CHAPTER - II

INDUSTRIAL LOCATION AND REGIONAL DEVELOPMENT - A REVIEW

Introduction:

Industrialisation has come to be regarded as synonymous with economic development and the distinction between the two terms is most often lost. Industrialisation is accepted as the most predominant component of development strategies. Because industrialisation is more powerful innovation which injects dynamism and brings about lasting increase in productivity of labour. It influences the growth of national output and income besides influencing the national life and the social, political and cultural pattern. It is, therefore, bound to bring about fundamental changes in the lives of the people.¹

Industrialisation is a process which is invariably the outcome or accompaniment of economic development. It is a set of policies which is preferred to any other set of policies as a means towards economic development.² Industrialisation exploits and activises the idle and dormant resources of the economy. It promotes the

development of multi-sectoral economy and such multi-sectoral economy could obviously supply better amenities of life and promote the economic welfare of the society than agriculture or primary industries alone could do.

The need for industrialisation is stressed explicitly in the theories of economic development. The underdeveloped countries which have been stagnant for centuries together need a 'big push' to come out of underdevelopment. Balanced and stable growth of an economy is possible through simultaneous investment in a large number of different industries. This is required to create an effective demand capable of absorbing the production of each industry. Accordingly the 'big push' must be made and the investment must be planned in a centralised and 'balanced' fashion over a large number of projects of varying sizes that dovetail with each other. Countries entering into take-off are required to prepare a broad industrial base capable of creating and sustaining the growth process.  

Further the abundant surplus labour in agricultural sector may not be effectively utilised unless the capitalist sector i.e., the manufacturing sector develops rapidly in


the economy. The surplus generated in the industrial sector helps to promote economic development.

In a historical perspective, Myrdal establishes a positive relationship between industrialisation and economic development. Many underdeveloped countries which are mainly traditional agricultural economies desire industrialisation because it enables the country to develop technical consciousness for removing the problems of poverty and unemployment, and they have observed that there is a strong and positive connection between the wealth and standard of living of a country and the extent of its industrialisation.

There is enough empirical evidence to show that industrialisation which involves the development of the manufacturing sector in particular and non-agricultural sector in general hold the key to economic development. Studies carried out by United Nations Industrial Development Organisation (UNIDO) indicate that "the most significant structural change accompanying an increase in the levels


of per capita income is a decline in the share of agriculture and a rise in the share of manufacturing in a country's output. Developing countries are seeking therefore, to achieve more rapid industrialisation and accelerated economic development. 7

Industrial development was recognised as a key factor in economic development of India, even before independence by Dr. M. Visveswaraiah, whose economic philosophy was "Industrialise or Perish". He believed that industrialisation with the emphasis on the development of the heavy industries should form the main course of the country's economic reconstruction. The National Planning Committee, set up by the Indian National Congress in 1938 also stated explicitly that "without industrialisation no country can have political or economic freedom - without industrialisation also the rapid and effective raising of the standard of the people is not possible". 8 The importance of industrialisation was further realised after independence. Jawaharlal Nehru, the first Prime Minister of India expressed that "the real progress must ultimately


depend on industrialisation". This is due to the fact that manufacturing activities have better potentiality for generating employment directly and indirectly through their backward and forward linkages with other sectors of the economy and are most effective in raising productivity of labour which is very essential for economic development. The Planning Commission\(^\text{10}\) has identified two basic factors which favour rapid industrialisation as a means to promote faster economic development. These are:

- a. The productivity of labour in industry is greater than in agriculture.
- b. The surplus created in the industrial sector is likely to be available for investment relatively more easily than surplus in agricultural sector.

Therefore, in India the planners and policy makers have viewed industrialisation as the most acceptable instrument to generate and promote growth. It is acknowledged as a means to bring about social transformation, social equality, more equitable distribution of income and well balanced regional development.

While industrialisation is a desirable policy, the pattern of industrial development observed from the historical experience indicates that it has an inherent

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tendency to get concentrated in few favourable regions. The uneven distribution of investment and employment and other related industrial activities give rise to regional disparities in the pattern of development. Regional disparities may then be mainly attributed to locational decisions of entrepreneurs which induce the interaction between industrial location and regional development. The present emphasis on regional policy/planning in both developing and developed countries indicate the clear recognition of regional factor in development.

Industrial Location: Theory and Practice.

The task of decision making about industrial location is highly complex. A manufacturer is guided by several technical, economic, institutional and practical factors at the time of choosing a location for the plant.

There are several leading approaches to the analysis of industrial location, which stress on different factors involved in the choice of industrial location. The analysis is very much diversified and significant contributions are made to it by both geographers and economists.

The theoretical base of industrial location emphasises on the two basic aspects of production structure of a commodity i.e., cost and demand.

The least cost theory treats the problem of location
from the cost side and identifies optimum location at a point where costs are minimum.

The market area or demand approach considers optimum location at a point where market area is optimum or profits are maximum.

The later developments in the theory of location attempts to provide a synthesis of these two aspects of production structure and determine the points of optimum location.\textsuperscript{11}

Least Cost Approach:

The least cost approach, considering costs as an important of production advocates that the production activity may become profitable at a point at which the costs will be minimum. The location point is therefore a point where costs are minimum.

Von Thunen considers two significant factors: transport cost and rent of land in the theory of agricultural location. Launhardt attempted an analysis of location of specific manufacturing industries in terms of

transport costs, market areas and raw material resources.\textsuperscript{12} Weber's analysis concentrated on location of manufacturing units and considered three costs influencing industrial location. These are transport cost, labour cost and costs due to agglomeration.\textsuperscript{13} He emphasised the role of transport cost in location decision and concluded "it is clear that an industry will be drawn to those locations which have the lowest costs of transportation, having regard both for the place of consumption and the place of the deposits of materials".\textsuperscript{14} The minimum transport cost point of location will be sub optimal in case labour costs are dominant. The location choice will then be at a point where savings in labour costs will be larger than additional transport costs. The agglomeration factor may influence location decisions where cost economies due to agglomeration exceed or equalise with the extra labour or transport costs involved. He, however, considers this a less prominent type of orientation.

Weber's restrictive assumption\textsuperscript{s} like uniformity of


interest rates, immobility of labour, spatial uniformity of demand conditions have come under considerable criticisms. The analysis therefore, is treated as partial with concentration on cost factors.

Hoover\textsuperscript{15} in his attempt, separated cost factors in two categories, transportation costs and extraction or production costs. As long as extraction costs do not vary with output (in the absence of economies of scale) transport costs alone influence location decisions. The basic limitation of Hoover's approach is that he, like the least cost theorists, is more concerned with costs than the demand factors. The other location theorists like Falander and Ritschl also treated least cost point as the optimal location.\textsuperscript{16}

Demand or Revenue Factor Approach:

Least cost factor approach is over emphasised with input side (cost minimisation) and under emphasised with output or demand side.

August Losch\textsuperscript{17} produced a theory of location with


\textsuperscript{17} Losch, August., 'The Economics of Location', Yale University Press, U.S.A, 1954.
demand as a major spatial variable. He provides the alternative optimum location point at which revenue is maximum. The right approach, to him, is to find the place of maximum profits, where total revenue exceeds total costs by the greatest amount.\(^\text{16}\) Considering three fundamental factors viz, existence of space exploiting activities, transportation costs and economics of scale and with assumptions like even distribution of natural resources, equal population density, uniform consumer preferences, uniform production technique and different demand functions for individual products, he arrived at a hexagonal market area surrounding the production site which would be optimal from the point of view of the individual plant.

Losch is also criticised on many grounds. His assumptions are questioned. He concentrates on demand as sole determinant of location and neglects spatial variations in costs. Transport cost has the effect only limiting the size of the market areas.

Profit Maximisation Approach - A Synthesis.

The cost factor and demand factor approaches are both one sided, holding either the input supply or market demand constant. Recent theorists Walter Isard\(^\text{19}\)


\(^{19}\) Isard, Walter, 'Location and Space Economy', The MIT Press, Massachusetts, 1956.
and Melvin Greenhut\textsuperscript{20} have attempted to integrate both least cost and market demand approaches to identify the profit maximisation location.\textsuperscript{21} In such a situation the optimum, profit maximising location may be neither the least cost nor the maximum revenue location. Greenhut's theory of industrial location incorporates the following factors:

1. Cost factors of location (transportation, labour and processing costs).
2. Demand factors of location (locational interdependence of firms, or attempts to monopolise certain market segments).
4. Revenue-increasing factors.
5. Personal cost-reducing factors.
6. Personal revenue-increasing factors.
7. Purely personal considerations.\textsuperscript{22}

Greenhut regards transportation costs influencing location only when the cost of transportation forms a substantial part of total costs. His theory incorporates both the major elements viz., the demand and cost factors of location and also institutional and non-institutional


\textsuperscript{22} Smith, D.M., op.cit., 1971, p.146.
factors and therefore it is a more general theory of location.

Industrial Location - Practical View.

Location factors are extremely diverse and in considering them difficulties arise because their relative importance tends to change over a period of time. Furthermore the relative importance of various factors differs from one industry to another and even from one firm to another. 

The following may be considered as some of the important factors that tend to govern location in practice.

1. Transport costs: The firms will be located at the point where their total transportation costs are at a minimum. The cost of procuring the raw materials can be reduced by moving the plant closer to their source. Distributive costs will be reduced by moving nearer to the market. These factors might pull in opposite directions. Therefore the producer tries to balance the relative advantages of each factor in deciding on the location for his plant.

2. Factors of production: Availability of factors of production are equally important in determining location.

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a. Land: The very high values of sound sites are prohibitive for most of the industries. Obtaining a suitable site may play a more important part in the location of new plant. Cheapest of the values of sites may attract industries to these regions. On this basis Government has launched the scheme of developing industrial estates in the backward regions.

b. Labour: The availability of suitable labour is a vital factor in the choice of factory location. Further if the labour of the area is aggressive, union minded and strike prone industrialists will be discouraged and will be making a move to other area.

c. Capital: With increasing automation and scale of production capital is becoming an essential resource. If capital is scarce and very expensive because of high interest rates, it becomes a major cost in the final cost of product. The availability of capital depends on the existence of banking and financial institutions. Industries prefer to get located in those regions where capital is easily available.

3. Power supply: Power supply has become an essential part of manufacturing. It increases the rate of production, productivity per employee, and will help in the dispersal and decentralisation of industries.
4. **Climate:** The natural choice of location for some industries is climate. The jute industry e.g., concentrated in West Bengal because of humidity of the climate. Thus climate plays an important role in the determination of location of industries using agricultural raw materials.

5. **External Economies:** When an industry grows up in a particular area, it becomes highly localised, firms in that industry may gain considerably from such concentration due to the existence of external economics of scale.

6. **Government Policy:** The need to bring about balanced regional development and development of industries in backward areas has led to provision of subsidies, concessions to industries in such regions. These may also act as pull factors to determine locations in these areas.

7. **Personal Factors:** Industrial entrepreneurs are not always guided by purely economic considerations in deciding location of their industrial enterprises. Personal factors preferences and prejudices are equally important. To quote from hypothetical industrialist "I am all right where I am. I am making a living. The home trade suits me. I don't like to move to a new location, it might be worse there. More income means higher taxes. Moving is bother. Here I know where I am .... If I move I might be richer, but I might be poorer. I know of a chap who went bankrupt after he moved. I am too old to think of expanding very much."
We've got all we need.  

Such a reaction are common among industrialists. The final location choice may, thus, be the result of personal preferences also rather than rational economic factors. The choice of location in practice is thus a multi dimensional problem and its solution is influenced by economic, political, social and personal, subjective as well as objective factors.

Interrelationship Between Industrial Activity and Regional Growth.

The interrelationship between location of economic activity specially manufacturing activity and the regional growth process, provides the analysis of a typical sequences of stages through which regions move during the growth process and the pattern of spatial structure that may emerge out of the interaction between the two. The concentration of economic activities in a space, economic or geographical gives rise to the growth poles. Growth generates in these poles and spreads to the surrounding regions. The existence of these poles thus affects the regional growth proces.

Growth Pole Theory.

The concept of growth pole, as developed by Perroux,

exists in abstract economic space. Growth poles are foci or centres in abstract economic space "from which centrifugal forces emanate and to which centripetal forces are attracted. Each centre being the centre of attraction and repulsion, has its proper field which is set in the fields of other centres". The theory recognises that inequality functional or spatial is inherent in the development process. Hence, "Growth does not appear everywhere at the same time, with variable intensity, it spreads through different channels, with variable terminal effects on the whole of the economy". Economic development is thus polarised and it inevitably results in clusters of economic activity.

Perroux was only concerned with economic growth, and primarily with firms and industries and their interrelations and not with the geographical implications of economic growth and intra and inter-industrial shifts. To Perroux geographical space appears to be only, and rather


26. Ibid., p.27.

"banal" type of space.\textsuperscript{28}

A growth pole consists of a 'propulsive firm' or 'propulsive industry' or a group of such firms or industries. The structure of this firm or industry is shaped on the basis of the set of relations existing between the size of a firm or industry, its capacity to innovate and the level of technology. The firm or industry is large in size operates at technologically advanced level and is able to spread its influence over different sectors and industries in the economy. Dominance is therefore a basic character of such a firm or industry and ..... "a dominant or propulsive, firm generally will be oligopolistic and large and will exert an important influence on the activities of suppliers and clients."\textsuperscript{29}

The important characteristics of a leading or propulsive industry are:

Firstly, it is relatively a new one, dynamic and operating at advanced levels of technology.

Secondly, its products enjoy a high income elasticity of demand.

Finally, it has strong inter-sectoral and inter-industry linkages. Therefore it is able to affect the size of the national output. The increase in total output


consists of the additional products produced by such an industry or group of industries and the additional product induced by them in other industries.

On the other hand a propulsive firm has the following characteristics.

Firstly, the firm is a large one.

Secondly, it belongs to a fast growing sector.

Thirdly, it has a high innovative capacity and is capable of generating growth within its environment.\(^{30}\)

The forces or impulses generated by these poles have their impact on surrounding geographical space. The structural transformation in functional space is followed by transformation in economic set-up in a geographical space. Therefore economic space has a regional character, as reflected in the clustering of activities at a point in geographical space.

The regional or geographical growth pole, as developed by Boudeville,\(^ {31}\) is located in the polarised space, i.e., in an urban area. It is "a set of expanding industries located in an urban area and inducing further development of economic activity throughout the zone of influence".\(^ {32}\)


\(^{32}\) Ibid., p. 11
The growth pole theory, therefore, emphasises the fact that the big industrial undertakings that are located in urban areas in geographical space are the points at which growth has its origin as well as a stimulative response. These growth poles generate and diffuse growth in the surrounding geographical space.

A development pole may be established by an industrial complex. An industrial complex may be defined in a very wide sense as an ensemble of technically and economically inter-connected industrial units usually located on a given territory. Such a complex is normally a 'planned' one, based on physical infrastructure and developed around one major industry - the propulsive industry - which forms the core of focal point of the complex. The concept of industrial complexes is basically functional.

The emergence and existence of growth poles of different size gives rise to a particular spatial structure in a geographical space. This spatial organisation as it exists at a particular point in time, is analysed by geographers and it has become the basis for formation of a theory known as the central place theory.

Central Place Theory.

The central place theory as developed by Christaller is a popular, well developed, and deeply researched model explaining the existing spatial structure. The theory seeks to explain the location and size, distribution of economic and social activities over geographical space.

The theory analyses the fact that geographical space is organised in a hierarchical form. The spatial hierarchy consists of central places of different size and scale, existing at various levels and interacting with each other. In this spatial hierarchy, the size of the centre is determined by the number and magnitude of goods and services that it provides to its own population and to the surrounding area. A central place, therefore, may be defined as "a place whose prime function is the provision of wide range of goods and services to a dispersed population around it".

The central places at different levels, provide for varying range of goods and services. The provision of goods and services in a particular centre is determined by two considerations, the threshold population and the market

34. Glasson, John., op.cit., p.149.
range for different goods and services. The threshold population of a particular good or service implies that, for any activity or service to develop and sustain, a minimum level of demand must be ensured.

The market range of good or service is the distance which the people are willing to travel to reach to the service or to purchase the good. It is, therefore, the outer boundary of the market area for any activity beyond which people would prefer to go to other centre. The threshold population and the market range of a good or service, then, determines the location of a good or service in a particular centre.

The position of the central place in the hierarchy depends upon the range of goods and services located in it and the area it serves. The service area or the zone of influence of a higher level centre is large in size and it provides a wide range of goods and services. The lower order centres have few goods and services and their service area is also small in size.


These elements form the basis of a hierarchy of central places developed by Christaller and others. These central places of different order are evenly distributed over space. In the hierarchy of central places, an implicit assumption is that a central place at a particular level in the hierarchy not only provides goods and services appropriate to its rank and level but also those provided by the lower order centres. Hence Christaller model does not allow for specialisation among different centres. The model also provides a partial analysis of spatial structure because all the centres here are service centres. It therefore, explains spatial distribution of service activity alone.

The theory, thus provides a useful explanation about the existing spatial organisation. Although in practice the existing pattern every where may not follow a strict regularities in the model, yet the theory serves as a better tool for analysing the location factors and spatial distribution of activities and services. It also provides a useful analysis of spatial implications of regional growth i.e., the emergence of the centres of different order, their hierarchical structure and functional relations among them. On the basis of this analysis, it may be possible to develop a policy framework involving guidelines for directing public

38. For details see, Hermansen.T., op.cit., 1971, p.28.
investments in strategic centres and strategic activities to bridge the gap in spatial structure.

The growth pole and central place theories may be linked together properly, for analysing a more general explanation about the spatial development process.39 These theories together provide a more comprehensive analysis of spatial distribution of activities and services and the incidence of growth over space.40

Interaction Between Industrial Location and Regional Growth: The Transmission Mechanism.

The two aspects of the growth process are the generation of growth and its diffusion over geographical space. Growth generates in the poles or centres of development, where industries tend to get located. The growth impulses released from the centre lead to the spreading of development over space or the mechanism may also lead to further concentration of growth in these poles.

An attempt to synthesise the geographical incidence of growth with the mechanism for geographical transmission


of growth impulses was made by Hirschman.\textsuperscript{41} He argues that for any economy to attain growth and higher income levels, it must develop some points or regional centres within the economy through concentration of investments in them. Growth is expected to 'trickle down' from these centres over a period of time and may pull up the lagging regions around them. The favourable effects generated by the centres in the trickle down process include an increased demand for agricultural goods of surrounding regions and expansion in employment opportunities for the people. Further the transfer of knowledge and technology from the centres is also beneficial to the surrounding regions.

Myrdal\textsuperscript{42} on the other hand argues that the polarisation forces tend to be stronger than the 'trickling down' forces. His 'backwash' and 'spread effects'\textsuperscript{43} are similar to Hirschman's polarisation and trickling down forces. The backwash effects include the loss of resources in the surrounding regions due to the movement of capital and human resources towards the centres of development.


\textsuperscript{43} Ibid., pp. 42-43.
Inadequate infrastructure facilities and other services, lack of skilled labour and entrepreneurial talents, reduce the investment opportunities. In the absence of education and other facilities the society continues to remain traditional and anti-progressive. All these forces of cumulative contraction lead to further poverty and stagnation. These effects are called 'backwash' effects.

The backwash effects get strengthened over a period of time, because as the centre grows rapidly the socio-cultural gap between the centre and its surrounding region goes on increasing. Further the development impulses generated by the centre may remain beyond the reach and adoption of the hinterland. Thus the possibilities of development in this region get reduced with the passage of time.

However, the development process at the centre do generate 'spread effects'. The expansion in the centres may increase the demand for agricultural products and raw materials produced by the surrounding regions. These regions may also gain from the social and cultural changes taking place in the centres. This process may, therefore contributed to the development of the whole area around them. Thus, the spread effects include the favourable social and economic effects generated by the centres of development, contributing to the development of surrounding
There exists a positive correlation between the level of development of a region and the strength of spread effects. In the early stages of development, the backwash effects are stronger than the spread effects. It is therefore essential that the backwash effects should be controlled and the spread effects should be strengthened through policy intervention, otherwise the alternative would be to wait for a natural end which may take a long time to occur.

Though the mechanism developed by Myrdal and Hirschman explains how the dual societies emerge during the process of development, yet the analysis does not provide the information regarding the channels through which growth

44. Myrdal, Gunnar., op.cit., 1958, pp.51-52. Myrdal pleads for favourable State policy directed towards reducing the regional inequalities. He says the existing State policy in the developing countries has been positive force for augmenting the regional inequalities. "In many of the poor countries the natural drift towards inequalities has been supported and magnified by the build-in-feudal and other egalitarian institutions and power structure which aid the rich in exploiting the poor".

45. Ibid., p.47. A natural end comes to the process when the increasing costs in the expanding region will halt the expansion. The high cost of living and the external diseconomies, produced by congestion, will ultimately outweigh the benefits of greater efficiency and higher money returns to the factors of production. These external and internal diseconomies generated in expanding regions may also halt immigration and may even reverse it.
is diffused. Further if policy intervention is needed then if what changes are required in the spatial structure to activate the favourable process. It is observed that many new ideas and innovations first originate in urban centres and then they are passed on to the towns in spatial hierarchy and through them to the surrounding regions.

A theoretical base to analyse the diffusion of ideas and innovations in a spatial structure is laid by Hagerstrand. The theory explains the fact that innovations do have a definite spatial and temporal pattern of adoption which normally tends to repeat itself for any new innovation that is introduced in a particular spatial system. Diffusion of innovation is a function of communication system. Such a diffusion takes place in a hierarchical form. The innovations tend to jump between big centres and from the higher level centres, to the centres at the next level in the urban hierarchy. Thus one channel of the spatial diffusion of growth is its spread through the 'hierarchical effect'. On the other hand, the spread in the local zone of influence of these urban centres is dominated

by 'neighbourhood' effects.  

Urbanisation.

It has generally been observed that there is a direct positive correlation between the growth of urbanisation and development of industries. Both are being cited by different authors as the cause of the others. While industrialisation leads urbanisation, urban growth on the other hand attract industries by offering economic and social infrastructure and thereby influencing the industrial location decision.

The Industrial Revolution which was followed by commercial revolution, produced a greater multiplication of towns and a more marked expansion in the size of the towns, than ever which has gone before. Thus during Industrial Revolution period industries played key role for the origin and shaping the size of urban centres. On the other side,

47. Hjermansen.T., 'Development Poles and Related Theories A Synoptic View'. op. cit., 1972, p.189 and also M.J. Mosely, 'Growth Poles in Spatial Planning'. Pergamon Press, Oxford, New York, 1974, p.55 The hierarchical and neighbourhood effects are defined by Cohen as "the hierarchical effect implies that the higher the ranking of a potential unit in a hierarchy, the greater the chance it will adopt the innovation. The neighbourhood effects means that the closer a potential adoption unit to the source of innovation or to another unit that has already adopted, the greater the probability that it will adopt".

urban centres being the centres of multi-functional and equipped with various socio-economic infrastructures attracted more and more industries.\textsuperscript{49}

Thus the rapid pace of urbanisation in a region provides essential condition for the rapid accumulation of capital, entrepreneurs and creation of institution that sustain the industrial growth. Once the process of industrial growth is, underway, it leads to stimulate itself through inter-industry linkage and agglomeration economies.\textsuperscript{50}

Conclusion:

A brief review of the theoretical approaches to the theory of industrial location shows that from partial cost analysis, the theories have moved forward to cover demand, profit and institutional as well as non-institutional factors in location analysis. In the earlier approaches transport costs and labour costs assumed importance, later demand became a significant factor. The integrated approach emphasises that profit maximisation is a basic motive choice of location rather than cost minimisation or revenue maximisation. In practice, location, besides governed by cost and demand factors, is also influenced by personal


\textsuperscript{50} Breeze, Gerald., op.cit., 1966, p.55.
factors, government policies etc.,

The influence of location of industries in few centres on regional growth process is analysed in Growth Pole and Central Place theories. The location of propulsive firms or industries in the centres give rise to growth poles. The centres of different order exist in geographical space with concentration of service activities. The growth transmission takes place in the surrounding region through the trickling down process or spread effects, but there is also a tendency for backwash effects being generated in the process which need to be controlled through proper government intervention. The transmission mechanism operating through hierarchical and neighbourhood effect provides sufficient scope for regional planning and policy to develop a suitable spatial structure to generate and diffuse the growth process in a planned manner and promote balanced regional development.

Thus the interaction between spatial organisation and industrial activity in its natural process leads to regional imbalances in development. Therefore a basic approach to check and correct existing imbalances is industrialisation of backward areas through a suitable policy of regional industrial dispersal.