CHAPTER - III

LOCATIONAL ASPECTS OF MANUFACTURING INDUSTRIES; A SPATIAL PROFILE

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3.1 Introduction:

Though India is an agricultural country, there has been rapid industrial development after the independence. Today India is one among the top ten industrial nations of the world. Industrial development has changed India's economy from the under developed status to developing status.

Industries can be classified into varies types on basic of their structure. The two main types are:

1. Manufacturing industries including heavy and light industries.
2. Small-scale industries and cottage industries.

India has a tradition of industry as old as human history. Before the eras of modern industrial revolution, India’s hand crafts made in village huts all over the land were prized in foreign countries and gold followed to our country in return for their sale. The industrial revolutions in Europe introduced modern factories manufacturing goods on a mass scale with greater mechanization. It led to the migration of workers to
cities, introduced money economy in place of the exchange system of trade, increased the industrial employment for some time but spelled the ruin of traditional village handicrafts.

We have large and medium scale industries such as jute, cotton textiles and a large variety of machine goods, engineering industries cottage and small-scale village industries are as widespread as agriculture. The number of persons employed in the handloom and other small village industries is still more than the number employed in large-scale factories, mines and plantation put together. Village industries characterize our rural economy widely. The family members or hired labourers are engaged in the pressing of local raw materials with simple techniques. This industrial activity is subsidiary to agriculture. These industries suffer from lack of good raw material and improvement in organized marketing. That is why the village industrial products are mostly supplying for the rural needs, particularly in inaccessible parts of the country.

Since the start of the planned development of Indian economy in 1951, from the view paint of structure, industries are divided into

1. Public
2. Private and
3. Joint and Co-operative Sectors
The heavy and basic industries mostly fall into public sector, managed by the state. The consumer goods and light engineering works are largely under private management. But there are no water tight compartments and industries like iron and steel and fertilizers are included in both the sectors. There are number of food industries, textiles, chemical, electrical, metallurgical, pharmaceutical and the handloom industries. Depending upon the raw material the industries are also classified as mineral-based and agro based industries.

Since India's independence, the expansion of the capacity of old industries, mostly producing consumer goods, and the establishment of new heavy industries as base of industrial development have been emphasized. In the new planning era product of our large-scale, industries have increased tremendously but the process of growth is far from complete. There are shortages of capital investment and raw materials and of skilled technicians.

By accelerating the tempo of manufacturing industries, India's industrial policy since 1956 has been aiming at the diversification of economy and a balanced regional development by suitable allocation as new units in backward areas.
In spite of our planned efforts in the evolution of a sound industrial structure the longstanding of industrial development has been only slightly reduced. Nearly 24% of India's modern factories are found in states of Maharashtra and Gujarat, 14% in Bihar 8 to 9% each in West Bengal and Andhra Pradesh and another 12% in Tamilnadu. The end becomes further clear by noticing the average daily factory employment. During 1956 Maharastra and Gujarat have 30% of it, Bihar 5%, West Bengal 20%, Andhra Pradesh 5%, Tamilnadu 8% and just one-third is the remaining states. The states like Orissa and Madhya Pradesh, which are endowed with rich natural resources, are at the bottom to end. Even the tiny territory of Delhi occupies a position higher to them in both these respects. The rate growth of daily factory employment in Maharashtra and Gujarat is equal to that of Orissa, Rajasthan, Assam, Madhya Pradesh, The Punjab, Karnataka and Kerala put together. The potentially rich areas in Orissa, Rajasthan, Madhya Pradesh and North East India need to be brought at par with others and the claims of backwards industrial arrears need to be explored.
3.2 The Concept of Location and Its Role in Manufacture Industries:

The study of the manufacturing which influences the location of manufacturing industries is complex. The range of their influences which may operate is wide as is the variety in manufacturing itself. In this context we are concerned with a consideration of the general broad principles which may be applied in attempting to explain why a particular manufacturing industries has grown up in a particular area. Manufacturing is frequently referred to as the 'secondary' industry of those economic activities which needs some explanation:

Primary industry:

The production of raw materials from agriculture, forestry, fisheries and mines constitute primary industry.

Secondary industry:

Manufacturing by collecting of the raw products or the semi-processed products of the primary industries, the processing of them and the dispatch of the products to market or for finishing elsewhere are included in secondary industry.
Tertiary industries:

The provision of services to the primary and secondary industries to the community, in administration, education, distributive trades, the professions, scientific research, transport, and communications, construction, repair and maintenance, defence, personal services such as dry-cleaning and hair dressing etc come under tertiary industry.

The factors affecting the location of the primary industries are usually clear; minerals can be mined only where they exist, fish, whether hunted or reared cannot live without a plentiful supply of water. In agriculture the factors are not always so simple. Farming is obviously best carried on where physical conditions of soil and climate (with the addition of easy access to a market in commercial farming) are most situated to the type of enterprise involved; But economic needs are political consideration may lead to a type of farming or a particular crop being developed in an area which does not basically suit it, and certain modern types of 'factors' on manufacturing for example the locational factors at work in the setting up of an organization concerned with the intensive rearing of live stock under cover or with the cultivation of horticultural crops under glass, in each case in completely controlled artificial environment, are those
more relevant to manufacturing than to the primary industry of agriculture.

The reasons for the location of the tertiary activity, the services, are also uncomplicated. Services arise to meet the needs of commerce and the community. The defense services apart, they inevitably cluster at central points to give rise to urban groups which, if trade and the community prosper snowball into even bigger urban concentrations. As countries develop industrially and industries become increasingly automated the number engaged in the tertiary activities rises. In industrially mature countries such as the United Kingdom or the United States, those engaged in service activities now constitute more than half of the working population.

The secondary industries, manufacturing is frequently divided into two: the industries, generally the heavy industries, which are tied to their locations for usually obvious reasons (ship building for example): and the mobile, foot-loose light industries which it is implied, may be established anywhere. There are however very few manufacturing industries which can ignore all the geographical restraints to be considered in this context and settled where they choose.
The two synonymous terms 'industry' and 'manufacturing' are used very often to denote economic activity. These two terms are expressed differently by various geographers. Some definitions are explained below:

According to "New Standard Encyclopedia", the term of industry in its broad sense i.e., all productive enterprises of a country or region. There are such words as manufacturing, agricultural, trade and commerce, transportation, communication, mining, lumbering, fishing, construction and they are termed as industries.

According to "Encyclopedia Dictionary of Geography" vol-2, 'industry' means the economic activity that is concerned, with the production of goods, extraction of minerals or the provision of services.

In narrow sense, the term industry is used for production of goods, including manufacturing industries, services such as tourism, banking and transport coal mining, oil drilling, building and constructing. The term manufacturing according to new Standard Encyclopedia", is the process or a set of operations, the change of raw materials or other goods into various products originally manufacturing (from the Latin for made by hand) meant production by hand labour. Today hand made goods are
called 'handicrafts' and they are of little importance in industrialized nations. The word 'manufacture' in Webster's (new 20th century) dictionary, has its French Latin rotes, that is manufacture (menu=hand and facture = a making form which means a making by hand) manufacturing means.

1. Employed in making as a manufacturing company.

2. Relating to manufacturing and industry is any branch of trade, business, production or manufacture such as the paper industry, the motion picture industry, etc.

As Sub-Committee report (1947) of manufacturing industries, provides simple definitions of a manufacturing Industries as "A manufacturing industries should, (a) come under the Factories Act, (b) use at least ten BHP matter or enjoin in aggregate, (c) employ labour to whom a fixed returned in cash and or kind is made or show any one are more of these characteristics:

Alexander (1963), “converting of commodities into a more useful form, is called manufacturing and commercial manufacturing includes all activities where by man: (1) assembles raw materials in an establishments (whether cottage workshop or factory building), (2) upgrades their usefullness by changing their forms, and (3) Ship out there, more valuable
commodities to other places. The focal point of this process is the factory it serves as a link between the market regions in which products are consumed,

Eliat Hurst (1972), the transformation of commodities from one form into another form, which we have called 'form utility' is the essence of manufacturing or secondary group of activities. Each type of Secondary activity varies in its particular inputs of materials labour and capital.

Singh (1983) 'manufacturing' is concerned with changing shape of different row materials by pre-requisite processes of physical and mechanical operations which makes them more purpose full, valuable and qualitative for human use.

Thus manufacturing which plays a crucial role in the national economy is a main contributor towards increasing national value. It is a source of Government revenue, through direct and indirect tax receipts. It is also a major exporter. In total it is not only true in the country as whole but it is also true in the study area.

3.3 Manufacturing Industries as geographic Phenomena

Industrial Location Theories: Optimum Locations a central theme in the development of industrial location theories has been the concept of optimum location: that there is for each
factory a 'best location'. In a real world that is constantly changing the existence of such a place seems improbable, but the concept has value in theory because it represents a standard against which reality can be measured.

The question arises of what is meant by the best location, since the term 'best' could be interpreted in economic, social or political senses. Since location theory has been largely developed in capitalist societies, the best location is taken to be that which gives the best profits. The best location is therefore where costs are lowest and revenues are highest, since income minus expenditure equals profit. There are, however, two problems to be faced in the development of maximum profit theories of industrial location.

First, such locations are difficult to find. Profitability is not absolute, and a basic distinction must be made between long-term and short-term profitability, since decisions emphasizing one or other of these considerations may require different locations. Even if this problem is solved, the number of variables involved, affecting both costs and revenues, makes the practical development of such theories very difficult.

Secondly, the whole assumption that actual decisions are made on a profit maximizing basis has been called into question.
This is because governments are playing an increasingly important role in location decision-making, subordinating profits to other social goals such as full employment, and also because of the growing awareness that individuals have goals other than that of making money.

Finding the Optimum Location:

Because of the practical problems involved in developing maximum profit theories, two principal approaches to location have been developed which examine the questions of costs and revenues separately. In the first or least cost theories, revenues are taken as being equal at all locations and variations in costs from place to place is examined to find the location where costs are least. This is then the optimum location. In the second or maximum revenue theories, costs are taken as being equal at all locations, and variations in demand are examined to find the location giving the maximum revenue. This is then the optimum location. This is not to say that the least cost school has totally ignored revenues, not that the maximum revenue school has ignored costs, but rather that there has been a distinct emphasis on one aspect or the other.
Least Cost Theory:

There are two general classes of costs that are usually considered in manufacturing: transport costs, involved in the collection of raw materials and the distribution of finished products: and processing costs, such as labour power, capital and services. The least cost school assumes that the manufacturer would best locate where the sum total of these costs is least.

To find the least cost location it is necessary to examine spatial variations in these costs, and also examine the cost structures of different industries, since a location with low labour costs will not be very attractive to an industry with a small labour cost component such as oil refining, while an area with high labour costs and cheap power will not attract industries with a high labour, low power component such as textiles.

The most important attempt to develop a theory based on costs came from A. Weber in 1909. To reduce the complexity of reality, Weber, in common with all other theories, had to simplify. His theory assumed that there was a uniform demand for a product at all locations, resulting in a uniform price, and
therefore the plant located at the point of least costs would get the highest profits.

To find this point, Weber first sought the least transport cost location, which he considered the most important influence, using a 'locational triangle'. (fig 3.1) Reality is simplified to two raw materials, M1 and M2 and one consumption point, C. The least transport cost point, P, is the point at which the total cost of moving raw materials and finished products is least. These transport costs are calculated by multiplying the weight of material or product by the distance carried, resulting in a 'Pull' being exerted on the production point by each of the corners of

![Weber's Locational Triangle](attachment:weber_triangle.png)

Fig 3.1 Weber's Locational Triangle.

the triangle. In (fig 3.1a) two tones of material M1 and two tones of material M2 are needed to produce one tonne of finished product. In a weight-losing manufacturing process such as iron smelting, the least transport cost location is near to the sources
of the raw material, but in (fig 3.1b) one tonne of material M1 and one tone of material M2 are needed to produce two tones of finished product, and in a weight gaining industry such as baking, a market-orientated location is attractive. It must be noted that only materials that are localized will have a locational effect and that materials found everywhere will be little significance.

Weber next examined the effects of labour costs on location since he considered that industries would be located away from the point of least transport costs to the point of least labour costs if savings in labour costs were greater than any additional transport costs involved in such a move.

In fig 3.2, 'P' is the least transport cost point, and around this point have been drawn a series of isodapanes (cost contours), or lines of equal transport cost per unit of production from 'P'. There is cheap labour at L1 and L2 which would reduce costs by 15 'P' per unit of production, and the question is whether or not it would be worthwhile for a manufacturer to relocate from P in order to take advantage of it. Clearly, any location within the 15 P transport isodapane would save more on labour than would be spent on extra transport and therefore L1
would be a more profitable location than \( P \). Locating at \( L_2 \) would increase transport costs more than any saving in labour costs and would not be attempted. Weber saw labour costs increasing in importance in location because technological developments were increasing in importance in location because technological developments were increasing the efficiency of transport, thus increasing the distance between the transport isodapanes, while labour costs were rising relative to other costs.

Fig. 3.3 The effect of agglomeration on location
Having combined the effects of transport and labour costs, Weber thirdly examined the effect of industry's tendency to agglomerate. In Fig. 3.3 A, B, C, D and E are least cost locations, but the firms located there could cut their production costs by L1 per unit of production if at least three of them operated in the same location. However, they must not incur increased transport costs of over L1 per unit of production. In Fig. 3.3, the critical isodapane of L1 has been drawn round each producer and it is clear that firms C, D and E could reduce their total costs by locating in the shaded area.

Weber's attempt of find the least transport cost location and then to examine how this would be modified by other considerations has obvious limitations, and has been criticized for being too abstract. His assumptions about transport rates and the effects of agglomeration have been questioned, but the theory is important because of its pioneering nature and its effects on later writers. The real test of a theory is that it should accord with reality, and empirical studies such as W. Isard's work on the US steel industry and W. Smith's work on weight-losing industries in Britain have shown the validity of many of Weber's conclusions.
3.4 Locational problems of manufacturing industries:

As we apply the reasoning we have developed to problems in the location of manufacturing, there appear to be several considerations that will affect the likelihood that an industrial category will be clustered or dispersed. One of these considerations is the probability of substitution of alternative goods by consumers. In case of cement manufacture, for example, price increase directly with distance from a manufacturing plant with higher prices, consumers, are likely turn to as plant or steel or wood or sum other means of satisfying their needs. This tendency towards substitution largely accounts for the fact the cement plants are widely disperses, with each plant serving a relatively small market area, more over, in cement, the product is highly standardized, brand loyalties are weak, and materials are obtainable widely.

We may contrast this situation with the probably location pattern in an industries characterized by few substation possibilities, we transport costs are small part of total costs, and where strong brand loyalties prevail among widely dispersed customers. In such circumstances, individual producers may find it profitable to serve relatively large market areas from similar location near the centers of such markets. Tendencies
toward this type of pattern may be seen in products such as beer, automobiles, and many kinds of consumer's durables.

Finally under certain circumstances manufacturers may find it profitable to attempt to secure a small portion of the total market by reason of location, and forego other locations that may have lower costs or are located centrally with respect to large market. Such a strategy would be likely to appear when the economies of a large scale plants are not great relative to the total demand or when established national brand name sellers are particulars strong.

Raw material plays a very vital role in location of any industry. Raw material is basic requirement of the industries. We can locate the industry where the raw material easily available, otherwise it became a problem for the industry.

Alfred Weber in his theory of industrial location pointed out that manufacturing using, low valued, heavy and bulky raw materials, tends to be located near the raw materials for example, in order to minimize transport cost iron and steel industry tends to be located near the coalfields. Since coal constitutes the greatest tonnage of all the raw materials.

Water is another important factor for the location of industry some of the industries are prolific consumers of water
such as paper making, food processing, chemical industries are particularly demanding upon the quality of water is become a problem. Some of the industries are located near the river, that river is the main source of water to that industry. The rivers are irregular in flow and almost dry a problem for the industries.

Marketing is another important aspect of Industries. The manufactured goods find their markets which are described as the people with willingness and ability to purchase, man must be jack of all trades in thinly populated areas with high degree of isolation. The densely populated areas with poor transportation and low purchasing power are not favorable for modern manufacturing. A numbers of industries are located in Maharashtra, Gujarat, and West Bengal etc. Because of big market centers in small cities market is one of the major problems to locate the industry.

Transportation plays a very essential role in location of industries. We transport things from where they are to where they ought to be. Transport provides a link between production and consumption. It is necessary, for assembling the raw materials and for marketing the finished products. To sum up, transportation is developed due to some other the varying influence of markets, materials and power. Well developed, low
cost transport network favors the growth. The great industrial commercial regions of west-central Europe and north-eastern United States have the most efficient transport network based on roads, railways, water-ways, pipelines and transmission lines. Transport facility is one of the major criteria for selecting a site of industrial development. Absence of good railway network in India during later half of the 19th century kept the growth of cotton textile industry confined to western India.

Capital is one of the chief difference between the primitive handicraft manufacturing and modern factory scale manufacturing lies in the investment of capital viewed as the means of productions capital is the mainstay pf modern manufacturing and it is the lack of capital which accounts for the primitive household made of manufacturing. capital helps generating power, developing transport system, assembling raw materials, employing labour, purchasing sites, and buying machinery. In India capital is one of the major problems for the development of industries.

Labour supply is another important factor for location of industries have greatly reduced strains on human muscle and brain, yet the modern factories of all size require energetic, intelligent, skilled and healthy workers, Availability of skilled
labour may also be a major point of attraction for some industries. Developed regions with a greater force of technically qualified persons attract industries like automobile, electronics, chemical etc. In India there is a problem of technically qualified labour. India's technically qualified labours go to developed countries where they get good salary and all basic facilities compare to India.

3.5 Manufacturing and Regional Development:

1. Manufacturing industries increase the national income and per capita income. Industrial development increases the employment opportunities to a large number of people and thus increases their income and the standard of living.

2. Industrial development solves the problems of unemployment and underemployment which are some of the major problems of India.

3. Industrial development promotes agricultural development. Many industries are agro-based industries, Agricultural products are raw materials for their industries.

4. Industrial developments help the utilization of natural resources, such as mineral resources, water resources, forest resources and other natural resources. Utilization of these resources helps in the progress of the country.
5. Many institutions belonging to the territory. Sector is also developed as a result of industrial development, e.g., banking, education, insurance, transport, and communication, etc.

6. Countries which depended only on agriculture have a low standard of living. But countries which have developed both agricultural and industries have a well-balanced economy.

7. Industrialization helps both the domestic and foreign trade of a nation. Many goods: which we produce are exported to other countries and help us to earn foreign exchange. It also reduces our dependence on foreign countries for many goods. Generally industries are located in towns and cities. This enables the towns and cities to become countries of trade and culture.

8. Arms and ammunition required for the defense of country need to be produced in the country itself. We cannot depend on other countries for their arms and ammunition. Industries manufacture tanks, aero planes, explosives, guns, bullets and many others defense requirements and thus help to strengthen the defense of the country.

9. Increase of industries helps in the increase of income of the government because industries pay taxes to the government.