanasi, Agra, Bareilly, Aligarh, Saharanpur, Rampur, Lucknow, Mirzapur, Meerut, Hathras, Ghaziabad, etc.

5. West Bengal has about 55 cotton textile mills. Kolkata is the most important centre. It is located away from the main cotton producing areas, but enjoys facilities of a port, local labour due to high density of population and a ready market. Other main centres in West Bengal are Haora, Murshidabad, Hugli, Serampur, Saikia, Shyamnagar, Maurigram, etc.

Other main centres of cotton textile industry are:
Andhra Pradesh:
Hyderabad, Secunderabad, Warangal, Guntur, Adoni, Ramagundam, Guntakal, Tirupathi, Udayagiri, etc.
Karnataka:
Bangalore, Mysore, Hubli, Bellary, Davangere, Gokak, Gulbarga, Chitradurga, Mangalore, Belgaum, etc.
Madhya Pradesh:
Indore, Gwalior, Ujjain, Nagda, Raipur, Dewas, Bhopal, Jabalpur, Barhanpur, Ratlam and Mandsaur.
Rajasthan:

Pali, Beaver, Kishangarh, Ganganagar, Bhilwara, Udaipur, Jaipur, Kota and Ajmer.

Kerala:

Alleppy, Kolam, Thiruvananthapuram, Trichur and Kochi.

Punjab:

Amritsar, Ludhiana and Phagwara.

Haryana:

Bhiwani, Hissar and Panipat.

Bihar:

Gaya, Patna, Bhagalpur

Key Markets and Export Destinations

- Cotton yarn and fabrics exports accounts for about 23 per cent of India's total textiles and apparel exports.
- In 2018-19, India's cotton production was 28.70 million bales of 170 Kg each
- During 2018-19, total textile and clothing exports stood at US$ 36.62 billion.
- During 2018-19 exports of cotton yarn, cotton fabrics and cotton made-ups reached to US$ US$ 3.90 billion and US$ 5.95 billion, respectively. During April-September 2019, exports of cotton yarn, cotton fabrics and cotton made-ups reached to US$ US$ 1.30 billion, US$ 3.08 billion and US$ 3.08 billion, respectively.
- Various reputed foreign retailers and brands such as Carrefour, Gap, H&M, JC Penney, Levi Strauss, Macy's, Marks & Spencer, Metro Group, Nike, Reebok, Tommy Hilfiger and WaI-Mart import Indian textile products.

Cotton Textile Export Promotion Council

The Cotton Textile Export Promotion Council (TEXPROCIL) takes part in national and international events to enhance the visibility of Indian products, advertises and promotes Indian products in various media vehicles such as fashion magazines, event-related pull-outs, India reports and leading trade magazines, and organises buyer-seller meets (BSM) and trade delegation visits.

Problems of cotton textile industry

The major problems of cotton textile industry are discussed as below

1. Problem of Organisation: Being essentially Indian in origin, cotton industry was started, financed, and managed by textile magnates who combined their traditional commercial activities with new industrial enterprise through a unique system of industrial management—the Managing Agency System (MAS). Of course, this provided the constant inflow of the commercial capital in the industry through its 'commercial nexus' but, at the same time, the system had retarded the growth of the 'industrial specialists'. Most of them did not have managerial leadership and technical knowledge except the financial capability. The result was the frequent changes of managing agents and liquidation of the companies on the one hand, and the oligarchic concentration of the mills to a few agency firms on the other hand.

2. Competition with British and Japanese Machine-made Cloth: Competition plays a dominant role. The Indian cotton textile industry had to face stiff competition from Britain's most internationally aggressive cotton industry. And, in the process, British industry suffered a lot at the hands of the Indian industry. But some events of the 1920s eroded the competitiveness of the Indian industry. After the end of the World War I, Japanese exports of cloth to India acted as a big threat to the Indian industry though such Japanese exports were held in check in the 1920s. But it reappeared after 1930 despite a high tariff rate of 50 p.c.

3. Problems of Labour: Most of the labourers of the cotton mills were unsophisticated in the sense that they were recruited from the small peasants and agricultural labourers. As a result, permanent textile labour force could not arise. Above all, they maintained 'village nexus' with their home village so as to return to their home land when the situation demanded. No doubt Indian labour efficiency was comparable to Britain. But so far 'as coarser products were concerned, efficiency of the Japanese labour was undoubtedly the best. In fact, it was due to the lower efficiency of Indian labour automatic looms came late in India in relation to Japan. Because of severe demand-supply gap consequent upon famine, plague and increased competition in the China market (between 1893 and the beginning of the World War I).

4. Machinery and Technology: Textile machinery and technology used in this industry were imported before the World War I and it continued till the outbreak of the World War II. However, India could not procure modern equipment's from America and Japan because technology of the cotton textile industry was heavily Manchester-biased. The prejudice in England against automatic looms acted against the use of such looms in India. During the War years (1914-18) favourable conditions for the expansion of the weaving section of the mill industry could not be capitalized because of excessive dependence on imports of machinery and mill stores.

5. Absence of Linkage Effects: Indian cotton textile industry could not become a leading industry as it lacked various linkage effects. For instance, textile machinery was unavailable in India—all of this machinery was heavily import-dependent. Further, Indian industrialists did not put much importance on having a skilled labour force. However, for all these, what prevented Indian industrialists from producing textile machinery was the protective tariff wall. And the British Government was not prepared to grant tariff protection for textile machinery. Had these linkage effects been created, Indian cotton textile industry would have flourished far more.

6. Miscellaneous Problems: Towards the end of the 19th century, the cotton industry encountered a variety of problems. A series of crop failures between 1896 and 1902 reduced the off-take of cloth in domestic markets. Foreign demand for both yarn and cloth dropped remarkably in 1893. Between 1894 and 1906, tariff agitation generated a great deal of uncertainty in the industry. Political disturbances in China adversely affected Indian exports to China. The year 1896 gave rise to a scarcity of labour and a rise in wages in Bombay industry following bubonic plague. In 1902, the American cotton boom resulted in shrinkage of profits in the Indian industry.

Probable Solutions

Following are some of the suggestive measures to overcome the various problems faced by the cotton textile industry.

●The weak links in the Indian conventional industry such as weaving and finishing have to be strengthened. A major thrust here is to have consolidated efforts by Indian Textile

Machinery Manufacturers Association, end-users and the Government to undertake a moonshot and come-up with alternatives to European Machinery, which the weaving sector can afford. This should be doable within the next five years, if dedicated efforts are undertaken with the financial support for R & D by the Government through its various schemes;

●Mission linked basic research spanning the entire supply chain. This should be carried out as a collaborative endeavour between the Ministry of Textiles and the Department of Science and Technology. Atleast in the next budget cycle, a pot of cash has to be earmarked and should be overseen by an autonomous central body. This autonomous body can be operated more or less similar to the National Textile Centre consortium in the USA and

●Industry specific and problem solving research programme supported as a joint venture between the Ministry of Textiles and the Ministry of Commerce, Government of India. This can be modelled after the Fraunhofer Institutes in Germany. In the fast growing and competitive world, those who deliver what the consumers want, and at the same time cheaper and faster will be the industry trend setters.

Things have changed and people are improving their life in many different ways. India is a place to eye on and certainly the Indian textile sector will have its share in the growth story.

Present scenario

The scenario has changed a lot. India is now a fast emerging market inching to reach half a billion middle income population by 2030. All these factors are good for the Indian textile industry in a long run. Even though the global economic crisis seems to be worsening day-by-day, as long as economies are emerging and growing as those in South and South East Asia, textile industry is here to grow provided it takes competition and innovation seriously. Read below to have an insight of the stand of the Indian Textile Industry in the economy. As the saying goes in the financial sector, it is not advisable to put all eggs in one basket. This is what happened somewhat in the case of the Indian textile industry. With the opening of world markets and the abolition of textile quotas since 2005, there came a negative situation as well. But, hindsight is always 20-20. Indian textile industry should have focused on all major sectors right from fibre to fashion and planned for an organized growth across the supply chain so as to compete with China and even countries such as Pakistan, Vietnam and Thailand. Instead, the industry had put majority of its stock in the spinning sector. This is clearly evident in the utilization of Technology Upgradation Fund Scheme effectively by the spinning sector. Not only India does not have world quality indigenous shuttle less looms, but also investments are not adequate to cope with the quality and quantity to cater to the export market. Technical textiles sector is still in its infancy and a tangible growth will be highly visible by 2035 when the growth in this sector will be exponential. 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. High economic growth has resulted in higher disposable income. This has led to rise in demand for products creating a huge domestic market.

IRON AND STEEL INDUSTRY

Factors for the growth of iron and steel industry

Iron and steel industry forms the base of all other industries; therefore it is called basic industry. It is one of the most complex and capital intensive industry. The factors responsible for the growth of iron and steel industry are

Raw material: Mostly large integrated steel plants are located close to source of raw materials, as they use large quantity of heavy and weight losing raw materials. Eg: Concentration of Iron and steel industry in Chota Nagpur region-Presence of Iron ore in this region. TISCO at Jamshedpur.

Markets: As its heavy & bulky transportation cost is high. Therefore nearness to market is important especially for mini steel plants access to nearby markets is most important in order to minimize transportation cost. Also as mini steel plants rely on scrap metal they are mostly present in Maharashtra. Visakhapatnam steel plant located near the coast has excellent import-export facility.

Labour: Availability of cheap labour is also important. Eg: Rourkhela plant, Orisa; Bhilai steel plant in Chattisgarh, mostly in **Chota Nagpur** region

Availability of electricity: mostly hydro and water for cooling. Eg: Bokaro steel plant on banks of river Damodar, Visheshwarya steel plant, Kar near river Bhadra.

Means of Transportation: Industries depend upon efficient and cheap transportation system, which is essential for the movement of raw material as well as the finished products. They may be rail, road or water. Railway junctions are considered to be the most suitable sites for the localization of industries. These enjoy benefits of easy transportation from different directions. Similarly sea ports also develop as industrial centres because of availability of facilities of water transportation for export and import of products.

Market: Market is an important factor in determining localization of industries. Goods are manufactured to be sold in the market. Industries are generally set up close to urban centres. Sometimes, dense population may not prove to be solid market for the disposal of the different industrial products. If the people are poor, the purchasing capacity also becomes poor. In some of the Asian countries, where people are poor, industries which are engaged in the manufacturing of cheap and essential goods like coarse cloth find an adequate market. This explains why under-developed countries, though densely populated are poor in manufacturing industries.

Other Factors.

Climate: Climate also plays a part in the location of industries. The stimulating cool temperate climate is more suitable for the development of industries because this type of climate adds to the work efficiency of the labour force. This is one of the major reasons why temperate latitudes have well-developed manufacturing industries rather than the tropics or the desert or the Tundra regions. Climate plays a significant role in location of cotton textile manufacturing industries. The cool and humid climate helps in spinning of yarn and weaving of cloth processes. Development of film industry at Mumbai is due to favourable climate.

Capital: Development of industries requires a large capital investment. It may come from any source, local or foreign. Banks and other financial institutions play an important role in the growth of industries from time to time.

Government Policy: In order to give boost to industries in the country, the government gives certain guidelines, tax exemptions, electricity at concessional rates, subsidies, rail link etc., if these are set up as per government plan. Mohali, an industrial town near Chandigarh has come up on the industrial map of India because of Government policies. Thus Government Policy plays a significant role in determining place of location of an

industry. If the Government bans import of foreign cars, the automobile industry is bound to flourish in that country.

Early Start: There is a tendency to set up new units in the area, where that industry is already much developed. It is because the area has been enjoying benefits of developed means of transport, financial institutions, banking facilities, availability of skilled labour and marketing ease. Hosiery industry got concentrated at Ludhiana can be cited as one example of role of early start.

Personal Preferences: Personal whims, prejudices of an entrepreneur and preferences also matter sometimes in the setting up of an industry in an area, ignoring all the economic and commercial considerations. In a democratic set up, sometimes political matters also initiate the establishment of certain heavy industries in certain regions. The setting of a Railway Coach Factory at Kapurthala in Punjab has been set up due to political interests rather than economic considerations. Construction of oil refinery at Bhatinda is another example of a political decision.

Major iron and steel industrial belts of the world

The growth and development of iron and steel industry is a reflection of global economy. The iron and steel industry depicts a changing nature in its growth and production pattern. In the mid-1970s, the relatively developed countries of North.America, Western Europe and Japan accounted for nearly two-third of the world's steel production. But gradually the spatial pattern has changed and attention has now shifted to the developing regions. Towards the end of the last century, the growth of steel production in countries like China, South Korea, Brazil and India has changed the entire pattern of steel production in the world. Now main producers of iron and steel in the world are China, Japan, USA, Russia, Germany, South Korea, Brazil, Ukraine, India, France, Italy and Great Britain. The other steel-producing countries are South Africa, Australia, Austria, Netherlands, Czech Republic, Romania, Spain, Belgium, Sweden, etc. It becomes clear that China is the leading producer of iron and steel in the world, which accounts for about 23.9 per cent production of pig iron and 17 per cent of crude steel of the world's production. Japan is the second largest producer with 14.7 per cent pig iron and 13.9 per cent crude steel production of the world.USA once the highest producer now ranks third in the world followed by Russia. India's position is 9th in the iron and steel production and its production of pig iron and crude steel accounts for 3.9 and 3.6 per cent respectively.

1. China:

China is having the oldest system of fabricators of iron, as is evident from its historical records. But until the adoption of her five-year plan in 1953, China had only insignificant iron and steel manufacturing of modern type. Gradually, China has developed the iron and steel industry and now it is the highest producer of iron and steel in the world. Since 1973, growth of steel production in China was spectacular and within a span of 15 years China was able to increase its production of crude steel to 217 percent. In that period consumption increased 300 per cent. This growth rate clearly reveals the rapid pace of industrialisation that is now going on in China. The iron and steel industry is concentrated in Anshan, Wuhan and Paotow triangle. The biggest iron and steel factory was established in the Chinese mainland at Anshan in Manchuria by Japanese, but was greatly expanded by the Chinese with Russian help. Other iron and steel production centres in Manchuria are Fushun, Penki, Shenyang, Harphin and Kirin. For Wuhan plants, ore is obtained from Taylh, i.e., 130 km away, and coal from Pingtinghan to the north of Yangtze River. The Wuhan steel plant is also in process of expansion. Other less extensive new steel plants are being created in Siangtan (Hunan), Tientsin, Tangshan, Nanking, Shanghai, etc.

At present, China is having following important areas of iron-steel industry:
(i) Southern Manchuria is the largest steel plant of China at Anshan and other plants at Pensihu and Mukden.
(ii) Shansi is also an old region of iron and steel production. In this region Taiyuan has been developed as a major steel centre.
(iii) The Lower Yangtze Valley: In this region Hankow, Shanghai, Hanyang and Chungking are the main centres of iron and steel industry.
(iv) Other centres are located at Paotow, Chinling Chen, Canton, Singtao and Huangsih.
The growth of iron and steel industry in China has been spectacular. Since 1973, China has increased its production of steel by 220 per cent, although her consumption of steel has also increased more than 300 per cent.

2. Japan:
In spite of the shortage of raw material (iron and coal), Japan has become one of the leading steel producers of the world. After China, Japan is the second largest producer of pig iron and crude steel in the world.

Centres of iron and steel industry in Japan

In Japan, large-scale concentration of iron and steel industry has occurred in the following regions:

The Tokyo-Yokohama Region: It is having all facilities required for the growth of iron-steel industry. The reclamation of Tokyo Bay provided large, extensive plane land for steel manufacturing units. The Tokyo-China region is the main area in which steel industrial units have been developed at Hitachi and North Tokyo.

Nagoya Region: It contributes about 20 per cent of the Japanese steel production. This region had witnessed a massive growth of industries within the period 1950-60.

Osaka-Kobe Region: At the head of the Osaka Bay, a highly industrialised area known as the Kinki has developed. The port of Osaka is the main centre. Other centres of this region are Amagaski, Kobe, Hemegi, Sakai and Wakayama.

Fukuoka-Yamaguchi Region: It is located in the extreme south of Japan within Kyushu and westernmost end of Honshu. The first government steel plant was established at Yawata in 1901. Kita-Kyushu is another notable iron and steel centre of this region.

Oka-Yamaha Region: It is a new industrial region situated in between Osaka-Kobe and Hiroshima.

Hokkaido Region: The main centre of this region is Murroran. A fairly big sized iron and steel industry has developed here depending upon local coal and iron ore. The most striking feature in the locational pattern of Japan's steel plants is that they are situated either on the Bay-Coast or on some canal or river. This is because of the fact that most of the Japanese steel plants depend upon outside raw material. Another feature is that they are located in the heart of great industrial districts which provide ready market for finished steel. In fact, localisation of iron and steel industry in Japan is market-oriented.

3. United States of America:

Once USA was the highest producer of iron and steel but now its rank is third in the world, next to China and Japan. In the US first iron and steel plant was established in 1629 at Massachusetts. During last 380 years or so the US steel industry has undergone through several changes. This change has not only occurred in growth and production pattern but also in localisation pattern. The major iron and steel regions in the USA are as follows:

Appalachian or Pittsburgh Region: The most important of all the regions is the northern Appalachian region of western Pennsylvania and eastern Ohio. This district contains about 42.5 per cent of the blast furnace capacity of the country and its centre, Pittsburgh, is the second greatest centre of steel industry in the world. The mills in this region are located almost exclusively in the narrow valleys of the headwater streams of the Ohio River, including the upper reaches of the Ohio itself. The region, often known as the Pittsburg-Youngstown region, includes several districts. The Pittsburgh district consists of industries located in the valleys of the Ohio, Monongahela, and Allegheny, within 60 km of Pittsburgh.

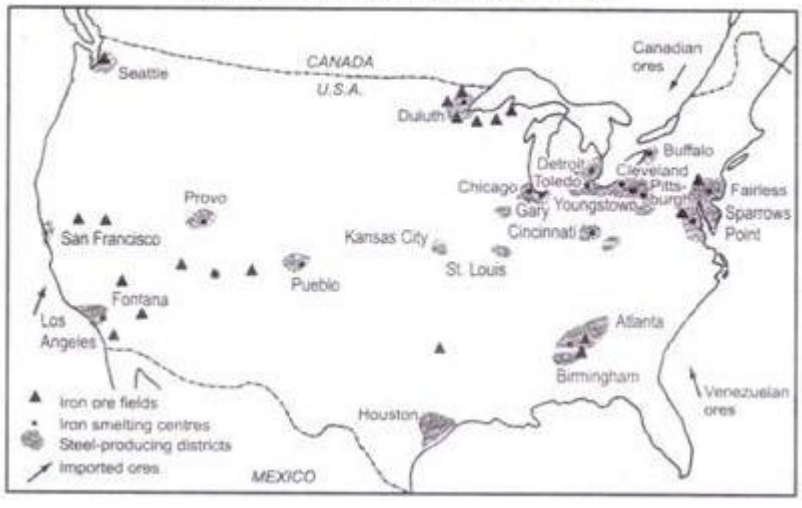
The Youngstown or the 'valley' districts consist of industries in the valleys of the Shenango and the Mahoning rivers.Wheeling, Johnstown, Stenhenville and Beaver Falls are other important steel-producing centres. The chief disadvantage of the region is its remoteness from the sources of iron ore supplies, which come from the Lake Superior region partly by rail and partly by water.

Lake Region:

The lake region falls into:

(a) The Lake Erie ports; Detroit, Cleveland and Buffalo, etc.;

Major centres of iron and steel industry in USA



(b) The centres near the head of Lake Michigan, Chicago-Gary or Calument district; and

(c) The Lake Superior region, Duluth. These districts represent a somewhat different adjustment to the three factors in the localisation of the industry, coal, iron and market. The Lake Erie ports are nearer to the Appalachian coal, but farther from the iron ore than the Duluth region.

The Michigan region is midway between the two. One important advantage that all these districts enjoy over the Pittsburg region is that, owing to their location on the lake shores, one extra handling of iron ore is eliminated. On the other hand, these centres are located a little away from the market. Duluth, for example, has in its immediate hinterland the forest, farm, and the ranching country, with little demand for iron and steel goods.Detroit is the largest steel consuming centre in the USA particularly because of its automobile industry.

Atlantic Seaboard Region:

On the Atlantic Seaboard, it is only the Middle Atlantic region (New York, Philadelphia and Baltimore, etc.) that is important. The chief advantage that this region enjoys is in respect of its location, both in relation to the tidewater, and the proximity to the large industrial centres of the East. Its location near the centre of the great manufacturing region of the Atlantic Seaboard, the region of the densest population, and of the most intense industrial development in North America, is the most remarkable.

The Middle Atlantic region is the only major region in which the production of pig iron and steel is notably greater, in proportion, than the iron ore consumed, because of the relatively larger amounts of scrap available in this highly industrialised region.There are many steel mills in this region which operate without blast furnaces, depending both on scrap and pig iron imported from other areas, particularly the Northern Appalachian region.

South Appalachian:

In the Southern Appalachians, in Alabama, however, large deposits of these raw materials are found in closer proximity than anywhere else in North America if not the world. While the ore is of low grade and requires shaft mining, much of the rock is lime and the ore is, therefore, self-fluxing. The region lacks, however, large industrial centres in the neighbourhood and has, therefore, a considerable amount of surplus pig iron which goes to the North.

Western Region:

This region extends from Colorado in the interior to the California on the west. Among the steel region in the USA, this is a new region. The first steel mill, although had been setup in 1882 at Pueblo. Later on steel industries were developed at Fontana in California and Provo at Utah. For these plants, iron ore is obtained from Wyoming and coal from Colorado.

4. Russia-Ukraine (erstwhile USSR):

Prior to disintegration in 1991, USSR was the leading steel-producing country of the world. Now also Russia and Ukraine are important iron and steel producers of the world. Russia ranks 4th in the production of pig iron and crude steel, while Ukraine stands 8th in world ranking.In the post-revolution period, the Soviet steel industry had achieved a remarkable expansion. During the Second World War, however, the Soviet iron and steel industry was affected badly.Most of the large production centres were either destroyed or damaged. However, soon the country recovered and by 1975 became the largest producer of iron and steel in the world.The four important iron- and steel-producing regions are:

Ural Region: It lies on both sides of the Urals. The major steel centres of this region are – Magnitogorsk, Chelyabink, Nizhnitagil, Sverdlovsk, Serov, Perm, Orsk, etc. Magnitogorsk is the largest steel-producing centre of Russia.
Kuznetsk or Kuzbas Region: It is located in the north of the Alai Mountains and south of Tomsk. This steel region is coal-based. The supply of iron ore is from the Ural region. Novokuznetsk is the leading steel centre of this region.
Moscow Region: Important centres of iron and steel in this region are Tula, Lipetsk, Cherepovetsk and Gorky.
Others: Other regions are isolated and developed in various parts. These are Baikal, St. Petersburg, Lower Amer valley and Pacific coastal region.

5. Ukraine:
Now, Ukraine is an independent country and has 8th position in world s production of iron and steel. In this region all the raw materials, i.e., iron ore, coal, limestone, manganese are available for steel production. A dense network of railways and cheap water transport facilitate the growth and development of iron and steel industry. The main centres of iron and steel plants are Krivoirog, Kerch, Zhdanow, Tagarerog, Zaporozhye, Pittsburgh, Dniepropetrovsk, etc.Other notable steel-producing centres of independent countries are Tbilisi, Tashkent and Bogovat in Uzbekistan and Tamir Tan in Kazakhstan.

6. Germany:
Before World War I, Germany was the second largest iron and steel producer in the world. It was the largest exporter of steel goods in the world. German iron and steel industry was handicapped since after the war of 1914 by the loss of ore, coal and productive capacity. The division of Germany was the main cause of lower status in terms of iron and steel production. But after re-unification of East and West Germany in 1990, the country is now one of the leading steel-producing countries in the world and ranks 5th in the world with an annual production of 27.3 crore tons of pig iron and 41.7 crore tons of crude steel. The most important centre of iron and steel industry in Germany is the Rhenish-Westphalia, contributing more than 80 per cent of the steel produced in Germany, and 85 per cent of pig iron. It manufactures a wide variety of specialities. Other regions of importance are the Siegerland Hessen-Nassau, Northern and Central Germany, Saxony, and South Germany. The greatest centre is Essen in the Ruhr valley where the world famous works of Krupp are situated.

7. South Korea:
South Korea is the 6th leading country of the world in iron and steel production. It is the third Asian country after China and Japan which produces high-grade of steel. Its annual production is 24.8 crore tons of pig iron and 43.4 crore tons of crude steel.

8. Brazil:
Brazil is the 7th ranking country in iron and steel production in the world. Its annual production is 27.7 crore tons of pig iron and 27.8 crore tons of steel. Therefore, Brazil is able to export bulk of her steel production. Most of the steel industries are located around Sao-Paulo and Curumba. Brazil possesses vast amount of iron ore. The largest of these deposits is located near Minas-Gerraes. Another large steel plant is located at Santa Catarina. Most of the mills obtain energy from hydel-power plants.

9. India:

India has a long history of the use of iron and steel. However, it was only after the first decade of the 20th century that manufacture of iron and steel as a modern industry made a beginning in this country. It was in 1911 that India's first iron and steel plant – the Tata Iron and Steel Company Ltd. (TISCO) was set up in Jamshedpur in Bihar in private collaboration with a US firm. Nearly three and a half decades later another plant was launched at Burnpur in neighbouring Bengal — the Indian Iron and Steel Company Ltd. (IISCO) — with British participation.At the commencement of Five-Year Plans (1951) there were three steel plants located at Jamshedpur, Asansol and Bhadravati. Not only capacity of these plants was increased but six integrated plants in public sector have been established at Durgapur, Rourkela, Bhilai, Bokaro, Vishakhapatnam and Salem, Apart from these more than 140 mini steel plants have also been set up to meet the growing internal demand. India is having the largest iron ore deposits in the world and also having coal, therefore, having very good prospects of the further growth of iron and steel industry.

10. France:

Till 1973, France was the 6th largest producer of steel in the world but now its position is 10th. France is the biggest iron ore-producing country of West Europe but there is scarcity of coal. In France, two regions are notable for iron and steel production. These are: Lorraine, and Sambre-Meuse. Metz, Briey, Nancy and Longway are notable steel centres of Lorraine region, while Clermount Ferrand, Le Creusot, St. Etienne, Lille, Valenciennes, Le Harre and Marseilles are important centres of Sambre-Meuse region. In Saar basin also, steel industry has developed on local coal deposits and iron ore from Lorraine.

11. Great Britain (UK):

Great Britain was not only the pioneer but a leading steel-producing country in the world for a long time. But its decline started in the first quarter of the 20th century. Now once again Great Britain has been able to establish itself as one of the important iron- and steel-producing countries and ranks 12th in the world. The main advantage of UK's iron and steel industry is that most of the centres are well-situated in relation to their coal and ore supplies and also have good facilities of importing raw material and exporting finished goods.The most important steel-producing centres of UK are North East Coast (Middles-borough, near New Castle, is the largest producing centre, and has the most modern equipment in Britain's industry), Derby, Leicester, etc., South Wales (Cardiff), Lincolnshire, West Coast, Scotland (Glasgow).

12. Italy:

Italy now has emerged as a leading iron- and steel-producing country not only of Europe but of the world. It ranks 11th in the world's production of iron and steel. Italy's annual production is 10.9 crore tons of pig iron and 26.6 crore tons of crude steel. Although Italy is having shortage of both coal and iron ore but it has developed this industry through well-planned management. The major steel plants of Italy are located at Naples, Genoa, Aosta and Trieste.

13. Poland:

Poland is an important producer of iron and steel in Europe. The main steel plants of Poland are located at Glewitz and Gracow.

14. Czech Republic:
Iron and steel industry is moderately developed in the country. The largest steel plant in the country is Skoda steel plant.

15. Sweden:
Sweden is very rich in her iron ore reserves. Energy is obtained from cheap hydel-power. Swedish steel is of very high quality. The best quality steels are generally exported. This country is not self-sufficient in ordinary steel production.

16. Holland:
This country is deficient in both iron ore and coal. As most of the steel plants are new, productivity rate is very high. The country has to import large amount of steel for domestic consumption.

17. Australia:
Australia is very rich in coal deposits. Most of the steel plants are new in Australia. So, the productivity is very high. The important steel plants are New Castle and Port Keembla.

18. Canada:
The Canadian steel industry is not very old. Most of the iron and steel centres were developed around Lake Ontario, Sydney, Nova Scotia. Canada is self-sufficient in the production of iron ore and coal. Most of the coal reserves are located within Nova Scotia and iron ores are located around Sydney. Apart from that, steady supply of iron ore and coal from adjacent USA has enabled Canada to develop a large steel industry. Some of the major steel plants are Hamilton, Sault Ste, Ontario, Sydney, etc.

19. Mexico:
Mexican steel industry is as old as American steel industry. The largest steel plant is located at Mouterrey. The others are Monclova, Coahuila, Piebras, Negras and Colima. The coal is obtained from Salivas area and iron ores from Durango.

20. South America:
In South America, apart from Brazil, steel plants have been established in Argentina, Chile, Uruguay and Venezuela.

21. Africa:
The largest steel producer of Africa is the South Africa. In South Africa steel plants are located at Transvaal and New Castle. In other African countries, iron and steel industry has not yet been developed properly.

22. Asia:
In Asia, apart from China, Japan, South Korea and India, steel industry has also been developed to a limited extent in Turkey, North Korea, Iran, Taiwan, Malaysia and Vietnam.

Major steel plants of India
Some of the major Iron and Steel Plants of India are as follows:
1. Tata Iron and Steel Company (TISCO):
This is the oldest iron and steel centre of India. It is a private sector enterprise. It was established in 1907 by Jamshedji Tata at Sakchi in Singhbhum district of Jharkhand. Later on, it was renamed as Jamshedpur after Jamshedji. It started producing pig iron in 1911 and

steel in 1912.The plant initially had capacity of producing 1.21 million tonnes of pig iron and 1.1 million tonnes of steel per annum. This capacity has been enhanced to 3.9 million tonnes of pig iron, 2 million tonnes of ingot steel and 3 million tonnes of saleable steel. Currently it produces about 3 million tonnes of saleable steel. Following facilities are available to this centre: (i) High grade haematite iron ore is available from Noamundi mines of Singhbhum in Jharkhand and Gurumahisani mines of Mayurbhanj in Orissa. These mines are located at a distance of 75-100 km from Jamshedpur.(ii) Coal is available from Jharia and Raniganj coal mines located 160 to 200 km from Jamshedpur.(iii) Manganese comes from Joda mines of Kendujhar district in Orissa.(iv) Dolomite, limestone and fire clay used as flux material are available from Sundargarh district of Orissa. (v) Kolkata, located at a distance of 250 km, provides port facilities and its industrialised hinterland provides market for the products.(vi) Sufficient water for cooling purposes is obtained from Subanarekha River. In addition to this, the storage dam on Kharkai River also provides water.(vii) Jamshedpur is well connected with Kolkata, Mumbai and Chennai by road and rail and enjoys good transport facilities.(viii) Densely populated regions of Jharkhand, Bihar and Orissa provide cheap labour. Major part of labour is drawn from tribal areas of Chota Nagpur plateau.

2. Indian Iron and Steel Company (IISCO):

Three plants at Kulti, Hirapur and Bumpur in West Bengal were set up in 1864, 1908 and 1937 respectively. These plants have been merged together and are known as Indian Iron and Steel Company (IISCO).It was brought under government control and management in July 1972. The three plants are linked by Kolkata-Asansol railway line. Hirapur plant produces pig iron which is sent to Kulti for making steel. The rolling mills are located at Bumpur. IISCO enjoys the following advantages:(i) Iron ore is available from Guna mines in Singhbhum district of Jharkhand located at a distance of 285 km. Some iron ore is also obtained from Mayurbanj area of Orissa.(ii) It used to receive coal from Jharia, located at a distance of 137 km but now the power from the Damodar Valley Corporation is extensively used.(iii) Dolomite and limestone are obtained from Sundargarh district of Orissa which is 327 km away. Limestone is also available from Gangpur and Paraghat areas of Orissa. (iv) Rail and road links connect it to Kolkata which is just 200 km away.(v) Cheap labour is readily available from the neighbouring areas. IISCO has annual capacity of producing 10 lakh tonnes of steel. Currently it produces over 4 lakh tonnes of pig iron, more than 3.5 lakh tonnes of crude steel and around 3.8 lakh tonnes of saleable steel.

3. The Visweswaraya Iron and Steel Ltd:

It was established as Mysore Iron and Steel Company (MISCO) in 1923 by the erstwhile state of Mysore. It is located at Bhadravati on the banks of river Bhadravati in Shimoga district of Karnataka. This plant was brought under state control in 1962 and was renamed as Visveswaraya Iron and Steel Ltd. after the name of great engineer Dr. Visweswaraya. This plant has got a capacity of 1.38 lakh tonnes of steel. There are plans to raise its capacity to two lakh tonnes. This centre enjoys the following advantages.(i) Bhadravati valley is 13 km wide as a result of which enough land is available.(ii) High grade haematite iron ore is brought from Kemmangundi mines in Chikmaglur which is just 40 km away.(iii) At the time of the setting up of the plant in 1923 the charcoal obtained from the forest-wood was used for smelting because coal was not available. Now it uses hydroelectric power obtained from Sharavati Power Project.(iv) Limestone is available from Bhundiguda just 25 km away.(v) Shimoga and Chitradurga supply manganese. These areas are just 50 km away.(vi) Dolomite and chromite are also available within a radius of 45-50 km.(vii) It lies on the main Bim-Shimoga railway line and makes use of railway facilities. In order to increase the production of iron and steel, the Government of India established The Hindustan Steel Limited in public

sector. Consequently, three plants under the public sector, i.e. Bhilai, Rourkela and Durgapur came into operation during the Second Five Year Plan. Capacity of each plant was fixed at 10 lakh tonnes of steel which was expanded during the Third Five Year Plan and a proposal of setting up a steel plant at Bokaro was also made.

4. Bhilai:

Bhilai iron and steel centre was set up in Durg district of Chhattisgarh in 1957 with the technical and financial support of the then Soviet Union. It started production in 1959. Its initial capacity was 10 lakh tonnes which has been raised to 52 lakh tonnes.Durg happens to be a backward area and the purpose of setting this plant was to bring prosperity to this area. This plant produced 41.87 lakh tonnes of crude steel, 38.32 lakh tonnes of saleable steel and 2.43 lakh tonnes of pig iron in 1996- 97. It enjoys following geographical advantages: (i) It procures rich haematite iron ore from Dalli-Rajhara range which is 80 km south of Bhilai.(ii) Coal is obtained from Korba and Kargali fields of Chhattisgarh located at 225 km away. Bokaro and Jharia (720 km) also supply coal.(iii) Limestone comes from Nandini mines hardly 24 km away.(iv) Bhandara of Maharashtra and Balaghat of Madhya Pradesh supply (v) The Korba Thermal Power station is the main source of power.(vi) It is connected with Kolkata-Nagpur railway line.(vii) Dolomite comes from Bilaspur.(viii) Cheap labour is available from the nearby areas.

5. Rourkela:

Plant of Hindustan Steel Limited at Rourkela is situated in the Sundargarh district of Orissa It was set up with the help of the then West German firm, Krupps and Demang, during t e Second Five Year Plan (West Germany and East Germany have united to form one country now). It became operative in 1959. It produced 12.40 lakh tonnes of crude steel, 11.80 lakh tonnes of saleable steel and 0.54 lakh tonnes of pig iron in 1996-97. This plant has the following facilities for its successful operation:(i) This plant uses iron ore obtained from Sundargarh and Keonjhar districts. These iron ore sources are located within a distance of 77 km from the site of the plant.(ii) Coal is obtained from Jharia coalfields located at a distance of 225 km and Talcher, located at a distance of 169 km.(iii) Hydro-electric power is obtained from Hirakud Power Project, located at a distance of 150 km.(iv) The plant receives manganese from Barajmda, dolomite from Baradwar and limestone from Pumapani. These materials are located within a radius of 222 km in Orissa.(v) It is located on the main Nagpur-Kolkata railway line and enjoys facilities of railway transport.(vi) Kolkata provides the port facilities and its hinterland serves as market.

6. Durgapur:

This plant of The Hindustan Steel Ltd. is located at Durgapur in Bardhaman district of West Bengal. It was set up in 1959 with the help of the United Kingdom. The production started in 1962. It has a total capacity of 35 lakh tonnes. It produced 12.45 lakh tonnes of crude steel, 10.93 lakh tonnes of saleable steel and 1.14 lakh tonnes of saleable pig iron in 1996-97.The Alloy Steel Plant at Durgapur has a capacity to produce 1.6 lakh tonnes of ingots steel which has been expanded to 2. lakh tonnes of crude steel. The following geographical factors favour its location and growth.(i) Iron ore comes from Bolani mines. Mayurbhanj also supplies iron ore. These areas are located within a radius of 320 km.(ii) Coal comes from Jharia and Raniganj.(iii) Limestone is obtained from Birmitrapur in Sundargarh and manganese from Keonjhar district of Orissa.(iv) Dolomite is supplied by Birmitrapur.(v) Hydroelectricity is available from Damodar Valley Corporation.(vi) Plenty of water is available from Durgapur Barrage built across Damodar River.(vii) The Kolkata-Asansol railway line links it with other parts of the country.(viii) Cheap labour is readily available from the surrounding areas.

7. Bokaro:
A new public sector company, the Bokaro Steel Ltd. was formed in 1964 to erect a steel plant with the collaboration of the eartwhile Soviet Union at Bokaro near the confluence of the Bokaro and Damodar rivers in Hazaribagh district of Jharkhand. It is the second plant set up with the Soviet help. It started production in 1972. Its initial capacity was 10 lakh tonnes which was raised to 40 lakh tonnes.There are plans to raise its capacity to 100 lakh tonnes making it the largest iron and steel making centre in India. It produced 36.44 lakh tonnes of crude steel, 30.46 lakh tonnes of saleable steel and 2.6 lakh tonnes of pig iron in 1996-97. This achievement has been made possible due to following few geographical factors:(i) It receives iron ore from Kiriburu mine in Orissa.(ii) Coal is obtained from Jharia coalfields located at a distance of 65 km.(iii) Limestone comes from Palamu district of Jharkhand.(iv) Hydroelectricity is obtained from Damodar Valley Corporation.(v) Kolkata is just 300 km from here and provides port facilities.Three more steel plants were planned during the Fourth Five-Year Plan in order to meet the growing requirement of steel. These plants are located at Salem in Tamil Nadu, Vishakhapatnam in Andhra Pradesh and Vijayanagar in Karnataka.

8. The Salem Steel Plant:
The plant has been set up at Salem in the Salem district of Tamil Nadu. The plant has the advantage of rich iron ore and limestone, which is readily available in the adjoining areas. It also enjoys the facilities of cheap power, charcoal and vast market. The iron ore available here has low sulphur and phosphorus content and is suitable for producing special grade iron and steel. The plant started commercial production in 1982. Its capacity was 32 thousand tonnes of stainless steel sheets in the beginning. This capacity was doubled in 1991 with the addition of another rolling mill. This capacity was further raised to 80 thousand tonnes of saleable steel in 1995-96. Today the Salem Steel Plant is a major producer of world class stainless steel and is in a position to export stainless steel to some of the advanced countries such as the USA, Mexico, Australia and some countries of South-East Asia. In order to cater to the growing demand for coinage of the Indian Government Mints, the management had also set up a blanking facility in 1993 with a capacity of 3,000 tonnes per annum. It also commissioned a hot rolling facility in November, 1995 which has state-of-the-art technology with high level of automation. This plant produced 48 thousand tonnes of saleable steel in 1995-96.

9. Vijayanagar Steel Plant:
This plant has been set up at Tomagal near Hospet in Bellary district of Karnataka. It has the installed capacity of 30 lakh tonnes. The production of mild steel will be its special feature. This plant enjoys the following facilities:(i) Iron ore is obtained from Hospet region located in close proximity.(ii) Coal comes from Kanhan valley in Chhattisgarh and Singareni coal fields in Andhra Pradesh.(iii) Good quality limestone and dolomite is available at a distance of about 200 km.(iv) Water and power requirements are met by the Tungabhadra hydel project located at a distance of about 36 km from the plant.

10. Vishakhapatnam Steel Plant (VSP):
This integrated steel plant has a unique location on the sea port. In fact, it is the first shore based steel plant in the country. Although the foundation stone of the plant was laid in 1972, the construction work could not start in the real sense till February 1982 when Rashtriya Ispat Nigam Limited was incorporated as a public sector company to implement the construction of the plant. In the year 1997-98, this plant produced 32.14 lakh tonnes of hot metal, 25.4 lakh tonnes of liquid steel, 22.5 lakh tonnes of saleable steel and 7.7 lakh tonnes of pig iron. It is a major export oriented steel plant and takes full advantage of its coastal location. In

1995-96, it exported 10.23 lakh tonnes of iron and steel worth Rs.702 crore, mainly to China and south-east Asian countries. The plant has the following advantages:(i) The coastal location facilitates import of coal and export of iron and steel.(ii) It is well connected to coal fields of Damodar valley in Jharkhand. Metallurgical coal is imported from Australia which meets about 70 per cent power requirements.(iii) The plant has a bright future with respect to its energy requirements because there are plans to replace coal imported from Australia by natural gas from the Krishna-Godavari basin.(iv) High quality rich iron ore deposits are available in the Bailadila area of Chhattisgarh.(v) Most of the requirements of limestone, dolomite and manganese are met by supplies from Chhattisgarh; Madhya Pradesh and Orissa.

11. Daitari Steel Plant:

A decision to set another steel plant at Daitari near Paradwip in Orissa has been taken. Initially, the plant was scheduled to be built by joint venture of British and South Korean companies but its responsibility has been given to the Tata group. The plant is expected to have capacity of producing 2.6 million tonnes of steel per annum.

12. Tata Steel Kalinganagar:

Tata Steel will set up a six million plant at Kalinganagar in Orissa with an investment of Rs. 15,000 crore. Land for the project has been acquired and detailed project report has been prepared. The first phase of 3 million tonnes capacity will be completed in three and a half years.Along with this project, Tata Steel is going to build a port at Dharma in Orissa in a joint venture with Larsen & Toubro to handle 3,00,000 tonne ship. A Rs. 1,500 crore investment has been earmarked for the port to facilitate import of coal and export of finished goods.

13. Dolvi Steel Plant:

A new steel plant is fast coming up at Dolvi in Ratnagiri district in Maharashtra. Being set up by the Ispat Industries Ltd., the plant will use new technology in steel making. The 3 million tonnes annual capacity hot rolled coil plant will be one of the most modern plants in the world. It will require less space, less energy, high labour productivity and will involve less cost of production. Producing thin strips will be a special quality of this plant.

Posco Steel, Paradwip:

Pohang Steel Company (Posco) of Korea has entered into a Memorandum of Understand (MoU) with Orissa Government for setting up a steel plant at Paradwip with a total investment of Rs. 51,000 crore. The project with a capacity of 12 million tonnes per annum will be completed by 2016. It is billed as the biggest foreign direct investment (FDI) in Indian history. A huge quantity of 600 million tonnes of iron ore will be made available for manufacturing iron and steel.

Mini Steel Plants:

In addition to the integrated steel plants, a large number of decentralised secondary units produce steel by using steel scrap/sponge iron as raw material and electric arc furnace and induction furnace for processing. With capacity varying from ten thousand to five lakh tonnes, these are known as mini steel plants. It is easy to construct such plants and their gestation period is short. While integrated steel plants mainly produce mild steel in bulk, the mini steel plants produce mild steel as well as alloy steel including stainless steel. Most of the mini steel plants are located in areas far away from the integrated steel plants so that they can meet the local demands there.

FIG. 27.5. India : Iron and Steel Industry

Currently, about 200 units with an installed capacity of 12 million tonnes have been commissioned and have started commercial production. Other units are at various stages of implementation. The estimated production by mini steel plants was about 2.8 million tonnes in 2003- 04. This sector experienced rapid growth in 1970s but remained more or less stagnant in 1980s. The new Industrial Policy announced in July 1991 has removed iron and steel from the list of industries reserved for the public sector and also exempted it from the requirements of compulsory licensing. According to the provisions of this policy, no industrial licence is required for the establishment of iron and steel plants of any capacity in the private sector, except for locations within 25 km of the city with a population of 10 lakh as per the 1991 census. Entrepreneurs are therefore; free to set up steel plants of any capacity, subject to locational restrictions.

Problems of cotton textile industry

The major problems faced by cotton textile industry

1. Capital:

Iron and steel industry requires large capital investment which a developing country like India cannot afford. Many of the public sector integrated steel plants have been established with the help of foreign aid.

2. Lack of Technology:

Throughout the 1960s and upto the oil crisis in mid-1970s, Indian steel industry was characterised by a high degree of technological efficiency. This technology was mainly from abroad. But during the following two decades after the oil crisis, steep hike in energy costs and escalation of costs of other inputs, reduced the margin of profit of the steel plants. In Japan and Korea, less than 1.1 tonnes (and in several developed countries 1.05 tonnes) of crude steel is required to produce a tonne of saleable steel. In India, the average is still high at 1.2 tonnes. Improvement in the yield at each stage of production, particularly for value added products will be more important in the coming years.

3. Low Productivity:

The per capita labour productivity in India is at 90-100 tonnes which is one of the lowest in the world. The labour productivity in Japan, Korea and some other major steel producing countries is about 600-700 tonnes per man per year. At Gallatin Steel a mini mill in the U.S. there are less than 300 employees to produce 1.2 million tonnes of hot rolled coils. A comparable facility in India employs 5,000 workers. Therefore, there is an urgent need to increase the productivity which requires retraining and redevelopment of the labour force.

4. Inefficiency of public sector units:

Most of the public sector units are plagued by inefficiency caused by heavy investment on social overheads, poor labour relations, inefficient management, underutilisation of capacity, etc. This hinders proper functioning of the steel plants and results in heavy losses.

5. Low potential utilisation:

The potential utilisation in iron and steel is very low. Rarely the potential utilisation exceeds 80 per cent. For example, Durgapur steel plant utilises only 50 per cent of its potential. This is caused by several factors, like strikes, lockouts, scarcity of raw materials, energy crisis, inefficient administration, etc.

6. Heavy demand:

Even at low per capita consumption rate, demand for iron and steel is increasing with each passing day and large quantities of iron and steel are to be imported for meeting the demands. Production has to be increased to save precious foreign exchange.

7. Shortage of metallurgical coal:

Although India has huge deposits of high grade iron ore, her coal reserves, especially high grade cooking coal for smelting iron are limited. Many steel plants are forced to import metallurgical coal. For example, steel plant at Vishakhapatnam has to import coal from Australia. Serious thought is now being given to replace imported coal by natural gas from Krishna-Godavari basin.

8. Inferior quality of products:

Lack of modern technological and capital inputs and weak infrastructural facilities leads to a process of steel making which is more time consuming, expensive and yields inferior variety of goods. Such a situation forces us to import better quality steel from abroad. Thus there is urgent need to improve the situation and take the country out of desperate position.

i. The iron and steel industry requires huge capital investments, which a developing country like India cannot afford.

ii. Most of the public sector plants are functioning inefficiently and thus incurring heavy losses.

iii. The per capita labour productivity in India is one of the lowest in the world.
iv. The under-utilisation of capacity leads to high cost of production. This is mainly due to strikes and lockouts.
v. The old technology needs to be updated and this needs very heavy investment.
vi. The control of prices by the government leaves very limited profits for future upgradation.
vii. The high-grade coking coal reserves are limited and India has to import coking-coal at market rates.
viii. Our old technology of smelting and steel making is expensive and yields inferior quality products.
ix. There is a limited demand for our products in the world market.

Probable Solutions

Following are some of the suggestive measures of the problems faced by iron and steel industry:

Low priced steel imports have been drastically increased in the recent past which has taken a toll on Indian steel industry. Domestic steel companies are reeling under losses and even large firms have seen squeezing profitability. Eg: SAIL, Essar Steel complained the same. It has also affected the banking industry as they account for big chunk of bad loans. Lead to deterioration of performance of domestic industry. Imposition of anti dumping duty (5.3%-57%): Recently govt imposed five yr anti-dumping duties on stainless steel imports from China, EU, USA, South Africa etc. Iron & steel being basic industry provide raw materials for other industries, in order to avoid the spiralling effect and ensure fair trade, provide level playing field to domestic industry govt has taken steps to make big the Make in India initiative.

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

- Government introduced Steel Scrap Recycling Policy aimed to reduce import.
- An export duty of 30 per cent has been levied on iron ore (lumps and fines) to ensure supply to domestic steel industry.
- Government of India's focus on infrastructure and restarting road projects is aiding the boost in demand for steel. Also, further likely acceleration in rural economy and infrastructure is expected to lead to growth in demand for steel.
- 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 envisages 300 million tonnes (MT) steel-making capacity and 160 kgs per capita steel consumption by 2030-31.
- 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).
- The Government of India raised import duty on most steel items twice, each time by 2.5 per cent and imposed measures including anti-dumping and safeguard duties on iron and steel items.

Present scenario

The steel industry has traditionally been very sensitive to the changing economic conditions. The recent economic meltdown has created several challenges – which when addressed appropriately, can be countered to positive effect. However, unlike the previous global recessions, this time around, all the countries have come together and taken action. Additionally, there has been a tremendous amount of governmental response to the global depression which is helping to bring about a possible easing of the situation.

India was the world's second-largest steel producer with production standing at 106.5 MT in 2018. 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. India's steel production capacity has expanded to 137.975 million tonnes in FY19. As of 2018, India is the world's second largest producer of crude steel (up from eighth spot in 2003).

India's finished steel consumption grew at a CAGR of 5.69 per cent during FY08-FY18 to reach 90.68 MT. India's crude steel and finished steel production increased to 106.56 MT and 131.57 MT in 2018-19, respectively. In FY20 (till November 2019), crude steel and finished steel production stood at 73.17 MT and 67.52 MT respectively. During 2018-19, 6.36 MT of steel was exported from India. Exports and imports of finished steel stood at 5.75 MT and 5.07 MT, respectively, in FY20P (up to November 2019).

Steel industry and its associated mining and metallurgy sectors have seen a number of major investments and developments in the recent past. According to the data released by Department for Promotion of Industry and Internal Trade (DPIIT), the Indian metallurgical industries attracted Foreign Direct Investments (FDI) to the tune of US$ 11.38 billion in the period April 2000–June 2019. The National Steel Policy, 2017, has envisaged 300 million tonnes of production capacity by 2030-31. The per capita consumption of steel has increased from 57.6 kg to 74.1 kg during the last five years. Further, India is expected to surpass USA to become the world's second largest steel consumer in 2019. As per Indian Steel Association (ISA), steel demand to grow by over 7.2 per cent in both 2019-20 and 2020-21. 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